

Automotive Product Catalogue





You develop for the future.
We help you shape it

Always there, wherever you need us

Decades of collaboration with customers in the automotive industry qualify HellermannTyton as an ideal partner for standard and tailor-made part solutions around all aspects of cable management in vehicles.

New technologies place high demands on vehicle design and construction. We can contribute positively to acceleration of development and production processes whilst helping you ensure highest quality standards whilst maintaining cost effectiveness.

Automotive expertise you can count on

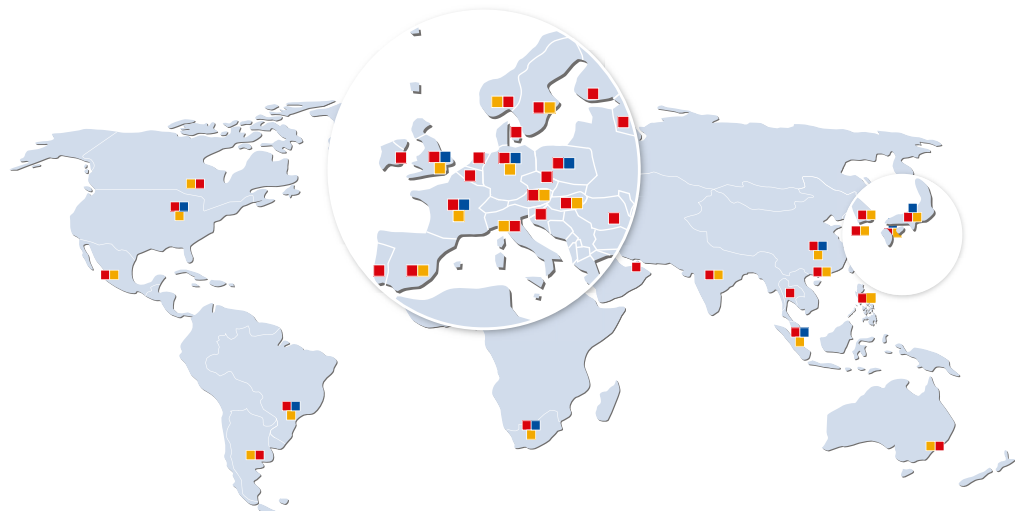
We have been working closely with the automotive industry for over 30 years. The result: products that are tailored precisely to individual requirements in vehicle construction and new innovations.

In HellermannTyton you find a specialized partner who understands your business needs. All of the components we manufacture for application in vehicles are certified according to current automotive standards.

We take pride in our ability to continually deliver top quality parts and services. We achieve this through rigorous quality assurance processes and continuous interaction with our customers.

Professional service worldwide

Our network of branch offices and distribution partners around the globe ensures a consistently high level of service, high flexibility and the fast response and delivery times you expect.



- Sales Office
- Manufacturing & Research
- Distribution Centre

Close to hand: our European development centres



HellermannTyton Germany,
Tornesch



HellermannTyton France,
Trappes



HellermannTyton Great Britain,
Manchester

You strive for development
optimisation.

We offer you best-fit solutions



Advanced engineering expertise: competence you can rely on

HellermannTyton has dedicated teams of engineers developing products tailored to customer specifications. We use the most current CAD and rapid prototyping systems and our experienced designers employ advanced development tools to ensure highest quality in our products from the outset. The result: innovative solutions and the opportunity to profit from our strength.



Highly complex plastic parts: Body Control Module bracket fixed to vehicle cockpit wall. Moulded as two separate parts and combined as a single unit on the assembly line.

Save development time

Our product developers work simultaneously with your engineers while we develop the solution. This shortens the development phase, even for parts whose dimensions have not yet been completely finalised.

Reduce weight

Replace metal with plastic without compromising on quality and performance. HellermannTyton injection-moulded parts offer complete freedom in geometric design, allowing easier integration of other functional elements. They are also corrosion-resistant.

Reduce component diversity

With our targeted cable-set analyses, we are able to demonstrate cost-effective alternatives, the application of preferred parts and how components can be optimised.

Choose the right material

Our many years' experience in product development will help you to select the right materials. If a suitable material for your application doesn't exist, we will work closely with you and our raw material suppliers to develop one. We're your reliable partner throughout the complete development process – from first contact to serial production.

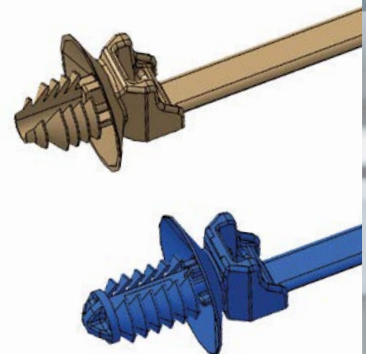
How can we support your vehicle development projects?
Find our contacts on page 275.

**You guarantee highest quality.
So do we**

Reengineering: the key to optimizing your development processes

Example: One-piece fixing tie.

By optimising the lamella geometry we achieve higher extraction force whilst lowering push-in force.



Design, engineering and manufacturing competence

We offer a diverse array of tailor-made components for automotive customers that incorporate decades of design and development experience. You can select from our extensive portfolio according to your requirements, or we can reengineer for a perfect fit, if the part is not exactly what you need.

Our products range from cable ties to two-component products for a wide range of challenges, such as high temperature or heavy duty and hybrid applications.



Examples of two-component custom parts for protecting cables and reducing vibration noise. The combination of materials is adjusted to meet the specific application requirements.



Challenges we take care of:



Vibration protection

Soft components permit firm, secure guidance of cable bundles whilst protecting them efficiently from vibration damage.



Slip resistance

Slippage of fixing elements on cable bundles can efficiently counteracted with specially designed soft components.



Noise reduction

Clamping cable bundles between soft layers ensures firm fixing of wires whilst decoupling the cable harness as a source of noise generation.



Waterproofing

Penetration of water or dirt can be inhibited with a soft seal adapted optimally to the surface where the part is fixed.

How can we support your vehicle development projects?
Find our contacts on page 275.

You set new standards in
vehicle construction.
We invent optimal components



Products that meet your demands

From ready-made solutions based on our comprehensive industry knowledge, to custom design projects including resident engineers, HellermannTyton offers the expertise automotive customers require.

We ensure the highest product and service standards through:

- use of high quality raw materials
- precision manufacturing through in-house tool construction
- mould flow analysis to optimise injection-moulding tools and production conditions
- comprehensive testing to ensure smooth processes, high quality, and the durability of products in our portfolio

Our extensive network of branches and distribution partners around the world ensures a consistently high level of service and flexibility, as well as quick response and delivery times.

Cable Ties and Fixings



EdgeClips provide an easy mounting solution for edge fastening.

Insulation



Heat shrink tubing SA47-LA for cable connection with thick inner adhesive liner. Ideal for electrical connections and splices in automobiles.

Cable Protection Systems



Helagaine HEGEMIP EMV braided sleeving provides protection from abrasion and electromagnetic waves.

Identification Systems



Professional identification solutions for hazardous environments: M-BOSS Compact Marker System.

Application Tooling

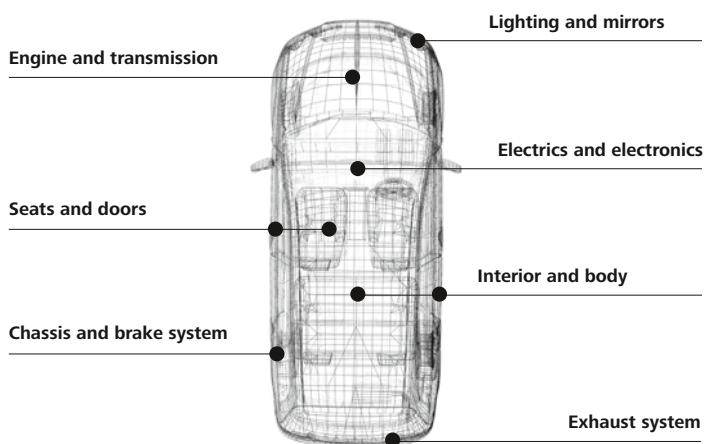


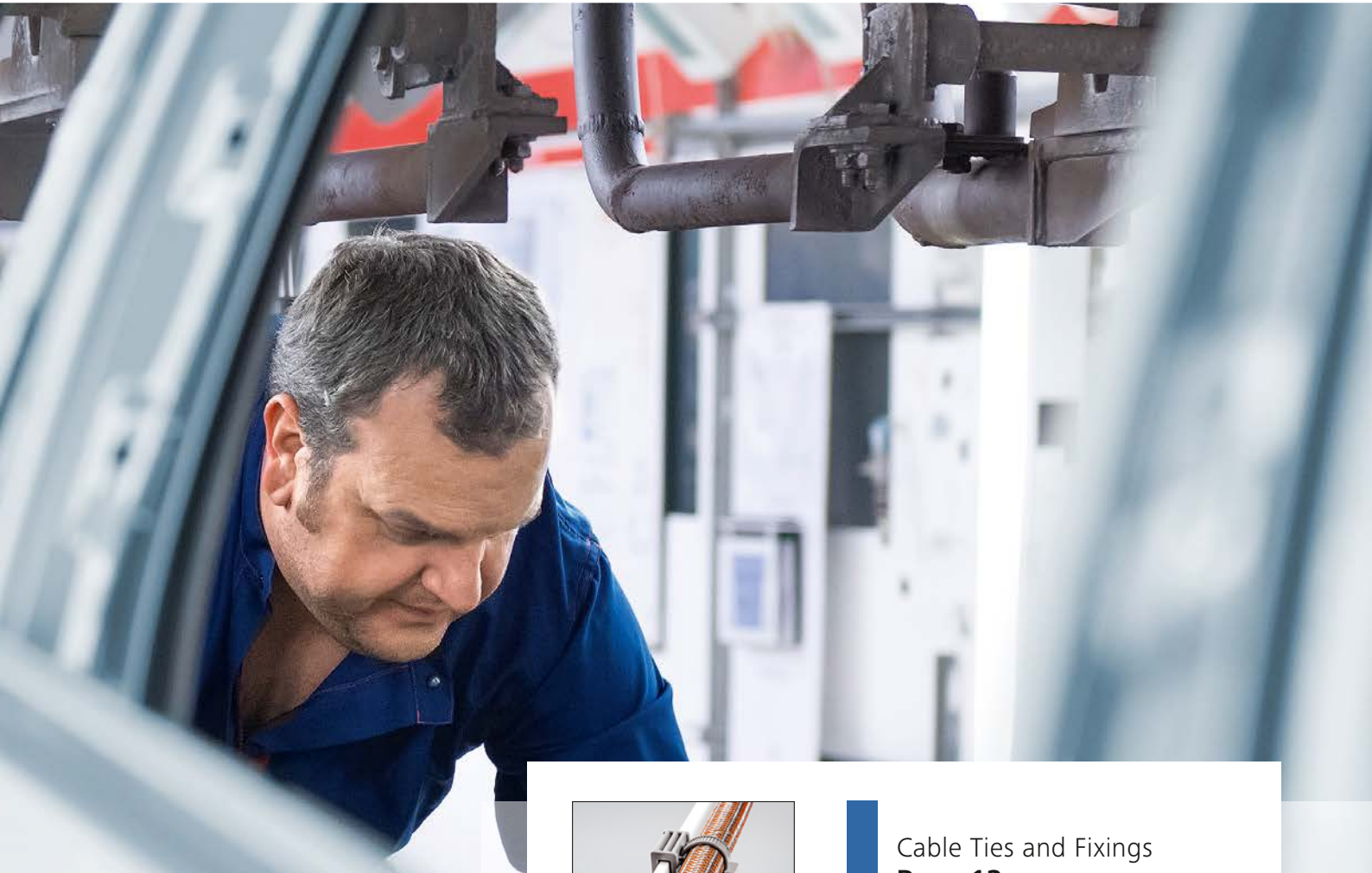
Automatic cable tying systems are ideal for large volume processing.

You seek the right solution.
We can provide it

The best solutions for cable bundling, fixing and protection in vehicle construction.

From cable bundling and protection through to identification, HellermannTyton offers you the ideal solution for use in vehicle construction – either from our existing product range, or as a customised development.

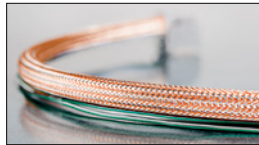




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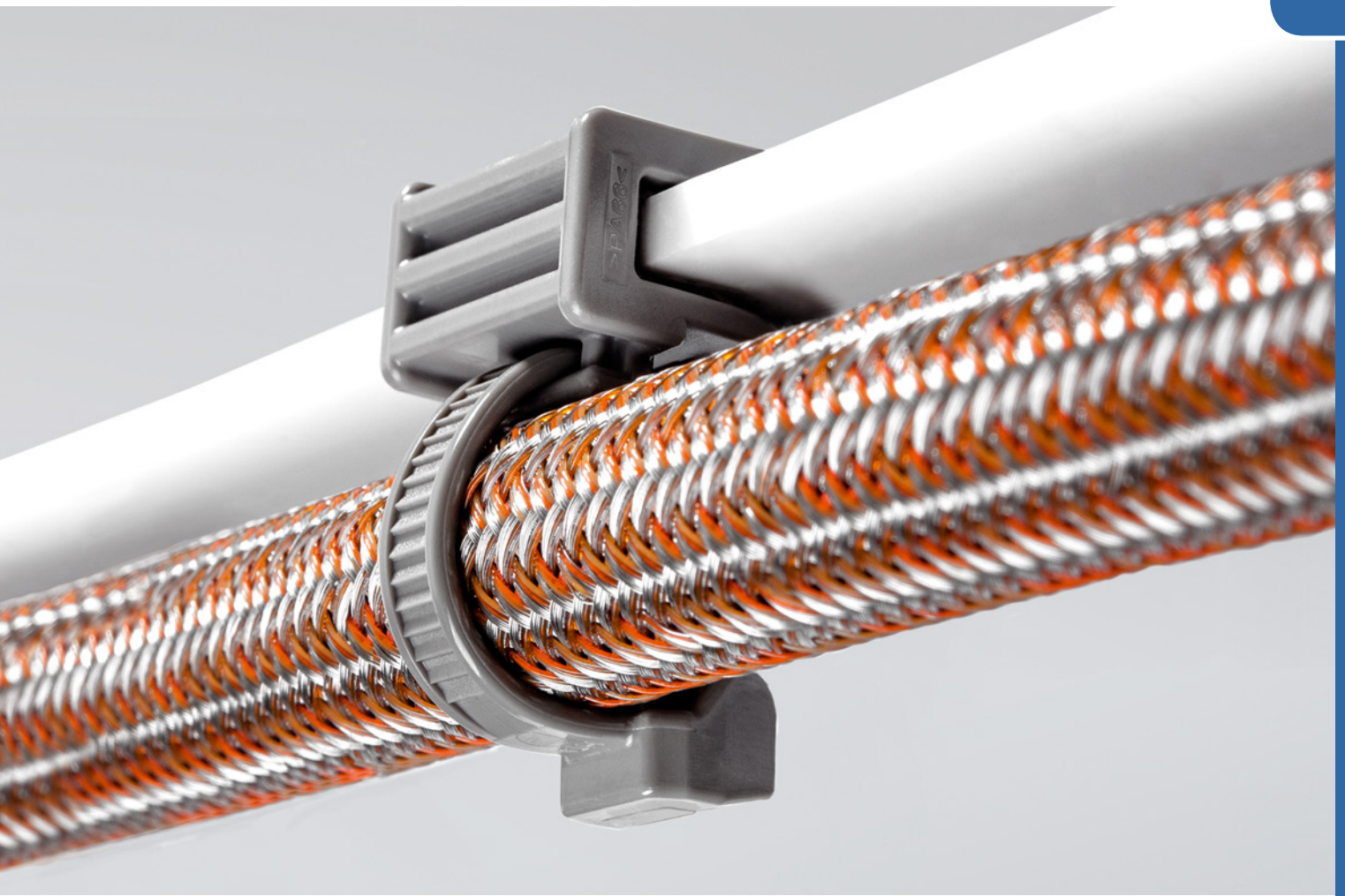
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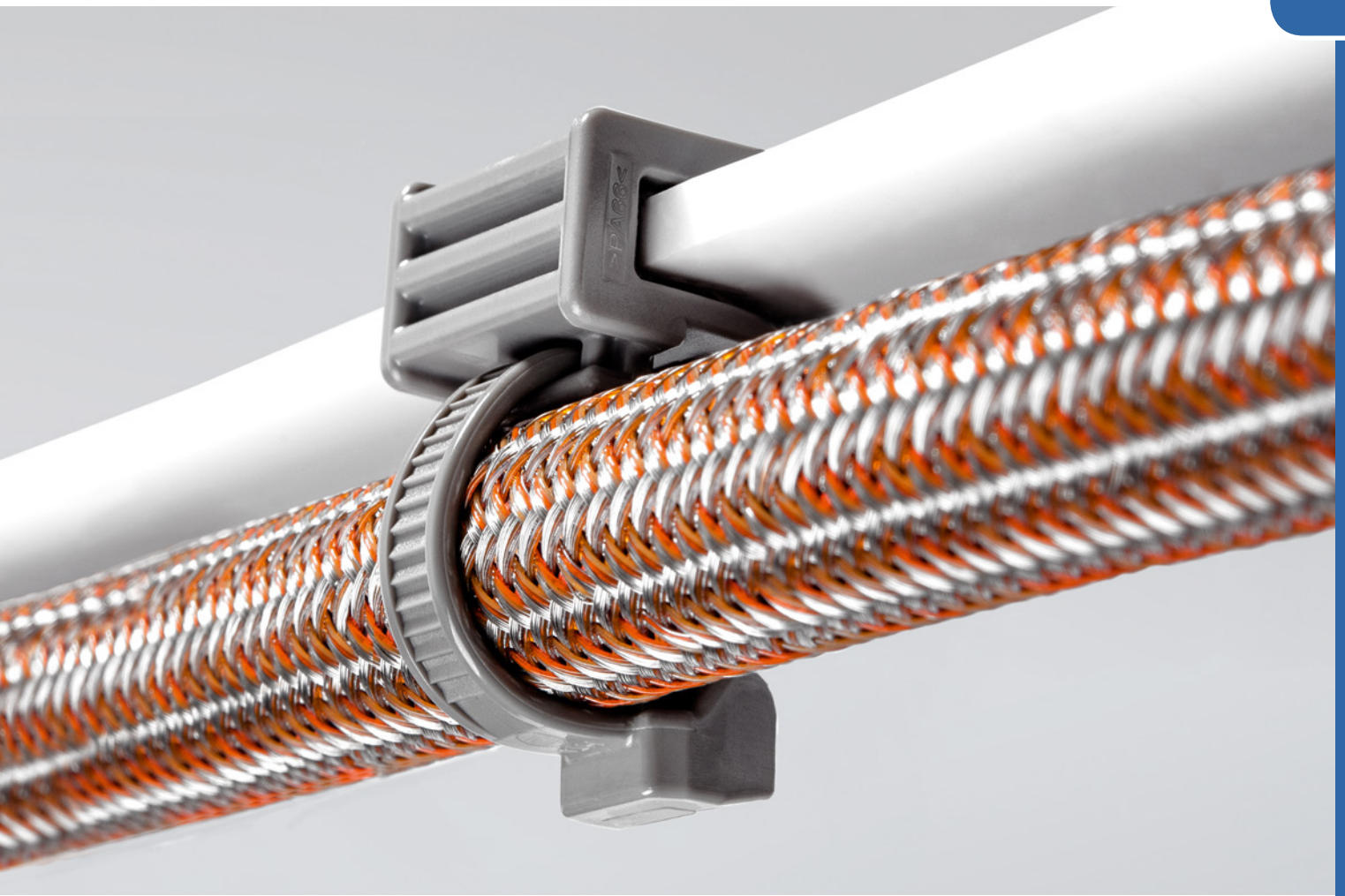
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Material Specification Overview

MATERIAL	Material Shortcut	Operating Temperature	Colour**	Flammability	Material Properties*	Material Specifications
Polyacetal	POM	-40 °C to +90 °C, (+110 °C, 500 h)	Natural (NA)	UL94 HB	<ul style="list-style-type: none"> Limited brittleness sensitivity Flexible at low temperature Not moisture sensitive Robust on impacts 	RoHS
Polyamide 12	PA12	-40 °C to +85 °C, (+105 °C, 500 h)	Black (BK)	UL94 HB	<ul style="list-style-type: none"> Good chemical resistance to: acids, bases, oxidizing agents UV-resistant 	HF RoHS
Polyamide 4.6	PA46	-40 °C to +150 °C (5000 h), +195 °C (500 h)	Natural (NA), Grey (GY)	UL94 V2	<ul style="list-style-type: none"> Resistance to high temperatures Very moisture sensitive Low smoke sensitive 	HF LFH RoHS
Polyamide 6	PA6	-40 °C to +80 °C	Black (BK)	UL94 V2	<ul style="list-style-type: none"> High yield strength 	RoHS
Polyamide 6, glass-fibre reinforced	PA6GF30	-40 °C to +100 °C	Black (BK)	UL94 HB	<ul style="list-style-type: none"> Good resistance to: lubricants, vehicle fuel and many solvents 	HF RoHS
Polyamide 6, high impact modified	PA6HIR	-40 °C to +80 °C	Black (BK)	UL94 HB	<ul style="list-style-type: none"> Limited brittleness sensitivity Higher flexibility at low temperature 	RoHS
Polyamide 6.6	PA66	-40 °C to +85 °C, (+105 °C, 500 h)	Black (BK), Natural (NA)	UL94 V2	<ul style="list-style-type: none"> High yield strength 	HF RoHS
Polyamide 6.6, glass-fibre reinforced	PA66GF13, PA66GF15	-40 °C to +105 °C	Black (BK)	UL94 HB	<ul style="list-style-type: none"> Good resistance to: lubricants, vehicle fuel, salt water and many solvents 	HF RoHS
Polyamide 6.6, heat and UV stabilised	PA66HSW	-40 °C to +105 °C	Black (BK)	UL94 V2	<ul style="list-style-type: none"> High yield strength Modified elevated max. temperature UV-resistant 	HF RoHS
Polyamide 6.6, heat stabilised	PA66HS	-40 °C to +105 °C	Black (BK), Natural (NA)	UL94 V2	<ul style="list-style-type: none"> High yield strength Modified elevated max. temperature 	HF RoHS
Polyamide 6.6, high impact modified	PA66HIR	-40 °C to +80 °C, (+105 °C, 500 h)	Black (BK)	UL94 HB	<ul style="list-style-type: none"> Limited brittleness sensitivity Higher flexibility at low temperature 	RoHS
Polyamide 6.6, high impact modified, heat and UV stabilised	PA66HIRHSW	-40 °C to +110 °C	Black (BK)	UL94 HB	<ul style="list-style-type: none"> Limited brittleness sensitivity Higher flexibility at low temperature Modified elevated max. temperature High yield strength, UV-resistant 	HF RoHS

Tefzel® is a registered trademark of DuPont. General linguistic usage for cable ties made from raw material E/TFE is Tefzel®-Tie. In addition to Tefzel® from DuPont HellermannTyton is also using equivalent E/TFE raw material from other suppliers.

**More colours on request.

*These details are only rough guide values. They should be regarded as a material specification and are no substitute for a suitability test. Please see our datasheets for further details.

 = **Minimum Loop Tensile Strength for Cable Ties (Newton)**

HF = Halogenfree

LFH = Limited Fire Hazard

RoHS = Restriction of Hazardous Substances

MATERIAL	Material Shortcut	Operating Temperature	Colour**	Flammability	Material Properties*	Material Specifications
Polyamide 6.6 , high impact modified, heat stabilised	PA66HIRHS	-40 °C to +105 °C	Black (BK)	UL94 HB	<ul style="list-style-type: none"> Limited brittleness sensitivity Higher flexibility at low temperature Modified elevated max. temperature 	RoHS
Polyamide 6.6 , high impact modified, scan black	PA66HIR(S)	-40 °C to +80 °C, (+105 °C, 500 h)	Black (BK)	UL94 HB	<ul style="list-style-type: none"> Limited brittleness sensitivity Higher flexibility at low temperature 	HF RoHS
Polyamide 6.6 , UV-resistant	PA66W	-40 °C to +85 °C, (+105 °C, 500 h)	Black (BK)	UL94 V2	<ul style="list-style-type: none"> High yield strength UV-resistant 	HF RoHS
Polyamide 6.6 V0 , High Oxygen Index	PA66V0-HOI	-40 °C to +85 °C, (+105 °C, 500 h)	White (WH)	UL94 V0	<ul style="list-style-type: none"> High yield strength Low smoke emissions 	HF LFH RoHS
Polyester	SP	-50 °C to +150 °C	Black (BK)	Halogen free	<ul style="list-style-type: none"> UV-resistant Good chemical resistance to: most acids, alkalis and oils 	HF LFH RoHS
Polyetheretherketone	PEEK	-55 °C to +240 °C	Beige (BGE)	UL94 V0	<ul style="list-style-type: none"> Resistance to radioactivity Not moisture sensitive Good chemical resistance to: acids, bases, oxidizing agents 	HF LFH RoHS
Polyethylene	PE	-40 °C to +50 °C	Black (BK), Grey (GY)	UL94 HB	<ul style="list-style-type: none"> Low moisture absorption Good chemical resistance to: most acids, alcohol and oils 	HF RoHS
Polyolefin	PO	-40 °C to +90 °C	Black (BK)	UL94 V0	<ul style="list-style-type: none"> Low smoke emissions 	HF LFH RoHS
Polypropylene	PP	-40 °C to +115 °C	Black (BK), Natural (NA)	UL94 HB	<ul style="list-style-type: none"> Floats in water Moderate yield strength Good chemical resistance to: organic acids 	HF RoHS
Stainless Steel	SS304, SS316	-80 °C to +538 °C	Natural (NA)	Non burning	<ul style="list-style-type: none"> Corrosion resistant Antimagnetic Weather resistant Outstanding chemical resistance 	HF LFH RoHS

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**More colours on request.

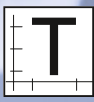
*These details are only rough guide values. They should be regarded as a material specification and are no substitute for a suitability test. Please see our datasheets for further details.

= Minimum Loop Tensile Strength for Cable Ties (Newton)

HF = Halogenfree

LFH = Limited Fire Hazard

RoHS = Restriction of Hazardous Substances

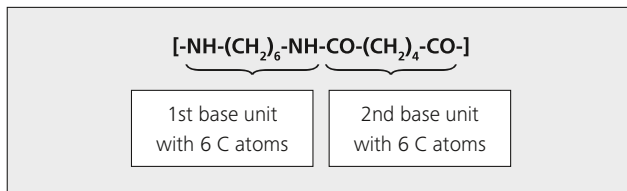


Properties of Polyamide PA66

Polyamides are among the most important thermoplastic synthetic materials. Thermoplastics can be reshaped by heating as often as required without undergoing chemical decomposition or other negative changes. This makes polyamide ideal for processing via injection moulding into high quality products. About 90 % of cable ties and fixings from HellermannTyton are made from this material. Polyamide is also known under the brand name of Nylon®, which was introduced by the Dupont company.

The inner structure of polyamide displays a partial order of polymer chains, i.e. polyamides are partially crystalline. Due to the tighter packing of the individual molecular chains polyamide only has limited transparency to light. The plastic is therefore described as translucent.

The molecular chains of PA66 are made from two base units:



Each base unit contains 6 carbon atoms (C). Hence the name PA66.

The polyamide PA66 has many properties which are highly advantageous for HellermannTyton cable ties and fixings, such as:

- High strength, rigidity and hardness
- High dimensional stability, even under the effect of heat
- High abrasion resistance

Having a wide range of polyamides and additives allows for an optimum adaptation of the properties of the finished product to suit the respective requirements.

The following PA66 variants are used for HellermannTyton products:

- Polyamide 6.6 standard (PA66) for temperature conditions of up to +85 °C
- Polyamide 6.6 Heat Stabilised (PA66HS) for temperature conditions of up to +105 °C
- Polyamide 6.6 UV Stabilised (PA66W) for exterior use
- Polyamide 6.6 Heat Stabilised and UV Stabilised (PA66HSW) for exterior use up to +105 °C
- Polyamide 6.6 Impact Resistant (PA66HIR) for high elasticity requirements
- Polyamide 6.6 Impact Resistant and Heat Stabilised (PA66HIRHS) for high elasticity requirements and temperatures up to +105 °C
- Polyamide 6.6 V0 for high standards of fire protection

Water content in polyamide

Polyamide is a hygroscopic material - this means that it absorbs and releases water. The mechanical properties are significantly affected by the water content – especially flexibility and minimum tensile strength.

In a standard atmosphere of 23 °C and 50 % relative humidity, the degree of water saturation of polyamide is around 2.5 %. For optimal processing of cable ties it is therefore important that the polyamide has a water content of approximately 2.5 % in a state of equilibrium.

The quality and functionality of the products are thus affected by the water content, therefore the correct storage of our products is crucial. Please read our separate instructions on storage.

Since humidity is so critical to the quality of the tie, the question arises: What happens if the tie is installed and the water content in the tie alters?

The water content determines the flexibility and strength of a tie. At a water content of approximately 2.5 % the tie has the ideal flexibility for installation. When the strap is being threaded through the head of the tie, the pawl must be flexible enough to “see-saw” over the serration of the strap without breaking. On the other hand, there must also be adequate material rigidity for the serrations of the pawl to engage with the serrations of the strap during the tying process so that a 'positive locking' action is achieved. After achieving the positive locking action the tie is in a static condition. Changes in the mechanical properties of the tie as a function of water content are insignificant during this status.



Properties of UV-stabilised Polyamide PA66W

The question constantly arises as to whether a black cable tie is suitable for use outside. This is dependant on the application of the tie, but in general the following statements can be made:

A black cable tie made of polyamide 6.6 standard (PA66) is only coloured black with a low proportion of carbon black. This is not sufficient to protect the material from damage caused by UV-radiation in the long term.

Products made from UV-stabilised polyamide PA66W are produced in accordance with ASTM standard D6779 with a higher carbon black percentage of approx. 2 %. So they resist UV-radiation in the European area for a considerably longer period than standard PA66.

This is clearly illustrated by the comparison of the two images:

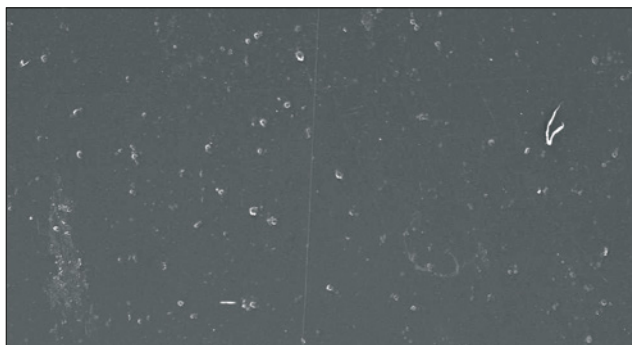
After 500 hours of UV-radiation exposure

Polyamide 6.6 standard (PA66) dyed black:



The joint has been damaged throughout by UV-radiation.

Polyamide 6.6 UV-stabilised (PA66W) with approx. 2 % carbon black:



The joint has only been altered at isolated points by the UV-radiation.

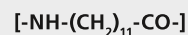
For outdoor use, therefore, we recommend our range of products made from UV-stabilised polyamide (PA66W).

A simple practical test: "the hammer test"

You can quickly determine whether or not a cable tie is UV stabilised. Strike with a hammer the tail of the strap on the tie. Hold up this flattened end to the light. Cable ties with a carbon black content of about 2 % allow no light through and look black throughout. Standard black ties, however, are transparent on the flattened end.

Properties of Polyamide PA12

Apart from PA66, there are polyamides which are less hygroscopic. These include PA12, which has a molecular chain made of a base unit with 12 carbon atoms:



PA12 has the following advantages over PA66:

- Less hygroscopic - saturation at 23 °C and 50 % relative humidity is approximately 1 %
- Better impact performance
- Good weather resistance, even without a special additive

These three properties make PA12 ideal for use outdoors, in particular when requirements may include impact resistance.

The water absorption of PA12 is not only less than that of PA66 but also slower. This is the requirement where the mechanical properties need to remain relatively unaffected by changing environmental conditions.

Properties of Polyamide PA46

Polyamide PA66, despite the use of additives, is not suitable for long-term use in temperatures of +105 °C. Due to considerably better heat resistance, polyamide PA46 is more suitable for temperatures of up to and exceeding 150 °C (depending on the length of time of operation).

The molecular chain of PA46 is composed of two base units:]

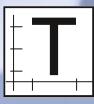


1st base unit
with 4 C atoms

2nd base unit
with 6 C atoms

Advantages of PA46 over PA66:

- Greater rigidity, even at higher temperatures
- Higher operating temperature ranges of up to +150 °C (5,000 hours)
- Greater form stability at higher temperatures
- Excellent chemical resistance



Properties of Polyetheretherketone PEEK

PEEK, a linear aromatic polymer, is semi-crystalline and is widely regarded as the highest performance thermoplastic material currently available. A summary of key physical properties is as follows:

High temperature performance

- Melting temperature of +343 °C (649 °F)
- Continuous use temperature of +240 °C (464 °F) (UL 746B)

Wear resistance

- Outstanding wear resistance over wide ranges of pressure, velocity, temperature and counter facial roughness

Chemical resistance

- Excellent resistance to a wide range of chemical environments, even at elevated temperatures
- The only common environment that dissolves it is concentrated sulfuric acid

Fire, smoke and toxicity

- Highly stable and requires no flame-retardant additives to achieve a V-0 rating at 1.45 mm thickness
- The composition and inherent purity of the material results in extremely low smoke and toxic gas emission in fire situations

Hydrolysis resistance

- PEEK is not attacked by water or pressurized steam
- Components that are constructed from these materials retain a high level of mechanical properties when continuously conditioned in water at elevated temperatures and pressures

Radiation resistance

- Excellent radiation resistance due to the energetically stable chemical structure of PEEK

Purity

- PEEK materials are inherently pure with exceptionally low levels of ionic extractables
- Excellent out gassing characteristics

This makes PEEK the right choice for any high performance application in any industry with a clearly outstanding continuous use temperature of +240 °C.

Properties of Ethylene Tetrafluoroethylene (E/TFE) - Tefzel®

E/TFE can be best described as a rugged thermoplastic with an outstanding balance of properties.

Mechanically, it is tough, has medium stiffness, impact and abrasion resistance.

E/TFE can perform successfully in applications where other materials are lacking in mechanical toughness, broad thermal capability and the ability to meet severe environmental conditions.

Tefzel® is a registered trademark of DuPont.

Summary of key properties:

- No load continuous use temperature of +170 °C
- Weather resistant
- Inert to most solvents and chemicals
- Hydrolytically stable
- Substantially better resistance to radiation than other plastic materials



Chemical resistance of various plastics

▲ = resistant
 △ = partly resistant
 ○ = not resistant

These values are only rough guides. They should be regarded as a material specification and are no substitute for a suitability test. Please see our technical datasheets for further details.

	Conc. (%)	Temp. (°C)	PA66	PA46	PA12	PA11	POM	PP	E/TFE (Tefzel®)	TPU	PEEK
Acetaldehyde, liquid	100	23 °C	▲	○		▲	▲	△	▲	○	▲
Acetowne	100	23 °C	▲	▲	▲	▲	▲	▲	▲	○	▲
Allyl chloride	100	23 °C	▲			▲		▲		○	
Aniline	100	23 °C	▲	△	△	▲	△	▲	▲	○	▲
Aromatic compounds							▲	○	▲	△	▲
Benzaldehyde		23 °C	▲	△		▲	▲	▲	▲	○	▲
Benzine/Benzol mix		23 °C	▲	▲	▲	▲	▲	△	▲	△	▲
Benzol	100	23 °C	▲		▲	▲	△	△	▲	△	▲
Bromine		23 °C		○	○	○		○		○	
Carbon bisulphide	100	23 °C	▲	○	▲	○	▲	○	▲	○	▲
Carbon tetrachloride	100	23 °C	▲	▲	△	○	▲	△	▲	○	▲
CFC								△			
Chlorine, gaeous	100	23 °C	○			○		○	▲	△	
Chlorine, liquefied	100	23 °C	○	○		○		○			
Chlorobenzene	100	23 °C			○	△	△	▲			
Chloroform	100	23 °C		○	○	▲	○	△		○	
Chromic acid 10 %	20	23 °C	○	○		○	○	▲	▲	○	▲
Chromic acid 20 %	10	20 °C	△	○		○	△	▲	▲		▲
Chromic acid 50 %	50	20 °C	○	○		○	○	▲	▲	○	
Cyclohexane	100	23 °C	▲			▲	▲	▲	▲	▲	▲
Cyclohexanone	100	23 °C	▲			▲	▲	▲	▲		▲
Decahydronaphthlene	100	23 °C	▲			▲	▲	△	▲	▲	▲
Diethyl ether	100	23 °C	▲			▲	▲	△	▲		▲
Di-isopropyl ether	100	23 °C						△			
Dimethyl formamide	100	23 °C	▲	▲		▲	▲	▲	▲		▲
Diocetyl phthalate		23 °C	▲	▲		▲	▲	▲	▲	○	▲
Engine oil	100	23 °C			▲	▲	▲	▲	▲	▲	▲
Ethanonic acid 10 %	10	20 °C	○	△	△	▲	▲	▲	▲		
Ethanonic acid 100 %	100	23 °C	○	○		▲	△	▲	▲		
Ethanonic acid 25 %	25	20 °C	○			▲	△	▲	▲		
Ethanonic acid 50 %	50	20 °C	○			▲	△	▲	▲		
Ethyl acetate	100	23 °C		▲	▲	▲	△	△		△	▲
Formic acid	98	23 °C	○		○	▲	○	▲	▲	○	△
Freon		23 °C						▲			▲
Heptane	100	23 °C	▲	▲	▲	▲	▲	▲	▲	▲	▲
Hydrogen peroxide 10 %	10	20 °C	△			▲	▲	▲	▲	△	
Hydrogen peroxide 30 %	30	23 °C	○	○		▲	▲	▲	▲	△	
Ketone			▲	▲			▲	▲	▲		▲
Methyisobutylketone	100	23 °C	▲			▲	▲	▲	▲		▲
Methylethylketone	100	23 °C	▲	▲		▲	△	▲	▲	○	▲
Nitric acid 10 %	10	20 °C	○		○	○	○	▲	▲	○	▲
Nitric acid 50 %	50	23 °C	○		○	○	○	○	▲	○	○
Nitrobenzene	100	23 °C	▲	△		▲	▲	▲	▲	○	▲
Ordinary petrol		23 °C		▲		▲	▲	▲	▲		▲
Paraffin oil		23 °C	▲	▲	▲	▲	▲	▲	▲	▲	▲
Perchloroethylene		23 °C	▲		▲	△	▲	△	▲	○	▲
Petroleum		23 °C	▲	▲	▲	▲	▲	▲	▲	▲	▲
Phenol	65	23 °C	○	○	○	○	○	▲	▲	○	
Potass. Permanganate	6	23 °C	○	○	○	○	▲	▲	▲	△	▲
Salad oil		23 °C		△		▲		▲			▲
Silicon oil		23 °C	▲	▲	▲	▲	▲	▲	▲	▲	▲
Sulphuric acid 10 %	10	20 °C	○		△	▲	○	▲	▲	○	△
Sulphuric acid 50 %	50	20 °C	○				○	▲	▲	○	○
Sulphuric acid 96 %	96	23 °C	○	○			○	○	▲	○	○
Toluol	100	23 °C	▲		▲	▲	▲	△	▲	○	▲
Trichlorethylene	100	23 °C	▲	△	△	△	△	△	▲	○	▲
Water, cold			▲		▲	▲	▲			▲	▲
Water, hot						▲		▲		△	▲
Xylene	100	23 °C	▲	▲	▲	▲	▲	△	▲	○	▲

Tefzel® is a registered trademark of DuPont.

General linguistic usage for cable ties made from raw material E/TFE is Tefzel®-Tie. In addition to Tefzel® from DuPont HellermannTyton is also using equivalent E/TFE raw material from other suppliers.

What does flammability UL94 mean?

UL is the shortcut for Underwriters Laboratories. This is an independent organisation in the United States to control and certificate product safety.

Beside a lot of product standards UL also specified the flammability test UL94 for plastic materials. UL94 is a material burning test done on a defined specimen of the raw material but not a test on final products.

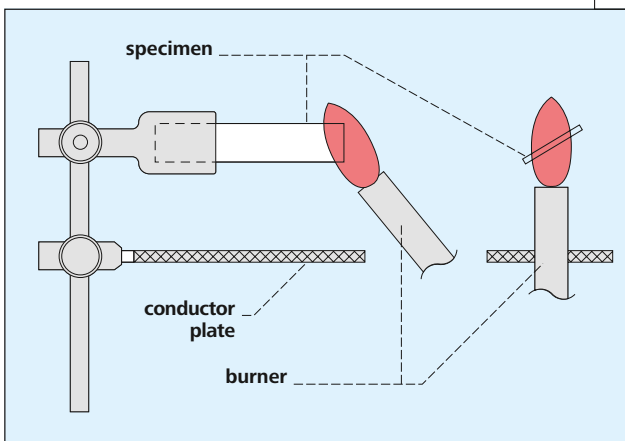
UL94 differs between a horizontal burning test UL94 HB (picture 1) and a vertical burning test UL94 V (picture 2). For the vertical test UL94 V there are three flame ratings defined: UL94 V0, UL94 V1 and UL94 V2.

In all these burning tests an open flame is applied for a certain time to the specimen. As the burning behaviour also depends on the thickness of the material it is important to classify the material not only according to HB, V0, V1 or V2 but also to mention the thickness of specimen.

UL94 HB:

Horizontal burning test

1



Test criteria:

- burning rate of specimen in mm/min.

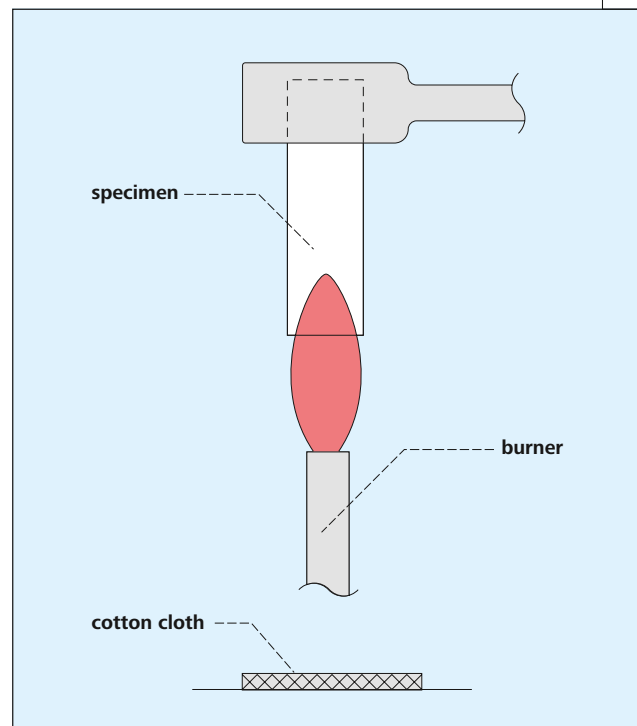
Classification:

- according to HB

UL94 V:

Vertical burning test

2

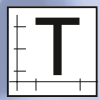


Test criteria:

- afterflame time of specimen
- drip of flaming particles

Classification:

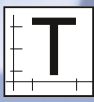
- according to V0, V1 or V2



Following table is a summary of test procedures and requirements of the UL94 classification.

Classification	Horizontal Test UL94		Vertical Test UL94		
	HB		V0	V1	V2
Number of specimen	3	3	5	5	5
Thickness of specimen	< 3 mm	3 to 13 mm	up to max. 13 mm		
1st flame application	30 sec.	30 sec.	10 sec.	10 sec.	10 sec.
2nd flame application	-	-	10 sec.	10 sec.	10 sec.
Burning rate	max. 75 mm/min	max. 40 mm/min	-	-	-
Afterflame time after 1st flame application for each individual specimen	-	-	max. 10 sec.	max. 30 sec.	max. 30 sec.
Afterflame time after 2nd flame application for each individual specimen	-	-	max. 30 sec.	max. 60 sec.	max. 60 sec.
Total afterflame time for all 5 specimen after 1st and 2nd flame application	-	-	max. 50 sec.	max. 250 sec.	max. 250 sec.
Afterflame or afterglow of any specimen up to its end allowed	yes	yes	no	no	no
Cotton indicator ignited by flaming particles or drops allowed	-	-	no	no	yes

Flammability behaviour on the following product pages are always related to the raw material burning rate according to UL94. Most commonly used raw materials for cable ties and fixing elements are Polyamide 6.6 standard, Polyamide 6.6 weather resistant and Polyamide 6.6 heat stabilised. These materials normally fulfill UL94 V2 requirement.



HellermannTyton cable ties conform to IEC 62275 standard

As a leading global manufacturer of quality, high performance cable management products for over 80 years, HellermannTyton's extensive fastening and fixings portfolio reflects our long-standing industry expertise.

Cable ties from the inside serrated (T-Series, Q-Series), the outside serrated (OS-Series) as well as our metal cable ties (MBT-Series and MST-Series) have been tested in accordance with the international cable tie standard IEC 62275 (Cable management systems - Cable ties for electrical installations). This standard supersedes EN 50146:2000 and all HellermannTyton products fully comply with the requirements. Cable ties manufactured from the standard material polyamide 6.6 (PA66), heat-stabilised polyamide 6.6 (PA66HS), UV-stabilised polyamide 6.6 (PA66W) and stainless steel grades SS304 and SS316 have been successfully tested and approved.

The IEC 62275 standard includes the following tests:

- Installation test on minimum and maximum specified bundle diameters
- Installation test at minimum specified installation temperature
- Impact test at minimum specified operating temperature
- Minimum tensile strength (in the standard this is described as the loop test)
- Loop tensile test after heat ageing at the specified operating temperature
- Loop tensile test after heat cycling at the minimum and maximum operating temperatures
- Loop tensile test after humidity and heat cycling at the minimum and maximum operating temperatures
- Contribution to the spread of fire on both the actual product and test substrate (tissue paper)
- Loop tensile and visual tests after exposure to ultraviolet light radiation for PA66W ties
- Resistance to corrosion (dependent on material)
- Loop tensile test after vibration test for metal cable ties

The following cable ties have been tested and certified:

- T-Series inside serrated in PA66-NA, PA66-BK, PA66HS-NA, PA66HS-BK, PA66W
- OS-Series outside serrated in PA66-NA, PA66-BK, PA66HS-NA, PA66HS-BK, PA66W
- Q-Series inside serrated in PA66-NA, PA66-BK, coloured PA66, PA66HS-NA, PA66HS-BK
- MBT-Series, uncoated in SS316 material grade
- MST-Series, uncoated in SS304 material grade



Material specification please see page 16.

In addition to the IEC 62275, we are proud to offer our customers products that have been certified by well-known and independent laboratories such as:



Profit from our knowledge and experience and the high-quality of HellermannTyton cable management solutions for your particular industry and market.

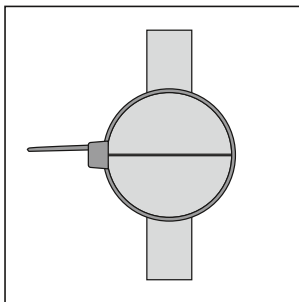


Determination of minimum tensile strength

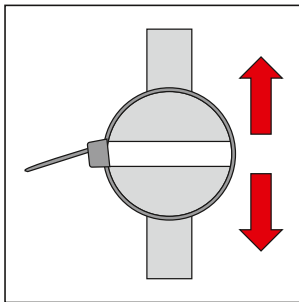
The minimum tensile strength is a critical selection criterion for cable ties. It expresses how much loading a cable tie can bear. This minimum tensile strength is determined in accordance with the Military Specification and Standards of the USA. Test conditions being laid down precisely in MIL-S-23190E:

The test procedure to determine minimum tensile strength:

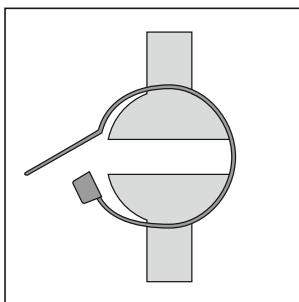
- Conditioning of the test pieces
- Construction of the test apparatus
- Application of the tie on a split test probe
- Test speed



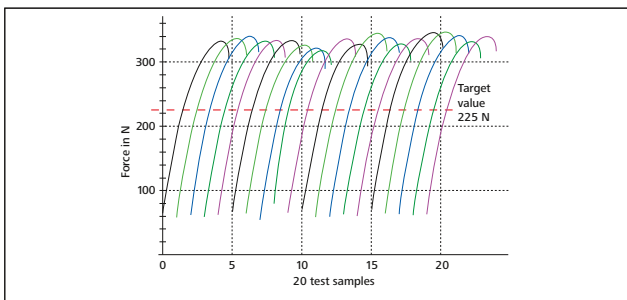
The cable tie is fixed onto a split mandrel test probe with the suitable cable tie application tool.



The mandrel is opened at a defined speed.



The loading at which the cable tie fails is determined. This value is stated in Newtons (N) and is recorded through a computer programme reading the tests. This programme produces graphs as outlined below.



Typical measurement protocol of a T50R made of PA66 with a minimum tensile strength of 225 N.

Explanation of minimum tensile strengths

What does a minimum tensile strength of 225 N (50LBS) mean?

To explain what this value means, the mass with which the tie can be loaded is calculated. The unit of measurement of the mass is stated in kg. To do so, the unit Newton (N) is shown in the following way:

$$[N] = [kg * m/s^2]$$

The formula for calculating the mass is:

$$\text{Mass} = \text{minimum tensile strength} / \text{acceleration due to gravity}$$

The acceleration due to gravity is 9.81 m/s²

$$\text{Mass} = \text{minimum tensile strength} / [kg * m/s^2] / 9.81 [m/s^2]$$

At a minimum tensile strength of 225 N (50LBS) the mass is:

$$\text{Mass} = 225 [kg * m/s^2] / 9.81 [m/s^2]$$

The units m/s² cancel each other out, leaving the unit [kg] for the mass. Thus:

$$\text{Mass} = 225 / 9.81 \text{ kg} = 22.9 \text{ kg}$$

Therefore, a T50R cable tie with a minimum tensile strength of 225 N (50LBS) can be loaded with 22.9 kg.

Conversely, with the required loading capacity the minimum tensile strength can be calculated by a mass:

$$\text{Min. tensile strength} = \text{mass} * 9.81 [m/s^2]$$

If the tie is to be loaded with, for example, 53 kg this produces:

$$\text{Minimum tensile strength} = [53 \text{ kg}] * 9.81 [m/s^2] = 520 \text{ N}$$

In order to withstand a load of 53 kg, the tie must therefore have a minimum tensile strength of 520 N. In this case, select our T120R with a minimum tensile strength of 535 N (120LBS).

$$\frac{N}{kg} \quad 225 \text{ N} / 9.81 = 22.9 \text{ kg}$$

$$\frac{kg}{N} \quad 53 \text{ kg} * 9.81 = 520 \text{ N}$$

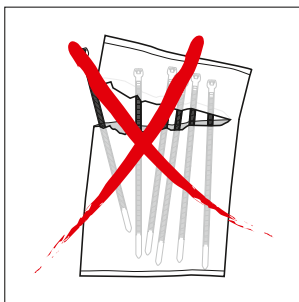
$$\frac{N}{N} = \text{Minimum Loop Tensile Strength for Cable Ties (Newton)}$$

Optimum storage conditions for cable ties made of Polyamide (PA)

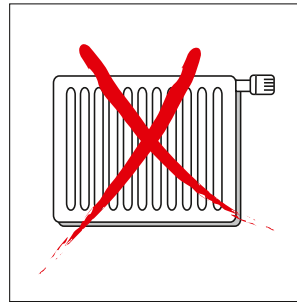
HellermannTyton cable ties, fastenings and fixings are manufactured from high-quality polyamide (PA). This industrial synthetic material is mainly processed using injection moulding, but can also be extruded.

Polyamide is a hygroscopic material. This means that the material absorbs and loses moisture. For optimum handling of cable ties it is important that the material is in a condition of equilibrium with a water content of approximately 2.5 %.

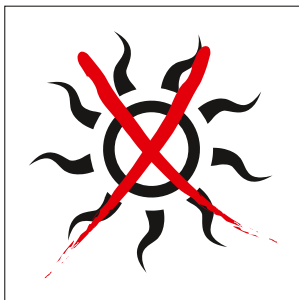
The packaging used by HellermannTyton ensures that the water content in the material remains constant. Therefore, it is important to store the products in their original packaging to preserve the quality of the ties.



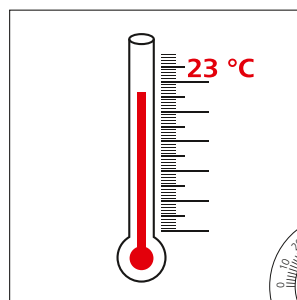
1. Once opened you should use the ties as quickly as possible.
2. Always store ties in the sealed plastic bag made of polyethylene.



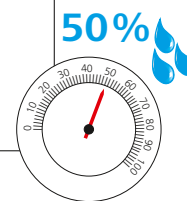
5. Store the product away from direct sources of heat.
6. Avoid contact with heat: for example, do not place on the radiators.



3. Do not expose the product to direct sunlight.
4. Do not store the product in sunlight; for example, on the windowsill.



7. The ideal storage conditions are those of the central European standard climate: 23 °C



50 % relative humidity

Introduction to the main locking technologies used for cable ties

HellermannTyton offers a wide range of cable ties for use in different applications. By constantly refining our products and satisfying the ever-changing demands of the market, various locking technologies have been developed. Below you will find a brief overview of three most common locking technologies and their characteristics.

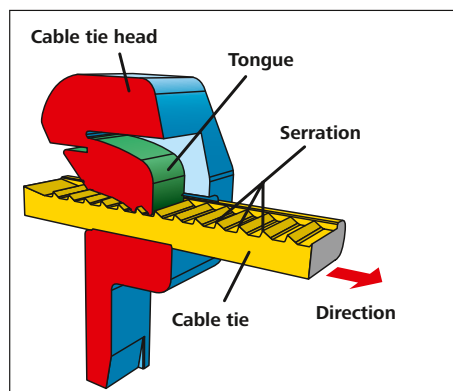
Cable ties with plastic pawls

This technology is used in 90 % of all polyamide (PA) cable ties applied by HellermannTyton. In order to cover a variety of applications, there are different variants of this system, for example: releasable versions, in-line versions, open head versions.

These are one-piece cable ties, the pawl is moulded as an integral part of the cable tie, thereby building in inherent strengths.

Locking technology

Positive locking is achieved by engaging the pawl with the strap serrations. This allows the cable tie to perform to the published minimum tensile strength, that is the loading that the cable tie can hold under application.

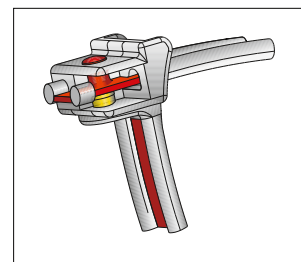
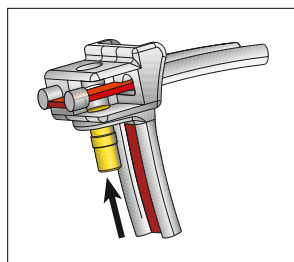


KR series cable ties

This cable tie is distinguished by its smooth strap and unique locking mechanism. With the KR series the chamfered head achieves an especially firm fit around the bundled material.

Locking technology

This patented lock technology takes advantage of the excellent deformation properties of polyamide (PA). Here, the glass fibre-reinforced (GRP) locking pin (yellow) is forced into the strap by the use of an application tool - either the KR6/8 or KR8PNSE. The strap is deformed into the head of the tie by the application of the pin, thereby locking the cable tie in position and allowing for the bundling of heavy loads.



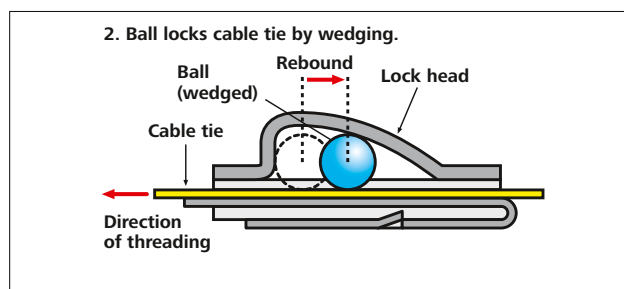
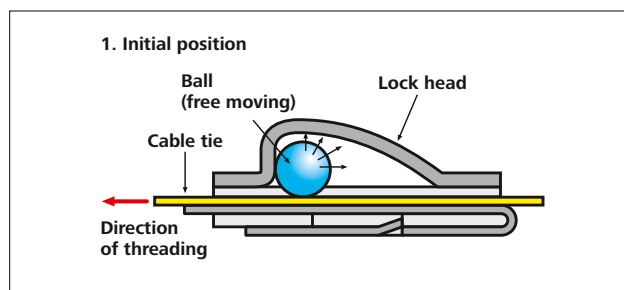
MBT series of cable ties

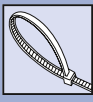
Made of stainless steel grade 304 or 316, the MBT range of cable ties have no serrations on the strap and are threaded parallel through the head, gliding under a metal ball-bearing locking mechanism. By using the MK9SST application tool the cable tie is tensioned and the strap cut to a flush finish.

Locking technology

The strap is locked into the head by means of the small ball-bearing. The ball locks into the small end of the wedged shaped housing, forming a positive locking with the strap.

This cable tie is not suitable for rigid objects. Retraction of the ball-bearing (see drawing) is required into the small end of the wedged shaped housing to allow for a positive locking of the strap and also to make a flush cut of the end of the strap. Retraction, therefore, cannot take place with the bundling of inflexible materials. To bundle rigid objects LFPC channel should be laid as buffer between strap and bundled material to compensate for this retraction. This locking technology allows for minimum tensile strengths of up to 7,000 Newton.





Cable Ties and Fixings

Cable Ties Inside Serrated

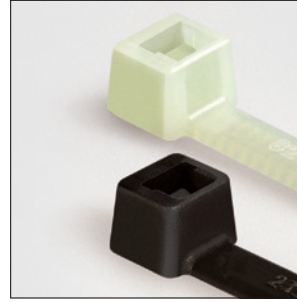
Cable Ties for temperatures up to +105 °C (heat stabilised)

T-Series in PA66HS natural and black

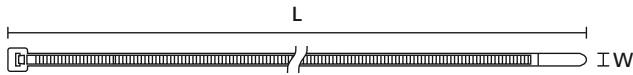
T-Series cable ties for bundling and securing cables, pipes and hoses. These cable ties can be used for almost any type of application.

Features and Benefits

- Heat stabilised cable tie available in a wide range of sizes
- Made from 100% high quality plastic, allows for good recycling
- Inside serration for a strong hold around bundles
- Easy application either manually or with a processing tool
- Simply to insert due to the ergonomically bent tail
- Higher temperature resistance up to +105 °C



T-Series.



T-Series



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
T18R	2.5	100.0	22.0	80	PA66HS	Black (BK)	100 pcs.	2;4-6	111-01950
	2.5	100.0	22.0	80	PA66HS	Natural (NA)	100 pcs.	2;4-6	111-01959
T18I	2.5	145.0	35.0	80	PA66HS	Black (BK)	100 pcs.	2;4-6	111-02358
	2.5	145.0	35.0	80	PA66HS	Natural (NA)	1,000 pcs.	2;4-6	111-02359
T18L	2.5	205.0	55.0	80	PA66HS	Black (BK)	100 pcs.	2;4-6	111-02049
	2.5	205.0	55.0	80	PA66HS	Natural (NA)	100 pcs.	2;4-6	111-02159
T30R	3.5	150.0	35.0	135	PA66HS	Natural (NA)	100 pcs.	2;4-6	111-03259
	3.5	150.0	35.0	135	PA66HS	Black (BK)	100 pcs.	2;4-6	111-03050
T30L	3.5	198.0	50.0	135	PA66HS	Black (BK)	100 pcs.	2;4-6	111-03450
	3.5	198.0	50.0	135	PA66HS	Natural (NA)	100 pcs.	2;4-6	111-03459
T30LL	3.5	290.0	80.0	135	PA66HS	Black (BK)	1,000 pcs.	2;4-6	111-03660
	3.5	290.0	80.0	135	PA66HS	Natural (NA)	100 pcs.	2;4-6	111-03569
T40R	4.0	175.0	40.0	180	PA66HS	Black (BK)	100 pcs.	2;4-8	111-01623
	4.0	175.0	40.0	180	PA66HS	Natural (NA)	100 pcs.	2;4-8	111-01627
T50S	4.6	150.0	35.0	225	PA66HS	Natural (NA)	100 pcs.	2-10	111-05859
	4.6	150.0	35.0	225	PA66HS	Black (BK)	100 pcs.	2-10	111-05850
T50R	4.6	200.0	50.0	225	PA66HS	Black (BK)	100 pcs.	2-10	111-04950
	4.6	200.0	50.0	225	PA66HS	Natural (NA)	100 pcs.	2-10	111-04882
T50I	4.6	300.0	85.0	225	PA66HS	Black (BK)	100 pcs.	2-10	111-05250
	4.6	300.0	85.0	225	PA66HS	Natural (NA)	100 pcs.	2-10	111-05259
T50L	4.6	390.0	110.0	225	PA66HS	Black (BK)	100 pcs.	2-10	111-05450
	4.6	390.0	110.0	225	PA66HS	Natural (NA)	100 pcs.	2-10	111-05436
T80R	4.7	210.0	55.0	355	PA66HS	Black (BK)	1,000 pcs.	2-12	117-08070
	4.7	210.0	55.0	355	PA66HS	Natural (NA)	100 pcs.	2-12	111-05059

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Please note! Not all products listed on this page may have this approval.



Cable Ties for temperatures up to +105 °C (heat stabilised)

T-Series in PA66HS natural and black

TYPE	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Tools	Article-No.
T80I	4.7	300.0	85.0	355	PA66HS	Black (BK)	100 pcs.	2-12	111-08250
	4.7	300.0	85.0	355	PA66HS	Natural (NA)	100 pcs.	2-12	111-08259
T80L	4.7	390.0	110.0	355	PA66HS	Black (BK)	100 pcs.	2-12	111-00388
	4.7	390.0	110.0	355	PA66HS	Natural (NA)	100 pcs.	2-12	111-05459
T120S	7.6	225.0	55.0	535	PA66HS	Black (BK)	50 pcs.	3;9-12	111-12850
	7.6	225.0	55.0	535	PA66HS	Natural (NA)	50 pcs.	3;9-12	111-12824
T120I	7.6	300.0	80.0	535	PA66HS	Natural (NA)	100 pcs.	3;9-12	111-12249
T150R(H)	7.6	365.0	100.0	670	PA66HS	Black (BK)	100 pcs.	3;9-12	111-15050
	7.6	365.0	100.0	670	PA66HS	Natural (NA)	100 pcs.	3;9-12	111-15069
T120R(E)	7.6	387.0	100.0	535	PA66HS	Black (BK)	100 pcs.	3;9-12	111-12050
	7.6	387.0	100.0	535	PA66HS	Natural (NA)	100 pcs.	3;9-12	111-12059
T120M	7.6	460.0	125.0	535	PA66HS	Black (BK)	100 pcs.	3;9-12	111-00153
T120XM	7.6	600.0	175.0	535	PA66HS	Black (BK)	50 pcs.	3;9-12	111-12700
	7.6	600.0	175.0	535	PA66HS	Natural (NA)	50 pcs.	3;9-12	111-12719
T120L	7.6	760.0	225.0	535	PA66HS	Black (BK)	50 pcs.	3;9-12	111-12440
	7.6	760.0	225.0	535	PA66HS	Natural (NA)	50 pcs.	3;9-12	111-12449
T150L	8.8	820.0	245.0	780	PA66HS	Black (BK)	25 pcs.	9-12	111-15410
T150M	8.9	530.0	150.0	780	PA66HS	Black (BK)	25 pcs.	9-12	111-15609
T150XL	8.9	1,095.0	330.0	780	PA66HS	Black (BK)	25 pcs.	9-12	111-15510

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PN5P2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



Cable Ties and Fixings

Cable Ties Inside Serrated

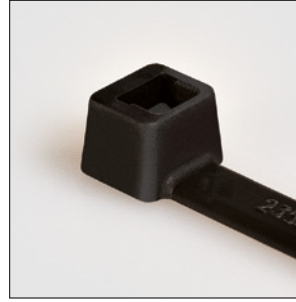
Cable Ties for outdoor use (UV-resistant)

T-Series in PA66W black

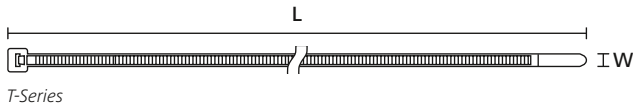
T-Series cable ties for bundling and securing cables, pipes and hoses. These cable ties can be used for almost any type of application.

Features and Benefits

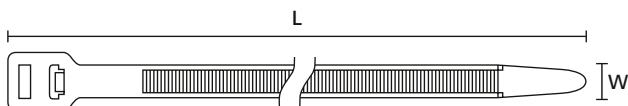
- Weather-resistant black cable tie available in a wide range of sizes
- Made from 100% high quality plastic, allows for good recycling
- Inside serration for a strong hold around bundles
- Easy application either manually or with a processing tool
- Simply to insert due to the ergonomically bent tail
- UV-resistant



T-Series.



T-Series



T250-series



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
T18R	2.5	100.0	22.0	80	PA66W	Black (BK)	100 pcs.	2;4-6	111-01960
T18I	2.5	145.0	35.0	80	PA66W	Black (BK)	100 pcs.	2;4-6	111-02360
T18L	2.5	205.0	55.0	80	PA66W	Black (BK)	100 pcs.	2;4-6	111-02160
T25LL	2.8	330.0	95.0	110	PA66W	Black (BK)	100 pcs.	2;4-6	111-02660
T30R	3.5	150.0	35.0	135	PA66W	Black (BK)	100 pcs.	2;4-6	111-03260
T30L	3.5	198.0	50.0	135	PA66W	Black (BK)	100 pcs.	2;4-6	111-03460
T30LL	3.5	290.0	80.0	135	PA66W	Black (BK)	100 pcs.	2;4-6	111-03570
T40R	4.0	175.0	40.0	180	PA66W	Black (BK)	100 pcs.	2;4-8	111-01625
T50S	4.6	150.0	35.0	225	PA66W	Black (BK)	100 pcs.	2-10	111-05860
T50R	4.6	200.0	50.0	225	PA66W	Black (BK)	100 pcs.	2-10	111-04889
T50M	4.6	245.0	65.0	225	PA66W	Black (BK)	100 pcs.	2-10	111-06206
T50I	4.6	300.0	85.0	225	PA66W	Black (BK)	100 pcs.	2-10	111-05260
T50L	4.6	390.0	110.0	225	PA66W	Black (BK)	100 pcs.	2-10	111-05440
T50LL	4.6	445.0	130.0	225	PA66W	Black (BK)	100 pcs.	2-10	111-06000
T80R	4.7	210.0	55.0	355	PA66W	Black (BK)	100 pcs.	2-12	111-05060
T80I	4.7	300.0	85.0	355	PA66W	Black (BK)	100 pcs.	2-12	111-08290
T80L	4.7	390.0	110.0	355	PA66W	Black (BK)	100 pcs.	2-12	111-05460
T120S	7.6	225.0	55.0	535	PA66W	Black (BK)	50 pcs.	3;9-12	111-12830

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.




Please note! Not all products listed on this page may have this approval.



Cable Ties for outdoor use (UV-resistant)

T-Series in PA66W black

TYPE	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Tools	Article-No.
T120I	7.6	300.0	80.0	535	PA66W	Black (BK)	100 pcs.	3;9-12	111-12230
T150R(H)	7.6	365.0	100.0	670	PA66W	Black (BK)	100 pcs.	3;9-12	111-14860
T120R(E)	7.6	387.0	100.0	535	PA66W	Black (BK)	100 pcs.	3;9-12	111-12060
T120M	7.6	460.0	125.0	535	PA66W	Black (BK)	100 pcs.	3;9-12	111-12660
T120L	7.6	760.0	225.0	535	PA66W	Black (BK)	50 pcs.	3;9-12	111-12430
T150L	8.8	820.0	245.0	780	PA66W	Black (BK)	25 pcs.	9-12	111-15460
T150M	8.9	530.0	150.0	780	PA66W	Black (BK)	25 pcs.	9-12	111-15660
T150XL	8.9	1,095.0	330.0	780	PA66W	Black (BK)	25 pcs.	9-12	111-15502
T150XLL	8.9	1,325.0	405.0	780	PA66W	Black (BK)	25 pcs.	9-12	111-15305
T250X	12.5	370.0	100.0	1,115	PA66W	Black (BK)	25 pcs.	11-12	111-25100
T250R	12.5	515.0	125.0	1,115	PA66HIRHSUV	Black (BK)	25 pcs.	11-12	111-24805

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



Cable Ties and Fixings

Cable Ties Inside Serrated

Cable Ties for higher impact resistant Polyamide 6.6 ScanBlack

T-Series in PA66HIR(S) black

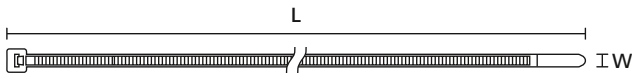
T-Series cable ties for bundling and securing cables, pipes and hoses. These cable ties can be used for almost any type of application.

Features and Benefits

- Impact resistant black cable tie available in a wide range of sizes
- Made from 100% high quality plastic, allows for good recycling
- Inside serration for a strong hold around bundles
- Easy application either manually or with a processing tool
- Simple to insert due to the ergonomically bent tail
- Higher flexibility in cold environments



T-Series.



T-Series



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
T50R	4.6	200.0	50.0	225	PA66HIR(S)	Black (BK)	100 pcs.	2-10	111-04890
T50I	4.6	300.0	85.0	225	PA66HIR(S)	Black (BK)	100 pcs.	2-10	111-00222
T50L	4.6	390.0	110.0	225	PA66HIR(S)	Black (BK)	100 pcs.	2-10	111-05441
T120I	7.6	300.0	80.0	535	PA66HIR(S)	Black (BK)	100 pcs.	3;9-12	111-12203
T120R(E)	7.6	387.0	100.0	535	PA66HIR(S)	Black (BK)	100 pcs.	3;9-12	111-12032
T120L	7.6	760.0	225.0	535	PA66HIR(S)	Black (BK)	50 pcs.	3;9-12	111-12402

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

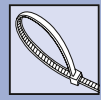
Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



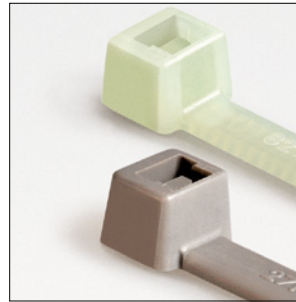
Cable Ties for temperatures up to +150 °C in Polyamide 4.6

T-Series in PA46 natural and grey

T-Series cable ties for bundling and securing cables, pipes and hoses. These cable ties can be used for almost any type of application.

Features and Benefits

- Higher temperature cable tie available in a wide range sizes
- Made from 100% high quality plastic, allows for good recycling
- Inside serration for a strong hold around bundles
- Easy application either manually or with a processing tool
- Simple to insert due to the ergonomically bent tail
- Higher temperature resistance up to +150 °C



T-Series.



T-Series

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
T18R	2.5	100.0	22.0	80	PA46	Natural (NA)	1,000 pcs.	2;4-6	114-01879
T30R	3.5	150.0	35.0	135	PA46	Grey (GY)	100 pcs.	2;4-6	111-00264
	3.5	150.0	35.0	135	PA46	Natural (NA)	100 pcs.	2;4-6	114-03079
T50R	4.6	200.0	50.0	225	PA46	Grey (GY)	100 pcs.	2-10	111-00824
	4.6	200.0	50.0	225	PA46	Natural (NA)	100 pcs.	2-10	111-00525
T50I	4.6	300.0	85.0	225	PA46	Natural (NA)	100 pcs.	2-10	111-05220
T50L	4.6	390.0	110.0	225	PA46	Natural (NA)	100 pcs.	2-10	111-00526
T120R(E)	7.6	387.0	100.0	535	PA46	Natural (NA)	100 pcs.	3;9-12	114-12179

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools										
2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



Cable Ties and Fixings

Cable Ties Inside Serrated

Cable Ties with streamlined design

X-Series

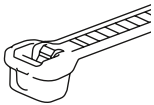
The X-series range of cable ties provides a new and improved design compared with standard cable ties, delivering a range of benefits and enhanced performance. With a new streamlined design and smaller head, the X-Series cable ties provide a superior fixing solution for tight applications, whilst also benefiting from a better grip around the bundle. This professional cable tie range is available in weather resistant and high impact / heat stabilised materials, ensuring these fixings consistently perform well at both high temperatures and in cold environments.

Features and Benefits

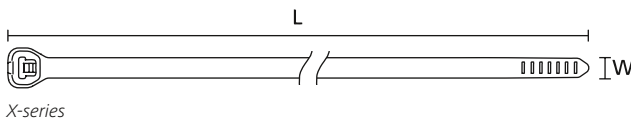
- Inside serrated cable tie
- High tensile strength around cable bundles
- Smooth, rounded head design
- Space saving solution
- Improved ergonomic design
- Provides a secure fastening with no lateral movement
- Complies with SAE Aviation specifications



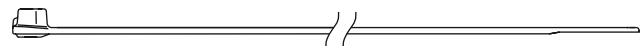
The X-series family.



The smooth rounded head of the X-series



X-series



X-series

TYPE	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Tools	Article-No.
X80S	4.7	150.0	35.0	355	PA66HIRHS	Black (BK)	100 pcs.	2-12	108-00001
X80R	4.7	200.0	50.0	355	PA66HIRHS	Black (BK)	100 pcs.	2-12	108-00004
X80I	4.7	300.0	84.0	355	PA66HIRHS	Black (BK)	100 pcs.	2-12	108-00018
X80L	4.7	385.0	110.0	355	PA66HIRHS	Black (BK)	100 pcs.	2-12	108-00028
X120R	7.7	369.0	100.0	535	PA66HIRHS	Black (BK)	100 pcs.	3;9-12	108-00040
X250R	13.0	535.0	150.0	1,115	PA66HIRHS	Black (BK)	50 pcs.	11-12	108-00050
X250I	13.0	715.0	205.0	1,115	PA66HIRHS	Black (BK)	50 pcs.	11-12	108-00045

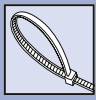
All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



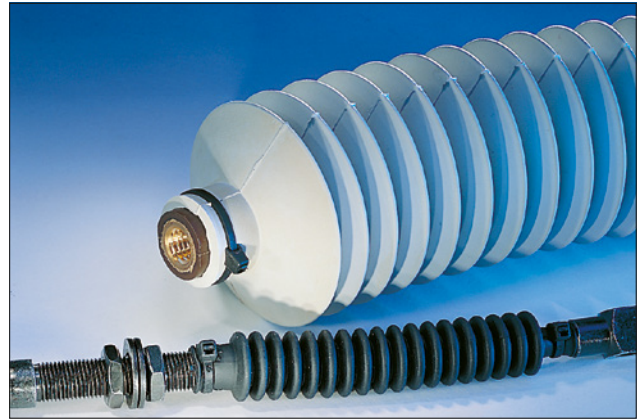
Cable Ties for hose and gaiter

CTT-Series natural and black

Designed to secure pipes, hoses and gaiters where low pressures are being secured. These ties can be used in many industries, including automotive, white goods manufacturing, medical and construction.

Features and Benefits

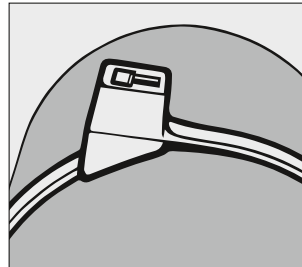
- Curved head design offers a good fit to the bundle
- Inside serration for a strong hold onto bundles
- Easy application either manually or with a processing tool



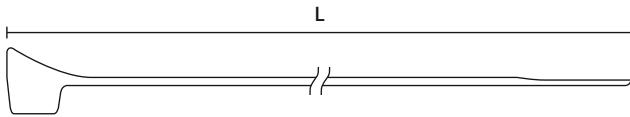
CTT ties installed on flexible gaiters.



Material specification please see page 16.



For secure fixing of round and solid shapes.



CTT Hose Ties

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
CTT20R	2.5	101.6	13.0	90	PA66	Natural (NA)	100 pcs.	2;4-6	112-51919
	2.5	101.6	13.0	90	PA66HS	Black (BK)	1,000 pcs.	2;4-6	112-51960
CTT60R	4.7	205.0	45.0	265	PA66HS	Black (BK)	100 pcs.	2-12	112-56060
	4.7	205.0	45.0	265	PA66	Black (BK)	100 pcs.	2-12	112-56019
HT120R	7.6	340.0	90.0	535	PA66HS	Black (BK)	100 pcs.	6-10	112-00100

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools										
2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



Cable Ties and Fixings

Cable Ties Inside Serrated

Cable Ties for parallel routing

DH-Series

Ideal for running two cables in parallel that need to be separated. These ties allow for installation of a second cable run without the need for additional cable ties.

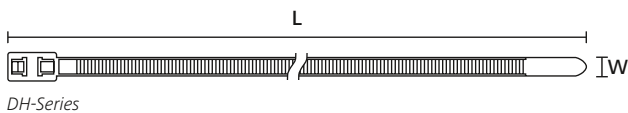
The DH ties are also widely used within the packaging industry - the first loop closes and secures the bag, whilst the second loop can be made into a carrying handle (subject to weight).

Features and Benefits

- Available in a wide range of materials
- Cable tie designed with two heads which creates an inside and outside serrated loop
- For parallel routing of two bundles with only one cable tie
- Bundles can be of different diameter
- Easy application either manually or with a processing tool



Parallel routing of two cable bundles using DH-Series. The double head creates an inside and an outside serrated loop.



DH-Series



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Ø max. side loops	N	Min. Tensile Strength 2nd loop (N)	Material	Colour	Pack Cont.	Tools	Article-No.
T50RDH	4.7	210.0	19.0	225	180	PA46	Grey (GY)	100 pcs.	2;4-6;8	117-05168
	4.7	210.0	19.0	225	180	PA66	Black (BK)	100 pcs.	2;4-6;8	117-05000
	4.7	210.0	19.0	225	180	PA66	Natural (NA)	100 pcs.	2;4-6;8	117-05002
	4.7	210.0	19.0	225	180	PA66HS	Black (BK)	100 pcs.	2;4-6;8	117-05050
	4.7	210.0	19.0	225	180	PA66W	Black (BK)	500 pcs.	2;4-6;8	117-05060
T50IDH	4.7	305.0	38.1	225	180	PA66	Natural (NA)	1,000 pcs.	2;4-6;8	117-05303
	4.7	305.0	38.1	225	180	PA66HS	Black (BK)	1,000 pcs.	2;4-6;8	117-05350
	4.7	305.0	38.1	225	180	PA66W	Black (BK)	100 pcs.	2;4-6;8	117-05360
T50LDH	4.7	395.0	50.8	225	180	PA66	Natural (NA)	1,000 pcs.	2;4-6;8	117-05461
	4.7	395.0	50.8	225	180	PA66HS	Black (BK)	100 pcs.	2;4-6;8	117-00008

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools

2	4	5	6	8
MK20	MK3SP	MK3PNSP2	EVO7	MK7P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



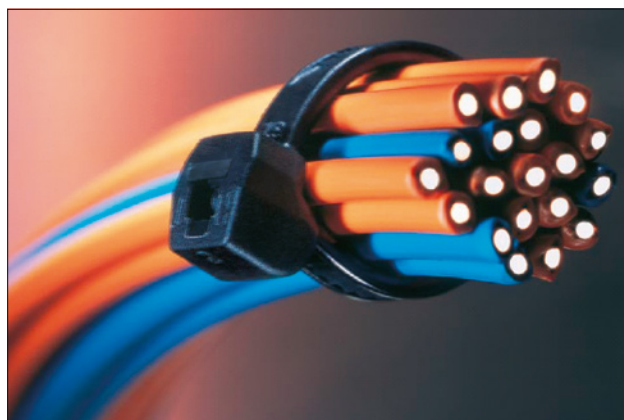
Cable Ties for thin-walled bundles

OS-Series

OS-Series cable ties are used in many areas where thin-walled or soft insulation wires and cables are being installed, e. g. automotive and aircraft industry. OS ties made from PA66V0 material are suitable for applications where safety regulations are required, e.g. reduction of smoke and dangerous gases.

Features and Benefits

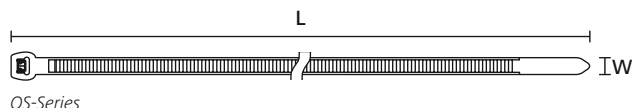
- Outside serrated cable tie with smooth surface to the bundle
- Tie follows the contours of the cable bundle perfectly
- Takes up less space due to curved head
- Easy insertion and high tensile strength
- For higher temperature or Limited Fire Hazard demand: Material PA46 or PA66V0
- Easy application either manually or with a processing tool



The contoured head needs less installation space, provides low insertion force and offers high strength.



The curved head design of the OS-Series



TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
T18ROS	2.5	100.0	1.6	20.0	80	PA66HS	Black (BK)	500 pcs.	2;4-6	118-04701
	2.5	100.0	1.6	20.0	80	PA66HS	Natural (NA)	1,000 pcs.	2;4-6	118-00035
	2.5	100.0	1.6	20.0	80	PA66V0-HOI	White (WH)	100 pcs.	2;4-6	118-00079
T30ROS	3.4	145.0	1.6	35.0	135	PA66HS	Natural (NA)	100 pcs.	2;4-6	118-00064
	3.4	145.0	1.6	35.0	135	PA66HS	Black (BK)	100 pcs.	2;4-6	118-04800
T30LOS	3.4	200.0	1.6	50.0	135	PA66HS	Natural (NA)	100 pcs.	2;4-6	118-00044
	3.4	200.0	1.6	50.0	135	PA66V0-HOI	White (WH)	100 pcs.	2;4-6	118-00080
	3.4	200.0	1.6	50.0	135	PA66HS	Black (BK)	100 pcs.	2;4-6	118-04900
T50SOS	4.6	150.0	1.6	35.0	225	PA66HS	Black (BK)	100 pcs.	2;4-8	118-05850
	4.6	150.0	1.6	35.0	225	PA66HS	Natural (NA)	100 pcs.	2;4-8	118-05859
T50ROS	4.6	200.0	1.6	50.0	225	PA46	Grey (GY)	500 pcs.	2;4-8	118-05078
	4.6	200.0	1.6	50.0	225	PA66HS	Black (BK)	500 pcs.	2;4-8	118-05040
	4.6	200.0	1.6	50.0	225	PA66HS	Natural (NA)	100 pcs.	2;4-8	118-05059
T50MOS	4.6	245.0	1.6	66.0	225	PA66HS	Black (BK)	100 pcs.	2;4-8	118-00018
	4.6	245.0	1.6	66.0	225	PA66HS	Natural (NA)	100 pcs.	2;4-8	118-00055
	4.6	245.0	1.6	66.0	225	PA66V0-HOI	White (WH)	100 pcs.	2;4-8	118-00081
T50LOS	4.6	384.0	1.6	110.0	225	PA66HS	Black (BK)	100 pcs.	2;4-8	118-05900
T120ROS	7.6	385.0	5.0	105.0	535	PA66HS	Black (BK)	100 pcs.	3;9-12	118-00066
	7.6	385.0	5.0	105.0	535	PA66HS	Natural (NA)	100 pcs.	3;9-12	118-00067
	7.6	385.0	5.0	105.0	535	PA66V0-HOI	White (WH)	100 pcs.	3;9-12	118-00082

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PN5P2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



Cable Ties and Fixings

Cable Ties Outside Serrated

Cable Ties for high temperature application up to +240 °C

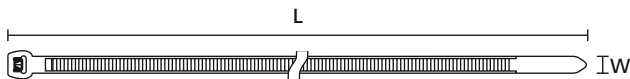
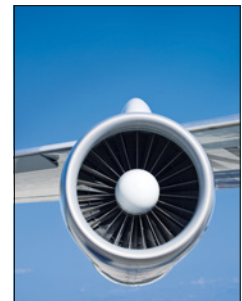
PEEK Ties have been designed for the use in hazardous environment. Their suitability for high temperature applications makes them ideal for use in the drilling industry, railway, offshore or automotive industry. The excellent chemical and radium ray resistance is predestined for applications in medical engineering, chemical industry and power stations. Within the aerospace industry, PEEK ties are suitable due to their good ratio weight to tensile strength. Because of this combination of different properties, PEEK ties can replace metal solutions.

Features and Benefits

- For high temperature applications from -55° C up to +240° C
- Outside serrated cable tie with smooth surface to the bundle
- Close fit to the cable bundle due to the deepening head shape
- Easy insertion combined with high tensile strength
- Takes up less space due to the curved head
- Combines the performance of a metal tie with the ease of use of a polyamide cable tie
- Easy application either manually or with a processing tool



The contoured head takes up less space, gives a low insertion force and offers high strength.



PEEK-Series



Material specification please see page 16.

PEEK Ties, outside serrated

TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
PT2A	3.4	145.0	4.0	35.0	230	PEEK	Beige (BGE)	100 pcs.	6-8	118-00032
PT3B	4.7	250.0	4.0	65.0	300	PEEK	Beige (BGE)	100 pcs.	6-8	118-00116

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

PEEK Ties, inside serrated

TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
PT220	4.7	220.0	8.0	56.0	380	PEEK	Beige (BGE)	100 pcs.	6-8	111-01235

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools		
6	7	8
EVO7	MK7HT	MK7P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



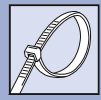
One Step to the Web!



Please find more PEEK products for your system solutions: see page 62, 65, 207.



Please note! Not all products listed on this page may have this approval.



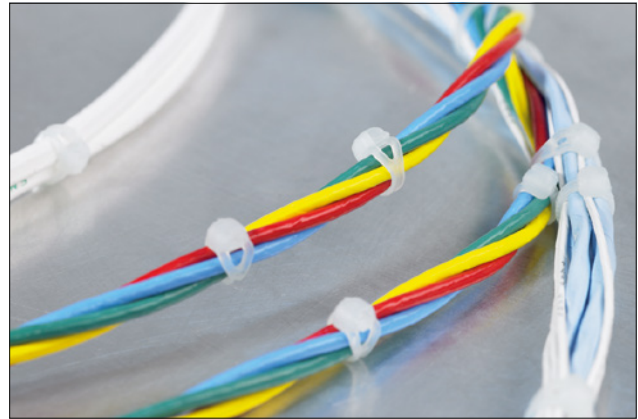
Cable Ties with 90° angled head

V-Series

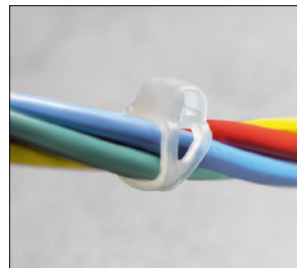
Due to its low profile head, V-Series outside serrated cable ties are perfectly suited for applications with restricted space, such as camera and alarm systems and automation systems (Remote I/O Systems). Where bundles are fed through a grommet or ductwork, V-Series provides a practical solution due to its unique rounded design.

Features and Benefits

- Outside serrated cable tie with smooth surface to the bundle
- Lentiform, 90° angled head
- Rounded head minimises the risk of damage to insulation, especially for parallel routed bundles
- Low profile head takes up less space above the bundle
- Close fit to the cable bundle
- Easy insertion and high tensile strength
- Easy application either manually or with a processing tool



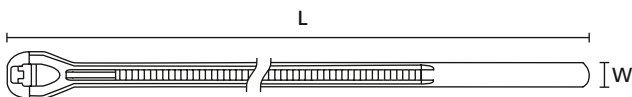
V-Series is perfect for parallel bundles.



V-Series - less height above the bundle.



Outside serration means no damage of insulation.



V-Series

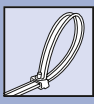
TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
V100R	2.5	102.5	20.0	100	PA46	Grey (GY)	1,000 pcs.	2;4-6	118-00109
	2.5	102.5	20.0	100	PA66HS	Natural (NA)	1,000 pcs.	2;4-6	118-00074
V150R	3.3	150.0	35.0	150	PA46	Grey (GY)	100 pcs.	2;4-6;8	118-00107
	3.3	150.0	35.0	150	PA66HS	Natural (NA)	100 pcs.	2;4-6;8	118-00089

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools				
2	4	5	6	8
MK20	MK3SP	MK3PNSP2	EVO7	MK7P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

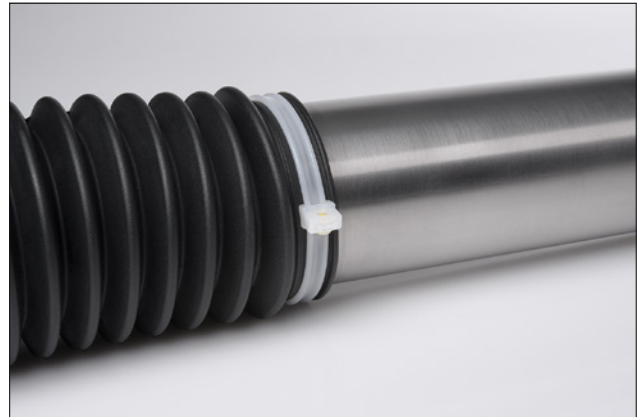
Cable Ties Without Serration

Cable Tie locked by glass fibre pin

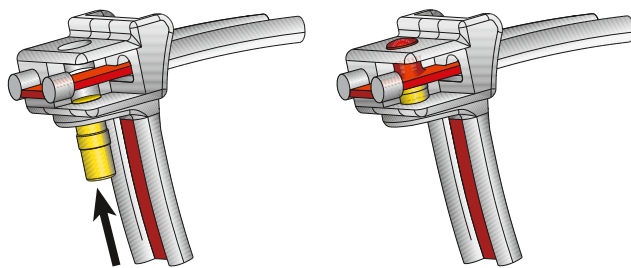
In addition to offering a secure method of bundling cables, the design of the KR-ties makes them ideal for use as a method of securing bellows on steering racks, water hoses and vacuum lines.

Features and Benefits

- Patented cable tie system
- Smooth strap which is locked into place with a glass-fibre reinforced pin
- For assembly a special KR-tool is needed
- Very secure and vibration resistant fixing
- KR-ties up to 426 mm are made as one piece fastening
- Available in various materials, including PA12 which is less hygroscopic



The KR-Series has been repeatedly proven in high vibration applications.



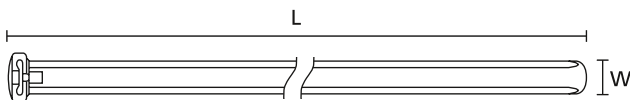
The unlocked head of a KR-tie.

The cable tie (red) is locked into place with the pin.



KR-Series is available in different sizes.

KR-Series, 1-Piece



Cable tie KR-Series

i Other dimensions are available on request.

Patented

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Material	Colour	Pack Cont.	Tools	Article-No.
KR6/35	6.1	360.0	93.0	490	PA66	Natural (NA)	50 pcs.	13	121-63519
	6.1	360.0	93.0	490	PA66HS	Natural (NA)	50 pcs.	13	121-63555
	6.1	360.0	93.0	490	PA66W	Black (BK)	50 pcs.	13	121-63560
KR8/21	8.0	210.0	47.0	785	PA66HS	Natural (NA)	50 pcs.	13-14	121-82155
	8.0	210.0	47.0	785	PA66	Natural (NA)	50 pcs.	13-14	121-82119
	8.0	210.0	47.0	785	PA66W	Black (BK)	50 pcs.	13-14	121-82160
KR8/33	8.0	337.0	86.0	390	PA12	Black (BK)	50 pcs.	13-14	121-83380
	8.0	337.0	86.0	785	PA66	Natural (NA)	50 pcs.	13-14	121-83319
	8.0	337.0	86.0	785	PA46	Grey (GY)	50 pcs.	13-14	121-83378
	8.0	337.0	86.0	785	PA66HS	Natural (NA)	50 pcs.	13-14	121-83355
	8.0	337.0	86.0	785	PA66W	Black (BK)	50 pcs.	13-14	121-83360

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Please note! Not all products listed on this page may have this approval.



Cable Tie locked by glass fibre pin

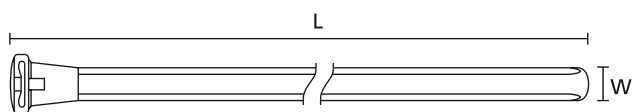
KR-Series, 1-Piece

TYPE	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Tools	Article-No.
KR8/43	8.0	426.0	105.0	785	PA66HS	Black (BK)	50 pcs.	13-14	121-74360
	8.0	426.0	105.0	785	PA66HS	Natural (NA)	50 pcs.	13-14	121-74359

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

KR-Series, ultrasonic welded



KR-Series, ultrasonic welded



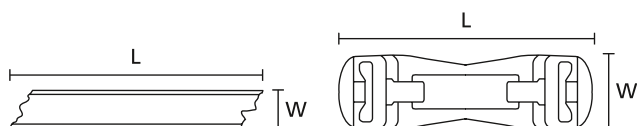
Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Pack Cont.	Tools	Article-No.
KR8/50	8.0	500.0	152.0	720	PA66HS	Natural (NA)	50 pcs.	13-14	121-05051
	8.0	500.0	152.0	785	PA66	Natural (NA)	50 pcs.	13-14	121-05019
	8.0	500.0	152.0	785	PA66W	Black (BK)	50 pcs.	13-14	121-05060
KR8/60	8.0	600.0	184.0	785	PA66	Natural (NA)	50 pcs.	13-14	121-06019
	8.0	600.0	184.0	785	PA66W	Black (BK)	50 pcs.	13-14	121-06060
KR8/70	8.0	700.0	216.0	785	PA66	Natural (NA)	50 pcs.	13-14	121-07019
	8.0	700.0	216.0	785	PA66W	Black (BK)	50 pcs.	13-14	121-07060
KR8/80	8.0	800.0	248.0	785	PA66	Natural (NA)	50 pcs.	13-14	121-08019
	8.0	800.0	248.0	785	PA66W	Black (BK)	50 pcs.	13-14	121-08060
KR8/100	8.0	1,000.0	300.0	785	PA66	Natural (NA)	50 pcs.	13-14	121-10019
	8.0	1,000.0	300.0	785	PA66W	Black (BK)	50 pcs.	13-14	121-10060
KR8/110	8.0	1,100.0	344.0	720	PA66HS	Natural (NA)	50 pcs.	13-14	121-11051
	8.0	1,100.0	344.0	785	PA66W	Black (BK)	50 pcs.	13-14	121-11060
KR8/120	8.0	1,200.0	375.0	785	PA66	Natural (NA)	50 pcs.	13-14	121-12019
KR8/150	8.0	1,500.0	471.0	785	PA66	Natural (NA)	50 pcs.	13-14	121-15019

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

KR-Series, endless



Cable tie KR8S1

Double-head KR8C5

Recommended Tools	
13	14
KR6/8	KR8PNSE

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

TYPE	Width (W)	Length (L)		Material	Colour	Pack Cont.	Tools	Article-No.
KR8/S1	8.0	50.0 m	785	PA66HS	Natural (NA)	50.0 m	13	121-98151
	8.0	50.0 m	785	PA66W	Black (BK)	50.0 m	13	121-98160
KR8/C5	11.7	38.0	-	PA66HS	Natural (NA)	200 pcs.	13	121-58551
	11.7	38.0	-	PA66W	Black (BK)	200 pcs.	13	121-58560

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Short Circuit Test (SCT)

The perfect alternative to cable cleats

HellermannTyton's single and double wrap Metal Ball (MBT) and Buckle Ties (AMT) fully withstand the maximum force of short circuits in trefoil formation according to the results of laboratory tests performed using the parameters outlined in the IEC 61914:2009 cable cleat standard.

The tests conducted by the NEFI High Power Laboratory in Norway – a member of the SATS Certification – demonstrated that our MBT and AMT stainless steel cable ties resist the huge forces unleashed by power cables in the event of a short circuit, even when they are installed in a 'worst case' trefoil formation (see drawing).

Construction of the HellermannTyton SCT

The MBT and AMT metal ties were insulated from the cable jackets with LFPC polyolefin protective channels as an added layer of protection. Two different cable sizes, Ø 36 mm (300 mm²) and Ø 13 mm (50 mm²), each with 3 cables 8 m in length in trefoil formation, were tested with short circuit times between 0.2 and 0.5 seconds at various current levels.

Results of the HellermannTyton SCT

- We validated the formula for calculating maximum force on conductors during short circuits outlined in IEC61914:2009
- We ensure that our single and double wrap Metal Ball (MBT) and Buckle Ties (AMT) withstand a short circuit application
- We provide a viable fixing solution for low and medium voltage cables
- We offer an inexpensive alternative to cable cleats

$$F_t = 0,17 \times i_p^2 / S$$

Formula for calculating maximum force on conductors according to IEC 61914:2009.

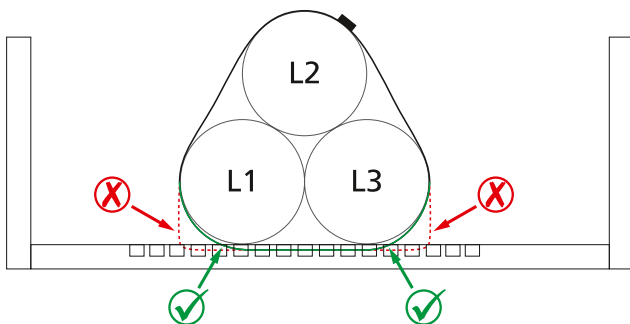
Advantages of using HellermannTyton stainless steel cable ties over cable cleats:

- They can be used for both inside and outside environments
- They offer very good heat and chemical resistance
- A range of strap lengths and widths make it is easy to choose a solution for every application
- Only one cable tie is required for many different cable diameters
- Lower installation costs
- Low inventory value

Conclusion

- With the SCT we have proven that our MBT and AMT cable ties are suitable for low and medium voltage cable and withstand a certain level of short circuits.
- By using the IEC specified formula we are able to offer customers the right cable tie for their applications.

Stainless steel cable ties from HellermannTyton are a perfect and inexpensive alternative to cable cleats.



Best practice for installation in trefoil formation. Ties should be bundled as closely as possible to the cables for a smooth loop and to avoid sharp edges.



Cable Ties with Ball-Lock

MBT-Series, Stainless Steel 304

Metal ties are ideal for all applications that require high strength, reliability and fire resistance. The MBT range of stainless steel cable ties can be used in chemical industries and on oil platforms as well as in mass transit, shipbuilding and mining industries. MBT ties are also suitable for machine building, apparatus construction and in the outside area of radio technology. Additionally, MBT ties are ideal for securing lighting in theatres and exhibition halls.

Features and Benefits

- MBT cable ties made from stainless steel 304
- Patented non-releasable locking feature
- Corrosion resistant
- Weather resistant
- Outstanding chemical resistance
- High temperature resistance
- Non-burning



Stainless Steel Cable Ties, uncoated, MBT_SS, MBT_HS.



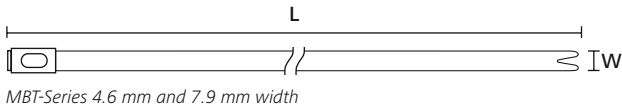
Stainless Steel Cable Ties, uncoated, MBT_XHS.



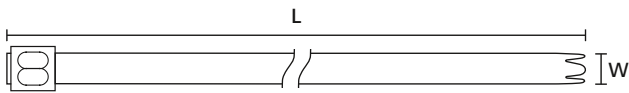
Patented



Material specification please see page 16.



MBT-Series 4.6 mm and 7.9 mm width



MBT-Series 12.3 mm width

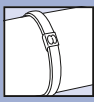
TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.		Material	Pack Cont.	Tools	Article-No.
MBT5SS	4.6	127.0	12.0	25.0	900	SS304	100 pcs.	15-18	111-93058
MBT8SS	4.6	201.0	17.0	50.0	900	SS304	100 pcs.	15-18	111-93088
MBT14SS	4.6	362.0	17.0	102.0	900	SS304	100 pcs.	15-18	111-93148
MBT20SS	4.6	521.0	17.0	152.0	900	SS304	100 pcs.	15-18	111-93208
MBT27SS	4.6	685.0	17.0	203.0	900	SS304	100 pcs.	15-18	111-93278
MBT33SS	4.6	838.0	17.0	254.0	900	SS304	100 pcs.	15-18	111-93338
MBT8HS	7.9	201.0	17.0	50.0	2,000	SS304	50 pcs.	15-18	111-94088
MBT14HS	7.9	362.0	17.0	102.0	2,000	SS304	50 pcs.	15-18	111-94148
MBT20HS	7.9	521.0	17.0	152.0	2,000	SS304	50 pcs.	15-18	111-94208
MBT27HS	7.9	685.0	17.0	203.0	2,000	SS304	50 pcs.	15-18	111-94278
MBT33HS	7.9	838.0	17.0	254.0	2,000	SS304	50 pcs.	15-18	111-94338
MBT14XHS	12.3	362.0	17.0	102.0	2,700	SS304	50 pcs.	15-18	111-95148
MBT20XHS	12.3	521.0	17.0	152.0	2,700	SS304	50 pcs.	15-18	111-95208
MBT27XHS	12.3	681.0	17.0	203.0	2,700	SS304	50 pcs.	15-18	111-95278
MBT33XHS	12.3	838.0	17.0	254.0	2,700	SS304	50 pcs.	15-18	111-95338

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools			
15	16	17	18
MK9SST	MK9PSST	HDT16	KST-STG200

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties, Stainless Steel

Cable Ties with Ball-Lock

MBT-Series, Stainless Steel 316

Metal ties are ideal for all applications that require high strength, reliability and fire resistance. The MBT range of stainless steel cable ties can be used in chemical industries and on oil platforms as well as in mass transit, shipbuilding and mining industries. MBT ties are also suitable for machine building, apparatus construction and in the outside area of radio technology. Additionally, MBT ties are ideal for securing lighting in theatres and exhibition halls.

Features and Benefits

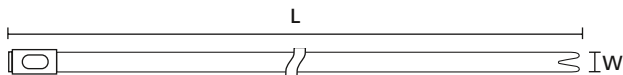
- MBT cable ties made from stainless steel 316
- Patented non-releasable locking feature
- Corrosion resistant
- Weather resistant
- Outstanding chemical resistance
- Antimagnetic
- High temperature resistance
- Non-burning



Stainless Steel Cable Ties, uncoated, MBT_S, MBT_H.



Patented



MBT-Series 4.6 mm and 7.9 mm width

TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.		Material	Pack Cont.	Tools	Article-No.
MBT5S	4.6	127.0	12.0	25.0	900	SS316	100 pcs.	15-18	111-93059
MBT8S	4.6	201.0	12.0	50.0	900	SS316	100 pcs.	15-18	111-93089
MBT14S	4.6	362.0	12.0	102.0	900	SS316	100 pcs.	15-18	111-93149
MBT20S	4.6	521.0	12.0	152.0	900	SS316	100 pcs.	15-18	111-93209
MBT27S	4.6	685.0	12.0	203.0	900	SS316	100 pcs.	15-18	111-93279
MBT33S	4.6	838.0	12.0	254.0	900	SS316	100 pcs.	15-18	111-93339
MBT8H	7.9	201.0	12.0	50.0	2,000	SS316	50 pcs.	15-18	111-94089
MBT14H	7.9	362.0	12.0	102.0	2,000	SS316	50 pcs.	15-18	111-94149
MBT20H	7.9	521.0	12.0	152.0	2,000	SS316	50 pcs.	15-18	111-94209
MBT27H	7.9	685.0	12.0	203.0	2,000	SS316	50 pcs.	15-18	111-94279
MBT33H	7.9	838.0	12.0	254.0	2,000	SS316	50 pcs.	15-18	111-94339

All dimensions in mm. Subject to technical changes.

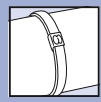
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools			
15	16	17	18
MK9SST	MK9PSST	HDT16	KST-STG200

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

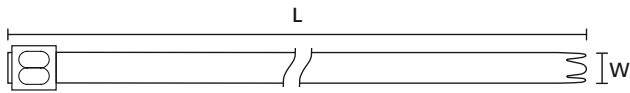


Please note! Not all products listed on this page may have this approval.



Cable Ties with Ball-Lock

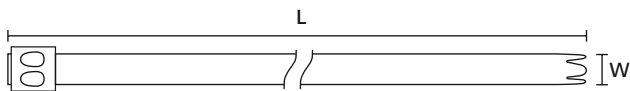
MBT-Series, Stainless Steel 316



MBT-Series 12.3 mm width



Material specification please see page 16.



MBT-Series 16.0 mm width

TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.		Material	Pack Cont.	Tools	Article-No.
MBT14XH	12.3	362.0	12.0	102.0	2,700	SS316	50 pcs.	15-18	111-95149
MBT20XH	12.3	521.0	12.0	152.0	2,700	SS316	50 pcs.	15-18	111-95209
MBT27XH	12.3	681.0	12.0	203.0	2,700	SS316	50 pcs.	15-18	111-95279
MBT33XH	12.3	838.0	12.0	254.0	2,700	SS316	50 pcs.	15-18	111-95339
MBT14UH	16.0	362.0	12.0	102.0	4,100	SS316	50 pcs.	15;17	111-01301
MBT20UH	16.0	521.0	12.0	152.0	4,100	SS316	50 pcs.	15;17	111-01302
MBT27UH	16.0	681.0	12.0	203.0	4,100	SS316	50 pcs.	15;17	111-01303
MBT33UH	16.0	838.0	12.0	254.0	4,100	SS316	50 pcs.	15;17	111-01304
MBT43UH	16.0	1,092.0	12.0	330.0	4,100	SS316	25 pcs.	15;17	111-01305
MBT49UH	16.0	1,245.0	12.0	380.0	4,100	SS316	25 pcs.	15;17	111-01306

All dimensions in mm. Subject to technical changes.

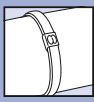
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools			
15	16	17	18
MK9SST	MK9PSST	HDT16	KST-STG200

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



Cable Ties and Fixings

Cable Ties, Stainless Steel

Double Wrap Cable Ties with Ball-Lock

MBTXHD- / MBTUHD-Series, Stainless Steel 316

The double wrap ties of the MBT-series are used in applications where a fixing requires an extraordinary high tensile strength.

Features and Benefits

- Stainless steel MBT ties with double wrap operation
- Wraps around the bundle and passes through the head twice
- Very high tensile strength to carry enormous applied loads
- Head with two locking balls
- Resistant to arduous conditions and environments



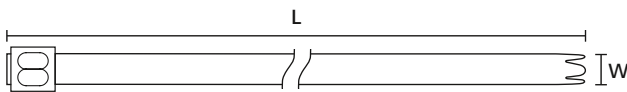
Double wrap Stainless Steel Cable Ties, uncoated, MBT_UHD.



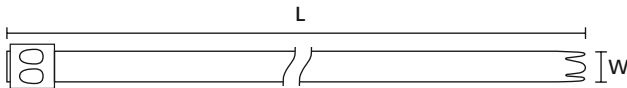
Patented



Material specification please see page 16.



MBT-Series 12.3 mm width



MBT-Series 16.0 mm width



Double wrap Stainless Steel Cable Ties, uncoated MBT_UHD.

TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.		Material	Pack Cont.	Tools	Article-No.
MBT27XHD	12.3	681.0	17.0	100.0	5,000	SS316	50 pcs.	15-18	111-01307
MBT33XHD	12.3	838.0	17.0	120.0	5,000	SS316	50 pcs.	15-18	111-01308
MBT43XHD	12.3	1,092.0	17.0	160.0	5,000	SS316	25 pcs.	15-18	111-01309
MBT49XHD	12.3	1,245.0	17.0	180.0	5,000	SS316	25 pcs.	15-18	111-01310
MBT60XHD	12.3	1,524.0	17.0	230.0	5,000	SS316	25 pcs.	15-18	111-01311
MBT27UHD	16.0	681.0	25.0	100.0	7,000	SS316	50 pcs.	15;17	111-01312
MBT33UHD	16.0	838.0	25.0	120.0	7,000	SS316	50 pcs.	15;17	111-01313
MBT43UHD	16.0	1,092.0	25.0	160.0	7,000	SS316	25 pcs.	15;17	111-01314
MBT49UHD	16.0	1,245.0	25.0	180.0	7,000	SS316	25 pcs.	15;17	111-01315
MBT60UHD	16.0	1,524.0	25.0	230.0	7,000	SS316	25 pcs.	15;17	111-01316

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools

15	16	17	18
MK9SST	MK9PSST	HDT16	KST-STG200

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties with Ball-Lock and Coating

MBT-FC-Series, Stainless Steel 316

The MBT range of stainless steel cable ties can be used in the most arduous of conditions or where the additional security, strength and fire resistance of a metal fixing is required. Used in all areas from mass transit, ship building, oil rigs, mining and chemical industries to theatres and exhibition halls. In the event of a fire, cables will remain securely held in place and will not fall to block emergency exits.

Features and Benefits

- Fully coated MBT, made from type 316 stainless steel with polyester coating
- Patented non-releasable locking feature
- Coated cable tie with smooth edges
- Comfortable handling and installation
- Eliminates contact corrosion between dissimilar materials during application



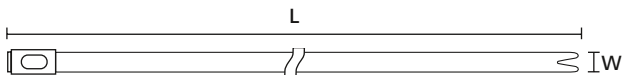
Patented



Stainless Steel Cable Ties, coated, MBT_SFC, MBT_HFC.



Stainless Steel Cable Ties, coated, MBT_XHFC.



MBT-Series 4.6 mm and 7.9 mm width

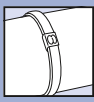
TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.	N	Material	Pack Cont.	Tools	Article-No.
MBT5SFC	4.6	127.0	15.0	25.0	540	SS316, SP	100 pcs.	15-18	111-00288
MBT8SFC	4.6	201.0	17.0	50.0	540	SS316, SP	100 pcs.	15-18	111-00289
MBT14SFC	4.6	362.0	17.0	102.0	540	SS316, SP	100 pcs.	15-18	111-00290
MBT20SFC	4.6	521.0	17.0	152.0	540	SS316, SP	100 pcs.	15-18	111-00291
MBT27SFC	4.6	681.0	17.0	203.0	540	SS316, SP	100 pcs.	15-18	111-00292
MBT33SFC	4.6	838.0	17.0	254.0	540	SS316, SP	100 pcs.	15-18	111-00293
MBT8HFC	7.9	201.0	17.0	50.0	1,020	SS316, SP	50 pcs.	15-18	111-00294
MBT14HFC	7.9	362.0	17.0	102.0	1,020	SS316, SP	50 pcs.	15-18	111-00295
MBT20HFC	7.9	521.0	17.0	152.0	1,020	SS316, SP	50 pcs.	15-18	111-00296
MBT27HFC	7.9	681.0	17.0	203.0	1,020	SS316, SP	50 pcs.	15-18	111-00297

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools			
15	16	17	18
MK9SST	MK9PSST	HDT16	KST-STG200

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

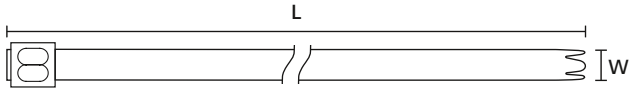


Cable Ties and Fixings


Cable Ties, Stainless Steel

Cable Ties with Ball-Lock and Coating

MBT-FC-Series, Stainless Steel 316



MBT-Series 12.3 mm width

TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.		Material	Pack Cont.	Tools	Article-No.
MBT33HFC	7.9	838.0	17.0	254.0	1,020	SS316, SP	50 pcs.	15-18	111-00298
MBT14XHFC	12.3	362.0	17.0	102.0	1,620	SS316, SP	50 pcs.	15-18	111-00299
MBT20XHFC	12.3	521.0	17.0	152.0	1,620	SS316, SP	50 pcs.	15-18	111-00300
MBT27XHFC	12.3	681.0	17.0	203.0	1,620	SS316, SP	50 pcs.	15-18	111-00301
MBT33XHFC	12.3	838.0	17.0	254.0	1,620	SS316, SP	50 pcs.	15-18	111-00302

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools

15	16	17	18
MK9SST	MK9PSST	HDT16	KST-STG200

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties with punch-locking mechanism

MST-Series, Stainless Steel 304

Stainless steel cable ties are designed for fixing loads and cables securely in hazardous industrial environments such as railway carriages, jet engines, inside power plants or on offshore drilling platforms, where exposure to extremes of weather, saltwater and temperature are common. The MST-Series tie with its new punch-locking mechanism is an excellent choice especially for environments which require high resistance to vibrations.

Features and Benefits

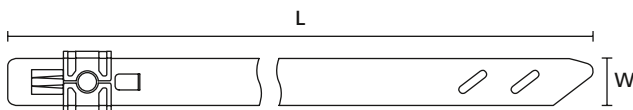
- MST-Series cable ties are made from stainless steel 304
- No loosening after bundling
- Corrosion and weather resistant
- Significantly improved vibration resistance
- Outstanding chemical resistance
- Space saving solution
- Safe cut-off (no sharp edges)
- High temperature resistant
- Non-burning



Stainless Steel Cable Ties MST-Series.



One Step to the Web!



MST tie



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.		Material	Pack Cont.	Tools	Article-No.
MST200S	5.9	207.0	5.0	50.0	900	SS304	100 pcs.	19	111-01549
MST360S	5.9	360.0	5.0	100.0	900	SS304	100 pcs.	19	111-01550
MST500S	5.9	500.0	5.0	145.0	900	SS304	100 pcs.	19	111-01551
MST700S	5.9	700.0	5.0	205.0	900	SS304	100 pcs.	19	111-01552
MST360M	8.9	369.0	8.0	100.0	1,500	SS304	50 pcs.	20	111-01631
MST500M	8.9	509.0	8.0	145.0	1,500	SS304	50 pcs.	20	111-01632
MST700M	8.9	700.0	8.0	205.0	1,500	SS304	50 pcs.	20	111-01633

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

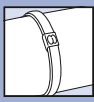
Recommended Tools

19	20
MST6	MST9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



Cable Ties and Fixings

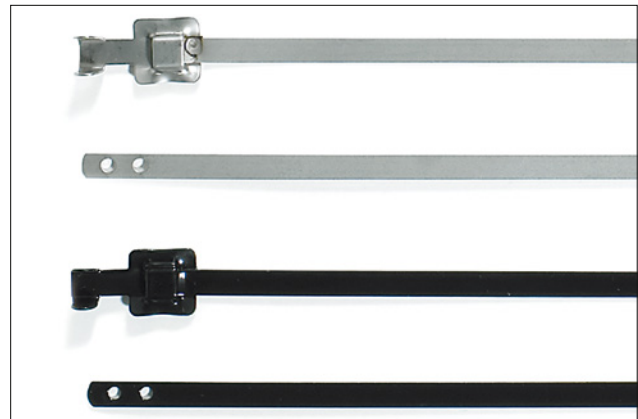
Cable Ties, Stainless Steel

Cable Ties with Fold Locking

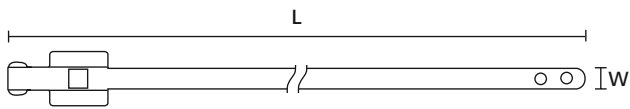
The MLT range of stainless steel cable ties can be used in the most arduous of conditions or where the additional security, strength and fire resistance of a metal fixing is required. Used in all areas from mass transit, ship building, oil rigs, mining and chemical industries to theatres and exhibition halls. In the event of a fire, cables will remain securely held in place and will not fall to block emergency exits.

Features and Benefits

- Releasable stainless steel buckle tie, MLT-series
- Heavy-duty type 316 stainless steel
- Can be re-opened and re-used
- Available also with polyester coating which prevents corrosion between dissimilar materials




MLT-Series. Releasable Stainless Steel buckle tie with and without coating.



MLT-Series


MLT-Series, Stainless Steel 316

TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.		Material	Pack Cont.	Tools	Article-No.
MLT8SS5	5.0	230.0	20.0	60.0	420	SS316	100 pcs.	17;21	111-94080
MLT12SS5	5.0	330.0	20.0	90.0	420	SS316	100 pcs.	17;21	111-94120
MLT16SS5	5.0	430.0	20.0	120.0	420	SS316	100 pcs.	17;21	111-94161
MLT24SS5	5.0	630.0	20.0	180.0	420	SS316	100 pcs.	17;21	111-91400
MLT8SS10	10.0	230.0	25.0	60.0	850	SS316	100 pcs.	17;21	111-95080
MLT12SS10	10.0	330.0	25.0	90.0	850	SS316	100 pcs.	17;21	111-95120
MLT16SS10	10.0	430.0	25.0	120.0	850	SS316	100 pcs.	17;21	111-91300
MLT24SS10	10.0	630.0	25.0	180.0	850	SS316	100 pcs.	17;21	111-95241

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

MLT-C-Series coated, Stainless Steel 316

TYPE	Width (W)	Length (L)	Bundle Ø min.	Bundle Ø max.		Material	Pack Cont.	Tools	Article-No.
MLT8SSC5	5.3	230.0	20.0	60.0	420	SS316, SP	100 pcs.	17;21	111-91000
MLT12SSC5	5.3	330.0	20.0	90.0	420	SS316, SP	100 pcs.	17;21	111-91121
MLT16SSC5	5.3	430.0	20.0	120.0	420	SS316, SP	100 pcs.	17;21	111-91161
MLT24SSC5	5.3	630.0	20.0	180.0	420	SS316, SP	100 pcs.	17;21	111-91180
MLT8SSC10	10.3	230.0	25.0	60.0	850	SS316, SP	100 pcs.	17;21	111-91001
MLT12SSC10	10.3	330.0	25.0	90.0	850	SS316, SP	100 pcs.	17;21	111-91123
MLT16SSC10	10.3	430.0	25.0	120.0	850	SS316, SP	100 pcs.	17;21	111-91163
MLT24SSC10	10.3	630.0	25.0	180.0	850	SS316, SP	100 pcs.	17;21	111-91181

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Recommended Tools

17 HDT16	21 MTT4
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For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



Protective Channel for Stainless Steel Ties

LFPC

When used in conjunction with the MBT, MST and AMT range of stainless steel cable ties this channel gives the cable protection against chafing, vibration and shock. Ideal for use in arduous conditions such as those found on board ships, oil rigs or in nuclear power stations.

Features and Benefits

- LFPC channel, manufactured from Polyolefin
- Works with MBT-, MST- and AMT-Series
- Smooth surface protects bundle against chafing caused by vibrations and shocks
- Can be cut from roll (50 m) to any length
- Halogenfree
- Flame retardant



Cable tie MBTXH with LFPC Protective Channel.



LFPC



Material specification please see page 16.

TYPE	Width (W)	For Ties	Material	Pack Cont.	Article-No.
LFPC70	7.0	MBTS	PO	25 m	111-93000
LFPC83	8.3	MBTH	PO	25 m	111-00257
LFPC103	10.3	MBTH	PO	25 m	111-94000
LFPC129	12.9	MBTXH	PO	50 m	111-00253
LFPC132	13.2	MBTXH	PO	25 m	111-00254
LFPC150	15.0	MBTXH	PO	25 m	111-95000
LFPC163	16.3	AMT, MBTUH	PO	50 m	111-00255

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

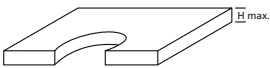
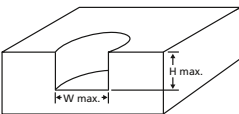

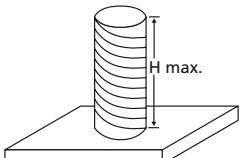


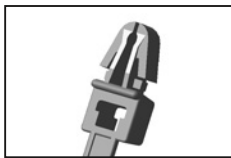
The fire protection properties of the material relate to the test performed on defined test samples. This is a test under laboratory conditions and not directly transferable to the product made from this material.



Please note! Not all products listed on this page may have this approval.

User guide for fixing ties

Application	Arrowhead	Fir Tree Mount	Rivet Wall Plug	Screw Mount	EdgeClip	Weld Stud Mount
	●	●		●		
		●	●	●		
					●	
						●



Arrowhead

This fixing tie is based on an arrowhead offering high extraction forces. The arrowhead is securely in place when a click can be heard and felt by the user.



Arrowhead with disc

The disc minimises the ingress of dust, dirt and water. Furthermore a safe fixation inside the drill hole is assured that withstands pressure from various directions.



Arrowhead with supporting legs

Arrowhead fixings with supporting legs offer good and stable fixation in drilled holes. The supporting legs generate additional pressure to assure a firm and secure fixing while taking up any variation in panel thickness. These ties are also suitable in high vibration applications.



Arrowhead without supporting legs

The arrowhead design assures good fixation while utilising lowest possible space.



Fir Tree Mount

Fir Tree Mounts can be pushed into pre-punched holes easily in panels or threaded, blind holes based on the low insertion forces. The design is ideally suited for a wide range of sheet thicknesses. The disc on top of the fir tree covers the hole and minimises the ingress of dust, dirt and water.



Weld Stud Mount

Many of the HellermannTyton weld stud mounts can easily be attached by hand ("soft push"). The design offers very low insertion forces that require no tools. The mounts can be removed by twisting to the left. SB9 and SB14 are based on "hard push" technology and require a hammer to be applied.



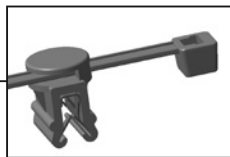
Weld Stud Fixings with Lateral Adjustment

The special oval shape of these mounts provides a 5-6 mm lateral adjustment to cater for any misalignment of the stud or incorrect positioning of ties on the cables. The bundle can therefore be moved when mounted.



EdgeClip

The EdgeClips are specifically designed to bundle and guide cable and wires on edges. Cost intensive drill holes for fixing are no longer required. EdgeClips are easily mounted by hand, the integrated metal clamp, securely keeping the clips on the edge.



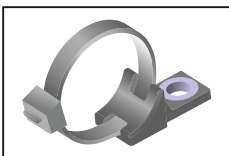
EdgeClip Twistable

Ideally suited for fixations where bundles need to be flexibly guided. These EdgeClips are available with facilities for 90° or 360° rotation.



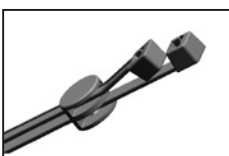
Cable and Hose Attachment

Excellent solution for subsequent attachment of pipes and wires to installed tubes.



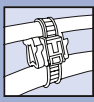
Heavy Duty Application

These sturdy fixing ties can withstand vibrations. They are easy to apply and give a secure alignment to the bundle. There will be high tightening torque through metal bushing.



Two Piece Fixing Ties with Clip Coupler

The Coupler is an article to connect two cable ties for parallel bundling of tubes, harnesses or cables. Its design enables the cable ties to rotate up to 90° and allows flexible installations.



Cable Ties and Fixings

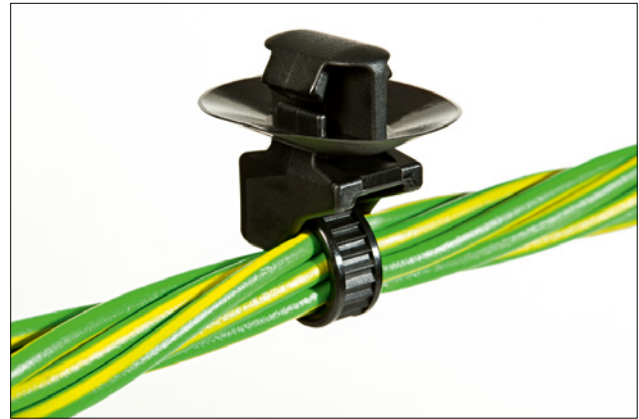
Cable Ties With Fixing Elements

1-Piece Fixing Tie with Arrowhead, with Disc

With a diverse range of fixing possibilities these ties are ideal for use in many different industries, including automotive, aerospace, white goods manufacture and panel building.

Features and Benefits

- Easy to install without the need for a tool
- Arrowhead simply locks into place
- Disc adjusts tie for pressures from various directions and minimises access of dust, dirt and water
- Cable tie head always situated in a defined position
- KSFT-types with specially rounded arrowhead minimise the assembly height

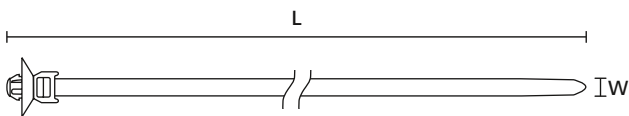


The flexible disc adjusts to take up variations in panel thickness - ensuring a firm fixing at all times.

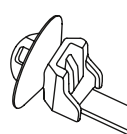


Material specification please see page 16.

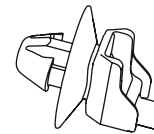
1-Piece Fixing Tie with Arrowhead, with Disc, for round holes



T50SOSKSFT5.4E



T50SOSKSFT6.5E



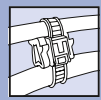
T50SOSSFT6.5E

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
PT2ASFT6.5 PT0.7-1.5-E	3.4	112.7	20.0	230	16.0	6.3 - 6.7	0.7 - 1.5	PEEK	Beige (BGE)	2;4-6	126-00183
T50SWPM7.0	4.6	140.0	27.0	225	15.0	6.8 - 7.2	0.7 - 3.0	PA66HS	Black (BK)	2-10	126-00168
T50SOSKSFT5.4E	4.6	156.0	35.0	180	16.0	5.2 - 5.6	0.7 - 1.3	PA66HS	Black (BK)	2-10	126-00075
T50SOSKSFT65E	4.6	156.0	35.0	180	16.0	6.3 - 6.7	0.7 - 1.3	PA66HS	Black (BK)	2-10	126-00081
T50SOSKSFT6.5S2-E	4.6	157.5	35.0	225	16.0	6.3 - 6.7	1.7 - 2.3	PA66HS	Black (BK)	2-10	126-00086
T50SOSSFT6.5E	4.6	158.8	30.0	200	16.0	6.3 - 6.7	1.9 - 2.5	PA66HS	Black (BK)	2-10	126-03102
T50SST5	4.6	170.0	31.0	225	16.2	6.1 - 6.5	0.7 - 1.5	PA66	Natural (NA)	2-10	126-02300
	4.6	170.0	31.0	225	16.2	6.1 - 6.5	0.7 - 1.5	PA66HS	Black (BK)	2-10	126-00017
	4.6	170.0	31.0	225	16.2	6.1 - 6.5	0.7 - 1.5	PA6HIRHS	Black (BK)	2-10	150-15395
T50SD6	5.0	160.0	31.0	225	18.0	6.3 - 7.5	0.6 - 1.8	PA66HS	Black (BK)	2-10	111-85350
T50MD7	5.0	225.0	59.0	225	16.0	6.8 - 7.2	0.8 - 2.0	PA66HS	Black (BK)	2-10	111-85850

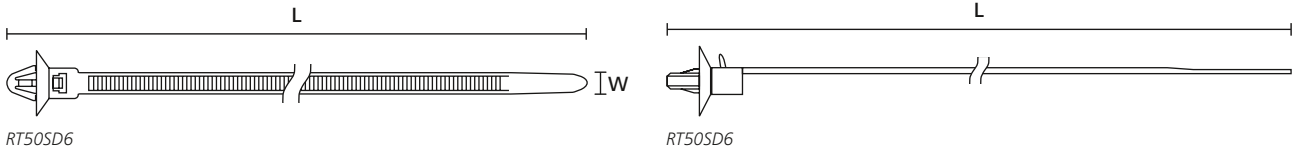
All dimensions in mm. Subject to technical changes.

Recommended Tools								
2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



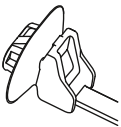
1-Piece Fixing Tie with Arrowhead, with Disc, releasable



TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
RT50SD6	5.0	160.0	31.0	180	18.0	6.3 - 7.5	0.6 - 1.8	PA66HS	Black (BK)	2-10	111-85480

All dimensions in mm. Subject to technical changes.

1-Piece Fixing Tie with Arrowhead, with Disc, for oval holes



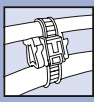
T50SOSKSFT62x122PT0.7-1.3

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T50SOSKSFT 62x122PT0.7-1.3	4.6	153.5	35.0	225	16.0 x 21.0	6.2 x 12.2	0.7 - 1.3	PA66HS	Black (BK)	2-10	126-00141
T50SOSKSFT 62x122PT0.7-1.3 90°	4.6	158.0	35.0	225	16.0 x 21.0	6.2 x 12.2	0.7 - 1.3	PA66HS	Black (BK)	2-10	126-00143
T50SOSKSFT 62x122PT1.7-2.3 90°	4.6	159.0	35.0	225	16.0 x 21.0	6.2 x 12.2	1.5 - 2.3	PA66HS	Black (BK)	2-10	126-00144
T50SOSKSFT 62x122PT1.7-2.3	4.6	159.0	35.0	225	16.0 x 21.0	6.2 x 12.2	1.7 - 2.3	PA66HS	Black (BK)	2-10	126-00142
T50SDOP	5.0	160.0	30.0	225	22.0	6.2 x 12.2	1.0 - 1.9	PA66HS	Black (BK)	2-10	126-00015
T60XSOSSFT 62X122-E	5.5	133.6	25.0	300	16.0 x 22.0	6.2 x 12.2	2.0 - 3.0	PA66HS	Black (BK)	3;8-12	126-00254

All dimensions in mm. Subject to technical changes.

Recommended Tools											
2	3	4	5	6	7	8	9	10	11	12	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

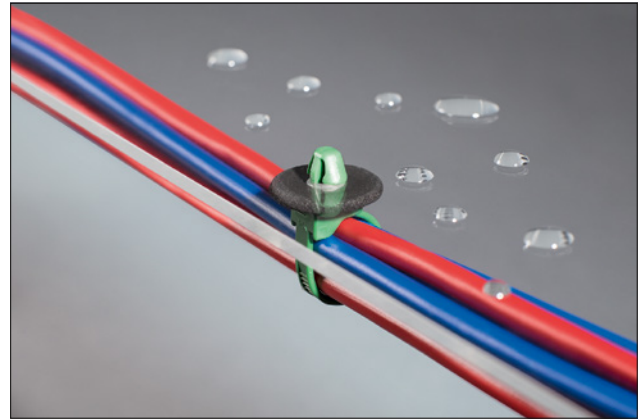
Cable Ties With Fixing Elements

1-Piece Fixing Ties with Arrowhead, with disc, sealed

The parts are mainly used in the automotive industry, e.g. for door harnesses.

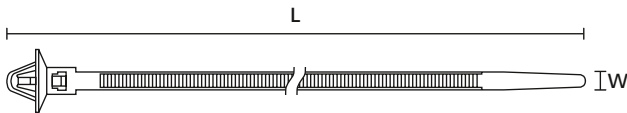
Features and Benefits

- One-piece fixing ties with cellular rubber disc
- Especially suitable for door and tailgate harnesses used for car body applications
- Made from PA66 heat-stabilised material
- Cellular rubber disc minimises access of dust, dirt and water

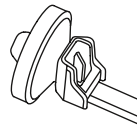


The additional seal protects against the ingress of moisture.

Fixing Ties, sealed, round holes



One piece fixing tie with arrowhead and disc, standard design



T50SOSSFT6.5E-MDL

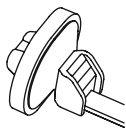


Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T50SOSSFT6.5E-MDL	4.6	158.8	30.0	200	16.0	6.3 - 6.7	0.6 - 1.8	PA66HS	Green (GN)	2-10	126-03100
	4.6	158.8	30.0	200	16.0	6.3 - 6.7	0.6 - 1.8	PA66HS	Black (BK)	2-10	156-00264
T50SOSSFT6.5E-MDL	4.6	158.8	30.0	200	16.0	6.3 - 6.7	0.6 - 1.8	PA66HS	Natural (NA)	2-10	156-00271
T50SOSSFT6.5E-MS-MD	4.6	163.0	35.0	180	16.0	6.25 - 6.75	0.7 - 1.6	PA66HS	Natural (NA)	2-10	126-00065
T50XCROSSFT6.5-E-MDL	4.6	200.0	45.0	200	16.0	6.25 - 6.75	1.2 - 2.1	PA66HS	Black (BK)	2-10	156-00379
T50SOSSFT7-E-MD	4.7	165.0	30.0	225	16.5	6.8 - 7.2	0.7 - 1.8	PA66HS	Natural (NA)	2-10	126-00226

All dimensions in mm. Subject to technical changes.

Fixing Ties, sealed, oval holes



T60SOSSFT6.5x130E-MD

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T60XCROSSFT 62X122-E-MD	5.5	133.6	25.0	300	16.0 x 22.0	6.2 x 12.2	0.7 - 2.0	PA66HS	Black (BK)	2-12	126-00208
T60SOSSFT 62x122-E-MD	5.5	157.5	30.0	300	16.0 x 22.0	6.2 x 12.2	0.6 - 2.0	PA66HS	Black (BK)	2-12	126-00080
T60SOSSFT 70x120-E-MD	5.5	157.5	30.0	300	16.0 x 22.0	7.0 x 12.0	0.7 - 2.0	PA66HS	Black (BK)	2-12	126-00079
T60SOSSFT 65x130-E-MD	5.5	157.6	30.0	300	16.0 x 22.0	6.5 x 13.0	0.6 - 2.0	PA66HS	Natural (NA)	2-12	126-00076

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



1-Piece Fixing Ties with Arrowhead, with Disc in the strap, for Round Holes

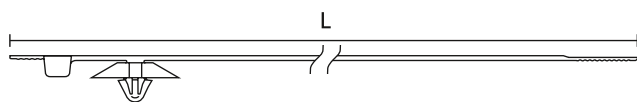
These fixing ties are ideal for use in many different industries, including automotive, aerospace, rail and panel building.

Features and Benefits

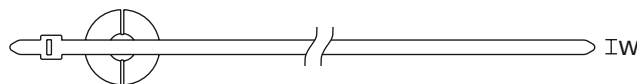
- Easy to assemble without the need for a tool
- Arrowhead simply locks into place
- Disc adjusts tie for pressures from various directions and minimises access of dust, dirt and water
- Cable tie head always situated in defined position
- Bundle runs directly across fixing point
- Simple assembly due to tab at the end of the head




The 'tab' on the head of the tie makes it easy to locate and lift the head for assembly.



T80RSFT



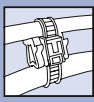
T80RSFT with flexible disc.

TYPE	Width (W)	Length (L)	Bundle Ø max.		Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T80RSFT	4.6	190.0	45.0	355	24.4	5.7 - 6.3	1.0 - 3.5	PA46	Grey (GY)	2;4-6;8	150-15498
	4.6	190.0	45.0	355	24.4	5.7 - 6.3	1.0 - 3.5	PA66HS	Black (BK)	2;4-6;8	150-15493

All dimensions in mm. Subject to technical changes.

Recommended Tools				
2	4	5	6	8
MK20	MK3SP	MK3PNSP2	EVO7	MK7P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

1-Piece Fixing Ties with Arrowhead, with wings

For bundling and fixing of cable harnesses, pipes and hoses in many different industries, including automotive, aerospace, white goods manufacturing and panel building.

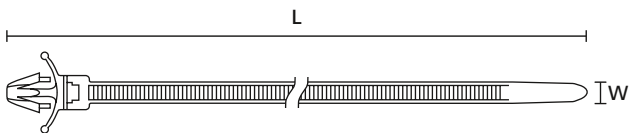
Features and Benefits

- Easy to assemble without the need for a tool
- Cable tie head always situated in defined position
- Arrowhead simply locks into place
- Supporting legs provide a secure and firm fixing in areas where space is limited



A wide range of arrowhead fixing ties which are suitable for different panel thicknesses and hole diameters.

1-Piece Fixing Ties with Arrowhead, with wings, for round holes



T50SSL5



Material specification please see page 16.

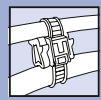
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T18RSF		2.5	100.0	16.0	80	4.6 - 4.8	0.8 - 3.0	PA66HS	Natural (NA)	2;4-6	111-85519
		2.5	100.0	16.0	80	4.6 - 4.8	0.8 - 3.0	PA66W	Black (BK)	2;4-6	111-85560
T50SSL5		4.6	135.0	27.0	200	6.1 - 6.5	0.5 - 2.7	PA66HS	Black (BK)	2-10	126-02204
		4.6	135.0	27.0	225	6.1 - 6.5	0.5 - 2.7	PA46	Grey (GY)	2-10	111-85395
		4.6	135.0	27.0	225	6.1 - 6.5	0.5 - 2.7	PA66	Natural (NA)	2-10	111-85339
T50SL5		4.6	163.0	34.0	222	6.1 - 6.5	0.8 - 2.7	PA66HIRHS	Black (BK)	2-10	126-00005
		4.6	165.0	34.0	222	6.1 - 6.5	0.8 - 2.5	PA66	Natural (NA)	2-10	111-85369
T50SL6		4.6	165.0	34.0	225	6.3 - 7.5	0.5 - 2.5	PA66	Black (BK)	2-10	111-85460
T50SL7		4.6	165.0	34.0	225	6.9 - 7.1	0.8 - 2.5	PA66	Natural (NA)	2-10	111-85479
T50SL5		4.7	165.0	34.0	222	6.1 - 6.5	0.8 - 2.5	PA66HS	Black (BK)	2-10	126-00001

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



1-Piece Fixing Ties with Arrowhead, with wings, for round holes

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T50SSF		4.6	160.0	35.0	225	6.0 - 6.6	0.7 - 3.0	PA66	Natural (NA)	2-10	111-85739
		4.6	160.0	35.0	225	6.0 - 6.6	0.7 - 3.0	PA66HS	Black (BK)	2-10	126-00032
		4.6	160.0	35.0	225	6.0 - 6.6	0.7 - 3.0	PA66HS	Natural (NA)	2-10	126-01104
T50RSF		4.7	205.0	45.0	225	6.0 - 6.6	0.7 - 3.0	PA66	Natural (NA)	2-10	111-85729
T50SAH		4.6	160.0	25.0	225	6.0 - 6.6	0.7 - 3.0	PA66HS	Natural (NA)	2-10	155-41102
T50RWPM7.0		4.6	200.0	45.0	225	6.8 - 7.2	0.7 - 3.0	PA66HS	Black (BK)	2-10	126-00169
T50SWPM4.7		4.8	155.0	35.0	225	4.6 - 4.8	3.2 - 4.0	PA66	Natural (NA)	2-10	126-00214
		4.8	155.0	35.0	225	4.6 - 4.8	3.2 - 4.0	PA66	Black (BK)	2-10	126-00236

All dimensions in mm. Subject to technical changes.

1-Piece Fixing Ties with Arrowhead, with wings, releasable

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
RT50RSF		4.6	215.0	50.0	225	7.8 - 8.2	0.8 - 2.5	PA66	Black (BK)	2-10	115-07010
RT50SFK		5.0	225.0	50.0	225	6.4 - 7.0	0.8 - 3.0	PA66	Black (BK)	2-10	115-06960

All dimensions in mm. Subject to technical changes.

1-Piece Fixing Ties with Arrowhead, with wings, for oval holes

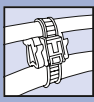
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T80RFT6X12		4.6	228.0	45.0	222	6.3 x 12.3	0.6 - 3.0	PA46	Grey (GY)	2-12	150-48397
		4.6	228.0	45.0	222	6.3 x 12.3	0.6 - 3.0	PA66	Black (BK)	2-12	150-48396

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

1-Piece Fixing Ties with Arrowhead, with Wings in the strap

This range of fixing ties are ideal for use in many different industries, for example: automotive, aerospace, rail and panel building.

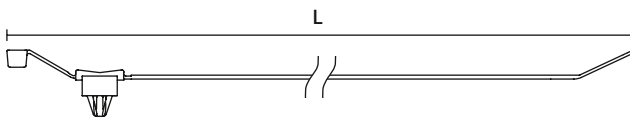
Features and Benefits

- Easy to assemble without the need for a tool
- Arrowhead simply locks into place
- Supporting legs provide a secure and firm fixing in areas where space is limited
- Bundle runs central across fixing point
- Cable tie head always situated in defined position
- For parallel routing of two bundles



Designed to secure battery cables the T80RSF6.5F offers a simple and secure fixing.

T80RSF6.5F



T80RSF6.5F

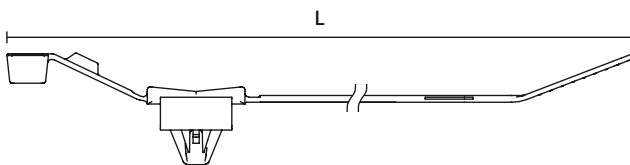


Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T80RSF6.5F	4.7	209.0	50.0	355	6.3 - 6.5	0.6 - 3.0	PA46	Grey (GY)	2;4-6;8	150-39395
	4.7	209.0	50.0	355	6.3 - 6.5	0.6 - 3.0	PA66HS	Black (BK)	2;4-6;8	126-02600

All dimensions in mm. Subject to technical changes.

T80RSF6.5FW with rib for convoluted tubes



T80RSF6.5FW

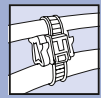
TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T80RSF6.5FW	4.7	209.0	50.0	355	6.3 - 6.5	0.6 - 3.0	PA66HS	Black (BK)	2;4-6;8	150-39385

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	4	5	6	8
MK20	MK3SP	MK3PNSP2	EVO7	MK7P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



1-Piece Fixing Ties with Arrowhead

1-Piece Fixing Ties with Arrowhead, without Wings and Disc

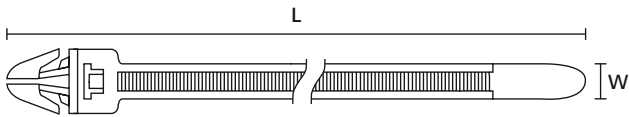
The arrowhead design allows these ties to be used in areas with limited space.

Features and Benefits

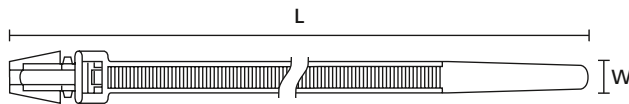
- Easy to assemble without the need for a tool
- Fixing tie with arrowhead without legs
- Arrowhead simply locks into place
- Cable tie head always situated in defined position



The arrowhead design allows these fixing ties to be used in areas with limited space.



T30RSF(U)



T50RSF(E)

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T30RSF	3.6	158.0	31.0	135	4.8 - 5.6	0.9 - 2.4	PA66	Natural (NA)	2;4-6	126-00213
	3.6	158.0	32.0	135	4.8 - 5.6	0.9 - 2.4	PA66HS	Black (BK)	2;4-6	126-00211
T50RSF(E)	4.6	210.0	50.0	225	6.2 - 6.4	2.9 - 3.0	PA66	Natural (NA)	2-10	111-85799
	4.6	210.0	50.0	225	6.2 - 6.4	2.9 - 3.0	PA66	Black (BK)	2-10	126-01001

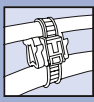
All dimensions in mm. Subject to technical changes.

Recommended Tools									
2	3	4	5	6	7	8	9	10	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Please note! Not all products listed on this page may have this approval.



Cable Ties and Fixings

Cable Ties With Fixing Elements

1-Piece Fixing Tie with Arrowhead, with Disc

For temperatures up to +240 °C

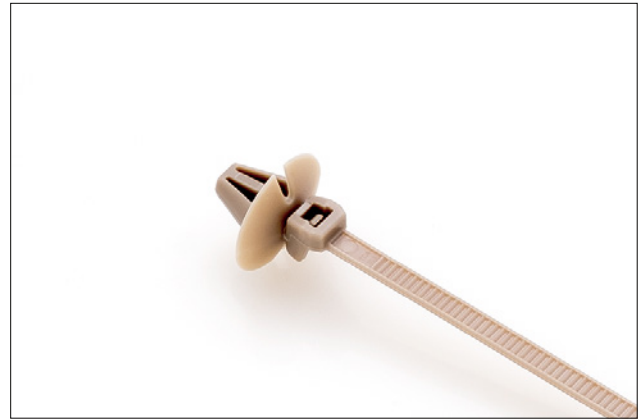
With a diverse range of fixing possibilities these ties are ideal for use in many different industries, including automotive, aerospace, white goods manufacture and panel building.

Features and Benefits

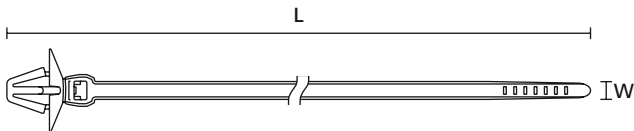
- Easy to install without the need for a tool
- Arrowhead simply locks into place
- Disc adjusts tie for pressures from various directions and minimises access of dust, dirt and water
- Cable tie head always situated in a defined position

Features Material PEEK

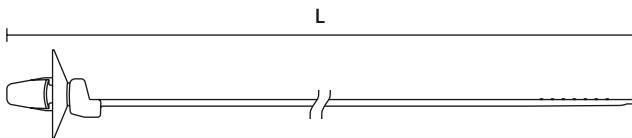
- -55 °C to +240 °C operating temperature
- Excellent resistance against chemicals and gamma radiation



One piece fixing tie with arrowhead, outside serrated.



PT2ASFT6.5PT0.7-1.5E



PT2ASFT6.5PT0.7-1.5E



Please find more PEEK products for your system solutions: see page 38, 65, 207.



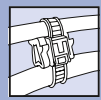
Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
PT2ASFT 6.5PT0.7-1.5-E	3.4	112.7	20.0	230	16.0	6.3 - 6.7	0.7 - 1.5	PEEK	Beige (BGE)	2;4-6	126-00183

All dimensions in mm. Subject to technical changes.

Recommended Tools			
2	4	5	6
MK20	MK3SP	MK3PNSP2	EVO7

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



2-Piece Fixing Ties with Arrowhead, with Disc

Primarily designed for fixing cable harnesses in the automotive industry, their simplicity and ease of use has resulted in these parts being used in other industries, for example aviation, switch gear and white goods manufacturing.

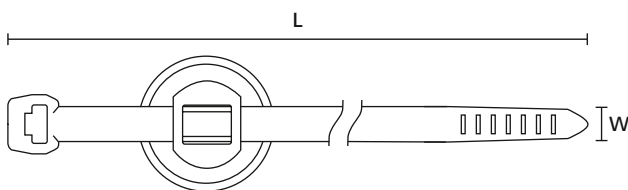
Features and Benefits

- Pre-assembled 2-piece fixing tie with arrowhead foot part
- Cable tie head can be moved after bundling
- Easy to assemble without the need for a tool
- Arrowhead simply locks into place
- Disc adjusts tie for pressure from various directions

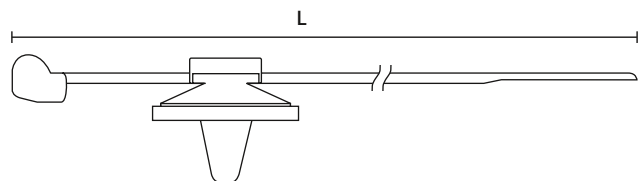


Being a two piece assembly allows the tie head to be located in the most convenient position.

2-Piece Fixing Ties with Arrowhead, with Disc, sealed



T50ROSSFT6.5-16-2MOD-MD

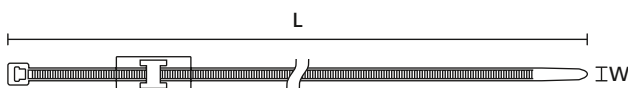


T50ROSSFT6.5-16-2MOD-MD

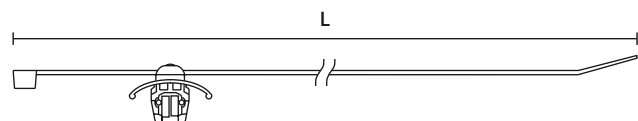
TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T50ROSSFT 6.5-D16-2 MD	4.6	200.0	45.0	222	22.4	6.3 - 6.7	0.7 - 1.8	PA66HS	PA66HIRHS	Black (BK)	2-10	150-93100
T50ROSSFT 6.5-16-2-MD	4.6	200.0	45.0	225	16.0	6.3 - 6.7	0.7 - 1.2	PA66HS	PA66HIRHS	Black (BK)	2-10	155-42002
T50ROSSFT 6.5 16-3MD	4.6	200.0	45.0	225	16.0	6.3 - 6.7	2.5 - 3.5	PA66HS	PA66HIRHS	Black (BK)	2-10	150-37799
T50RAHD6-MS-MD	4.6	202.0	50.0	225	18.0	6.5 - 7.0	0.7 - 1.2	PA66HS	PA66HS	Natural (NA)	2-10	156-01193

All dimensions in mm. Subject to technical changes.

2-Piece Fixing Ties with Arrowhead, for oval holes



T50RFT62x122



T50RFT62x122

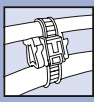
TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T30RSFT712	3.5	150.0	34.0	133	7.0 x 12.0	0.6 - 1.5	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01460
T30RKSFT65x13	3.5	150.0	36.0	135	6.5 x 13.0	1.0 - 1.7	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01235
T50RFT62x122HR	4.6	202.0	45.0	225	6.3 x 12.2	0.6 - 3.0	PA46	PA46	Grey (GY)	2-10	156-00446
T50RFT6OVAL	4.6	202.0	45.0	355	6.3 x 12.2	0.6 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2-10	150-37591
T80RFT62x122	4.7	205.0	45.0	355	6.3 x 12.2	0.6 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2-12	156-01521

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

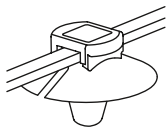
For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



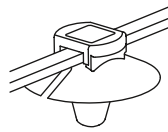
Cable Ties and Fixings

Cable Ties With Fixing Elements

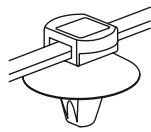
2-Piece Fixing Ties with Arrowhead, with Disc, for round holes



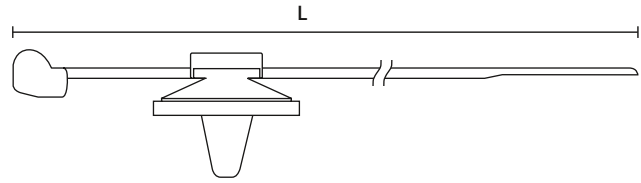
T50SSFT6.5



T50SSFT6.5



T50RSFT6.5D18



T50ROSSFT6.5-16-2MOD-MD

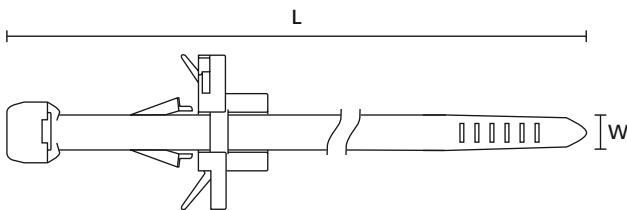
TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T30RSFT7H	3.5	150.0	36.0	135	16.0	6.8 - 7.2	0.8 - 1.5	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01044
T50SOSSFT 651620D	4.6	150.0	35.0	225	16.0	6.3 - 6.7	1.5 - 2.2	PA66HS	PA66HIRHS	Black (BK)	2-10	150-93130
T50SSFT6.5	4.6	150.0	35.0	225	22.4	6.3 - 6.7	0.7 - 2.0	PA66HS	PA66HS	Black (BK)	2-10	150-13593
T50RSFT 6.5D18	4.6	200.0	45.0	200	18.0	6.5 - 6.8	0.4 - 1.6	PA66HS	PA66HIRHS	Black (BK)	2-10	150-37691
T50ROS-SFT 6.5 16-3	4.6	200.0	45.0	225	16.0	6.3 - 6.7	2.5 - 3.5	PA66HS	PA66HIRHS	Black (BK)	2-10	150-37791
T50RSFT6.5	4.6	200.0	45.0	225	22.4	6.3 - 6.7	0.7 - 2.0	PA66HS	PA66HS	Black (BK)	2-10	150-13591
T50RSFT 6.5 16-3	4.6	200.0	49.0	222	16.0	6.3 - 6.7	2.5 - 3.5	PA66HS	PA66HIRHS	Black (BK)	2-10	150-37792
T50ROS P1SFT6.5	4.6	200.0	45.0	225	16.0	6.3 - 6.7	0.7 - 1.3	PA46	PEEK	Grey (GY), Beige (BGE)	2;4-8	156-00455
T50ROS P2SFT6.5	4.6	200.0	45.0	225	16.0	6.3 - 6.7	1.7 - 2.3	PA46	PEEK	Grey (GY), Beige (BGE)	2;4-8	156-00456
T80ISFT6.5	4.6	300.0	81.0	355	22.4	6.3 - 6.7	0.7 - 2.0	PA66HS	PA66HS	Black (BK)	2-12	150-13596
T50RDHSFT6.5	4.7	210.0	38.0	178	22.4	6.4 - 6.8	0.7 - 2.0	PA66HS	PA66HS	Black (BK)	2-10	117-05160

All dimensions in mm. Subject to technical changes.

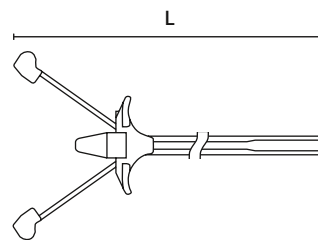
2-Piece Fixing Ties with Arrowhead, for parallel routing



Material specification please see page 16.



T50SOSDSFT6.5



T50SOSDSFT6.5

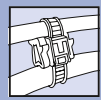
TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T50SOSDSFT6.5	4.6	150.0	35.0	225	6.3 - 6.7	0.7 - 1.5	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00133

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



2-Piece Fixing Ties with Arrowhead, with Disc

For temperatures up to +240 °C

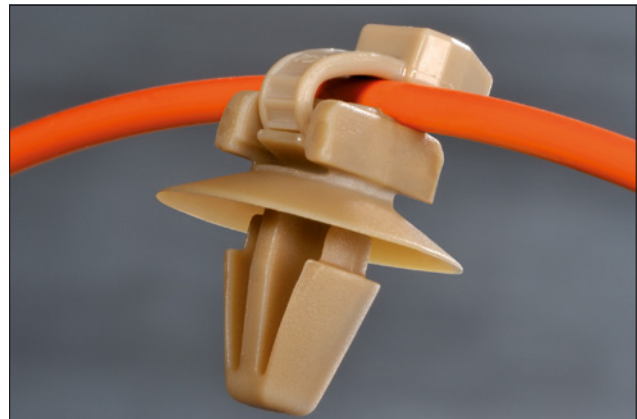
Primarily designed for fixing cable harnesses in the automotive industry, their simplicity and ease of use has resulted in these parts being used in other industries, for example aviation, switch gear and white goods manufacturing.

Features and Benefits

- Pre-assembled 2-piece fixing tie with arrowhead foot part
- Cable tie head can be moved after bundling
- Easy to assemble without the need for a tool
- Arrowhead simply locks into place
- Disc adjusts tie for pressure from various directions and minimises access of dust, dirt and water

Manufactured in PEEK material

- -55 °C to +240 °C operating temperature
- Excellent resistance against chemicals and gamma radiation



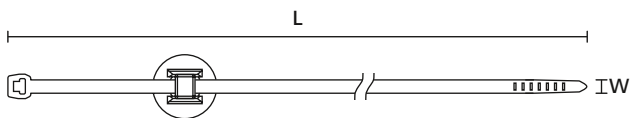
PEEK FixingTies can be used for small diameters from 1.0 mm.



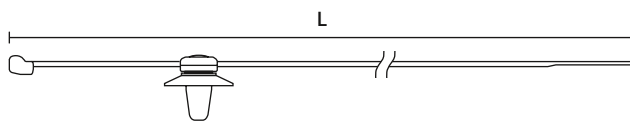
One Step to the Web!



Please find more PEEK products for your system solutions: see page 38, 62, 207.



PT2AP1SFT6.5



PT2AP1SFT6.5

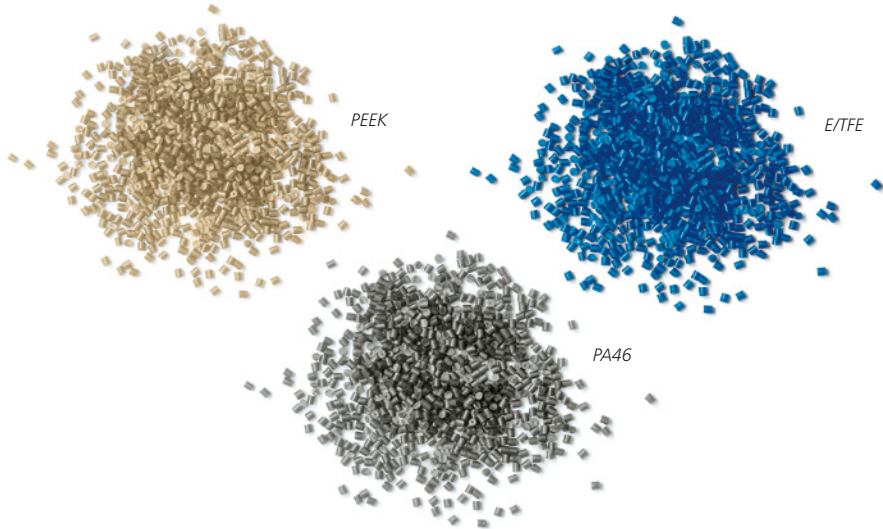
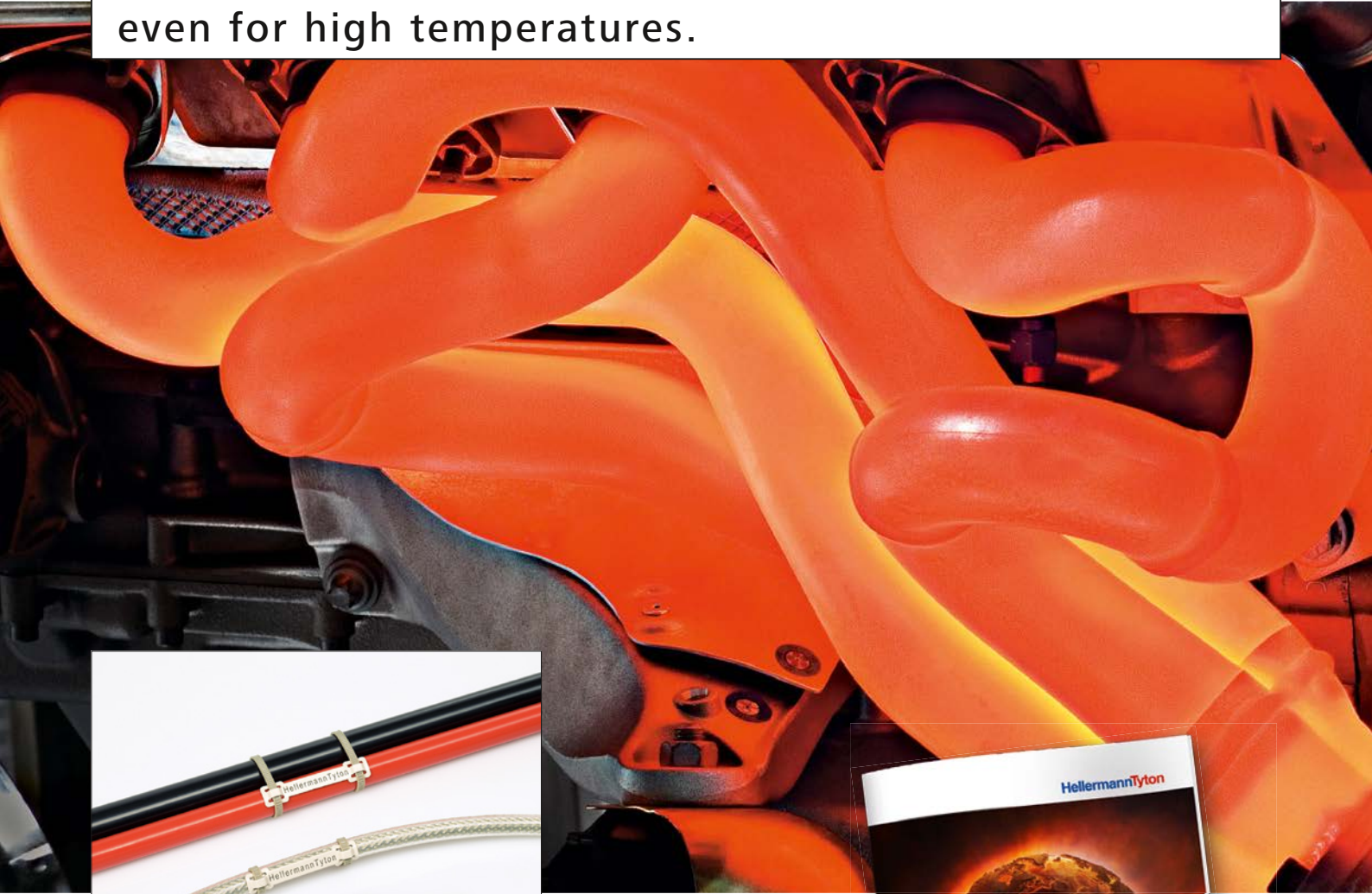
TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
PT2AP1SFT6.5	3.4	145.0	35.0	230	16.0	6.3 - 6.7	0.7 - 1.3	PEEK	Beige (BGE)	2;4-6	156-01090
PT2AP2SFT6.5	3.4	145.0	35.0	230	16.0	6.3 - 6.7	1.7 - 2.3	PEEK	Beige (BGE)	2;4-6	156-01091
PT2AP3SFT6.5	3.4	145.0	32.0	230	16.0	6.3 - 6.7	1.2 - 1.8	PEEK	Beige (BGE)	2;4-6	156-01146

All dimensions in mm. Subject to technical changes.

Recommended Tools			
2	4	5	6
MK20	MK3SP	MK3PNSP2	EVO7

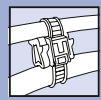
For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

We replace metal solutions with plastic components – even for high temperatures.



Learn more about our fixing ties and elements for high temperature applications in our brochure.

Order now!



1-Piece Fixing Ties with Fir Tree, with Disc

Primarily designed for fixing cable harnesses in the automotive industry, their simplicity and ease of use has resulted in these parts being used in other industries, for example aviation, switch gear and white goods manufacturing.

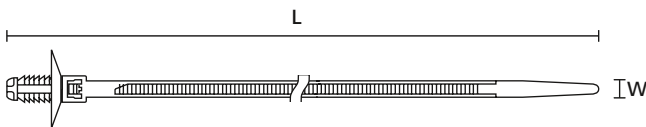
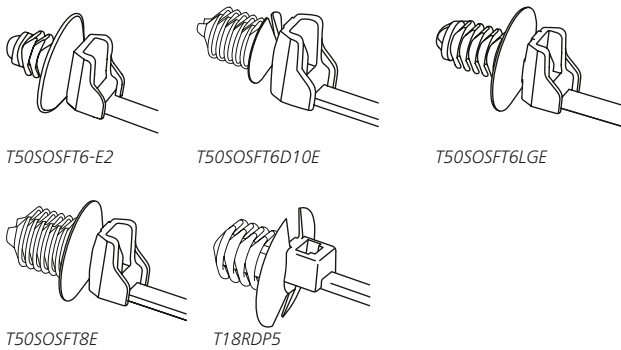
Features and Benefits

- Cable tie head always situated in defined position
- Easy to assemble without the need for a tool
- Disc adjusts tie for pressure from various directions and minimises access of dust, dirt and water
- Fir tree foot part can be used for a variety of panel thicknesses
- Suitable for use within threaded holes




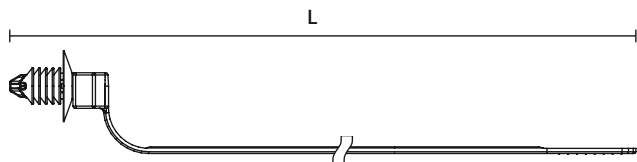
Fir tree foot parts can be used for a variety of panel thicknesses.

1-Piece Fixing Ties with Fir Tree, with Disc




One piece fixing tie with fir tree mount, standard design

 **Material specification please see page 16.**

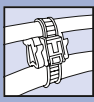


Special design without a gap between head and bundle; FT220DP7

TYPE	Width (W)	Length (L)	Bundle Ø max.		Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T18RDP5	2.5	110.0	20.0	80	13.0	4.9 - 5.1	3.0 - 4.0	PA66	Black (BK)	2;4-6	150-55610
T50SOSFT6-E2	4.6	160.0	35.0	180	16.0	6.3 - 7.0	0.6 - 4.2	PA66HS	Black (BK)	2-10	157-00085
T50SOSFT6D10E	4.6	163.0	32.0	180	9.8	5.8 - 6.2	0.8 - 5.5	PA46	Grey (GY)	2-10	157-00028
	4.6	163.0	32.0	225	9.8	5.8 - 6.2	0.8 - 5.5	PA66HS	Black (BK)	2-10	157-00045
T50SOSFT8E	4.6	163.0	35.0	225	16.0	8.0 - 8.5	0.6 - 6.0	PA46	Grey (GY)	2-10	157-00115
	4.6	163.0	35.0	225	16.0	8.0 - 8.5	0.6 - 6.0	PA66HS	Black (BK)	2-10	157-00072
T50SOSFT6LGE	4.6	165.0	35.0	180	16.0	6.3 - 7.0	0.7 - 7.0	PA66HS	Black (BK)	2-10	157-00228
T50SOSFT6LG-E2	4.6	167.0	35.0	180	16.0	6.1 - 6.9	0.6 - 8.3	PA66HIRHS	Black (BK)	2-10	157-00242
T50SOSFT6E1	4.7	161.4	35.0	150	16.0	6.3 - 7.0	0.7 - 3.0	PA66HIRHS	Black (BK)	2-10	157-00033
T50SOSFT7-E	4.7	165.0	30.0	225	16.5	6.8 - 7.2	0.6 - 6.0	PA66HS	Black (BK)	2-10	157-00185
FT220DP7	4.7	232.0	40.0	225	16.0	6.8 - 7.2	0.8 - 5.0	PA66	Black (BK)	2-12	150-01700
T50SOSFT6LG-E4	4.9	165.0	31.0	200	22.0	6.3 - 7.0	6.3 - 7.0	PA66HS	Black (BK)	2-10	157-00237
OS170FT7LH	5.3	170.0	30.0	147	16.0	6.8 - 7.2	0.7 - 4.5	PA66	Black (BK)	3;9-12	157-00019

All dimensions in mm. Subject to technical changes.





Cable Ties and Fixings

Cable Ties With Fixing Elements

1-Piece Fixing Ties with Fir Tree, with Disc

TYPE	Width (W)	Length (L)	Bundle Ø max.		Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
OS160FT6HEX	5.3	170.0	30.0	200	16.0	6.35	0.7 - 5.0	PA66	Black (BK)	3;9-12	157-00080
	5.3	170.0	30.0	200	16.0	6.35	0.7 - 5.0	PA66HS	Black (BK)	3;9-12	157-00081

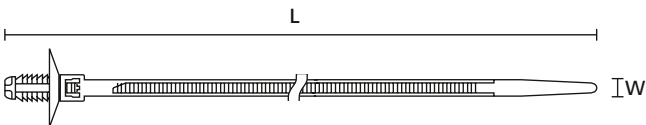
All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

1-Piece Fixing Ties with Fir Tree, with Disc, releasable



One piece fixing tie with fir tree mount, standard design

TYPE	Width (W)	Length (L)	Bundle Ø max.		Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
REL30SDP6	5.0	170.0	31.0	135	22.0	6.3 - 7.1	3.0 - 7.0	PA66	Black (BK)	2;4-6	150-55500

All dimensions in mm. Subject to technical changes.

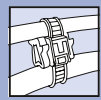
Recommended Tools

2	4	5	6
MK20	MK3SP	MK3PNSP2	EVO7

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Material specification please see page 16.

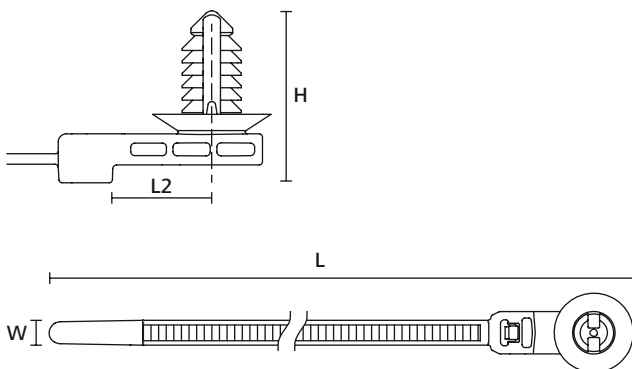


1-Piece Fixing Ties with Fir Tree and Disc, with Stand-off, for round holes

With offset 12.5 and 25.0 mm

Features and Benefits

- Bundling and fixing solution
- Ideal combination of materials and design
- Different positions of the fixing anchor are available to fit installation space
- 1-Piece Fixing Tie with defined offset 12.5 and 25.0 mm



T50ROSFT825SO and T50ROSFT812.5SO.



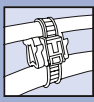
T50ROSFT6SO25A.

TYPE	Drawing	Width (W)	Length (L)	Length (L2)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T50ROSFT 612.5SO		5.1	234.2	12.5	50.0	222	6.1 - 6.9	0.6 - 6.0	PA66HIRHS	Black (BK)	2-10	157-00216
T50ROSFT 6SO12.5A		5.1	215.5	12.5	50.0	222	6.1 - 7.0	0.6 - 6.7	PA66HIRHS	Grey (GY)	2-10	157-00130
		5.1	215.5	12.5	50.0	222	6.1 - 7.0	0.6 - 6.7	PA66HIRHS	Black (BK)	2-10	157-00145
T50ROSFT M6SO12.5A		5.1	215.5	12.5	50.0	222	M6	0.6 - 5.5	PA46	Brown (BN)	2-10	157-00212
		5.1	215.5	12.5	50.0	222	M6	0.6 - 5.5	PA66HIRHS	Grey (GY)	2-10	157-00118
T50ROSFT 8SO25A		5.1	230.0	25.0	50.0	222	7.6 - 8.4	0.6 - 6.7	PA46	Brown (BN)	2-10	157-00168
		5.1	230.0	25.0	50.0	222	7.6 - 8.4	0.6 - 6.7	PA66HIRHS	Grey (GY)	2-10	157-00120
T50ROSFT 6SO25A		5.1	230.0	25.0	50.0	222	6.1 - 7.0	0.6 - 6.7	PA46	Brown (BN)	2-10	157-00158
		5.1	230.0	25.0	50.0	222	6.1 - 7.0	0.6 - 6.7	PA66HIRHS	Grey (GY)	2-10	157-00119
		5.1	230.0	25.0	50.0	222	6.1 - 7.0	0.6 - 6.7	PA66HIRHS	Black (BK)	2-10	157-00150
T50ROSFT 6SO12.5B		5.1	215.5	12.5	50.0	222	6.1 - 7.0	0.6 - 6.7	PA66HIRHS	Black (BK)	2-10	157-00171
T50ROSFT 6SO25B		5.1	230.0	25.0	50.0	222	6.1 - 7.0	0.6 - 6.7	PA46	Brown (BN)	2-10	157-00186
		5.1	230.0	25.0	50.0	222	6.1 - 7.0	0.6 - 6.7	PA66HIRHS	Black (BK)	2-10	157-00169
T50ROSFT 6SO12.5R		5.1	223.1	12.5	50.0	222	6.1 - 7.0	0.6 - 6.7	PA66HIRHS	Black (BK)	2-10	157-00165
T50ROSFT 6SO25R		5.1	237.7	25.0	50.0	222	6.1 - 7.0	0.6 - 6.7	PA66HIRHS	Black (BK)	2-10	157-00164

All dimensions in mm. Subject to technical changes.

Recommended Tools									
2	3	4	5	6	7	8	9	10	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

1-Piece Fixing Ties with Fir Tree, with Disc, for Oval Holes

1-Piece Fixing Ties with Fir Tree, with Disc, for Oval Holes

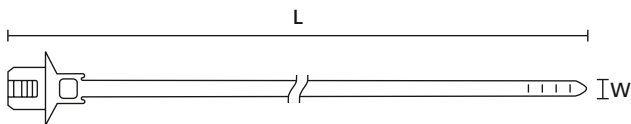
Primarily designed for fixing cable harnesses in the automotive industry their simplicity, and ease of use, has seen these parts used in everything from aircraft, to switch-gear, to washing machines.

Features and Benefits

- Cable tie head always situated in defined position
- Easy to assemble without the need for a tool
- Disc adjusts tie for pressure from various directions and minimises access of dust, dirt and water
- Fir tree foot part can be used for a variety of panel thicknesses
- Suitable for use within threaded holes
- Versions for oval holes feature anti-twist protection.



The DOP versions for oval holes feature anti-twist protection.



T50SOS2DOP



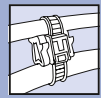
Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.		Hole Ø (FH)	Material	Colour	Tools	Article-No.
T50SOS2DOP	4.6	164.0	35.0	200	6.2 x 12.2	PA46	Grey (GY)	2-10	157-00069
	4.6	164.0	35.0	200	6.2 x 12.2	PA66HS	Black (BK)	2-10	157-00014
T50SOS2DOP7X12-E	4.6	164.0	35.0	225	7.0 x 12.0	PA66HS	Black (BK)	2-10	157-01105
T50SOS3DOP65130E	4.6	165.0	35.0	180	6.5 x 13.0	PA66HS	Black (BK)	2-10	157-00016
T50SOSFT7X12U	5.1	165.0	35.0	225	7.0 x 12.0	PA66HS	Black (BK)	2-10	157-00053
T50SOSFTOVALU	5.1	174.2	35.0	222	6.2 x 12.2	PA66HS	Black (BK)	2-10	157-00143
T50ROSFT7X12U	5.1	216.0	50.0	225	7.0 x 12.0	PA66HS	Black (BK)	2-10	157-00054
T50ROSFTOVALU	5.1	225.0	50.0	222	6.2 x 12.2	PA66HIRHS	Black (BK)	2-10	157-00142

All dimensions in mm. Subject to technical changes.

Recommended Tools								
2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



2-Piece Fixing Ties with Fir Tree, with Disc, for Round Holes

Primarily designed for fixing cable harnesses in the automotive industry, their simplicity and ease of use has resulted in these parts being used in other industries, for example aviation, switch gear manufacturer, white goods manufacturer.

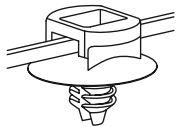
Features and Benefits

- Pre-assembled 2-piece fixing tie with fir tree foot part
- Cable tie head can be moved after bundling
- Easy to assemble without the need for a tool
- Disc adjusts tie for pressure from various directions and minimises access of dust, dirt and water
- Fir tree foot part can be used for a variety of panel thicknesses
- Suitable for use within threaded holes

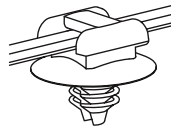


These Fir Tree fixings can also be used in threaded, blind holes.

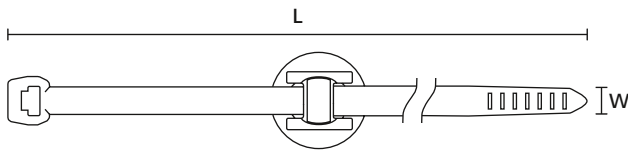
Fir Tree Parts FT5



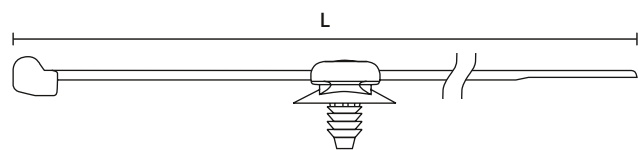
T30RFT5



T50SOSFT5SD



T50SOSFT5SD



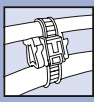
T50SOSFT5SD

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Disc Ø	Hole Ø (FH)	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T18RFT5	2.5	100.0	20.0	80	16.0	4.5 - 5.0	0.7 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01225
T18RFT5-MOD	2.5	100.0	22.0	80	11.0	4.5 - 5.0	0.7 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01270
T30RFT5	3.5	150.0	34.0	135	16.0	4.5 - 5.0	0.7 - 3.0	PA46	PA46	Natural (NA), Grey (GY)	2;4-6	150-55948
	3.5	150.0	34.0	135	16.0	4.5 - 5.0	0.7 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2;4-6	150-55850
	3.5	150.0	34.0	135	16.0	4.5 - 5.0	0.7 - 3.0	PA46	PA46	Grey (GY)	2;4-6	156-01316
T30RFT5-MOD	3.5	150.0	36.0	133	11.0	4.5 - 5.0	0.7 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01271
T50SOSFT5	4.6	150.0	31.0	225	16.0	4.5 - 5.0	0.7 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-06200
T50SOSFT5SD	4.6	150.0	35.0	225	16.0	4.5 - 5.0	0.7 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00432
T50RFT5	4.6	200.0	45.0	225	16.0	4.5 - 5.0	0.7 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00025

All dimensions in mm. Subject to technical changes.

Recommended Tools									
2	3	4	5	6	7	8	9	10	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	

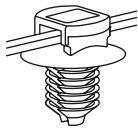
For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



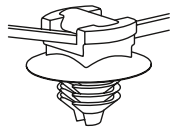
Cable Ties and Fixings

Cable Ties With Fixing Elements

Fir Tree Parts FT6

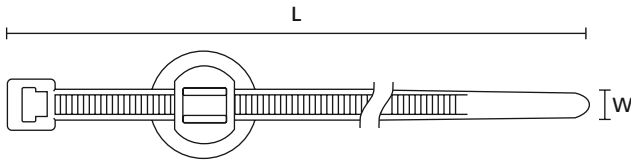


T30RFT6LG

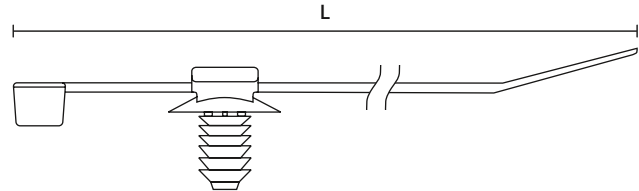


T50ROSFT6SD

i Other dimensions are available on request.



T50RFT6LG



T50RFT6LG

TYPE	Width (W)	Length (L)	Bundle Ø max.		Disc Ø	Hole Ø (FH)	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T18RFT6	2.5	100.0	20.0	80	16.0	6.5 - 7.0	0.8 - 3.0	PA66	PA66	Black (BK)	2;4-6	150-09110
PT2AFT 6LG	3.4	145.0	35.0	230	16.0	6.4 - 7.1	0.8 - 6.0	PEEK	PA46	Beige (BGE), Grey (GY)	2;4-6	156-01336
T30RFT6	3.5	150.0	34.0	135	16.0	6.4 - 7.1	0.8 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2;4-6	150-77950
T30RFT 6LG	3.5	150.0	35.0	133	16.0	6.4 - 7.1	0.8 - 6.0	PA66HS	PA66HIRHS	Black (BK)	2;4-6	150-31090
T30RFT6SD	3.6	148.0	35.0	135	16.0	6.4 - 7.1	0.8 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2;4-6	150-52690
T50SFT 6LG1SD	4.6	160.0	30.0	225	16.0	6.5 - 7.0	0.6 - 6.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00154
T50ROSFT6	4.6	200.0	45.0	225	16.0	6.4 - 7.1	0.8 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00076
T50ROSFT 6SD	4.6	200.0	45.0	225	16.0	6.4 - 7.1	0.8 - 3.0	PA46	PA46	Grey (GY)	2-10	156-00085
	4.6	200.0	46.0	225	16.0	6.4 - 7.1	0.8 - 3.0	PA66HS	PA66HIR	Black (BK)	2-10	156-05902
T50RFT 6LGSD-HEX	4.6	202.0	45.0	225	16.0	6.25 - 6.75	0.7 - 5.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00399
T50RFT6	4.6	202.0	45.0	225	16.0	6.4 - 7.1	0.8 - 3.0	PA46	PA46	Grey (GY)	2-10	150-77938
	4.6	202.0	45.0	225	16.0	6.4 - 7.1	0.8 - 3.0	PA66HS	PA66	Black (BK)	2-10	150-77941
T50RFT6LG	4.6	202.0	44.0	225	16.0	6.4 - 7.1	0.8 - 6.0	PA66HS	PA66HIRHS	Black (BK)	2-10	150-31091
T80IFT6LG	4.6	300.0	81.0	356	16.0	6.4 - 7.1	0.8 - 6.0	PA66HS	PA66HIRHS	Black (BK)	2-12	150-31096
T50RDHFT6	4.7	210.0	19.0	180	16.0	6.4 - 7.1	0.8 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2-10	150-77936
T80LFT6	5.0	390.0	108.0	355	16.0	6.4 - 7.1	0.8 - 3.0	PA66HS	PA66HIRHS	Black (BK)	2-12	150-77934

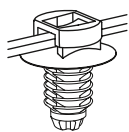
All dimensions in mm. Subject to technical changes.

Recommended Tools											
2	3	4	5	6	7	8	9	10	11	12	
MK20	MK21	MK3SP	MK3PNP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P	

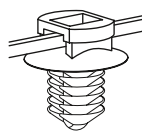
For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



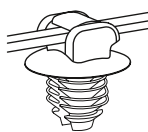
Fir Tree Parts FT7 - FT10



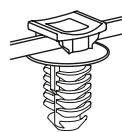
T50IFT7



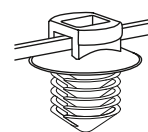
T50RFT8



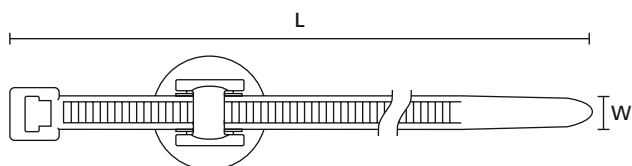
T50RFT8GSD



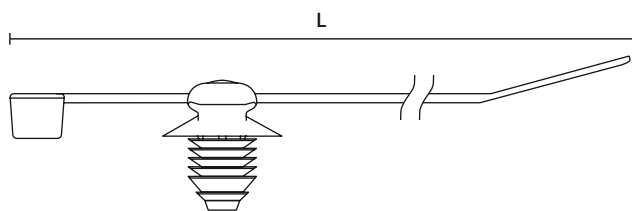
T120IFT9




T50RFT10




T50RFT8GSD



T50RFT8GSD

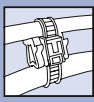
 **Material specification please see page 16.**

TYPE	Width (W)	Length (L)	Bundle Ø max.		Disc Ø	Hole Ø (FH)	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
V150RFT10	3.3	150.0	35.0	150	18.0	9.7 - 10.0	0.8 - 5.0	PA66	PA66HS	Black (BK)	2;4-6	156-01233
T40RFT8GSD	4.0	180.0	40.0	180	16.0	8.0 - 8.5	1.5 - 4.0	PA66HS	PA66HIRHS	Black (BK)	2;4-8	156-00104
T50RFT7	4.6	200.0	44.0	225	16.0	6.5 - 7.0	0.8 - 7.0	PA66HS	PA66HS	Black (BK)	2-10	111-85871
T50RFT10	4.6	200.0	45.0	225	18.0	9.7 - 10.0	0.8 - 5.0	PA66HS	PA66HS	Black (BK)	2-10	111-85810
T50ROSFT10	4.6	200.0	45.0	225	18.0	9.7 - 10.0	0.8 - 5.0	PA66HS	PA66HS	Black (BK)	2-10	156-00120
T50RFT8	4.6	200.0	49.0	225	16.0	7.7 - 8.0	0.8 - 6.0	PA66HS	PA66HS	Black (BK)	2-10	111-85880
T50RFT7HD	4.6	200.0	45.0	225	21.6	6.2 - 7.2	0.8 - 7.0	PA46	PA46	Brown (BN)	2-10	156-00457
T50RFT8GSD	4.6	202.0	45.0	225	16.0	8.0 - 8.5	1.5 - 4.0	PA66HS	PA66HIRHS	Black (BK)	2-10	133-00034
	4.6	202.0	45.0	225	16.0	8.0 - 8.5	1.5 - 4.0	PA46	PA46	Grey (GY)	2-10	156-00235
T50IFT7	4.6	300.0	81.0	225	16.0	6.5 - 7.0	0.8 - 7.0	PA66HS	PA66HS	Black (BK)	2-10	150-00700
T120IFT9	7.6	300.0	80.0	535	20.0	9.0 - 10.6	5.0 - 11.0	PA66HIR(S)	PA66HIR(S)	Black (BK)	3;9-12	156-00200

All dimensions in mm. Subject to technical changes.

Recommended Tools											
2	3	4	5	6	7	8	9	10	11	12	
MK20	MK21	MK3SP	MK3PN5P2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P	

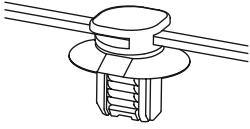
For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.




Cable Ties and Fixings

Cable Ties With Fixing Elements

2-Piece Fixing Ties with Fir Tree, with disc, for oval holes



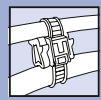
T50ROS1DOP

TYPE	Width (W)	Length (L)	Bundle Ø max.		Disc Ø	Hole Ø (FH)	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T50ROS1 DOP62x122	4.6	200.0	45.0	225	16.0 x 21.0	6.2 x 12.2	0.6 - 6.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-05908
T50ROSFT OVAL-B	4.6	200.0	50.0	225	17.6 x 23.6	6.2 x 12.2	0.6 - 6.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-01519
T50RFT OVAL-A	4.6	200.0	50.0	225	17.6 x 23.6	6.2 x 12.2	0.6 - 5.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-01464
	4.6	200.0	50.0	225	17.6 x 23.6	6.2 x 12.2	0.6 - 5.0	PA46	PA46	Natural (NA)	2-10	156-01465
T50R6DOP	4.6	200.0	50.0	225	16.0 x 21.0	6.2 x 12.2	0.6 - 6.0	PA46	PA66	Natural (NA)	2-10	156-01277
LK2AFT 62x122A	4.6	275.0	73.0	225	16.0 x 21.0	6.2 x 12.2	0.6 - 5.0	PA66HIRHS	PA66HIRHS	Black (BK)	2-10	156-01208
LK2AFT 62x122B	4.6	275.0	73.0	225	16.0 x 21.0	6.2 x 12.2	0.6 - 5.0	PA66HIRHS	PA66HIRHS	Black (BK)	2-10	156-01209

All dimensions in mm. Subject to technical changes.

Recommended Tools									
2	3	4	5	6	7	8	9	10	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



2-Pieces Fixing Ties with Deep Hole Anchor, with Disc, for Round Holes

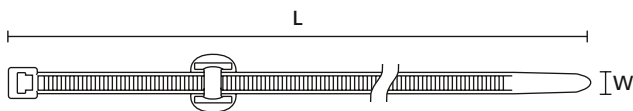
Deep Hole Anchor DHA5.5 - DHA8.4

Features and Benefits

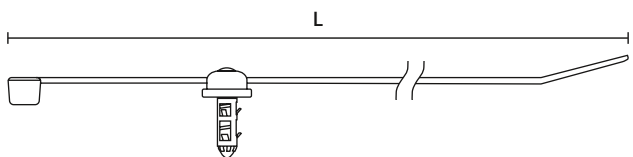
- Pre-assembled 2-piece fixing tie with deep hole anchor
- The high 'pull off' forces are due to the integrated metal clamp
- Cable tie head can be moved after bundling
- Easy to assemble without the need for a tool
- Disc adjusts tie for pressure from various directions and minimises access of dust, dirt and water
- Suitable for use within blind holes with or without thread



DHA5.5x15 and DHA8.4x20 for blind hole applications.



Fixing tie with deep hole anchor



Fixing tie with deep hole anchor



Material specification please see page 16.

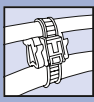
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Hole Ø (FH)	Panel Thickness	Material	Colour	Tools	Article-No.
T50RDHA 5.5x15		4.6	202.0	45.0	225	5.4 - 5.6	15.0	PA46	Grey (GY)	2-10	156-01203
T50RDHA 8.4x20		4.6	202.0	45.0	225	8.3 - 8.5	20.0	PA46	Grey (GY)	2-10	156-01155

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

1-Piece Fixing Ties for Weld Studs

For cable routing above the stud

Primarily designed for use in the automotive industry, these parts can be used in a wide variety of applications where weld studs or ISO bolts are used and cables need to be bundled and secured (WS series, T120RSM, DCT9 & DCT 11 are for 1/4" bolts).

Features and Benefits

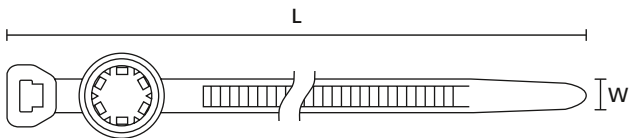
- Cable tie head always situated in defined position
- Easy to assemble without the need for a tool
- Bundle runs directly above weld stud with defined stand-off from the panel



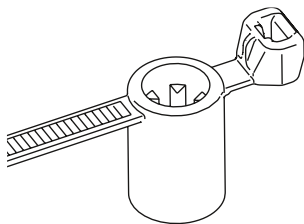
The T50SSBS50TE / T50SSBS60T-E allows very precise routing of cable bundles.



Material specification please see page 16.



T50SSBS60T-E



T50SSBS50TE

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Stud Ø	Material	Colour	Tools	Article-No.
T50SSBS50TE	4.6	160.0	35.0	200	5.0	PA66HS	Black (BK)	2-10	155-30602
T50SSBS60T-E	4.6	160.0	35.0	200	6.0	PA66HS	Black (BK)	2-10	157-00083
T50SOSSBH5E	4.6	166.4	35.0	225	5.0	PA66HS	Black (BK)	2-10	155-05701
T50SOSSBS6E	4.7	160.0	35.0	225	6.0	PA66HS	Black (BK)	2-10	157-00211

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

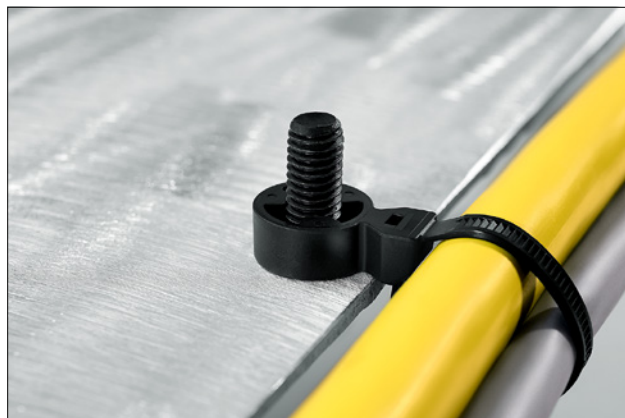


1-Piece Fixing Ties for Weld Studs

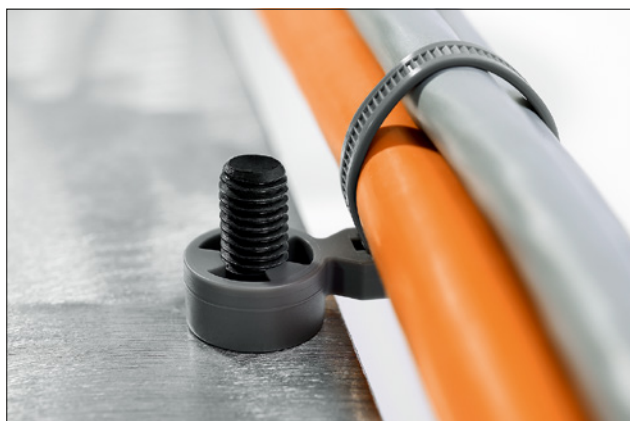
For cable routing alongside the stud

Features and Benefits

- Cable tie head always situated in defined position
- Easy to install without the need for a tool
- Bundles are routed very close to stud



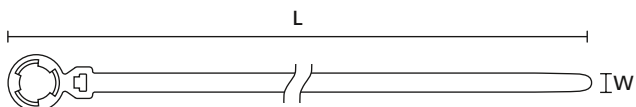
T50SOSSBD-M8/10.



T50SOSSBU-M8/10 for bundles which run below the stud.



This outside serrated cable tie with weld stud mounting keeps the cables close to the fixing stud.



T50SOSSBD-M8/M10

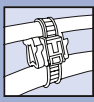
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Stud Ø	Material	Colour	Tools	Article-No.
T50SOSSBD-M10		5.7	175.0	30.0	150	10.0	PA66HSW	Black (BK)	2-10	157-00040
T50SOSSBD-M8		5.7	175.0	30.0	150	8.0	PA66HSW	Black (BK)	2-10	157-00039
T50SOSSBU-M10		5.7	175.0	30.0	150	10.0	PA66HSW	Grey (GY)	2-10	157-00067
T50SOSSBU-M8		5.7	175.0	30.0	150	8.0	PA66HSW	Grey (GY)	2-10	157-00066
T50SOSSBS5E		4.7	160.0	35.0	225	5.0	PA66HS	Black (BK)	2-10	155-12300

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

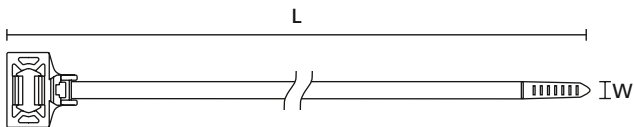
Cable Ties With Fixing Elements

1-Piece Fixing Ties for Weld Studs, moveable

T50SOSWSP5E-2 for 5 mm studs, retainer height 3.5 mm

Features and Benefits

- Cable tie head always situated in defined position
- Easy to install without the need for a tool
- Provides 5 - 6 mm lateral adjustment
- Very low profile, stackable design
- For parallel routing of several bundles



T50SOSWSP5E-2



T50SOSWSP5E, parallel installation using two fixing ties.

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Stud Ø	Material	Colour	Tools	Article-No.
T50SOSWSP5E-2	4.6	162.6	35.0	225	5.0	PA66HS	Black (BK)	2-10	133-01553

All dimensions in mm. Subject to technical changes.

Recommended Tools

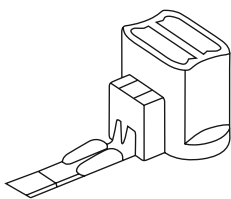
2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

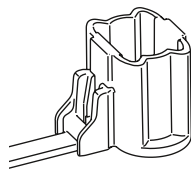
T50SOSSB5-High-E-C-CC for 5 and 6 mm studs

Features and Benefits

- Cable tie head always situated in defined position
- Easy to install without the need for a tool
- Provides a 5 – 6 mm lateral adjustment possibility



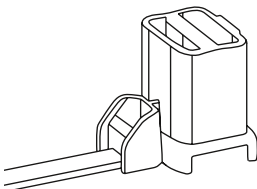
FixingTie_T50SOSSB5-High-E-C-CC



T50SOSSB6HE



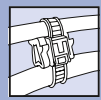
T50SOSSB5-High-E-C-CC.



T60ROSSB6HEC

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Stud Ø	Material	Colour	Tools	Article-No.
T50SOSSB6HE	4.7	160.0	35.0	170	6.0	PA66HS	Black (BK)	2-10	155-46302
T50SOSSB5-High-E-C-CC	5.0	167.0	35.0	225	5.0	PA66HS	Black (BK)	2-10	157-00227
T60ROSSB6HEC	5.5	227.4	55.0	300	6.0	PA66HS	Black (BK)	3;9-12	157-00101

All dimensions in mm. Subject to technical changes.

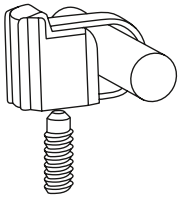


1-Piece Fixing Ties for Weld Studs

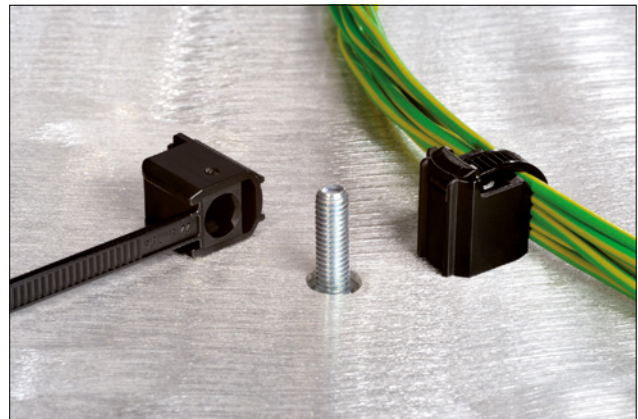
LFC-Series for routing close to the stud

Features and Benefits

- 1-piece fixing tie for 5 mm studs
- Cable tie head always situated in defined position
- Easy to install without the need for a tool
- Bundle runs very close next to stud
- Closed stud retainer protects the bundle against damage
- Contact surface allows secure bundling with tensioning tool



LFC165-2 can be put on by hand.



LFC165-2 for bundle diameters up to 35.0 mm



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.		Stud Ø	Material	Colour	Tools	Article-No.
LFC165(PSA)	4.7	165.0	35.0	90	5.0	PA66HS	Black (BK)	2-10	155-34202
LFC165-2	4.7	165.0	35.0	150	5.0	PA66HS	Black (BK)	2-10	157-00047

All dimensions in mm. Subject to technical changes.

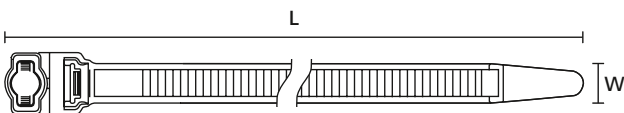
1-Piece Fixing Ties for Weld Studs, for Heavy Duty Applications

WS-Series for threaded studs

Wide strap stud-mounted cable ties are primarily designed for use in the automotive or truck industry.

Features and Benefits

- Very flexible strap provides minimum pinching of soft hoses and convoluted tubing
- Low profile head for compact bundling
- Clamping rails to increase grip on round bundles
- Flexible hinge



Wide Strap Heavy Duty Stud Mount Cable Ties



The wide strap stud mount cable tie minimizes pinching on soft bundles.

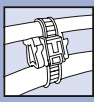
TYPE	Width (W)	Length (L)	Bundle Ø max.		Stud Ø	Material	Colour	Tools	Article-No.
WSS8MM	12.7	246.4	57.1	534	8.0	PA66HIRHSW	Black (BK)	11-12	157-00034
WSI8MM	12.7	322.6	82.5	534	8.0	PA66HIRHSW	Black (BK)	11-12	157-00035
WSR8MM	12.7	398.8	104.1	534	8.0	PA66HIRHSW	Black (BK)	11-12	157-00036

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

2-Piece Fixing Ties for Weld Studs

Series SBH5 and SBH5SD are used mainly in the automotive industry. The SD variant is for the smallest bundle diameters from 1.0 mm. Series SB5 and SBS5 are suitable for bundling and fastening cable looms and pipes in switch cabinet construction and automotive and construction machine industry.

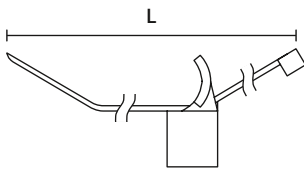
Features and Benefits

- Pre-assembled 2-piece fixing tie with stud retainer
- Cable tie head can be moved after bundling
- Easy to install without the need for a tool
- SB5-types for 5 mm studs or 5 mm ISO threaded studs
- Types with discs can retain insulation materials while fixing a cable bundle
- Oval shape can be adjusted in a lateral position
- GB58C for 8 mm retainer enables parallel routing



Cable ties illustrating the variety of application methods for weld stud fixing.

2-Piece Fixing Ties for Weld Studs, moveable



TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Stud Ø	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T30RSB5		3.5	150.0	32.0	135	5.0	PA66HS	POM	Black (BK)	2;4-6	150-10140
T50SSB5		4.6	150.0	32.0	225	5.0	PA6HS	PA66HS	Black (BK)	2-10	150-10144
T50SOSSB5		4.6	150.0	35.0	225	5.0	PA66HS	POM	Black (BK)	2-10	156-00080
T50RSB5		4.6	200.0	45.0	225	5.0	PA66HS	POM	Black (BK)	2-10	150-10141
T50ROSSB5		4.6	200.0	45.0	225	5.0	PA66HS	POM	Black (BK)	2-10	150-10149
T50RSB5		4.6	202.0	45.0	225	5.0, 6.0	PA46	PA46	Grey (GY)	2-10	156-00084
T50RSB5CSD		4.6	200.0	45.0	225	5.0	PA66HS	PA66HS	Black (BK)	2-10	156-00083
T50ROSSB5CSD		4.6	200.0	45.0	225	5.0	PA66HS	PA66HS	Black (BK)	2-10	156-05906

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



2-Piece Fixing Ties for Weld Studs

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Stud Ø	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T30RSBS5		3.5	150.0	35.0	135	5.0	PA66HS	PA66HS	Black (BK)	2;4-6	150-21290
T50SOSSBS5		4.6	150.0	31.0	225	5.0	PA66HS	PA66	Black (BK)	2-10	156-00079
T50SBS5		4.6	150.0	35.0	225	5.0	PA66HS	PA66HS	Black (BK)	2-10	150-21293
T50RSBS5		4.6	200.0	45.0	225	5.0	PA66HS	PA66HS	Black (BK)	2-10	150-21291
T50ROSSBS5		4.6	200.0	45.0	225	5.0	PA66HS	PA66HS	Black (BK)	2-10	150-21299
T80ISBS5		4.7	305.0	80.0	355	5.0	PA66HS	PA66HS	Black (BK)	2-12	150-21297
T50ROSGBS8CA		4.6	200.0	45.0	225	8.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00251
T50ROSGBS8CB		4.6	200.0	45.0	225	8.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00252
T50ROSGBS8CC		4.6	200.0	45.0	225	8.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00116

All dimensions in mm. Subject to technical changes.



Material specification please see page 16.

2-Piece Fixing Ties for Weld Studs, with disc

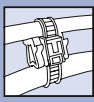
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Stud Ø	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T50RSBH5		4.6	202.0	45.0	225	5.0	PA66HS	PA66HS	Black (BK)	2-10	150-16943
T80ISBH5		5.0	300.0	80.0	355	5.0	PA66HS	PA66HS	Black (BK)	2-12	150-16945
T50RSBH5-SD		4.6	200.0	45.0	222	5.0	PA66HS	PA66HS	Black (BK)	2-10	150-92904
T50ROSSBH5SD		4.6	200.0	45.0	225	5.0	PA66HS	PA66HS	Black (BK)	2-10	156-05905
T80ISBH5SD		4.6	300.0	78.0	356	5.0	PA66HS	PA66HS	Black (BK)	2-12	150-92905
T50R-SBH5SD-14		4.6	200.0	45.0	222	5.0	PA66HS	PA66HS	Black (BK)	2-10	150-77591
T50RSBH6SD		4.6	200.0	45.0	225	6.0	PA66HS	PA66HS	Black (BK)	2-10	156-00819

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

2-Piece Fixing Ties for Weld Studs, for parallel routing

T50SDSBS5 for max. bundle diameter 35.0 mm

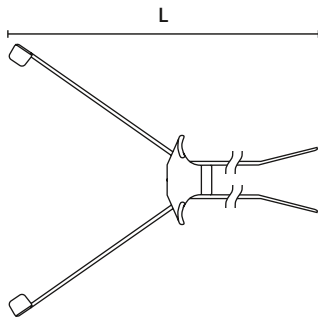
Many applications require cables to be run parallel to each other but separated to avoid abrasion. The double mounting base, when used with two cable ties, allow this to be achieved simply and quickly. Widely used for securing cables, pipes and hoses in the automotive and truck building industries, the mounting base is simply pushed onto a 5mm diameter weld stud or bolt.

Features and Benefits

- Pre-assembled 2-piece fixing tie with stud retainer
- For parallel routing of cables, hoses or harnesses
- Cable tie head can be moved after bundling
- Easy to install without the need for a tool
- For 5 mm studs or 5 mm ISO threaded studs



Parallel fixation of two cables.



DSBS5



Other dimensions are available on request.



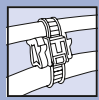
Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Stud Ø	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T50SDSBS5	4.6	150.0	35.0	225	5.0	PA66HS	PA66HIRHS	Black (BK)	2-10	150-56193
T50ROSBS5	4.6	200.0	45.0	222	5.0	PA66HS	PA66HIRHS	Black (BK)	2-10	150-56199

All dimensions in mm. Subject to technical changes.

Recommended Tools								
2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Fixing Ties for Edges

EdgeClip-Family

These cable ties and EdgeClip assemblies are ideal for use where holes are not acceptable or where, due to temperature problems, adhesives will fail. Once the cable tie is fastened around the cables the EdgeClip is presented ready for attaching to the panel. Widely used within the automotive and panel building industries these cable ties and EdgeClips save time and money.

Features and Benefits

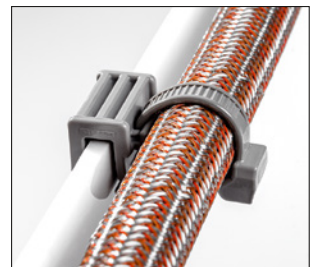
- Easy assembly by hand
- For edges of 1 – 3 mm or 3 – 6 mm
- Integrated metal clamp holds clip firmly in place
- Clamp consists of double tempered steel spring
- Ideal for applications where holes or adhesives are not suitable



T50ROSEC10 fitted onto a plastic panel to hold a Ø 6 mm harness.



1-Piece-Fixing Tie T50SOSEC12 can be pushed easily on edges.

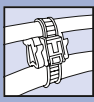


Pre-assembled 2-Piece Fixing Tie with Edge Clip for edges of 1-3 mm.

The silver-grey clamp, the heart of our EdgeClips, consists of double-tempered spring steel in accordance with DIN EN 10132-4 C75S. The spring steel gives the clamp both the necessary rigidity to provide high pull-off forces and also sufficient flexibility for various possible applications.

The double coating is applied initially with a zinc plate system followed by inorganic surface sealing. Naturally, no chromium (VI) is used in this process. The clamp therefore complies with the current

EU Directive 2000/53/EC on end of life vehicles and the prohibition on heavy metals. The refined spring-steel clamp also fulfils the requirements for resistance to salt spray stipulated in DIN EN ISO 9227 NSS (min. 840 h without corrosion of base metal) and DIN EN ISO 6270-Z-CH (min. 720 h without corrosion of base material). This solution has therefore been approved by many OEMs for exposed installation locations, e.g. in engine compartments and the running-gear area.



Cable Ties and Fixings

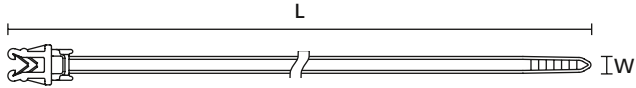
Cable Ties With Fixing Elements

Fixing Ties for Edges

EdgeClip-Family



EdgeClips are also available on request for panel thickness from 4 - 7 mm.



T50SOSEC12E

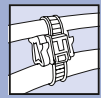
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Panel Thickness	Material	Colour	Tools	Article-No.
T50SOSEC12E		4.6	160.0	35.0	180	1.0 - 3.0	PA66HS	Black (BK)	2-10	148-00200
T50SOSEC13E		4.6	160.0	35.0	180	1.0 - 3.0	PA66HS	Black (BK)	2-10	126-00000
T40XEC5SP-E		4.0	85.0	15.0	178	1.0 - 3.0	PA66HS	Black (BK)	2;4-8	133-00059
T50SOSEC34E		4.6	155.0	35.0	180	1.0 - 3.0	PA66HS	Black (BK)	2-10	126-00036
T50SOSEC20-E		4.6	161.0	35.0	180	3.0 - 6.0	PA66HS	Black (BK)	2-10	126-00235

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



2-Piece Fixing Ties for Edges, 1.0 - 3.0 mm, Top Fixing

EdgeClip-Family

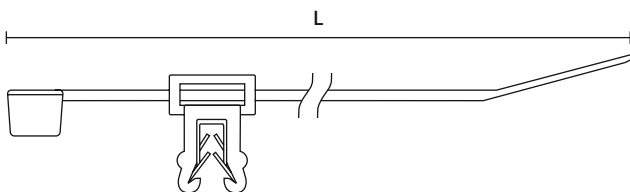
These cable ties and EdgeClip assemblies are ideal for use where holes are not acceptable or where due to temperature problems adhesives will fail. These assemblies are widely used for fixing and bundling cables, pipes and hoses within the automotive industry, harness making, panel building and electrical industry.

Features and Benefits

- Pre-assembled 2-piece fixing tie with EdgeClip
- Cable tie head can be moved after bundling
- EC9, EC10, EC21 and EC22 are for minimum bundle diameters of 1 mm
- For edges of 1 – 3 mm



T50ROSEC10 fitted onto a plastic panel to hold a Ø 6 mm harness.



Fixing Tie with EC4



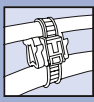
Material specification please see page 16.

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T30REC4A		3.6	148.0	33.0	135	PA66HS	PA66HIRHS	Black (BK)	2;4-6	150-76090
T50SOSEC4A		4.6	150.0	35.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-76093
T50ROSEC4A		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-76099
T50ROSEC4A-W		4.6	200.0	45.0	225	PA66W	PA66W	Black (BK)	2-10	156-00570
T50REC4A		4.6	202.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-76091
T30REC4B		3.6	148.0	35.0	135	PA66HS	PA66HIRHS	Black (BK)	2;4-6	150-76080
T50SOSEC4B		4.6	150.0	35.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00109
T50ROSEC4B		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-76079
T18REC10SD		2.5	100.0	22.0	80	PA66HS	PA66HIRHS	Black (BK)	2;4-6	155-38304
T50SOSEC10		4.6	150.0	31.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00015
T50ROSEC10		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-05904
T18REC9SD		2.5	100.0	22.0	80	PA66HS	PA66HIRHS	Black (BK)	2;4-6	155-37104
T50SOSEC9SD		4.6	150.0	31.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00019
T50ROSEC9		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-05903
T50REC9SD		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-01280

All dimensions in mm. Subject to technical changes.

Recommended Tools								
2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

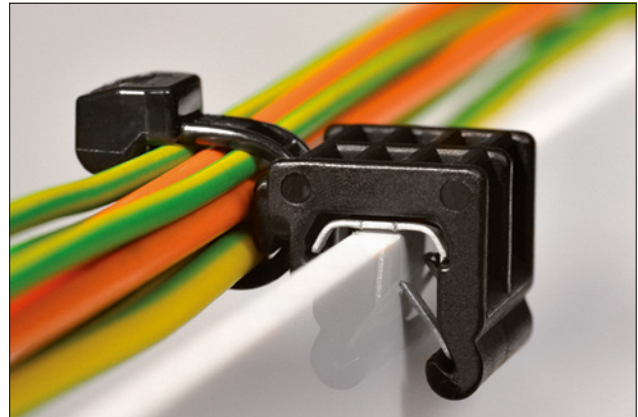
2-Piece Fixing Ties for Edges, 1.0 - 3.0 mm, Side Fixing

EdgeClip-Family

These cable ties and EdgeClip assemblies are ideal for use where holes are not acceptable or where due to temperature problems adhesives will fail. These assemblies are widely used for fixing and bundling cables, pipes and hoses within the automotive industry, harness making, panel building and electrical industry.

Features and Benefits

- Pre-assembled 2-piece fixing tie with EdgeClip
- Cable tie head can be moved after bundling
- EC9, EC10, EC21 and EC22 are for minimum bundle diameters of 1 mm
- For edges of 1 – 3 mm



T50ROSEC23 - the cable bundle runs parallel with the edge.



Material specification please see page 16.

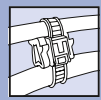
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T30REC5A		3.6	148.0	33.0	135	PA66HS	PA66HIRHS	Black (BK)	2,4-6	156-00003
T50SOSEC5A		4.6	150.0	31.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-40593
T50ROSEC5A		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-40591
T50SOSEC5B		4.6	150.0	31.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-40583
T50REC5B		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-40582
T50ROSEC5B		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-40581
T18REC21		2.5	100.0	18.0	80	PA66W	PA66HIRHS	Black (BK)	2,4-6	156-01231
T50SOSEC21		4.6	150.0	35.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00017
T50ROSEC21		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00010
T50ROSEC22		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00011
T50REC22		4.6	200.0	45.0	225	PA66W	PA66HIRHS	Black (BK)	2-10	156-00576

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



2-Piece Fixing Ties for Edges, 3.0 - 6.0 mm, Top Fixing

EdgeClip-Family

Features and Benefits

- Pre-assembled 2-piece fixing tie with EdgeClip
- Cable tie head can be moved after bundling
- For minimum bundle diameters of 1 mm
- For edges of 3 – 6 mm



Other combinations between cable tie and foot part available on request.

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T18ROSEC19		2.5	100.0	20.0	80	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-04600
T50SOSEC19		4.6	150.0	35.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-04601
T50ROSEC19		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-04602
T50SOSEC20		4.6	150.0	35.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00016
T50ROSEC20		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00020

All dimensions in mm. Subject to technical changes.

2-Piece Fixing Ties for Edges, 3.0 - 6.0 mm, Side Fixing

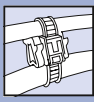
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T50ROSEC23		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00006
T50ROSEC24		4.6	200.0	45.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00007

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

2-Piece Fixing Ties for Edges, 0.5 - 2.5 mm, Top Fixing

Edge Clip Family for flat and thin edges

These cable ties and EdgeClip assemblies are ideal for use where holes are not acceptable or where due to temperature problems adhesives will fail. These assemblies are widely used for fixing and bundling cables, pipes and hoses within the automotive industry, harness making, panel building and electrical industry. These EdgeClips are specially designed for applications where space is limited such as in mirrors and headlights.

Features and Benefits

- For flat edges
- For thin edges 0.5 - 2.5 mm
- Small housing for limited space
- Pre-assembled 2-piece fixing tie with EdgeClip
- Cable tie head can be moved after bundling



T30ROSEC0.5-2.5SPV for application on thin edges.



The capabilities of our popular Edge Clip family have been enhanced with the introduction of new, smaller clips. These smaller clips allow bundles to run more safely on thin or flat edges.

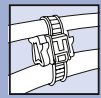
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T30ROSEC0.5-2.5TP-SD		3.4	145.0	35.0	135	0.5 - 2.5	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01543
T30ROSEC0.5-2.5TPVA		3.4	145.0	35.0	135	0.5 - 2.5	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01542
T30ROSEC0.5-2.5TV-SD		3.4	145.0	35.0	135	0.5 - 2.5	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01545

All dimensions in mm. Subject to technical changes.

2-Piece Fixing Ties for Edges, 0.5 - 2.5 mm, Side Fixing

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T30ROSEC0.5-2.5SP-SVB		3.4	145.0	35.0	135	0.5 - 2.5	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01546
T30ROSEC0.5-2.5SPVA		3.4	145.0	35.0	135	0.5 - 2.5	PA66HS	PA66HIRHS	Black (BK)	2;4-6	156-01544

All dimensions in mm. Subject to technical changes.



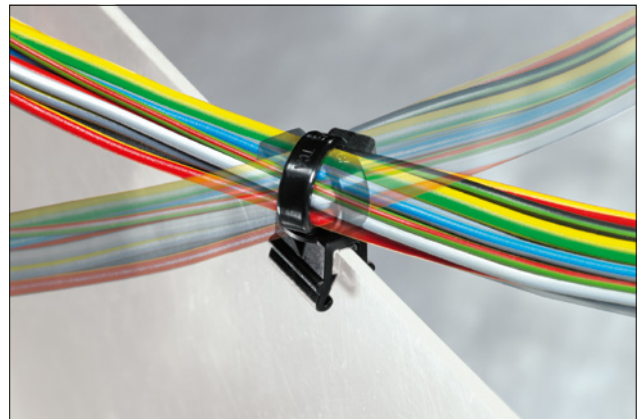
2-Piece Fixing Ties for Edges, twistable

EdgeClip-Family

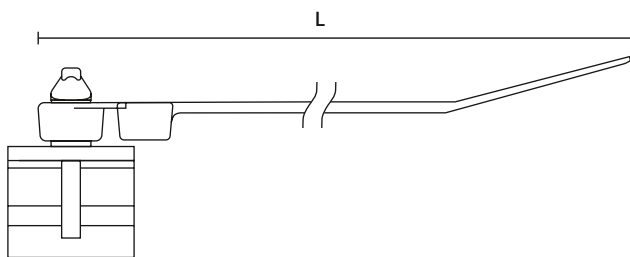
These cable ties and EdgeClip assemblies are ideal for use where holes are not acceptable or where due to temperature problems adhesives will fail. These assemblies are widely used for fixing and bundling cables, pipes and hoses within the automotive industry, harness making, panel building and electrical industry.

Features and Benefits

- Pre-assembled 2-piece fixing tie with EdgeClip
- Easy to assemble by hand
- Cable tie head can be moved after bundling
- For edges of 1 – 2.5 mm or 1 – 3 mm
- Can be rotated to the desired position during mounting



EdgeClip CBTO50R, rotatable 90°.



CBT30MR



Material specification please see page 16.

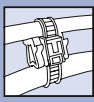
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Panel Thickness	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
CBT30MR		3.5	160.0	32.0	135	2.5	PA66HS	POM	Black (BK)	2;5-6	156-00049
CBTO50R		4.6	202.0	47.0	225	3.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-01601
CBTOS50R STUD5		4.6	200.0	47.0	225	3.0	PA66HS	PA66HIRHS	Black (BK)	2-10	156-00380

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

2-Piece Fixing Ties for Edges, for Holes

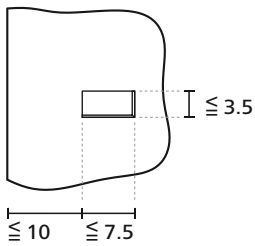
Due to the tie's reduced installation height it is ideal for use wherever space is at a premium.

Features and Benefits

- Pre-assembled 2-piece fixing tie with EdgeClip
- Easy to assemble by hand
- Cable tie head can be moved after bundling
- For edges of 1.0 - 3.0 mm
- Secure fixing of the EdgeClip into drill hole
- Ideal for use wherever space is at its premium



The holding tab increases the tensile strength additionally.



Position of the drill hole for the holding tab



**Material specification
please see page 16.**

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T50REC2.5B		4.6	202.0	40.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-45292
T50ROSEC2.5A		4.6	200.0	50.0	225	PA66HS	PA66HIRHS	Black (BK)	2-10	150-45299

All dimensions in mm. Subject to technical changes.

Recommended Tools									
2	3	4	5	6	7	8	9	10	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



1-Piece Fixing Tie with Pipe Clip

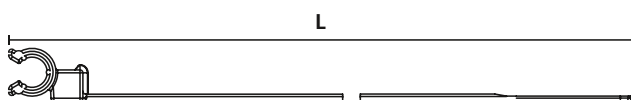
Bracket brake line

Features and Benefits

- Easily locks onto a cable, tube or hose (D = 4.8 – 5.4 mm)
- Cable tie head always in defined position
- Suitable for post-installation of bundles



Brake cable fixing suitable for post installation of bundles.



Brake cable fixing

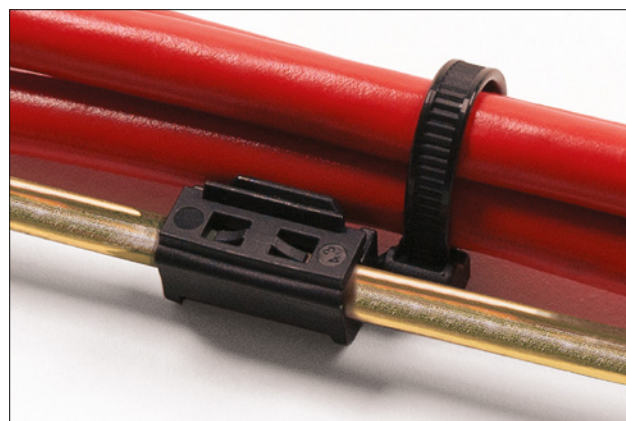
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Attach to Ø	Material	Colour	Tools	Article-No.
Bracket brake line		3.6	150.0	35.0	133	4.8 - 5.4	PA46	Grey (GY)	2;4-6	148-00101
		3.6	150.0	35.0	133	4.8 - 5.4	PA66HS	Natural (NA)	2;4-6	148-00100

All dimensions in mm. Subject to technical changes.

1-Piece Fixing Ties with Wire Clip

Features and Benefits

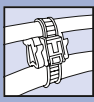
- Cable tie head always in defined position
- Easy to close by simply pressing the cover
- Firm fit around wires
- Suitable for post-installation of bundles
- Available in a range of sizes



T50SOSWA - The easy way for parallel guidance of cables next to a wire.

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	N	Attach to Ø	Material	Colour	Tools	Article-No.
T50SOSWA1.8E		4.6	150.0	35.0	225	1.8	PA66HS	Black (BK)	2-10	148-00089
T50SOSWA2.0E		4.6	150.0	35.0	225	2.0	PA66HS	Black (BK)	2-10	148-00088
T50SOSWA3.4E		4.6	150.0	35.0	225	3.4	PA66HS	Black (BK)	2-10	148-00095
T50SOSWA4.3E		4.6	150.0	35.0	225	4.3	PA66HS	Black (BK)	2-10	148-00092
T50SOSWB1.8E		4.6	150.0	35.0	225	1.8	PA66HS	Black (BK)	2-10	148-00090
T50SOSWB2.0E		4.6	150.0	35.0	225	2.0	PA66HS	Black (BK)	2-10	148-00093
T50SOSWB3.4E		4.6	150.0	35.0	225	3.4	PA66HS	Black (BK)	2-10	148-00096
T50SOSWB4.3E		4.6	150.0	35.0	225	4.3	PA66HS	Black (BK)	2-10	148-00091

All dimensions in mm. Subject to technical changes.



Cable Ties and Fixings

Cable Ties With Fixing Elements

2-Piece Fixing Ties with Pipe Clip, twistable 360°

Features and Benefits

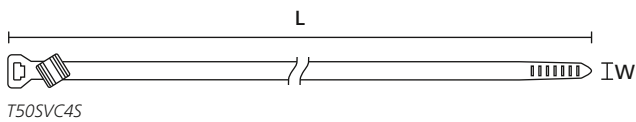
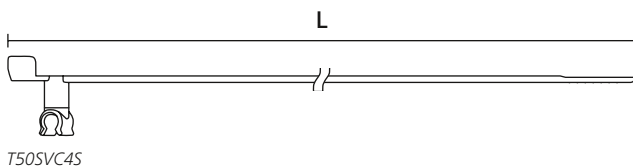
- Simply clip onto a wire or hose
- Fixing clip offers full 360° rotation
- Routed cable can move in any direction in relation to the fixing point
- Inside serrated cable tie
- Ideally used in the Automotive Industry



T50SVC5 rotates in any direction.



Material specification please see page 16.



TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	Attach to Ø	Material	Colour	Tools	Article-No.
T50SVC4		4.7	155.0	35.0	3.8 - 4.2	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01375
T50SVC5		4.7	155.0	35.0	4.5 - 5.2	PA66HS	Black (BK)	2-10	156-01366
T50SVC4S		4.7	155.0	35.0	3.8 - 4.2	PA66HS, PP	Black (BK), Natural (NA)	2-10	156-01374
T50SVC3.5		4.7	155.0	35.0	3.45 - 3.55	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01376
T50SVC6.5		4.7	155.0	35.0	6.5 - 8.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01371

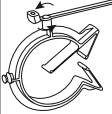
All dimensions in mm. Subject to technical changes.

Recommended Tools								
2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



2-Piece Fixing Ties with Pipe Clip, twistable 360°

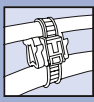
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	Attach to Ø	Material	Colour	Tools	Article-No.
T50SVCOC10-14		4.7	155.0	35.0	10.0 - 14.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01367
T50SVCOC15-18		4.7	155.0	35.0	15.0 - 18.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01368
T50SVCOC19-24.5		4.7	155.0	35.0	19.0 - 24.5	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01369
T50SVCOC25-31		4.7	155.0	35.0	25.0 - 31.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01372
T50SVCOC31-39		4.7	155.0	35.0	31.0 - 39.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01373
T50SVCOC39-45		4.7	155.0	35.0	39.0 - 45.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01370
T50SVCOC9-11A		4.7	155.0	35.0	9.0 - 11.0	PA66HIRHS, PA66HS	Black (BK)	2-10	156-01236
T50SVCOC9-11B		4.7	155.0	35.0	9.0 - 11.0	PA66HIRHS, PA66HS	Black (BK)	2-10	156-01237
T50SVCOC14		4.7	155.0	35.0	14.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01318
T50SVCOC18-20A		4.7	155.0	35.0	18.0 - 20.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01190
T50SVCOC18-20B		4.7	155.0	35.0	18.0 - 20.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01194
T50SVCOC28		4.7	155.0	35.0	28.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01239
T50SMVCOC28		4.7	210.0	50.0	28.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-01268
T50SMVCOC1014		4.7	210.0	50.0	10.0 - 14.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00128
T50SMVCOC15-18		4.7	210.0	50.0	15.0 - 18.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00129
T50SMVCOC19-24.5		4.7	210.0	50.0	19.0 - 24.5	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00130
T50SMVCOC19-24.5		4.7	210.0	50.0	19.0 - 24.5	PA46	Grey (GY)	2-10	156-00577
T50SMVCOC25-31		4.7	210.0	50.0	25.0 - 31.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00303
T50SMVCOC31-39		4.7	210.0	50.0	31.0 - 39.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00304
T50SMVCOC39-45		4.7	210.0	50.0	39.0 - 45.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00131

All dimensions in mm. Subject to technical changes.

Recommended Tools

2	3	4	5	6	7	8	9	10
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

2-Piece Fixing Ties with Automatic Harness Clip, connectable and twistable 360°

IAHC-Series

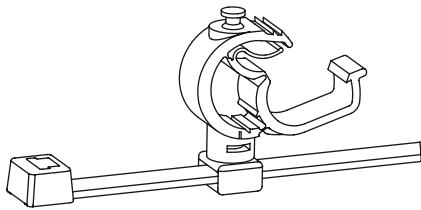
Offering a simple and secure method of attaching cables together. Originally designed for the automotive industry, these products are used in a wide range of applications.

Features and Benefits

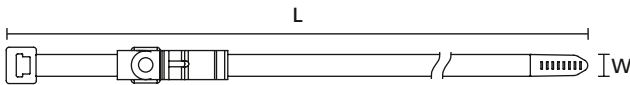
- Push and click closure
- 360 degrees rotatable
- Coupling elements of the IAHC variants allow parts to interconnect



T120R cable tie assembled with an IAHC.



T120RIAHC()TCR



T120RIAHC()TCR



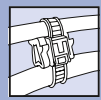
Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.	Attach to Ø		Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T50RIAHC1TCR	4.6	200.0	50.0	3.0 - 13.0	225	PA66HIR(S)	PA66HIRHS	Black (BK)	2-10	156-05331
T50RIAHC2TCR	4.6	200.0	50.0	11.0 - 20.0	225	PA66HIR(S)	PA66HIRHS	Black (BK)	2-10	156-05330
T50RIAHC5TCR	4.6	200.0	50.0	35.0 - 45.0	225	PA66HIR(S)	PA66HIRHS	Black (BK)	2-10	156-01048
T120RIAHC4TCR	7.6	387.0	100.0	27.0 - 36.0	535	PA66HIR(S)	PA66HIRHS	Black (BK)	3;9-12	156-00176
T120RIAHC5TCR	7.6	387.0	100.0	35.0 - 45.0	535	PA66HIR(S)	PA66HIRHS	Black (BK)	3;9-12	156-01317
T120RIAHC3TCR	7.6	390.0	100.0	19.0 - 26.0	535	PA66HIR(S)	PA6HIRHS	Black (BK)	3;9-12	156-00175
T120RIAHC1TCR	7.6	390.0	108.0	3.0 - 13.0	535	PA66HIR(S)	PA66HIRHS	Black (BK)	3;9-12	156-00172
T120RIAHC2TCR	7.6	390.0	108.0	11.0 - 20.0	535	PA66HIR(S)	PA66HIRHS	Black (BK)	3;9-12	156-00108

All dimensions in mm. Subject to technical changes.

Recommended Tools											
2	3	4	5	6	7	8	9	10	11	12	
MK20	MK21	MK3SP	MK3PN5P2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



2-Piece Fixing Ties with Pipe Clip

Features and Benefits

- For post-installation of additional cables for pre-assembled cable looms
- Variety of twist angles and even different loop directions provide flexibility for cable routing
- For OC1 and 2A additional cable tie dimensions are available
- CBTO-series for cable ties up to 5 mm



EdgeClip CBTO50R, verdrehbar um 90°.

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	Attach to Ø	Material	Colour	Tools	Article-No.
T30ROC2A		3.6	148.0	31.0	6.5 - 7.5	PA46	Grey (GY)	2;4-6	156-00014
		3.6	148.0	31.0	6.5 - 7.5	PA66HS, PA66HIRHS	Black (BK)	2;4-6	156-00013
T30ROC1A		3.6	148.0	31.0	4.0 - 10.0	PA66HS, PA66HIRHS	Black (BK)	2;4-6	156-00012
T50ROC1A		4.6	202.0	45.0	4.0 - 10.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00036
T30ROC1B		3.6	148.0	30.0	4.0 - 10.0	PA66HS, PA66HIRHS	Black (BK)	2;4-6	156-00505
T50ROC1B		4.6	202.0	45.0	4.0 - 10.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00306
T30ROC2B		3.6	148.0	31.0	6.5 - 7.5	PA66HS, PA66HIRHS	Black (BK)	2;4-6	156-00470

All dimensions in mm. Subject to technical changes.

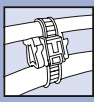
2-Piece Fixing Ties with Pipe Clip, twistable 90°

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	Attach to Ø	Material	Colour	Tools	Article-No.
T50ROC10-14CBTO-SD-SET		4.6	202.0	45.0	10.0 - 14.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00416
T50ROC15-18CBTO-SD-SET		4.6	202.0	45.0	15.0 - 18.0	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00419
T50ROC19-24.5CBTO-SD-SET		4.6	202.0	45.0	19.0 - 24.5	PA66HS, PA66HIRHS	Black (BK)	2-10	156-00422

All dimensions in mm. Subject to technical changes.

Recommended Tools									
2	3	4	5	6	7	8	9	10	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

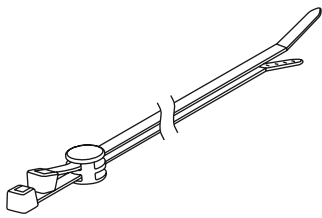
2-Piece Fixing Ties for parallel separation

Features and Benefits

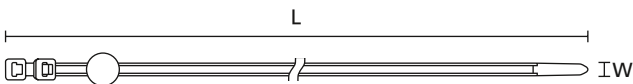
- Pre-assembled 2-piece fixing tie with coupler
- Cable tie head can be moved after bundling
- Easy addition of cables after assembly
- For parallel routing of bundles that can be twisted 90° even after installation



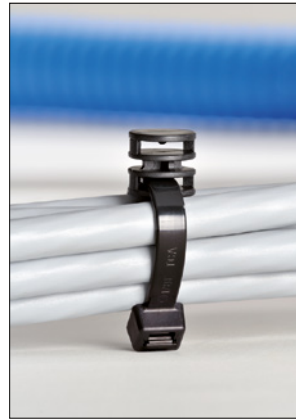
Fixing Element - Coupler



T120RCoupler



Two Cable Ties with Coupler



T120RCoupler can be used for parallel routing of two cable ties.



The second tie can be used for post-installations.



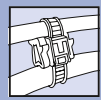
Material specification please see page 16.

TYPE	Width (W)	Length (L)	Bundle Ø max.	N	Material Cable Tie	Material Foot Part	Colour	Tools	Article-No.
T50RCOUPLER	4.6	202.0	47.0	225	PA46	PA46	Grey (GY)	2-10	156-00382
	4.6	202.0	47.0	225	PA66HIR(S)	PA66HIRHS	Black (BK)	2-10	156-00276
T50RSINGLECOUPLER	4.6	202.0	47.0	225	PA66HIRHS	PA66HIRHS	Black (BK)	2-10	156-01134
T120RCOUPLER	7.6	390.0	105.0	535	PA66HIR(S)	PA66HIRHS	Black (BK)	3;9-12	156-00275
T120RSINGLECOUPLER	7.6	390.0	105.0	535	PA66HIR(S)	PA66HIRHS	Black (BK)	3;9-12	156-00550

All dimensions in mm. Subject to technical changes.

Recommended Tools										
2	3	4	5	6	7	8	9	10	11	12
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.

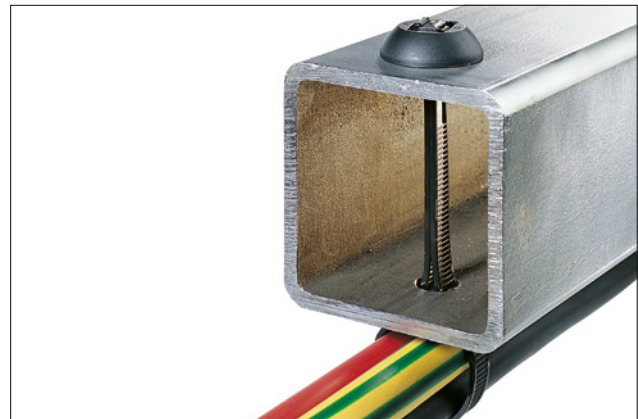


Cable Ties for single hole application (Chassis Tie)

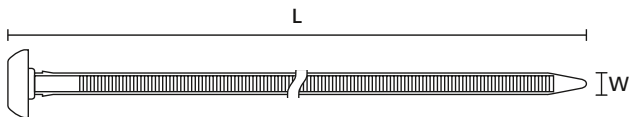
Using a single hole these 'chassis ties' are widely used in the automotive, truck and heavy equipment markets. Ideal for applications which have access to both sides of the hole - for example truck frames.

Features and Benefits

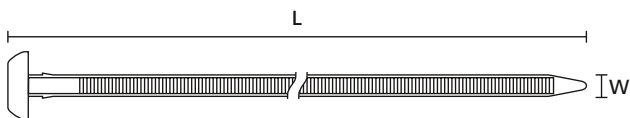
- Both sides of the cable tie serrated
- BHT-Series with round head for larger bearing area
- BHT375 for centred position
- CT- and DE-Series with small squared head for restricted space areas
- Tensioning with application tool



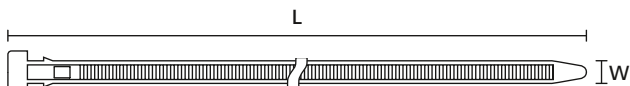
BHT375 - used for mounting cables via a single hole.



BHT375



BHT375M



CT375, DE863220



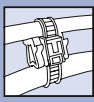
For your system solutions we offer suitable fixing elements: MSBT120, page 106.

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.		Material	Colour	Tools	Article-No.
BHT375		7.6	375.0	100.0	700	PA66HS	Black (BK)	3;9-11	150-37595
BHT375M		7.6	375.0	100.0	700	PA66HS	Black (BK)	3;9-11	150-47595
DE863220		6.0	300.0	80.0	135	PA66HS	Black (BK)	3;9-11	132-00200
CT375		7.6	375.0	100.0	700	PA66HS	Black (BK)	3;9-11	132-37540

All dimensions in mm. Subject to technical changes.

Recommended Tools			
3	9	10	11
MK21	MK6	MK9	MK9HT

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Cable Ties and Fixings

Cable Ties With Fixing Elements

2-Piece Fixing Ties for Heavy Duty Applications, for Screws

HDM-Series

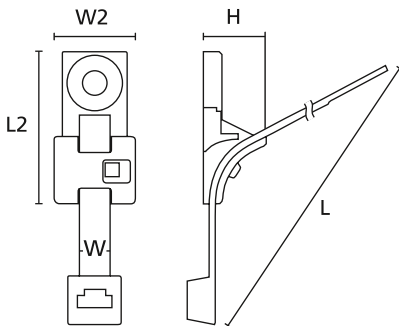
Used in the automotive and truck industry for harness fixing in the engine body, these parts offer solutions in many other industrial applications within difficult environments.

Features and Benefits

- Pre-assembled 2-piece fixing tie
- Cable tie head can be moved after bundling
- Secure alignment to the bundle due to H-design
- A suitable alternative for metal clamps
- Withstands vibrations and displacement forces
- High tightening torque through metal bushing



These HDM are suitable for assembling on screws.



HDM with cable tie (L = length of the tie "flat")



Material specification please see page 16.

TYPE	Width (W)	Width (W2)	Length (L)	Length (L2)	Height (H)	Bundle Ø max.	Mounting Screw Type	Material	Colour	Tools	Article-No.
T50RHDM6	4.6	20.0	200.0	37.5	16.0	50.0	M6	PA66HIRHS	Black (BK)	2-10	156-00410
T50RHDM8	4.6	20.0	200.0	37.5	16.0	50.0	M8	PA66HIRHS	Black (BK)	2-10	156-00412
X80RHDM60	4.6	26.0	200.0	34.7	15.5	23.0	M6	PA66HS, PA66HIRHS	Black (BK)	2-12	156-01219
T120RHDM6	7.6	20.0	390.0	37.5	16.0	105.0	M6	PA46	Grey (GY)	3;9-12	156-00407
	7.6	20.0	390.0	37.5	16.0	105.0	M6	PA66HIRHS	Black (BK)	3;9-12	156-00406
T120RHDM8	7.6	20.0	390.0	37.5	16.0	105.0	M8	PA46	Grey (GY)	3;9-12	156-00409
	7.6	20.0	390.0	37.5	16.0	105.0	M8	PA66HIRHS	Black (BK)	3;9-12	156-00408
T120RDHDM6	7.6	25.4	387.0	59.4	15.5	100.0	M6	PA46	Grey (GY)	3;9-12	156-01098
T120RDHDM8	7.6	25.4	387.0	59.4	15.5	100.0	M8	PA46	Grey (GY)	3;9-12	156-01099
X120RHDM6	7.7	20.0	369.0	61.0	16.0	100.0	M6	PA66HIRHS, PA6GF15	Black (BK)	3;9-12	156-01105
X120RHDM8	7.7	20.0	369.0	61.0	16.0	100.0	M8	PA66HIRHS, PA6GF15	Black (BK)	3;9-12	156-01106
X120RDHDM6	7.7	25.4	369.0	59.4	15.5	100.0	M6	PA66HIRHS	Black (BK)	3;9-12	156-01096
X120RDHDM8	7.7	25.4	369.0	59.4	15.5	100.0	M8	PA66HIRHS	Black (BK)	3;9-12	156-01097
X120RHDM65x160	7.7	32.0	369.0	40.2	15.5	100.0	M6	PA66HIRHS	Black (BK)	3;9-12	156-01466

All dimensions in mm. Subject to technical changes.

Recommended Tools											
2	3	4	5	6	7	8	9	10	11	12	
MK20	MK21	MK3SP	MK3PNSP2	EVO7	MK7HT	MK7P	MK6	MK9	MK9HT	MK9P	

For detailed information on Application Tooling please refer to our Main Catalogue or the Internet.



Heavy Duty Harness Clips

Beam Clamps

Primarily designed for use in the automotive/truck industry, these parts can be used in a wide variety of industries and applications where bundles need mounting.

These heavy duty harness clips help to fix and secure cables, lines and hydraulic lines in truck, agriculture and railway vehicle construction, as well as in the ship building industry and industrial buildings.

Features and Benefits

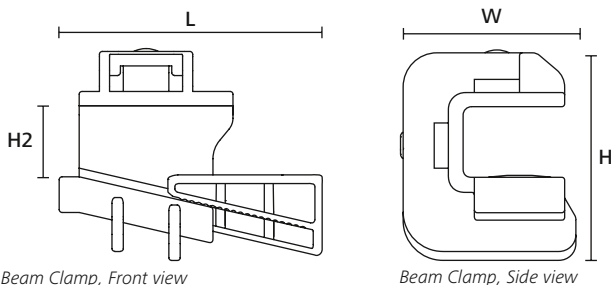
- Easy to install
- No damage to surfaces
- Easy maintenance of bundle by simply changing cable tie
- Cable tie head can be moved after bundling
- Applicable to a wide range of panel thicknesses



The Beam Clamp can be fixed onto a beam with a wedge. Up to two bundles can be routed on the top or rear side of the clamp.



Our two Beam Clamps with 3 different wedges for diverse sheet thicknesses.



Beam Clamp, Front view

Beam Clamp, Side view

TYPE	Drawing	Width (W)	Length (L)	Height (H)	Height (H2)	Panel Thickness	Material	Colour	Article-No.
Beam Clamp D		28.6	46.2	36.7	12.5	5.5 - 7.0	PA6GF30	Black (BK)	151-00886
Beam Clamp B		28.6	46.2	36.7	12.5	7.0 - 8.5	PA6GF30	Black (BK)	151-00822
Beam Clamp C		28.6	46.2	36.7	12.5	8.5 - 10.5	PA6GF30	Black (BK)	151-00823
Beam Clamp D with foam		28.6	46.2	36.7	12.5	5.5 - 7.0	PA6GF30	Black (BK)	151-01188
Beam Clamp B with foam		28.6	46.2	36.7	12.5	7.0 - 8.5	PA6GF30	Black (BK)	151-01186
Beam Clamp C with foam		28.6	46.2	36.7	12.5	8.5 - 10.5	PA6GF30	Black (BK)	151-01187

All dimensions in mm. Subject to technical changes.

Information and installation instructions for self-adhesive mounting bases

HellermannTyton uses different types of adhesives for self-adhesive bases: acrylate and synthetic rubber. These differ in the operating temperature range and the 'pull off' force of the adhesive. Synthetic rubber has an excellent initial grip, allowing for almost immediate use. Acrylate adhesive has less initial grip, so there is a need to wait for a few hours before use, but has a higher 'pull off' force than synthetic rubber. This enables a permanent fixing lasting months or even years. To use these adhesives the surface must be dry, and free of dust, oil, oxides, parting agents and other impurities. For this the use of isopropanol / water (50/50) is recommended. After cleaning allow the surface to dry completely. Peel off the protective backing on the self-adhesive base, ensuring the adhesive is not touched. Apply the part to the surface and press down firmly for several seconds.

ADHESIVE		Adhesive Operating Temperature
Acrylate with base of acrylic foam	mod. Acrylate	-40 °C to +90 °C

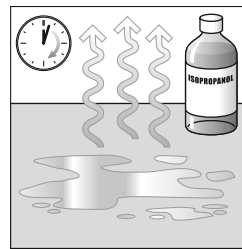


We will be happy to send you on request an up-to-date technical datasheet for whichever adhesive you are using.

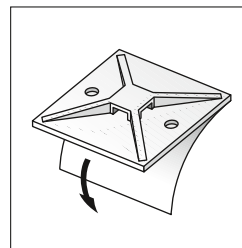
Instructions for use



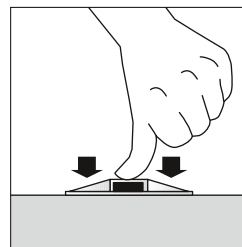
1. The surface must be dry, free from dust, oil, oxides, parting agents and other impurities. The surface to be glued should be cleaned using a clean cloth and isopropanol / water (50/50). When using other appropriate cleaning agents, ensure that they do not attack the surface nor leave any residues.



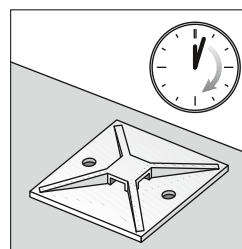
2. After cleaning allow the surface to air-dry completely.



3. Peel off protective backing and ensure the adhesive area is not touched.



4. Press down firmly on the base with the thumbs for several seconds.



5. Depending on the type of adhesive, wait for several minutes (synthetic rubber) or hours (acrylate) so that the adhesive can bond completely with the surface.



Fixing Parts with Special Adhesive

SolidTack-Series MB

SolidTack mounts offer an innovative fixing solution especially for low energy surfaces like PP, PE or if drilling a hole is not possible. Suitable for a wide range of indoor and outdoor applications on varnished, plastic or metal surfaces in many areas e. g. electrical cabinet, railway, aerospace, automotive and agricultural machinery.

Features and Benefits

- MB mounts with homogeneous system of acrylic adhesive
- Very good initial adhesion, increases with time
- High cohesive strength combined with good weathering resistance
- Innovative fixing solution for low energy surfaces like PP, PE or painted / varnished surfaces
- Protection foil with finger lift for easy peel off



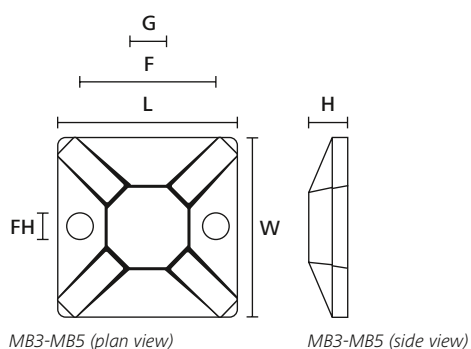
SolidTack products work on varnished and powder coated surfaces.



One Step to the Web!



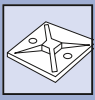
Material specification please see page 16.



TYPE	Width (W)	Length (L)	Height (H)	Hole Ø (FH)	Fixing Hole Centres (F)	Strap Width max. (G)	Material	Colour	Adhesive	Pack Cont.	Article-No.
MB2APT	13.0	13.0	4.1	-	-	2.7	PA66	Black (BK)	mod. Acrylate	100 pcs.	151-00996
MB3APT	19.0	19.0	3.8	3.1	13.2	4.1	PA66	Black (BK)	mod. Acrylate	100 pcs.	151-00432
	19.0	19.0	3.8	3.1	13.2	4.4	PA66	Natural (NA)	mod. Acrylate	100 pcs.	151-00514
MB4APT	28.0	28.0	4.7	4.0	20.2	5.4	PA66	Black (BK)	mod. Acrylate	100 pcs.	151-00433
	28.0	28.0	4.7	4.0	20.2	5.6	PA66	Natural (NA)	mod. Acrylate	100 pcs.	151-00587
MB5APT	38.0	38.0	6.3	4.7	25.3	10.0	PA66	Black (BK)	mod. Acrylate	100 pcs.	151-00434

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Paste Adhesive Mount

PMB5 mount for uneven surfaces

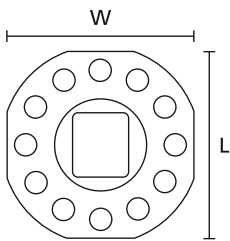
The PMB5 mount offers a fixing solution for applications where a screw fixing is not possible. Due to a larger diameter the mount can even be installed onto uneven surfaces. PMB5 mounts are used in the railway industry as well as in the renewable energy industry. Further applications can be seen in the ship building and electrical industries and the production of switching cabinets.

Features and Benefits

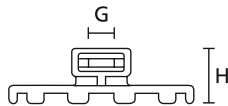
- PMB5 paste adhesive mount for fixings with paste / liquid adhesive
- Mount geometry offers a good form closure with cured adhesive
- Can even be installed onto uneven surfaces due to large diameter
- Can also be applied in combination with hot-melt adhesive, as mount is made of heat resistant PA66



PMB5 mount with paste adhesive.



PMB5 Mount (plan view)



PMB5 Mount (front view)

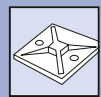


Material specification please see page 16.

TYPE	Width (W)	Length (L)	Height (H)	Strap Width max. (G)	Material	Colour	Pack Cont.	Article-No.
PMB5	36.0	36.0	10.7	4.8	PA66HS	Black (BK)	100 pcs.	151-00498

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Harness Clip for Heavy Duty Applications, for Screws or threaded Bolts

Primarily designed for use in the automotive / truck industry, these parts can be used in a wide variety of industries and applications where bundles need mounting.

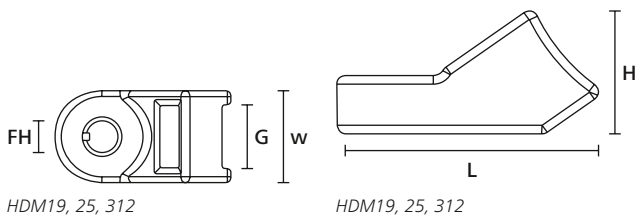
Features and Benefits

- Secure alignment to the bundle due to H-design
- Pre-fixing of clip with integrated nose (standard types)
- For cable ties up to 12.7 mm wide
- High tightening torque through metal bushing
- Easy maintenance of bundle by simply changing the cable tie



Heavy Duty Mounts HDM-Series, Patent Number US5820083.

Standard Torque Mounts



TYPE	Drawing	Width (W)	Length (L)	Height (H)	Hole Ø (FH)	Strap Width max. (G)	Material	Colour	Pack Cont.	Article-No.
HDM25		19.0	35.8	16.7	6.2	12.7	PA66HIRHSW	Black (BK)	100 pcs.	151-00437
HDM19		19.3	36.3	16.7	4.7	12.7	PA66HIRHSW	Black (BK)	100 pcs.	151-00134
HDM312		19.3	36.3	16.7	7.8	12.7	PA66HIRHSW	Black (BK)	100 pcs.	151-00439

All dimensions in mm. Subject to technical changes.

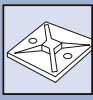
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Medium Torque Mounts

TYPE	Drawing	Width (W)	Length (L)	Height (H)	Hole Ø (FH)	Strap Width max. (G)	Material	Colour	Pack Cont.	Article-No.
HDM321		24.0	46.0	20.7	8,31	12.7	PA66HSW	Black (BK)	500 pcs.	151-07100
HDM401		24.0	46.0	20.7	9,5	12.7	PA66HIRHSW	Black (BK)	100 pcs.	151-00442
HDM501		24.0	46.0	20.7	12,7	12.7	PA66HIRHSW	Black (BK)	500 pcs.	151-07500

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Cable Ties and Fixings

Cable Tie Mounts

High Torque Mounts (metal bushing)

TYPE	Drawing	Width (W)	Length (L)	Height (H)	Hole Ø (FH)	Strap Width max. (G)	Material	Colour	Pack Cont.	Article-No.
HDM320		25.0	47.0	20.7	8,31	12.7	PA66HIRHSW	Black (BK)	500 pcs.	151-07000
HDM400		25.0	47.0	20.7	10,29	12.7	PA66HIRHSW	Black (BK)	500 pcs.	151-07200
HDM500		25.0	47.0	20.7	12,95	12.7	PA66HIRHSW	Black (BK)	500 pcs.	151-07400

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

High Torque Double Mounts (metal bushing)

TYPE	Drawing	Width (W)	Length (L)	Height (H)	Hole Ø (FH)	Strap Width max. (G)	Material	Colour	Pack Cont.	Article-No.
HDM375BDM4W		34.5	89.0	25.2	9,5	12.7	PA66HIRHSW	Black (BK)	100 pcs.	151-00756

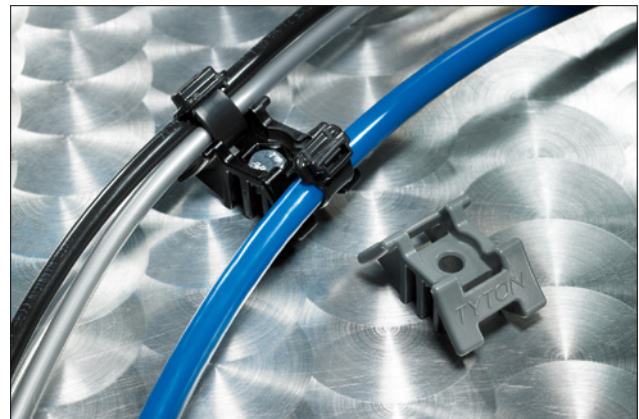
All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Harness Clip for Heavy Duty Applications for Screws or threaded Bolts, for parallel separation

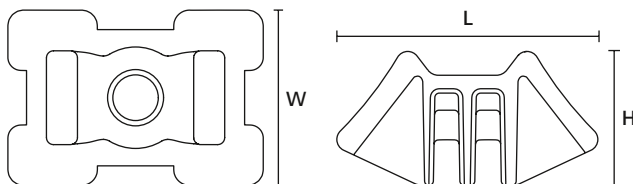
This heavy duty harness clip helps to fix and secure cables and wires in railway, truck and agricultural vehicle construction, and is also used in the ship building industry.

Features and Benefits

- For parallel routing of bundles
- Secure alignment to the bundle due to H-design
- Cable tie head can be moved after bundling
- For cable ties up to 12.7 mm wide
- Easy maintenance of bundle by simply changing the cable tie



This saddle mount is installed between two bundles to separate them and prevent chafing and wear.



S2CM25

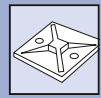
S2HM25



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Height (H)	Hole Ø (FH)	Bundle Ø max.	Material	Colour	Pack Cont.	Article-No.
S2CM25	30.0	45.0	23.0	6.0	89.0	PA66HIRHS	Grey (GY)	500 pcs.	151-29400
S2HM25	30.0	45.0	23.0	6.0	89.0	PA66HIRHSW	Black (BK)	500 pcs.	151-29403

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

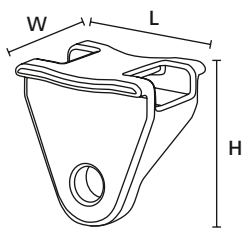


Harness Clip for Heavy Duty Applications, for Screws or threaded Bolts for Edges

This heavy duty harness clip helps to fix and secure cables and wires in railway, truck and agricultural vehicle construction, and is also used in the ship building industry.

Features and Benefits

- Guides bundles securely above sharp edges
- For bolts or screws of D = 8 mm
- Cable tie head can be moved after bundling
- Secure alignment to the bundle due to H-design
- For cable ties up to 12.7 mm wide



SAM83



Axial oval mounts stand off bundles from frame rails and cross members to prevent them from rubbing and chafing.

TYPE	Width (W)	Length (L)	Height (H)	Hole Ø (FH)	Material	Colour	Pack Cont.	Article-No.
SAM83	26.0	34.0	35.0	8.0	PA66HIRHS	Grey (GY)	500 pcs.	151-29600
SAOM82	26.0	34.3	35.0	8.0	PA66HIRHSW	Black (BK)	500 pcs.	151-29701

All dimensions in mm. Subject to technical changes.

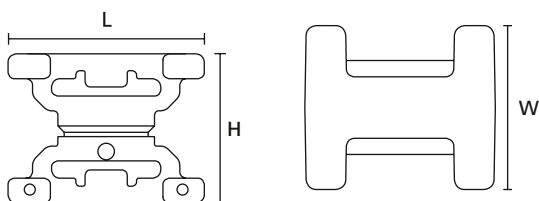
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Fixing elements for Parallel Routing, twistable

These fixing element for parallel routing can be used where bundles need separation from each other combined with the necessary functionality to support moving harnesses.

Features and Benefits

- For parallel routing of bundles that can be twisted 360° even after setting
- Secure alignment to the bundle due to H-design
- Cable tie head can be moved after bundling
- For cable ties up to 12.7 mm wide
- For post-installation of bundles



DSWS4

DSWS5

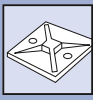


The spacers can be easily rotated by hand, allowing the bundles to be crossed and rotated at any angle.

TYPE	Width (W)	Length (L)	Height (H)	Bundle Ø min.	Bundle Ø max.	Material	Colour	Pack Cont.	Article-No.
DSWS4	20.3	23.6	18.0	6.0	76.0	PA66HS, POM	Black (BK)	2,200 pcs.	151-06500
DSWS5	25.4	40.6	23.6	16.0	152.0	PA66HS	Black (BK)	50 pcs.	151-06502

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Cable Ties and Fixings

Cable Tie Mounts

Fixing Elements with Fir Tree, for Distance Routing

Saddle Mount

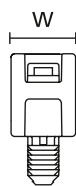
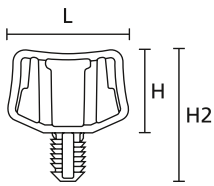
These heavy duty fixing offers excellent performance for ship building and the truck and construction vehicle industries.

Features and Benefits

- For parallel routing of four bundles
- Secure alignment to the bundle due to H-design
- For cable ties up to 12.7 mm wide
- Pre-fixing of tie with integrated nose



The mount can secure up to 4 separate bundles, providing parallel spacing between the frame rail and adjacent bundles.



Fir Tree Saddle Mounts



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Height (H)	Height (H2)	Hole Ø (FH)	Panel Thickness	Bundle Ø max.	Material	Colour	Pack Cont.	Article-No.
S3STM50	22.0	50.0	35.0	55.0	12,7 - 13,7	1.9 - 13.0	127.0	PA66HIRHS	Black (BK)	100 pcs.	151-29500

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

Fixing Elements for BHT-Ties for Distance Routing

MSBT120

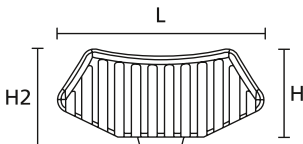
This heavy duty fixing offers excellent performance for ship building and the truck and construction vehicle industries.

Features and Benefits

- For parallel routing of three bundles
- Retainer is fixed in the hole with BHT-tie
- Socket centres retainer in the hole and can protect tie from sharp edges



Saddle Mount MSBT120.



MSBT120

TYPE	Width (W)	Length (L)	Height (H)	Height (H2)	Hole Ø (FH)	Panel Thickness	Material	Colour	Pack Cont.	Article-No.
MSBT120	16.5	48.3	20.6	22.2	12.2	2.7	PA66HIRHSW	Black (BK)	500 pcs.	151-29301

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Heavy Duty Mounts for 3-way routing

Primarily designed for use in the automotive/truck industry, these parts can be used in a wide variety of industries and applications where bundles need mounting.

These heavy duty harness clips help to fix and secure cables, lines and hydraulic lines in truck, agriculture and railway vehicle construction, as well as in the ship building industry.

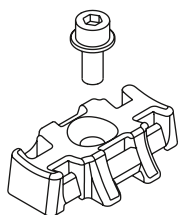
Features and Benefits

- For parallel routing of bundles
- Secure alignment to the bundle due to H-design
- Easy maintenance of bundle by simply changing cable tie
- Cable tie head can be moved after bundling

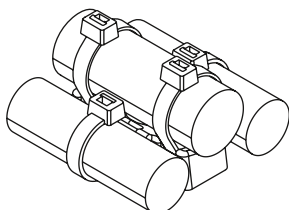


S3CBM8 in combination with our X-Series.

S3CBM8



Suitable for external cylindrical hexagonal bolts M8



Exemplary illustration of a possible 3-way transfer



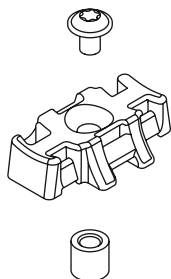
S3SB15CBM8 and S3CBM8.

TYPE	Width (W)	Length (L)	Height (H)	Bundle Ø max.	Strap Width max. (G)	Material	Colour	Pack Cont.	Article-No.
S3CBM8	46.0	70.0	18.6	100.0	9.0	PA6GF30	Black (BK)	500 pcs.	151-01040

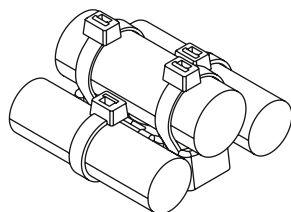
All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

S3SB15CBM8



Suitable for welding studs (M8 internal bore & outer diameter 15 mm)



Exemplary illustration of a possible 3-way transfer

TYPE	Width (W)	Length (L)	Height (H)	Bundle Ø max.	Strap Width max. (G)	Material	Colour	Pack Cont.	Article-No.
S3SB15CBM8	46.0	70.0	18.6	100.0	9.0	PA6GF30	Black (BK)	500 pcs.	151-01010

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

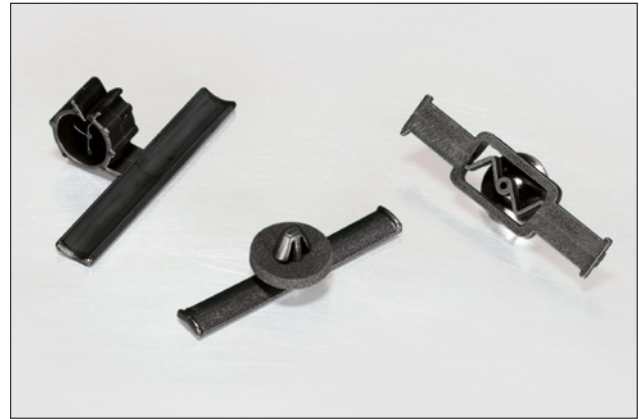


Bundling Clips with Arrowhead

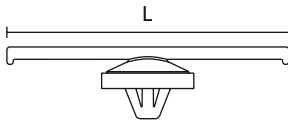
Originally designed for the Automotive industry, these clips offer simple and easy methods of securing cables, hoses or pipes. They have many applications within a wide range of industries.

Features and Benefits

- Especially for banding of cables and cable looms
- Fastened onto winding bar with binding twine, adhesive tape or cable ties
- Manually or automatic application with Autotool 2000, AT2000CPK or ATS3080
- Various base geometries for wide variety of metal gauges and bore diameters



BundlingClip with OmegaClip, BundlingClip with foam, BundlingClip LRJ1



BCSFT6.5 16-3MD



**Material specification
please see page 16.**

TYPE	Drawing	Length (L)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
LRJ1		55.0	6.2 - 6.7	0.7 - 2.0	PA6	Black (BK)	151-08101
BCSFT6.5 16-3		55.0	6.3 - 6.7	2.3 - 3.5	PA66HIRHS	Black (BK)	151-00431
ATSBCSFT6.5		39.0	6.3 - 6.7	2.3 - 3.3	PA66HIRHS	Black (BK)	102-69066
ATSBCKSFT6.5		39.0	6.3 - 6.7	0.7 - 1.3	PA66HIRHS	Black (BK)	102-69067
ATSBK2KSFT6.5		39.0	6.3 - 6.7	1.7 - 2.3	PA66HIRHS	Black (BK)	102-69068
ATSBKOWSFT6.5		39.0	6.3 - 6.7	2.3 - 3.3	PA46	Grey (GY)	102-69070
ATSBKSFT 6.5PT2.3-3.3		39.0	6.3 - 6.7	2.3 - 3.3	PA46	Grey (GY)	102-69069
BC70SFT712-MD		70.0	7.0 x 12.0	0.7 - 1.8	PA66HIRHS	Black (BK)	151-01094
BC70SFT712		70.0	7.0 x 12.0	0.7 - 3.2	PA66HIRHS	Black (BK)	151-01036
BCHSFT712-MD		42.0	7.0 x 12.0	0.7 - 1.8	PA66HIRHS	Black (BK), Natural (NA)	151-01301
BCHSFT712		40.0	7.0 x 12.0	0.7 - 1.8	PA66HIRHS	Black (BK)	151-01037
BCLSFT712		64.5	7.0 x 12.0	0.8 - 2.0	PPT20	Black (BK)	151-01014

All dimensions in mm. Subject to technical changes.



Bundling Clips with Arrowhead, sealed

TYPE	Drawing	Length (L)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
BCSFT6.5 16-3MD		55.0	6.3 - 6.7	1.5 - 3.0	PA66HIRHS	Black (BK)	155-11601
ATSBCSFT6.5-MD		39.0	6.3 - 6.7	2.0 - 3.0	PA66HIRHS	Black (BK)	102-69065

All dimensions in mm. Subject to technical changes.

Bundling Clips with additional Harness Clip

TYPE	Drawing	Length (L)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
OCTC1		60.0	-	-	PA66HIRHS	Black (BK)	151-00447
Halter SFT6.5		60.0	6.3 - 6.7	0.6 - 1.5	PA66HIRHS	Black (BK)	133-00067

All dimensions in mm. Subject to technical changes.

Bundling Clips, moveable

An easy means of routing and securing cable sets in various parts of cars.

Features and Benefits

- Easy to install without the need for a tool
- Horizontal length tolerance compensation
- Ideal if holes do not fit registration or bundles need to be routed around corners



The CHA2 with fir tree base and length tolerance compensation for precise cable routing even in difficult conditions.

CHA1 with arrowhead

TYPE	Drawing	Width (W)	Length (L)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
CHA1		6.0	54.0	6.3 - 7.0	0.5 - 1.2	PA66HS	Black (BK)	150-08110

All dimensions in mm. Subject to technical changes.

CHA2 with fir tree

TYPE	Drawing	Width (W)	Length (L)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
CHA2		6.0	54.0	6.5 - 7.0	0.8 - 2.0	PA66	Black (BK)	151-02901

All dimensions in mm. Subject to technical changes.

TCSFT6.5CHAMD with arrowhead, sealed

TYPE	Drawing	Length (L)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
TCSFT6.5S-CHA-MD		54.0	6.5 - 6.7	0.6 - 1.8	PA66HS	Green (GN)	156-01238

All dimensions in mm. Subject to technical changes.

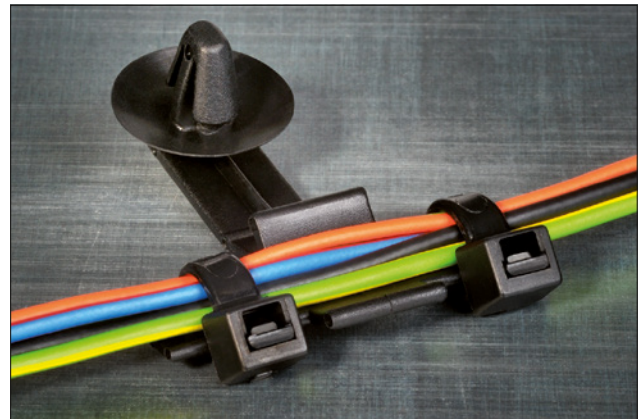


Bundling Clips with Arrowhead for Distance Routing

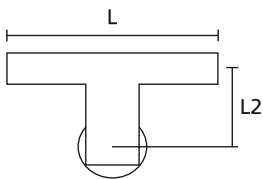
Originally designed for the Automotive industry, these clips offer simple and easy methods of securing cables, hoses or pipes. They have many applications within a wide range of industries.

Features and Benefits

- Easy to install without the need for a tool
- Arrowhead simply locks into place
- Disc adjusts tie for pressure from various directions and minimises access of dust, dirt and water
- Versions for oval holes feature anti-twist protection



StandOff Clips allow cable looms to be routed at a set distance from the punched holes.



Material specification please see page 16.

TYPE	Drawing	Length (L)	Length (L2)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
CH20D6		50.0	20.0	6.4 - 7.0	0.6 - 1.4	PA66HS	Black (BK)	151-00077
CH20D7		50.0	20.0	7.0	0.8 - 1.6	PA66	Black (BK)	151-02600
STAND-OFF-CLIP-2		40.0	25.0	6.5 - 6.8	0.4 - 1.6	PA66HIRHS	Black (BK)	155-01600
STAND OFF CLIP		40.0	31.0	6.5 - 6.8	0.4 - 1.6	PA46	Grey (GY)	150-45398
		40.0	31.0	6.5 - 6.8	0.4 - 1.6	PA66HIRHS	Black (BK)	150-45397
BC20KSFT6.5		50.0	19.2	6.25 - 6.75	0.7 - 1.3	PA66HIRHS	Black (BK)	151-01070
BC20SFT6.5-MD		50.0	24.0	6.25 - 6.75	0.7 - 1.6	PA66HIRHS, EPDM	Black (BK)	151-01067
SOC20SFT712-MD		50.0	20.0	7.0 x 12.0	0.6 - 2.0	PA66HIRHS, EPDM	Black (BK)	151-01255
SOC32SFT65X130-MD		50.0	32.0	6.5 x 13.0	0.6 - 2.0	PA66HIRHS	Black (BK)	151-01331

All dimensions in mm. Subject to technical changes.



Bundling Clips with Fir Tree, for Round Holes

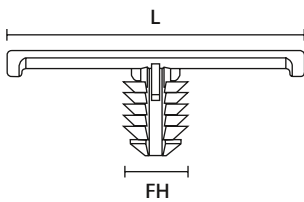
Widespread use in cable harness production; a quick and easy means of fixing cables and lines securely in various parts of cars.

Features and Benefits

- Easy to install without the need for a tool
- One fir tree foot part can be used for a variety of panel thicknesses
- Suitable for use within threaded holes
- Holding tabs prevent the tie slipping sideways
- Versions for oval holes feature anti-twist protection



BundlingClips with fir tree bases for a variety of applications with a wide range of metal thicknesses and drill holes.



TYPE	Drawing	Length (L)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
TC5FT6S		37.0	6.4 - 7.1	0.8 - 1.5	PA66HIRHS	Black (BK)	150-95500
TC3FT6S		37.0	6.5 - 7.0	0.8 - 1.5	PA66HIRHS	Black (BK)	151-00028
TC4FT6LG		37.0	6.3 - 7.0	0.6 - 5.1	PA66HIRHS	Black (BK)	151-00215
TC4FT6LG-A		37.0	6.3 - 7.0	0.6 - 5.1	PA66HIRHS	Natural (NA)	151-00467
TCDSFT6-HEX		40.0	6.3	0.8 - 4.5	PA66HIRHS	Black (BK)	155-39002
BCFT6XL56		56.0	6.3 - 7.0	0.7 - 9.0	PA66HIRHS	Black (BK)	151-00662
ATSBCFT6LG		39.0	6.3 - 7.0	0.6 - 5.1	PA66HIRHS	Black (BK)	102-67065
BCOWFT5		24.9	4,9 - 5,1	2.9 - 3.1	PA66HIRHS	Black (BK)	151-00904
BCOWFT6M		27.3	6,5 - 7,0	0.6 - 3.5	PA66HIRHS	Natural (NA)	151-00790
BC13FT6.35		40.0	6.25 - 6.75	1.1 - 5.0	PA66HIRHS	Black (BK)	151-01335
BC37FT7LG		37.0	6.3 - 6.7	0.5 - 2.8	PA66HIRHS	Black (BK)	151-01262
TC2FT6LG		55.0	6.3 - 7.0	0.6 - 5.1	PA66HIRHS	Black (BK)	155-30802
		55.0	6.3 - 7.0	0.6 - 5.1	PA66HIRHS	Natural (NA)	151-00020

All dimensions in mm. Subject to technical changes.



Bundling Clips with Fir Tree, for Oval Holes

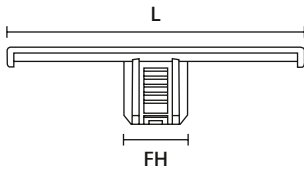
Originally designed for the Automotive industry, these clips offer simple and easy methods of securing cables, hoses or pipes. They have many applications within a wide range of industries.

Features and Benefits

- Especially for banding of cables and cable looms
- Fastened onto winding bar with binding twine, adhesive tape or cable ties
- Manually or automatic application with Autotool 2000, AT2000CPK or ATS3080
- Various base geometries for wide variety of metal gauges and bore diameters



BundlingClips with fir tree bases for a variety of applications with a wide range of metal thicknesses and drill holes.



Material specification please see page 16.

TYPE	Drawing	Length (L)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
TCOP62x122		55.0	6.2 x 12.2	0.6 - 6.0	PA66HIRHS	Black (BK)	151-00605
TCOP70x120		55.0	7.0 x 12.0	0.6 - 6.0	PA66HIRHS	Black (BK)	151-00029
WICKELCLIP-VDS		40.0	6.3 x 9.0	0.6 - 2.5	PA66HIRHS	Black (BK)	155-16301
BCFT63x100S		40.0	6.5 x 10.2	0.6 - 2.5	PA66HIRHS	Black (BK)	151-00759
BC70LFT712		81.3	7.0 x 12.0	0.9 - 5.5	PA66HIRHS	Black (BK)	151-01217

All dimensions in mm. Subject to technical changes.



Bundling Clips with Fir Tree, for Distance Routing

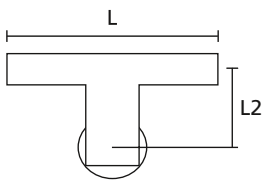
Originally designed for the Automotive industry, these clips offer simple and easy methods of securing cables or pipes and have many applications within a wide range of industries.

Features and Benefits

- Easy to install without the need for a tool
- One fir tree foot part can be used for a variety of panel thicknesses
- Suitable for use within threaded holes
- Disc covers the hole to prevent dirt and water gaining access
- Bundle runs in a set distance to the hole



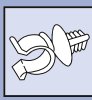
COW Clip used as tape-on clip.



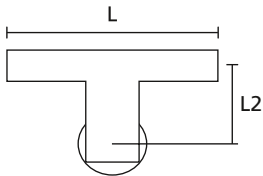
TYPE	Drawing	Length (L)	Length (L2)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
COW20DP7		42.0	20.0	6.3 - 7.0	0.8 - 4.5	PA66HS	Brown (BN)	151-03100
COW30DP7		42.0	30.0	6.3 - 7.0	0.8 - 4.5	PA66	Black (BK)	151-03200
SOC4 M.FT6		55.0	20.0	6.5 - 7.0	0.7 - 5.1	PA66HIRHS	Black (BK)	155-30902
SOC5FT6LG		55.0	13.0	6.5 - 7.0	0.7 - 5.1	PA66HIRHS	Black (BK)	151-00074
SOC5FT6S		55.0	13.0	6.5 - 7.0	0.8 - 2.5	PA66HIRHS	Black (BK)	151-01329
SOC6		55.0	22.0	6.3 - 7.0	0.8 - 3.5	PA66HIRHS	Black (BK)	151-00023
SOC10405		55.0	20.0	6.3 - 6.7	0.7 - 3.5	PA66HIRHS	Black (BK)	151-00282
SOC3-FT6-LG.		12.0	30.0	6.4 - 7.1	0.8 - 6.0	PA66HIRHS	Black (BK)	155-19001
SOC7FT6		56.0	42.5	6.35 - 7.0	0.7 - 5.7	PA66HIRHSW	Black (BK)	151-00629

All dimensions in mm. Subject to technical changes.





Bundling Clips with Fir Tree, for Distance Routing



TYPE	Drawing	Length (L)	Length (L2)	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
SOC8FT6LG		40.0	30.0	6.5 - 7.0	0.7 - 5.8	PA66HIRHS	Black (BK)	151-00665
CH20FT6		50.0	20.0	6.5 - 7.0	0.8 - 2.5	PA66HIRHS	Black (BK)	151-00830
SOC11FTOVAL		50.0	20.0	6.2 x 12.2	0.6 - 6.8	PA66HIRHS	Black (BK)	151-00992
		50.0	20.0	6.2 x 12.2	0.6 - 6.8	PA66HIRHS	Natural (NA)	151-00932
SOC13FTOVAL		50.0	20.0	6.5 x 12.5	0.6 - 4.0	PA66HIRHS	Black (BK)	151-01018
SOC20FT5		50.0	20.0	4.5 - 5.0	0.7 - 3.0	PA66HIRHS	Black (BK)	151-00970
SOC25FT63x100		42.0	18.0	6.3 x 10.0	0.6 - 2.5	PA66HIRHS	Black (BK)	133-00824
SOC25FT712		50.0	25.0	7.0 x 12.0	1.1 - 6.1	PA66HIRHS	Black (BK)	151-01213

All dimensions in mm. Subject to technical changes.



Bundling Clips for Weld Studs, moveable

Originally designed for the Automotive industry, these clips offer simple and easy methods of securing cables, hoses or pipes. They have many applications within a wide range of industries.

Features and Benefits

- Easy assembly without the need for a tool
- Horizontal length tolerance compensation up to 4.0 mm
- BCUWS5-D5-25: for coarse thread studs
- If connector retainer is a request: TCSB5CYCC
- If post-installation of cables is needed: Bundling clip SB5
- For defined distance of bundles to surface: BCOS variants



TCSB5CYCC: Tapebar, Stud Retainer and ConnectorClip in just one article.



**Material specification
please see page 16.**

Bundling Clips for Weld Studs, moveable

TYPE	Drawing	Stud Ø	Length (L)	Material	Colour	Article-No.
WICKELCLIP-SB5		5.0	60.0	POM	Black (BK)	155-23701
TC-SB5C		5.0	55.0	PA66HS	Black (BK)	151-26101
TCSB5CYCC		5.0	55.0	PA66HIRHS	Black (BK)	151-00484
BCUWS5-D5-25		5.0	50.0	PA66HIRHS	Natural (NA)	151-00851

All dimensions in mm. Subject to technical changes.

Bundling Clips for Weld Studs

TYPE	Drawing	Stud Ø	Length (L)	Material	Colour	Article-No.
BCOS5		5.0	59.0	PA66HIRHS	Black (BK)	151-00664
BCOS6		6.0	59.0	PA66HIRHS	Black (BK)	151-00281

All dimensions in mm. Subject to technical changes.

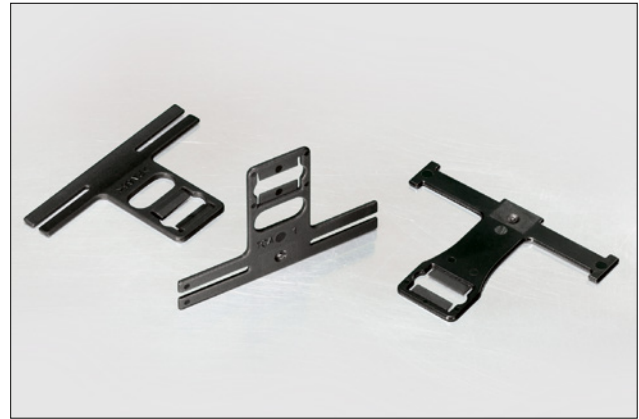


Bundling Clips for Weld Studs, moveable

The BC series is proving very popular in the automotive industry as a means of installing cable sets easily in various areas of the vehicle.

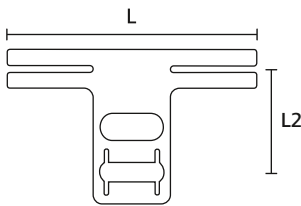
Features and Benefits

- Very flat bundling clip for 5.0 mm weld stud
- Horizontal length tolerance compensation
- Suitable for cables of reduced weight and diameter

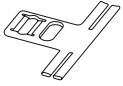


The slim line BC series is particularly compact and flexible.

BC2212 for distance routing 12.0 and 22.0 mm

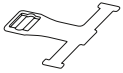


Material specification please see page 16.

TYPE	Drawing	Length (L)	Length (L2)	Stud Ø	Material	Colour	Article-No.
BC2212		55.0	22.0	5.0	PA66HIRHS	Black (BK)	151-00017

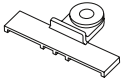
All dimensions in mm. Subject to technical changes.

BC30 for distance 30.0 mm

TYPE	Drawing	Length (L)	Length (L2)	Stud Ø	Material	Colour	Article-No.
BC30		55.0	30.0	5.0	PA66HIRHS	Black (BK)	151-00016

All dimensions in mm. Subject to technical changes.

BC-SCR6

TYPE	Drawing	Length (L)	Length (L2)	Hole Ø (FH)	Material	Colour	Article-No.
BC-SCR6		60.0	20.0	6.5	PA66GF60, PA66HIRHS	Black (BK)	156-00390

All dimensions in mm. Subject to technical changes.



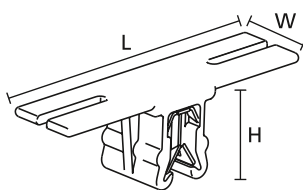
Bundling Clips for Edges

EdgeClip-Family

EdgeClips are used in the automotive and electrical industries and are ideal when it is impossible to drill holes or no other fixing points are available.

Features and Benefits

- Easy assembly, just shuffle manually
- Designed for edges of 1 - 3 and 1.5 - 4 mm
- Integrated metal clamp holds clip firmly in place
- Clamp consists of double tempered steel spring
- ATS fixing elements can be tied automatically with tools ATS3080, AT2000 or AT2000CPK



EC15



Cables and leads can be fastened with a cable tie or adhesive tape to the bars of the mounting element.

TYPE	Drawing	Width (W)	Length (L)	Height (H)	Panel Thickness	Material	Colour	Article-No.
EC14		10.0	40.0	12.4	1.0 - 3.0	PA66HIRHS	Black (BK)	151-03404
EC15		10.0	40.0	12.4	1.0 - 3.0	PA66HIRHS	Black (BK)	151-03401
EC16		10.0	40.0	13.0	1.0 - 3.0	PA66HIRHS	Black (BK)	151-03402
EC17		10.0	46.5	13.0	1.0 - 3.0	PA46	Grey (GY)	151-00819
		10.0	46.5	13.0	1.0 - 3.0	PA66HIRHS	Black (BK)	151-03403
ATSBCEC35		9.0	39.0	13.2	1.5 - 4.0	PA66HIRHS	Black (BK)	102-68355
ATSBCEC36		9.0	39.0	16.0	1.5 - 4.0	PA66HIRHS	Black (BK)	102-68365
ATSBCEC37		9.0	39.0	14.2	1.5 - 4.0	PA66HIRHS	Black (BK)	102-68375
ATSBCEC38		2.5	39.0	14.2	1.5 - 4.0	PA66HSW	Black (BK)	102-68385

All dimensions in mm. Subject to technical changes.

Bundling Clips for Edges, 1.0 - 3.0 mm, for Distance Routing

TYPE	Drawing	Width (W)	Length (L)	Length (L2)	Height (H)	Panel Thickness	Material	Article-No.
EC30		9.0	50.0	65.0	13.5	1.0 - 3.0	PA66HIRHS	151-00022

All dimensions in mm. Subject to technical changes.



Bundling Clips for Connectors

Originally designed for the Automotive industry, these clips offer simple and easy methods of securing cables, hoses or pipes. They have many applications within a wide range of industries.

Features and Benefits

- Bundles are guided above connector plug
- Secure fixing of connector
- For horizontal length tolerance compensation up to 5.0 mm:
CONNECTOR CLIP



ConnectorClips designed for cables and cable sets used in the automotive industry.



Material specification please see page 16.

Bundling Clips for Connectors

TYPE	Drawing	Length (L)	Material	Colour	Article-No.
YAZ-CONN-TAPE-CLIP		55.0	PA66HS	Black (BK)	155-31102

All dimensions in mm. Subject to technical changes.

Bundling Clips for Connectors, moveable

TYPE	Drawing	Length (L)	Material	Colour	Article-No.
CONNECTOR CLIP		55.0	PA66HIRHS	Black (BK)	150-41397

All dimensions in mm. Subject to technical changes.

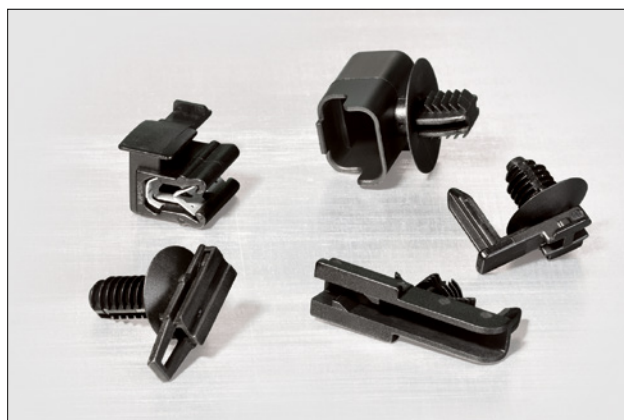


Connector Clips for round holes

The connector clips used here have been designed for electronic cables and cable sets used in the automotive industry.

Features and Benefits

- Connector easily installed by simply pushing into place
- Connection can be released (non-destructive)
- One fir tree foot part can be used for a variety of panel thicknesses
- Arrowhead simply locks into place
- Disc covers the hole to prevent dirt and water gaining access
- For twist protection: Variants with additional stick or for oval holes



ConnectorClips are available for many different connector types and fixing varieties.

TYPE	Drawing	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
Big YCC TS		6.4 - 7.1	0.7 - 5.1	PA66HIRHS	Black (BK)	151-00235
FT6LG.JAE. CONNECT.TS		6.5 - 7.0	0.7 - 5.1	PA66HIRHS	Black (BK)	151-00459
FT6LG.M.St.Aufn.II		6.5 - 7.0	0.8 - 5.0	PA66HIRHS	Black (BK)	155-32602
FT6LG.M. STECKERAUFN.		6.4 - 7.1	0.8 - 6.0	PA66HIRHS	Black (BK)	155-18901
FT6LG.YAZ. Connect.TS		6.4 - 7.1	0.7 - 5.1	PA66HIRHS	Black (BK)	155-30702
FT6S-Y-CONN-TS		6.5 - 7.0	0.8 - 1.5	PA66HIRHS	Black (BK)	155-43702
STECKERHALTER SITZ		6.5 - 7.0	0.6 - 3.0	PA66HIRHS	Black (BK)	155-36002
YCC-FT6-S		6.5 - 7.0	0.8 - 1.5	PA66HIRHS	Black (BK)	155-38102
YCCFT6S-2		6.5 - 7.0	0.8 - 1.5	PA66HIRHS	Black (BK)	151-00606

All dimensions in mm. Subject to technical changes.





Connector Clips for round holes

TYPE	Drawing	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
BIG CONNECTOR CLIP		6.3 - 6.7	0.7 - 2.7	PA66HIRHS	Black (BK)	150-54498
CCFT6LG		6.0 - 6.7	0.7 - 4.0	PA66HIRHS	Black (BK)	151-00785
CCSFT5		4.8 - 5.2	0.7 - 2.3	PA66HIRHS	Black (BK)	151-00980
CCSFT6.5		6.3 - 6.7	1.7 - 2.3	PA66HIRHS	Black (BK)	151-00775
CP6FT6		6.2 - 6.5	0.7 - 5.0	PA6HIR	Black (BK)	151-00162
CP2FT6		6.2 - 6.5	0.7 - 5.0	PA66HIRHS	Black (BK)	151-00216
CP3FT6		6.2 - 6.5	0.7 - 5.0	PA66HIRHS	Black (BK)	151-00163
YCKSFT6.5		6.3 - 6.7	0.7 - 1.3	PA66HIRHS	Black (BK)	151-00675
CC-PAEKSFT6.5PT1.7-2.3		6.3 - 6.7	1.7 - 2.3	PA66HIRHS	Black (BK)	151-00840
YCKSFT6.5-PT1.7-2.3		6.5	1.7 - 2.3	PA66HIRHS	Black (BK)	151-00792
CC1SFT7-MD		6.8 - 7.2	0.7 - 2.0	PA66HIRHS	Black (BK)	151-01336
CC2SFT7-MD		6.8 - 7.2	0.7 - 2.0	PA66HIRHS	Black (BK)	151-01337
CCFT6TSS11		6.3 - 7.0	0.6 - 4.0	PA46	Grey (GY)	151-01294
CCSFT6.5-MOD		6.5 - 7.0	1.7 - 2.3	PA66HIRHS	Black (BK)	151-01323
CCFT6LG-TS		6.4 - 7.1	0.7 - 5.1	PA66HIRHS	Black (BK)	151-01141

All dimensions in mm. Subject to technical changes.



Connector Clips for oval holes

Features and Benefits

- Connector easily installed by simply pushing into place
- Connection can be released (non-destructive)
- Easy to assemble without the need for a tool
- Oval connectors offer twist protection



Material specification please see page 16.



For a secure fixing simply push the connector by hand (ConnectorClip YCCFT62x122).

TYPE	Drawing	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
CCSFT7x12		7.0 x 12.0	0.8 - 2.0	PA66HIRHS	Black (BK)	151-00194
		7.0 x 12.0	0.8 - 2.0	PA66HIRHS	Blue (BU)	151-00595
		7.0 x 12.0	0.8 - 2.0	PA66HIRHS	Grey (GY)	151-00222
YCCFT82x185		8.2 x 18.5	1.5 - 4.5	PA66HIRHS	Black (BK)	151-00704
YCCSFT62122		6.2 x 12.2	0.6 - 1.0	PA66HIRHS	Black (BK)	151-00513
YCCFT62x122		6.2 x 12.2	0.6 - 6.0	PA66HIRHS	Black (BK)	151-00180
YCCSFT6.5x13PT2.5-3.5		6.5 x 13.0	2.5 - 3.5	PA66HIRHS	Black (BK)	151-01356
CP21DOP		6.2 x 12.2	0.6 - 5.0	PA66HIRHS	Black (BK)	151-00465
CP31DOP		6.2 x 12.2	0.6 - 5.0	PA66HIRHS	Black (BK)	151-00214
CP61DOP		6.2 x 12.2	0.6 - 5.0	PA66HIRHS	Black (BK)	151-00466
CCIISFT6.5x13		6.5 x 13.0	0.7 - 3.0	PA66HIRHS	Black (BK)	151-00620
CCIVSFT6.5x130		6.5 x 13.0	0.7 - 3.0	PA66HIRHS	Black (BK)	133-00392
YCCKSFT 62x122PT0.7-1.3 90°		6.2 x 12.2	0.7 - 1.3	PA66HIRHS	Black (BK)	151-00833
YCCKSFT 62x122PT0.7-1.3		6.2 x 12.2	0.7 - 1.3	PA66HIRHS	Black (BK)	151-00835
YCCKSFT 62x122PT1.7-2.3 90°		6.2 x 12.2	1.7 - 2.3	PA66HIRHS	Black (BK)	151-00834

All dimensions in mm. Subject to technical changes.





Connector Clips for oval holes

TYPE	Drawing	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
YCKCSFT 62x122PT1.7-2.3		6.2 x 12.2	1.7 - 2.3	PA66HIRHS	Black (BK)	151-00836
CCFT8X15		8.0 x 15.0	0.7 - 6.4	PA66HIRHS	Black (BK)	151-01358
CCSFT6.5X12.5-MD		6.5 x 12.5	0.6 - 1.5	PA66HIRHS	Black (BK)	151-01312
CCSFT8.5X16		8.5 x 16.0	0.7 - 1.5	PA66HIRHS	Black (BK)	151-01004
TCCSFT6.2x12.2-MD		6.2 x 12.2	0.6 - 2.0	PA66HIRHS, EPDM	Black (BK)	151-01254
TCCSFT 6.5X13PT0.6-2.0-MD		6.5 x 13.0	0.6 - 2.0	PA66HIRHS, EPDM	Black (BK)	151-01272
YCCSFT 6.5X13PT0.6-2.0-MD		6.5 x 13.0	0.6 - 2.0	PA66HIRHS, EPDM	Black (BK)	151-01273

All dimensions in mm. Subject to technical changes.

Connector Clips for Weld Studs

TYPE	Drawing	Stud Ø	Material	Colour	Article-No.
CCSB55		5.0	PA66HIRHS	Black (BK)	151-01196

All dimensions in mm. Subject to technical changes.



Connector Clips for Edges

EdgeClip-Family

Edge Clips are used in the automotive and electrical industries for applications where it is impossible to drill holes or no other fixing points are available.

Features and Benefits

- Connectors are mounted simply by pushing them into retainer
- Connector can be removed without damage
- Fastened to an edge, the EdgeClip ensures a snug fit on almost all types of connector



Material specification please see page 16.



EdgeClip EC6mod.

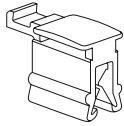
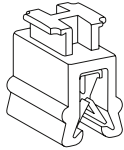
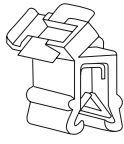
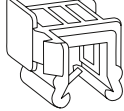
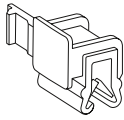
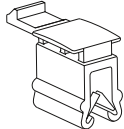
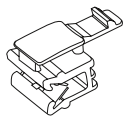
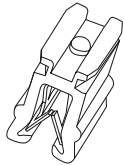
TYPE	Drawing	Panel Thickness	Material	Colour	Article-No.
Edge-Clip25		1.0 - 3.0	PA66HIRHS	Black (BK)	133-00075
EC28		1.0 - 3.0	PA66HIRHS	Black (BK)	151-00151
EC32		1.0 - 3.0	PA66HIRHS	Black (BK)	151-00173
EC33		1.0 - 3.0	PA66HIRHS	Black (BK)	151-00192
EC42		1.5 - 4.0	PA66HIRHS	Black (BK)	151-00429
EC43		1.5 - 4.0	PA66HIRHS	Black (BK)	151-00430
EC45		1.0 - 3.0	PA66HIRHS	Black (BK)	151-00460

All dimensions in mm. Subject to technical changes.





Connector Clips for Edges

TYPE	Drawing	Panel Thickness	Material	Colour	Article-No.
EC6mod		1.0 - 3.0	PA66HIRHS	Black (BK)	151-00464
EC JAE CC		1.0 - 3.0	PA66HIRHS	Black (BK)	151-00472
CCEC3.0TP		1.0 - 3.0	PA66HIRHS	Black (BK)	151-00611
ECC1CPT		3.0 - 6.0	PA66HIRHS	Black (BK)	151-00499
EC11		1.0 - 3.0	PA66HIRHS	Black (BK)	155-40602
CONNECTOR-CLIP EC6		1.0 - 3.0	PA66HIRHS	Black (BK)	150-92600
CCEC3.0SV		1.0 - 3.0	PA66HIRHS	Black (BK)	151-01058
CCIIEC6mod		1.0 - 3.0	PA66HIRHS	Black (BK)	151-01124

All dimensions in mm. Subject to technical changes.

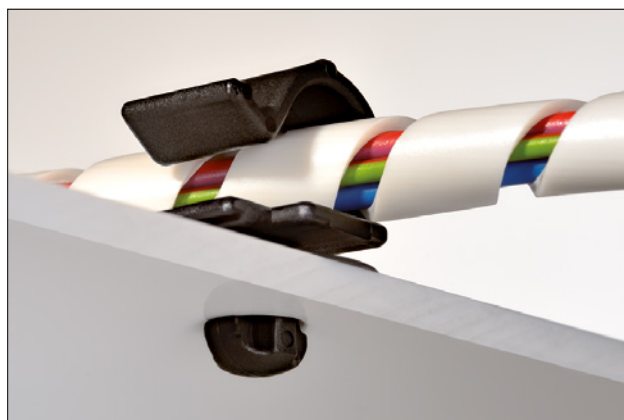


Fixing Elements for Tubes and Harnesses

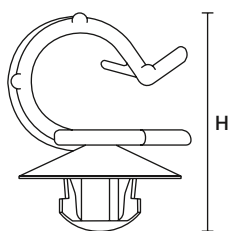
These fixing elements can be used in a wide range of applications where space saving work is necessary.

Features and Benefits

- Fixing part with rounded arrowhead to minimise assembly height
- Ideal for applications where space is limited
- Simply clip on a wire or hose
- Bundle diameter is defined
- Suitable for post-installation of bundles



The very low arrowhead is specially designed for narrow installation spaces.



KSFT6.5 OC 7-9



Material specification please see page 16.

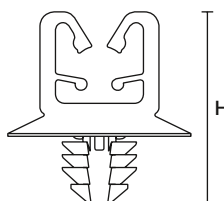
TYPE	Drawing	Height (H)	Attach to Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
KSFT6.5OC1-3		14.4	1.0 - 3.0	6.3 - 6.7	2.3 - 2.7	PA66HIRHS	Black (BK)	151-00673
KSFT6.5 OC 7-9		21.6	7.0 - 9.0	6.3 - 6.7	2.3 - 2.7	PA66HIRHS	Black (BK)	151-00674

All dimensions in mm. Subject to technical changes.

Fixing Elements with Fir Tree

Features and Benefits

- Easy to install without the need for a tool
- Disc covers the hole to prevent dirt and water gaining access
- Bundle diameter is defined
- Clips to be attached into bore hole
- Suitable for post-installation of bundles



HC48FT6

TYPE	Drawing	Height (H)	Attach to Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
HC48FT6		20.8	4.3 - 5.2	6.5 - 7.0	0.7 - 2.8	PA66HIRHS	Black (BK)	151-00680

All dimensions in mm. Subject to technical changes.



Fixing Elements for Tubes and Harnesses

PC-Series

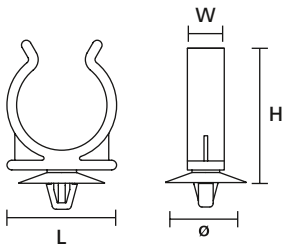
Pipe clips offering a simple and time saving fixing method for hoses and pipes even when a cable tie can't be used.

Features and Benefits

- Fixing elements with fir tree or arrow head
- Simply clip on a wire or hose
- Clips to be attached into bore hole
- Bundles can be released at any time



For quick and simple routing of tubes and harnesses.



Material specification please see page 16.

TYPE	Drawing	Width (W)	Length (L)	Height (H)	Disc Ø	Attach to Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
PC23		10.0	22.0	36.0	22.0	22.0 - 24.0	6.3	0.6 - 1.6	PA66	Black (BK)	151-14300
PC35LAH		8.0	9.0	10.5	-	3.5	4.7	0.8 - 2.0	PA66	Black (BK)	151-14700
PC5DP7S		8.0	16.0	9.5	16.0	5.0	7.0	0.8 - 3.0	PA66	Black (BK)	151-00119
PC5DP7L		8.0	16.0	9.5	16.0	5.0	7.0	0.8 - 7.0	PA46	Black (BK)	151-14801

All dimensions in mm. Subject to technical changes.

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Fixing Elements for Tubes and Harnesses, interconnectable

Originally designed for the automotive industry they are finding a wide and time saving variety of applications in all industries where the use of a cable tie is not suitable.

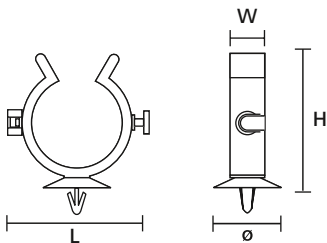
Features and Benefits

- Fixing elements with fir tree or arrow head
- Simply clip on a wire or hose
- Clips to be attached into bore hole
- Bundles can be released at any time



Simple and secure installation of pipes or hoses to panels.

IPC-Series with Arrowhead, connectable



IPC Clip



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Height (H)	Disc Ø	Bundle Ø max.	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
IPC10AH	10.0	22.2	18.4	22.0	12.5	6.3	1.6	PA66HIR	Black (BK)	151-00096
IPC13AH	10.0	25.9	21.0	22.0	13.5	6.3	1.6	PA66	Black (BK)	151-14130
IPC15AH	10.0	27.2	23.0	22.0	14.7	6.3	1.6	PA66	Black (BK)	151-14500
IPC23AH	10.0	36.7	34.0	22.0	25.0	6.3	1.6	PA66	Black (BK)	151-14601

All dimensions in mm. Subject to technical changes.

IPC-Series, connectable

TYPE	Width (W)	Length (L)	Height (H)	Bundle Ø max.	Material	Colour	Article-No.
IPC5P	10.0	12.0	9.8	6.0	PA66	Black (BK)	151-00870
IPC10P	10.0	22.2	15.0	12.5	PA66HIR	Black (BK)	151-14400
IPC13P	10.0	25.9	17.4	13.5	PA66	Black (BK)	151-14132
IPC15P	10.0	27.2	19.5	14.7	PA66HIR	Black (BK)	151-14502
IPC23P	10.0	36.7	30.5	25.0	PA66	Black (BK)	151-14603

All dimensions in mm. Subject to technical changes.



Fixing Elements for Tubes and Harnesses with Automatic Locking Feature

AHC-Series

Offering a simple and secure method of attaching cables to panels. Originally designed for the automotive industry, these products are used in a wide range of applications with sheet metal panels across various industries.

Features and Benefits

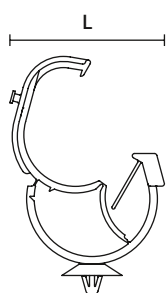
- Push and click closure for fixing of wires
- Clip is clicked into a specific hole
- AHC()SS und AHC()SB can be pushed onto a 5.0 mm stud



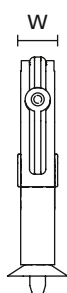
Automatic Harness Clip open.



Automatic Harness Clip closed.



AHC()AH



AHC()AH

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	Hole Ø (FH)	Stud Ø	Panel Thickness	Material	Colour	Article-No.
AHC2SS		10.0	29.0	20.0	-	5.0	-	PA66HIRHS	Black (BK)	151-00368
AHC1AH		10.0	24.0	13.0	6.2 - 6.7	-	0.5 - 2.0	PA66HIRHS	Black (BK)	151-00366
AHC2AH		10.0	29.5	20.0	6.2 - 6.7	-	0.5 - 3.0	PA66HIRHS	Black (BK)	151-00367
AHC4AH		13.5	57.6	41.5	6.2 - 6.7	-	0.8 - 2.7	PA66HIRHS	Black (BK)	151-00374
AHC3SB		10.0	43.0	28.0	-	5.0	-	PA66HIRHS	Black (BK)	151-00373
AHC3DH		10.0	66.0	28.0	6.2 x 12.2	-	0.5 - 2.0	PA66HIRHS	Black (BK)	151-00181
AHC3EH2		11.0	44.2	28.0	6.2 x 12.2	-	1.8 - 4.8	PA66HIRHS	Black (BK)	151-00928

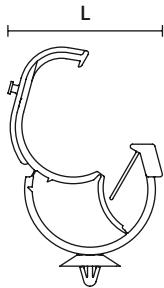
All dimensions in mm. Subject to technical changes.



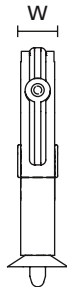


Fixing Elements for Tubes and Harnesses with Automatic Locking Feature

AHC-Series



AHC()AH



AHC()AH



Material specification please see page 16.

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	Hole Ø (FH)	Stud Ø	Panel Thickness	Material	Colour	Article-No.
AHC3BH2		9.0	41.5	28.0	6.2 x 12.2	-	0.6 - 3.0	PA46	Grey (GY)	151-01195
AHC2BH		10.0	31.5	20.0	6.2 x 12.2	-	0.5 - 3.0	PA66HIRHS	Black (BK)	151-00208
AHC3BHR		10.0	40.0	28.0	6.2 x 12.2	-	0.7 - 3.0	PA66HIRHS	Black (BK)	151-00370
AHC25FT6LG		10.0	34.0	22.0	6.4 - 7.0	-	0.7 - 4.0	PA66HIRHS	Black (BK)	151-01198
AHC223FT6LG		10.0	35.0	23.0	6.4 - 7.0	-	0.7 - 4.0	PA66HIRHS	Black (BK)	151-01078
AHC3CHR		10.0	40.0	28.0	6.2 x 12.2	-	1.0 - 2.7	PA6HIR	Black (BK)	151-00371
AHC336FT6LG		14.0	50.0	37.0	6.4 - 7.0	-	0.7 - 4.0	PA66HIRHS	Black (BK)	151-01376
AHC3CH2		11.0	44.1	28.0	6.2 x 12.2	-	0.7 - 2.5	PA66HIRHS	Black (BK)	151-00937
AHC45BHG2		14.0	50.0	36.0	6.2 x 12.2	-	1.0 - 3.0	PA46	Grey (GY)	151-01377

All dimensions in mm. Subject to technical changes.



Fixing Elements for Tubes and Harnesses with Automatic Locking Feature, interconnectable

IAHC-Series, Connectable

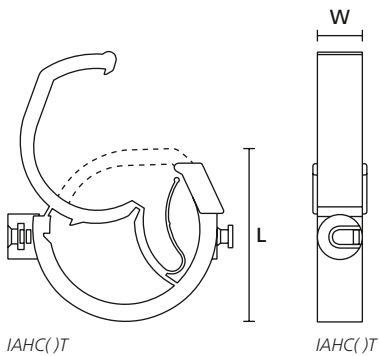
Offering a simple and secure method of attaching cables to panels. Originally designed for the automotive industry, these products are used in a wide range of applications with sheet metal panels across various industries.

Features and Benefits

- Push and click closure
- Coupling elements of the IAHC variants allow parts to interconnect
- Clip is clicked into a specific hole
- IAHC(T) can only be connected with another IAHC element



IAHC(J)AH in combination with an IAHC(T).



IAHC(T)

IAHC(J)



IAHC elements can be connected.

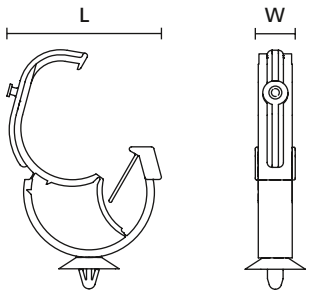
TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	Material	Colour	Article-No.
IAHC1T		10.0	23.0	13.0	PA66HIRHS	Black (BK)	151-00223
IAHC2T		10.0	30.0	20.0	PA66HIRHS	Black (BK)	151-00199
IAHC3T		10.0	40.0	28.0	PA66HIRHS	Black (BK)	151-00213
IAHC4T		13.5	47.0	36.0	PA66HIRHS	Black (BK)	151-00207
IAHC5T		13.5	57.0	45.0	PA66HIRHS	Black (BK)	151-00195

All dimensions in mm. Subject to technical changes.



Fixing Elements for Tubes and Harnesses with Automatic Locking Feature, interconnectable

IAHC-Serie, Connectable, with Arrowhead



AHC()AH

AHC()AH



Material specification please see page 16.

TYPE	Drawing	Width (W)	Length (L)	Bundle Ø max.	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
IAHC3AH		13.5	40.0	28.0	6.2 - 6.7	0.7 - 2.7	PA66HIRHS	Black (BK)	151-00378
IAHC4AH		13.5	53.0	36.0	6.2 - 6.7	0.7 - 3.0	PA66HIRHS	Black (BK)	151-00382
IAHC5BH		13.5	57.0	45.0	6.2 x 12.2	0.7 - 3.0	PA66HIRHS	Black (BK)	151-00384
IAHC3CH		10.0	47.0	28.0	6.2 x 12.2	0.7 - 2.0	PA66HIRHS	Black (BK)	151-00381
IAHC4CH		13.5	53.0	36.0	6.2 x 12.2	0.7 - 2.0	PA6HIRHS	Black (BK)	151-00383
IAHC3EH		13.5	44.5	28.0	6.2 x 12.2	1.5 - 3.1	PA66HIRHS	Black (BK)	151-00489
IAHC5FH		13.5	61.5	45.0	6.2 x 12.2	1.5 - 3.0	PA66HIRHS	Black (BK)	151-00787

All dimensions in mm. Subject to technical changes.



Fixing Elements for Tubes and Harnesses

DTC "Double Tube Clip" rotatable 360°

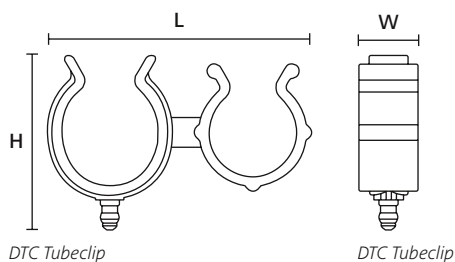
These Pipeclips interconnect two different bundles of goods, of various size and type. The mobility of the fixing tie provides even in difficult conditions, such as vibrations, a secure grip and protects the cables or bundles.

Features and Benefits

- Fixing clip offers full 360° rotation
- For routing of two different bundles
- Simply clip on a wire or hose
- Suitable for post-installation of bundles



DTCs for easy assembly of rotatable routed tubes and harnesses.



DTC Tubeclip

DTC Tubeclip



An overview of the DTC18x() family.

TYPE	Width (W)	Length (L)	Height (H)	Ø D	Ø D2	Material	Colour	Article-No.
DTC18x5-S	12.0	37.1	26.0	18.0	5.0	PA66HIRHS	Black (BK)	156-01311
DTC18x6.5-S	12.0	38.1	26.0	18.0	6.5	PA66HIRHS	Black (BK)	156-01312
DTC18x9-11-S	12.0	43.0	26.0	18.0	11.0	PA66HIRHS	Black (BK)	156-01313
DTC18x18-20-S	12.0	54.0	35.6	18.0	20.0	PA66HIRHS	Black (BK)	156-01314
DTC18x28-S	12.0	63.0	45.0	18.0	28.0	PA66HIRHS	Black (BK)	156-01315

All dimensions in mm. Subject to technical changes.



Fixing Elements for Corrugated Tubing, with Arrowhead

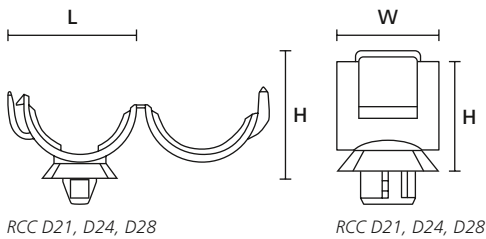
These holders are used in the automotive industry, in the production of cable harnesses and in the electrical industry. Their quick and easy mounting is the reason for their universal success wherever corrugated tubing and pipes have to be fixed quickly and securely.

Features and Benefits

- Clamps for corrugated tubing for a variety of nominal diameters
- Arrowhead simply locks into place
- Tube is guided accurately, clipping into place
- Movement is prevented by the inside profile of the clamp
- CTCLPROFILE clamp can also fastened to a metal edge



Simple and secure installation of pipes or hoses to panels.



Material specification please see page 16.

TYPE	Drawing	Width (W)	Length (L)	Height (H)	Nominal Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
RCC D21		22.0	31.0	30.0	21.0	6,2 x 12,2	0.7 - 2.5	PA66HIRHS	Black (BK)	150-92300
RCC D24		22.0	33.0	33.0	24.0	6,2 x 12,2	0.7 - 2.5	PA66HIRHS	Black (BK)	155-04000
RCC D28		22.0	37.0	37.0	28.0	6,75 x 13,25	0.7 - 3.0	PA66HIRHS	Black (BK)	151-00598
OCTCSFT6.5		20.0	64.0	24.5	21.0	6,3 - 6,6	1.0 - 2.0	PA66HIRHS	Black (BK)	151-00021
CTCLPROFILE		12.0	64.5	59.5	31.2	7,8 - 8,2	2.3 - 2.7	PA66HIRHS	Black (BK)	151-00026

All dimensions in mm. Subject to technical changes.



Fixing Elements for Corrugated Tubing, with Fir Tree

CTC-Series

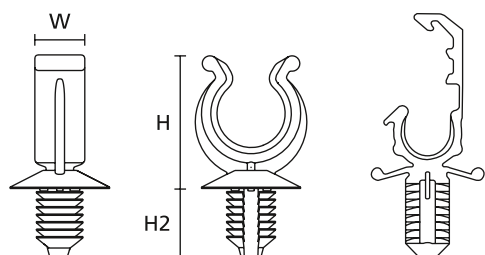
CTC clamps are used in the automotive, harness making and electrical industries and wherever corrugated tubing has to be quickly and firmly fixed.

Features and Benefits

- Available for a variety of nominal diameters
- Fir tree foot part can be used for a variety of panel thicknesses
- Suitable for use within threaded holes
- Tube is guided accurately, clipping into place
- Movement is prevented by the inside profile of the clamp

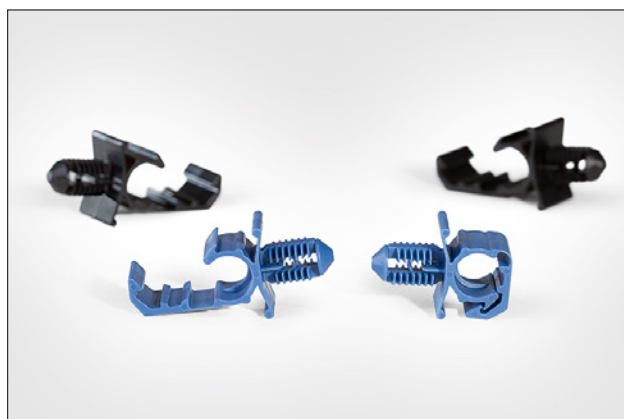


The tubing clips into the CTC clamp and is held firmly.



CTC10FT6LG

CNCTC8FT6.5LG



CNCTC8FT6.5LG Clamps

TYPE	Width (W)	Height (H)	Height (H2)	Nominal Ø	Disc Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
CTC4.5FT6LG	8.0	16.1	11.1	4.5	16.0	6.5 - 7.0	0.8 - 6.0	PA66HIRHS	Black (BK)	151-14314
CTC7.5FT6LG	8.0	18.6	11.1	7.5	16.0	6.5 - 7.0	0.8 - 6.0	PA66HIRHS	Black (BK)	151-14313
CTC7.5FT9	8.0	19.9	12.2	7.5	23.0	8.7 - 9.0	3.0 - 5.0	PA66HIRHS	Black (BK)	155-31602
CTC10FT6	8.0	21.4	7.5	10.0	16.0	6.5 - 7.0	0.8 - 3.0	PA66HIRHS	Black (BK)	151-14311
CTC10FT6LG	8.0	21.4	11.1	10.0	16.0	6.5 - 7.0	0.8 - 6.0	PA66HIRHS	Black (BK)	151-00018
CTC10FT9	8.0	22.7	12.2	10.0	23.0	8.7 - 9.0	3.0 - 5.0	PA66HIRHS	Black (BK)	155-17801
CTC13FT6	8.0	25.2	7.5	13.0	16.0	6.5 - 7.0	0.8 - 3.0	PA66HIRHS	Black (BK)	151-14312
CTC13FT6LG	8.0	25.2	11.1	13.0	16.0	6.5 - 7.0	0.8 - 6.0	PA66HIRHS	Black (BK)	151-00019
CTC22FT9	8.0	37.7	12.2	22.0	23.0	8.7 - 9.0	3.0 - 5.0	PA66HIRHS	Black (BK)	155-25201
CTCFT6	11.0	18.5	9.3	15.0	-	6.3 - 6.7	0.7 - 4.5	PA66HIRHS	Black (BK)	151-00783

All dimensions in mm. Subject to technical changes.

CNCTC-Series with cover

TYPE	Width (W)	Height (H)	Height (H2)	Nominal Ø	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
CNCTC8FT6.5LG	10.0	11.0	11.4	7.0	6.5 - 6.7	1.0 - 6.0	PA66HIRHS	Black (BK)	151-01038
	10.0	11.0	11.4	7.0	6.5 - 6.7	1.0 - 6.0	PA66HIRHS	Blue (BU)	151-01177

All dimensions in mm. Subject to technical changes.



Fixing Elements for Tubes and Harnesses, for Edges

EdgeClip-Family

Edge Clips are used in the automotive and electrical industries for applications where it is impossible to drill holes or no other fixing points are available.

Features and Benefits

- Releasable fixing elements with EdgeClip
- Low-vibration routing of larger bundle diameters
- Can be easily pushed onto an edge by hand
- Can also be snapped together with one hand
- Bundles can be released at any time
- EC27: fixing element enables use of smaller bundle diameters
- EC41: for parallel guidance of two bundles



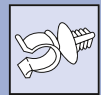
EdgeClip cable and tube clips are suitable for the low-vibration routing of cables and tubes with larger bundle diameters.



Material specification please see page 16.

TYPE	Drawing	Panel Thickness	Attach to Ø	Material	Colour	Article-No.
EC27		1.0 - 3.0	15.0 - 22.0	PA66HIRHS	Black (BK)	151-00161
EC39		1.0 - 3.0	15.3 - 15.9	PA6HIR	Black (BK)	151-00174
EC41		3.0 - 6.0	2 x 8.0	PA66HIR	Black (BK)	151-00234
HCEC3.0SP-C		1.0 - 3.0	12.0 - 15.0	PA66HIRHS	Black (BK)	151-00610
HCEC3.0TPS		1.0 - 3.0	4.5 - 5.0	PA66HIRHS	Black (BK)	151-00645

All dimensions in mm. Subject to technical changes.



Fixing Elements for Corrugated Tubing, for Weld Studs

CTC-Series for Weld Studs

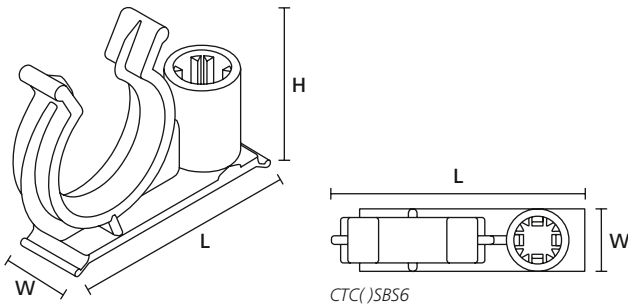
These holders are used in the automotive industry, in the production of cable harnesses and in the electrical industry. Their quick and easy mounting is the reason for their universal success wherever corrugated tubing and pipes have to be fixed quickly and securely.

Features and Benefits

- Fixing elements for corrugated tubing for nominal diameters from 4.5 - 17.0 mm
- For M6 weld studs
- Soft-Push mechanic for simple assembly without the need for a tool
- Tube is guided accurately, clipping into place
- Movement is prevented by the inside profile of the clamp
- Clamp can be unscrewed and removed from the weld stud



The tubing clips into the CTC clamp and is held firmly.



TYPE	Drawing	Width (W)	Length (L)	Height (H)	Nominal Ø	Stud Ø	Material	Colour	Article-No.
CTC4.5SBS6		11.0	28.6	18.7	4.5	6.0	PA66HIRHS	Black (BK)	151-00700
CTC7.5SBS6		11.0	31.8	19.4	7.5	6.0	PA66HIRHS	Black (BK)	151-00701
CTC10SBS6		11.0	35.3	22.2	10.0	6.0	PA66HIRHS	Black (BK)	151-00702
CTC13SBS6		11.0	37.0	26.5	13.0	6.0	PA66HIRHS	Black (BK)	151-00703
CTC17SBS6		11.0	44.6	33.2	17.0	6.0	PA66HIRHS	Black (BK)	151-00010

All dimensions in mm. Subject to technical changes.



Fixing Elements for Weld Studs

Many industries (but specifically the automotive market) use 'weld studs' as the standard method of attaching components. Simply hammered onto the stud, these parts provide ideal fixing bases for attaching cables, pipes or hoses. The use of weld studs avoids the problems associated with 'holes' (ingress of moisture, corrosion etc).

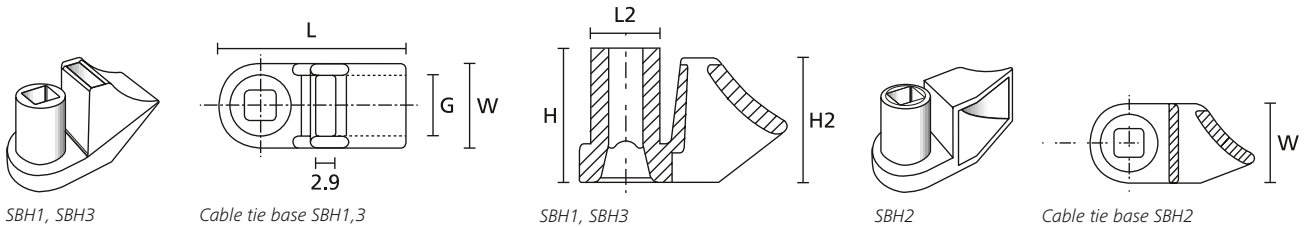
Features and Benefits

- Simple and quick method of fixing
- SBH types simply hammered onto the stud
- SBH1 and SBH3 allow cables to run across the panel
- SBH2 allow cables to run at 90° to the panel



SBH2 allow cables to run at 90° to the panel.

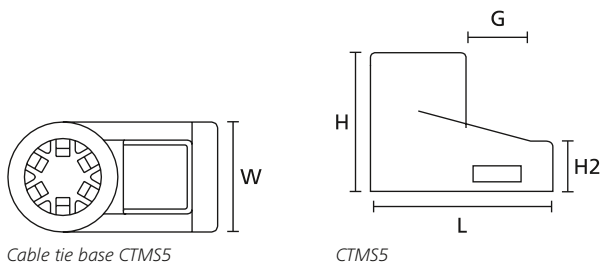
SB-Series



TYPE	Width (W)	Length (L)	Length (L2)	Height (H)	Height (H2)	Stud Ø	Strap Width max. (G)	Material	Colour	Article-No.
SBH1	12.5	26.8	9.0	13.9	15.9	5.0	8.5	PA66	Black (BK)	151-26150
SBH2	12.5	26.8	9.0	14.0	12.5	5.0	8.5	PA66	Black (BK)	151-26250
SBH3	12.5	26.8	9.0	18.0	15.9	5.0	8.5	PA66	Black (BK)	150-18900

All dimensions in mm. Subject to technical changes.

CT-Series



TYPE	Width (W)	Length (L)	Height (H)	Height (H2)	Stud Ø	Strap Width max. (G)	Material	Colour	Article-No.
CTM55	10.0	19.0	14.5	5.3	5.0	5.0	PA66	Black (BK)	151-03301

All dimensions in mm. Subject to technical changes.



Fixing Elements for Weld Studs

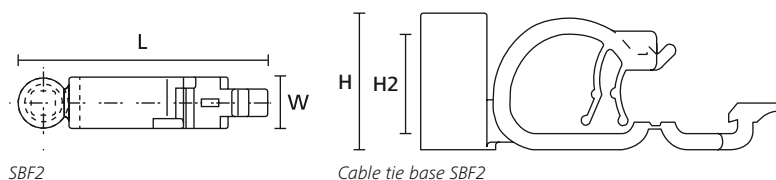
SBF-Clips

Many industries (but specifically the automotive market) are using 'weld studs' as the standard method of attaching components. Simply hammered onto the stud these parts provide ideal fixing bases for attaching cables, pipes or hose.

The use of weld studs avoids the problems with 'holes' (ingress of moisture, corrosion etc).

Features and Benefits

- One-piece fixing and retainer
- For bundles of up to 13.5 mm



SBF2

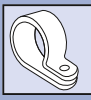
Cable tie base SBF2



Material specification please see page 16.

TYPE	Width (W)	Length (L)	Height (H)	Height (H2)	Stud Ø	Bundle Ø max.	Material	Colour	Article-No.
SBF2	10.0	47.7	18.2	13.5	5.0	13.5	PA66	Black (BK)	150-47700

All dimensions in mm. Subject to technical changes.



Snapper Hose Clips for Tubes and Harnesses

SNP-Series

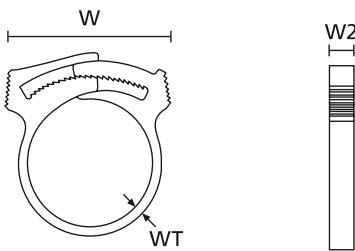
SNP range may replace metal hose clamps. Snapper hose clips can be used in markets as diverse as automotive, agriculture, white goods, venting systems, pumps and hydraulic systems to medical engineering.

Features and Benefits

- Releasable and reusable plastic hose clamps
- Self-locking
- Releasable by giving a lateral movement to the 'head'
- Installation by hand possible
- Installation with processing tool for secure tensing
- For higher operating temperatures: Glass Filled PA66



SNP - Snapper Hose Clips range.



SNP - Snapper Hose Clip (front view)

SNP Clip (side view)



Material specification please see page 16.



SNP Snapper are also available on request in material PA66HS and PA46.

TYPE	Bundle Ø min.	Bundle Ø max.	Width (W) min.	Width (W) max.	Width (W2)	Wall (WT)	Material	Colour	Article-No.
SNP1	6.0	6.5	8.33	11.73	3.8	1.00	POM	White (WH)	190-00022
	6.0	6.8	8.56	11.79	3.8	1.00	PA66GF13	Black (BK)	192-10010
SNP1.25	7.1	7.7	10.57	12.62	3.8	1.10	PA66GF13	Black (BK)	190-00029
SNP1.5	7.8	9.2	13.00	17.00	3.7	1.40	PA66GF15	Black (BK)	193-00150
SNP2(E)	8.7	10.0	17.00	21.00	6.0	1.50	POM	Natural (NA)	191-10029
SNP2	9.3	10.5	12.22	17.48	5.9	1.70	PA66GF13	Black (BK)	192-10020
SNP3(E)	10.0	11.4	19.00	25.00	6.0	1.80	POM	Natural (NA)	191-10039
SNP4	10.4	11.7	13.39	19.15	5.9	1.70	PA66GF13	Black (BK)	192-10040
SNP4(E)	10.8	12.3	19.00	23.00	6.0	1.80	POM	Natural (NA)	191-10049
SNP7	11.4	13.7	18.62	28.73	5.9	1.70	PA66GF13	Black (BK)	192-10070
SNP6	11.7	13.3	14.71	21.54	5.9	1.70	PA66GF13	Black (BK)	192-10060
SNP6(E)	12.0	13.7	19.00	24.00	6.0	1.80	POM	Natural (NA)	191-10069
SNP8	13.1	15.0	16.69	24.89	5.7	1.70	PA66GF13	Black (BK)	192-10080
SNP8(E)	13.7	15.3	19.00	24.00	6.0	1.80	POM	Natural (NA)	191-10089
SNP10	14.5	16.6	17.60	26.90	5.9	1.80	PA66GF13	Black (BK)	192-10100
SNP10(E)	15.0	16.8	19.00	24.00	6.0	1.80	POM	Natural (NA)	191-10109
SNP12A	15.9	18.2	20.96	29.90	5.9	1.80	PA66GF13	Black (BK)	190-00254
SNP12(E)	16.8	18.4	19.00	24.00	6.0	1.80	POM	Natural (NA)	191-10129
SNP14(E)	18.1	19.9	19.00	24.00	6.0	1.80	POM	Natural (NA)	191-10149
SNP14A	18.5	21.0	20.90	30.10	5.9	1.80	PA66GF13	Black (BK)	190-00300
SNP16	19.1	21.7	19.89	30.81	5.8	1.50	PA66GF13	Black (BK)	192-10160
SNP16(E)	19.9	21.7	19.00	24.00	6.0	1.90	POM	Natural (NA)	191-10169

All dimensions in mm. Subject to technical changes.





Snapper Hose Clips for Tubes and Harnesses

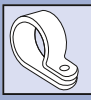
SNP-Series

TYPE	Bundle Ø min.	Bundle Ø max.	Width (W) min.	Width (W) max.	Width (W2)	Wall (WT)	Material	Colour	Article-No.
SNP18A	20.0	23.1	24.03	35.51	5.9	1.80	PA66GF13	Black (BK)	190-00258
SNP18(E)	21.4	23.0	16.00	22.00	6.0	1.90	POM	Natural (NA)	191-10189
SNP19	22.3	25.3	22.30	36.09	5.9	1.80	PA66GF13	Black (BK)	190-00090
SNP20(E)	22.7	24.7	20.00	26.00	6.0	1.80	POM	Natural (NA)	191-10209
SNP22	23.7	27.4	23.90	37.69	6.0	1.80	PA66GF13	Black (BK)	192-10220
SNP22(E)	25.3	27.3	20.00	26.00	6.0	1.60	POM	Natural (NA)	191-10229
SNP24	25.8	29.2	26.49	39.40	7.4	1.70	PA66GF13	Black (BK)	192-10240
SNP24(E)	26.5	28.6	26.50	39.40	7.4	2.50	POM	Natural (NA)	191-10249
SNP28	29.1	33.6	25.91	41.81	7.3	1.70	PA66GF13	Black (BK)	190-00127
SNP32(E)	30.3	33.1	27.00	34.00	7.5	2.00	POM	Natural (NA)	191-10329
SNP32	31.2	35.8	27.33	44.40	7.3	1.80	PA66GF13	Black (BK)	192-10320
SNP34(E)	32.5	35.1	27.00	34.00	7.5	2.00	POM	Natural (NA)	191-10349
SNP36(E)	34.8	37.1	27.00	34.00	7.5	2.00	POM	Natural (NA)	191-10369
SNP38(E)	36.7	38.9	27.00	34.00	7.5	2.00	POM	Natural (NA)	191-10389
SNP36	37.8	44.0	32.41	43.99	7.3	1.70	PA66GF13	Black (BK)	192-10360
SNP42(E)	41.0	44.2	32.00	45.00	7.5	2.00	POM	Natural (NA)	191-10429
SNP38	41.0	48.1	35.61	57.51	7.3	1.80	PA66GF13	Black (BK)	192-10380
SNP42N	44.5	52.2	35.10	58.93	7.3	1.70	PA66GF13	Black (BK)	191-00005
SNP46(E)	44.6	47.6	32.00	45.00	7.5	2.00	POM	Natural (NA)	191-10469
SNP50(E)	48.8	52.0	32.00	45.00	7.5	2.00	POM	Natural (NA)	191-10509
SNP50	52.2	58.6	36.50	60.40	7.5	1.70	PA66GF13	Black (BK)	192-10500
SNP54(E)	52.3	55.7	32.00	45.00	7.5	2.00	POM	Natural (NA)	191-10549
SNP58(E)	56.7	59.2	31.00	39.00	7.5	2.00	POM	Natural (NA)	191-10589
SNP62(E)	61.1	63.5	31.00	39.00	7.5	2.00	POM	Natural (NA)	191-10629

All dimensions in mm. Subject to technical changes.



Snapper tools please
see page 241.



Blind Plugs

These products were developed especially for the automotive industry for application in trunks, doors, wheel housing and dash panels. Parts are even used for optical applications.

Features and Benefits

- Easy assembly without the need of a tool
- Disc of the part covers the hole and minimises ingress of dust, dirt and water
- Standard geometry, e.g. fir tree or arrowhead



Blindplugs are available in different dimensions and materials.



Material specification please see page 16.

TYPE	Drawing	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
TRIM PLUG 5		5.0	4.0	PA66HIR	Natural (NA)	151-00333
PLUG11		11.0	4.0 - 6.0	PA66HIRHS	Natural (NA)	151-00485
		11.0	6.0 - 8.0	POM	Black (BK)	151-00360
PLUG5.5		5.0 - 5.5	2.5 - 26.0	PA6HIR	Black (BK)	151-00399
		5.0 - 5.5	2.5 - 26.0	PA6HIR	Grey (GY)	151-00401
PLUG SQ8x8		7.6 - 8.0	1.0 - 3.0	PA66HIR	Black (BK)	151-00415
PLUG5 WITH OPENING		5.05 - 5.25	4.8 - 5.2	PA66HIRHS	Black (BK)	151-00419
PLUG10		10.2	2.0 - 12.0	PE	Black (BK)	151-00426
		10.2	2.0 - 12.0	PE	Grey (GY)	151-00488
PLUGFT6XL		6.5 - 7.0	0.7 - 18.0	PA46	Brown (BN)	151-00428
		6.5 - 7.0	0.7 - 18.0	PA66HIR	Black (BK)	241-00002
		6.5 - 7.0	0.7 - 18.0	PA66HIR	Grey (GY)	241-00001
PLUGFT7		7.05 - 7.25	2.5 - 8.0	PA6HIR	Black (BK)	151-00414
PLUGSFT8.4		8.3 - 8.5	0.7 - 0.9	POM	Natural (NA)	151-01114

All dimensions in mm. Subject to technical changes.



Cover Plugs and Open Plugs

These products were developed especially for the automotive industry for application in trunks, doors, wheel housing and dash panels, particularly where holes have to be covered and tubes must be guided securely. Parts are even used for optical applications.

Features and Benefits

- Easy assembly without the need for a tool
- Protection of ingress of dust, dirt and water are offered by cover plugs
- Open plugs cover and secure the edges of drilled holes



Cover Plugs protect and secure boreholes.

Cover Plugs

TYPE	Drawing	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
Cover Plug 20x50		20.0 x 50.0	2.5	PP, EPDM	Black (BK)	151-00342
Cover Plug 20		19.5	3.0	PP, EPDM	Black (BK)	151-00343
Cover Plug 32		32.0	2.5	EPDM	Black (BK)	151-00424

All dimensions in mm. Subject to technical changes.

Open Plugs

TYPE	Drawing	Hole Ø (FH)	Panel Thickness	Material	Colour	Article-No.
Open Plug 55x70		55.0 x 70.0	5.0 - 8.0	PP	Black (BK)	151-00392
Open Plug 42x84		42.0 x 84.0	5.0 - 8.0	PA6HIR	Black (BK)	151-00391
OPEN PLUG 34.6x112		34.6 x 112.0	5.0 - 8.0	PA66HIR	Black (BK)	151-00394

All dimensions in mm. Subject to technical changes.





Heat Shrinkable Tubing

Product Selection

Size Overview	146
The right Heat Shrink Tube	147
Heatshrinkable Tubing Overview	148
Thin walled	
TR27, 2:1, halogen free and highly flame retardant	150
TCN20, 2:1, self extinguishing	151
TCN20 overexpanded, 3:1, self extinguishing	152
HFT-A, 2:1, flexible and coloured, self extinguishing	153
TF21, 2:1, flexible and coloured	154
TF24, 2:1, flexible and transparent; VG	157
TF31, 3:1, flexible and coloured	158
TF34, 3:1, flexible and transparent, VG	161
TK20, 2:1, PVDF semi-rigid in 1.2 m lengths	167

Thin walled with adhesive liner

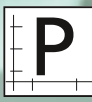
EPS-300, 3:1, on reel	162
EPS-400, 4:1, on reel	162

Standard wall with adhesive liner

SA47, 4:1, 1.2 m lengths	163
SA47-LA, 4:1, 1.2 m lengths	164
SA47-HT, 4:1, 1.2 m lengths	165

Standard walled

SE28, 2:1, Elastomer	166
Viton®-E, 2:1, high performance Fluoroelastomer	168



Overview of Applications for Heat Shrink Tubing

When selecting the correct heat shrink tubing size, it is important to bear in mind the 80:20 rule. The heat shrink tubing must shrink by at least 20 % and not more than 80 % of its complete shrinkage capacity to achieve the right result. In our overview of applications you will find the best heat shrink tube for every cable diameter. The 80:20 rule has of course been taken into account in the table.

Heat Shrinkable Tubing with a shrink ratio of 2:1

HFT-A, TL27, TF21, TF24, VITON®-E, TK20, TK29, TFE-2, TR27, TCN20, SE28

Shrink ratio 2:1 Size mm		Cable/Wire Diameter
1.2/0.6		0.7 mm
		1.1 mm
3.2/1.6	2.4/1.2	1.4 mm
		1.9 mm
		2.2 mm
		2.9 mm
6.4/3.2	4.8/2.4	3.8 mm
		4.3 mm
		5.7 mm
		5.8 mm
12.7/6.4	9.5/4.7	7.7 mm
		8.6 mm
		11.4 mm
		15.2 mm
25.4/12.7	19.1/9.5	17.2 mm
		22.9 mm
		30.5 mm
50.8/25.4	38.1/19.1	34.3 mm
		45.7 mm
		61.0 mm
101.6/50.8	76.2/38.1	68.6 mm
		91.4 mm

Heat Shrinkable Tubing with a shrinkage ratio of 3:1

With the optimal shrinkage ratio of 3:1, you can cover a wide range of applications with just a few sizes. This leads to reduced stock expenditure and requires less space. 3:1 heat shrink tubes: TF34, TF31, EPS-300, TCN20 overexpanded, TA32, TA37

Shrink ratio 3:1 Size mm		Cable/Wire Diameter
1.5/0.5		0.7 mm
		1.3 mm
6/2	3/1	1.4 mm
		2.6 mm
		2.8 mm
		5.2 mm
18/6	12/4	5.6 mm
		8.4 mm
		10.4 mm
		11.2 mm
40/13	24/8	15.6 mm
		18.4 mm
		20.8 mm
		34.6 mm

Conversion from imperial to metric

Inch	1/32"	3/64"	1/16"	5/64"	3/32"	1/8"	3/16"	1/4"	3/8"
mm	0.8	1.2	1.6	2.0	2.4	3.2	4.8	6.4	9.5
Inch	1/2"	5/8"	3/4"	1"	1-1/4"	1-1/2"	2"	3"	4"
mm	12.7	15.9	19.1	25.4	31.8	38.1	50.8	76.2	101.6

VITON® is a registered trademark of DuPont.

The Right Heat Shrink Tube

The 80:20 rule means that a heat shrink tube should shrink by a maximum of 80% and a minimum of 20%.

For example:

A cable with a diameter of 5mm is to be wrapped in heat shrink tubing. In theory both sizes 6/2 and 12/4 would be suitable, since the required diameter of 5mm lies within the shrink range of both tube sizes.

Size 6/2

Maximum shrink (100 %)



Shrinkage of 4 mm

Optimum shrinkage max. (80 %)



Shrinkage of 0.8 mm

Optimum shrinkage min. (20 %)



Shrinkage of 3.2 mm

Size 12/4

Maximum shrink (100 %)



Shrinkage of 8 mm

Optimum shrinkage max. (80 %)



Shrinkage of 6.4 mm

Optimum shrinkage min. (20 %)



Shrinkage of 1.6 mm

Size 6/2 has a range of application of between 2.8 mm and 5.2 mm and is therefore suitable for the cable diameter of 5 mm.

The smallest application diameter of size 12/4 is 5.6 mm. This size is therefore unsuitable for a cable diameter of 5 mm.

Calculator tool for Heat Shrink Tubing

The calculator tool for heat shrink tubing is a selection guide for shrink tubing sizes based on the object to be covered.

Fill in your specification and the calculator presents the right tubing size according to the 80:20 rule. Find more information under <http://www.HellermannTyton.co.uk/heatshrink-calculator/>

The calculator tool also checks if the heat shrink tubing you have chosen is suitable for your application. For example you can find the heat shrink tubing with the Product Search on the HellermannTyton website.



Heatshrinkable Tubing Overview

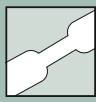
TYPE	Packaging type	Variant	Material	Shrink Ratio	Operating Temperature	Dimension (mm)	Halogen-free	Colour	Specifications	Page	
TCN20		Thin-Wall	PO-X	2:1	-55 °C to +125 °C	1.2 - 50.8		Black	3, 14, 15	151	
TCN20 over-expanded			PO-X	3:1	-55 °C to +125 °C	2.4 - 38.0		Black	3, 14, 15	152	
HFT-A			PO-X	2:1	-55 °C to +135 °C	1.2 - 101.6		Black	1, 3, 4, 7, 9, 10, 11, 12, 13, 14, 15, 16	153	
TF21			PO-X	2:1	-55 °C to +135 °C	1.2 - 101.6		Black, Blue, Green-Yellow, Orange, Red, White, Yellow	3, 6, 10, 13, 14, 15	154, 155, 156	
TF24			PO-X	2:1	-55 °C to +135 °C	1.2 - 101.6	HF ✓	Transparent	4, 13, 16	157	
TF31			PO-X	3:1	-55 °C to +135 °C	1.5 - 40.0		Black, Blue, Green, Green-Yellow, Red, White, Yellow	3, 14, 15	158, 159, 160	
TF34			PO-X	3:1	-55 °C to +135 °C	1.5 - 40.0	HF ✓	Transparent		161	
EPS-300			Thin-Wall Hot melt adhesive	PO-X	3:1	-55 °C to +125 °C	3.0 - 40.0		Black	13	162
EPS-400				PO-X	4:1	-55 °C to +125 °C	4.0 - 32.0		Black	13	162
SA47			Standard-Wall Hot melt adhesive	PO-X	4:1	-40 °C to +125 °C	5.75 - 32.0	HF ✓	Clear		163
SA47-LA		PO-X		4:1	-40 °C to +125 °C	5.75 - 52.0	HF ✓	Clear		164	
SA47-HT		PO-X		4:1	-40 °C to +150 °C	7.6 - 32.0		Black		165	
SE28		Standard-Wall	POA	2:1	-75 °C to +150 °C	3.2 - 102.0		Black	10, 13, 16	166	
TK20		Thin-Wall	PVDF	2:1	-55 °C to +175 °C	1.2 - 50.8		Transparent	1, 11, 12, 13, 14, 15, 16	167	
Viton®-E		Standard-Wall	FPMX	2:1	-55 °C to +220 °C	3.2 - 50.8		Black	7, 16	168	
TR27		Thin-Wall	PO-X	2:1	-40 °C to +105 °C	3.2 - 50.8	HF ✓	Black	4, 2, 8	150	

Heatshrinkable Tubing Overview

SPECIFICATION

1 	2 	3 	4 	5 	6 	7
8 	9 	10 	11 	12 	13 	14
15 	16 					

Please refer to the Approvals Overview for further information, see page: 250, 251



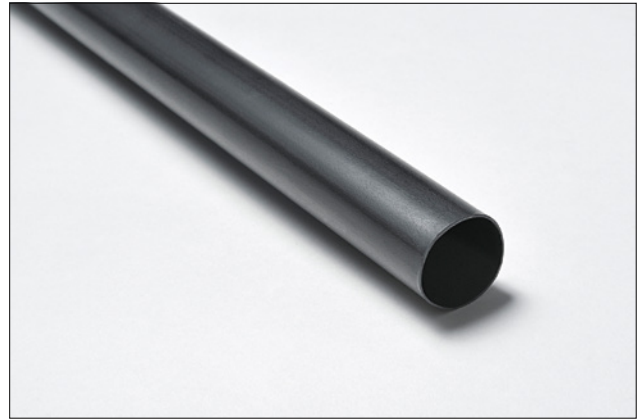
Heat Shrinkable Tubing 2:1 - Flame retardant

TR27

TR27 is used in applications where toxic emissions evolved in a fire must be minimised, e.g. heavily populated buildings or safety sensitive areas like tunnels, hospitals, schools, theatres, mass transit vehicles and computer centres.

Features and Benefits

- Thin walled, flexible polyolefin tubing
- Optional available with adhesive or as thick walled version (SR27)
- Halogen free and excellent flame-retardant properties
- Meets various industrial standards



TR27 is ideal for safety sensitive areas.

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	2:1
Operating Temperature	-40 °C to +105 °C
Minimum Shrink Temperature	+115 °C
Longitudinal change after shrinkage	+5 %/-10 % max.
Dielectric Strength	15 kV/mm according to IEC 60684 P2
Flammability	Limited Fire Hazard, Halogen free, Low generation of toxic gases and corrosive acid, Low smoke generation
Specifications	DEF STAN 59-97 Type 8, EN 45545: 2013, LUL Engineering Standard E1042:A6



TR27 is mainly used in the railway industry.



Heat Shrinkable Tubing 2:1

TYPE	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TR27-3.2/1.6	3.2	1/8 "	1.6	0.51	150 m	Black (BK)	315-50320
TR27-4.8/2.4	4.8	3/16 "	2.4	0.51	60 m	Black (BK)	315-50480
TR27-6.4/3.2	6.4	1/4 "	3.2	0.64	60 m	Black (BK)	315-50640
TR27-9.5/4.8	9.5	3/8 "	4.8	0.64	60 m	Black (BK)	315-50950
TR27-12.7/6.4	12.7	1/2 "	6.4	0.64	60 m	Black (BK)	315-51270
TR27-19.1/9.5	19.1	3/4 "	9.5	0.76	60 m	Black (BK)	315-51900
TR27-25.4/12.7	25.4	1 "	12.7	0.89	60 m	Black (BK)	315-52540
TR27-38.1/19.1	38.1	1-1/2 "	19.1	1.02	60 m	Black (BK)	315-53810
TR27-50.8/25.4	50.8	2 "	25.4	1.14	60 m	Black (BK)	315-55100

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Low-Heat Shrinkable Tubing 2:1

TCN20 - self extinguishing

TCN20 is suitable for a wide range of applications such as electrical insulation, mechanical protection and cable bundling.

Features and Benefits

- Thin walled general purpose polyolefin tubing
- Highly flame-retardant, UL224 VW-1, CSA
- Fast shrinking
- Low shrink temperature



Heat Shrink Tubing TCN20.



Detailed Information about Heatguns please refer to page 242.

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +125 °C
Minimum Shrink Temperature	+100 °C
Longitudinal change after shrinkage	+/- 5 %
Dielectric Strength	20kV/mm according to ASTM D2671
Flammability	Self extinguishing
Specifications	CSA, UL224 125 °C 600V VW-1

RoHS



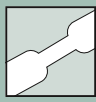
Heat Shrinkable Tubing 2:1

TYPE	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TCN20-1.2/0.6	1.2	3/64 "	0.6	0.30	300 m	Black (BK)	300-73010
TCN20-1.6/0.8	1.6	1/16 "	0.8	0.35	300 m	Black (BK)	300-73020
TCN20-2.4/1.2	2.4	3/32 "	1.2	0.45	300 m	Black (BK)	300-73030
TCN20-3.2/1.6	3.2	1/8 "	1.6	0.45	300 m	Black (BK)	300-73040
TCN20-4.8/2.4	4.8	3/16 "	2.4	0.50	300 m	Black (BK)	300-73050
TCN20-6.4/3.2	6.4	1/4 "	3.2	0.55	300 m	Black (BK)	300-73060
TCN20-9.5/4.8	9.5	3/8 "	4.8	0.55	100 m	Black (BK)	300-73070
TCN20-12.7/6.4	12.7	1/2 "	6.4	0.65	100 m	Black (BK)	300-73080
TCN20-19.1/9.5	19.1	3/4 "	9.5	0.80	60 m	Black (BK)	300-73090
TCN20-25.4/12.7	25.4	1 "	12.7	0.90	60 m	Black (BK)	300-73100
TCN20-38.1/19.1	38.1	1-1/2 "	19.1	1.02	30 m	Black (BK)	300-73110
TCN20-50.8/25.4	50.8	2 "	25.4	1.15	30 m	Black (BK)	300-73120

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Heat Shrinkable Tubing 3:1 - Self extinguishing

TCN20 overexpanded

Mechanical, electrical and corrosion protection applications for parts with high diameter variances. This fast shrinking tubing makes it suitable for high volume production.

Features and Benefits

- Thin walled overexpanded polyolefin tubing
- Inch size tubing with 3:1 shrink ratio
- Very fast shrinking and low shrink temperature
- Highly flame-retardant, UL224 VW-1



Heat shrink tubing TCN20 overexpanded.



Detailed Information about Heatguns please refer to page 242.

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	3:1
Operating Temperature	-55 °C to +125 °C
Minimum Shrink Temperature	+100 °C
Longitudinal change after shrinkage	+/- 5 %
Dielectric Strength	20kV/mm according to ASTM D2671
Flammability	Self extinguishing
Specifications	CSA, UL224 125 °C 600V VW-1



RoHS ✓

TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TCN20-2.4/0.8	2.4	0.8	0.40	300 m	Black (BK)	300-73130
TCN20-3.2/1.2	3.2	1.2	0.50	300 m	Black (BK)	300-73140
TCN20-4.8/1.6	4.8	1.6	0.50	300 m	Black (BK)	300-73150
TCN20-6.6/2.4	6.6	2.4	0.55	300 m	Black (BK)	300-73160
TCN20-9.5/3.2	9.5	3.2	0.65	100 m	Black (BK)	300-73170
TCN20-12.7/4.8	12.7	4.8	0.75	100 m	Black (BK)	300-73180
TCN20-19.0/6.4	19.0	6.4	0.75	60 m	Black (BK)	300-73190
TCN20-25.4/9.5	25.4	9.5	0.79	60 m	Black (BK)	300-73200
TCN20-38.0/12.7	38.0	12.7	0.95	30 m	Black (BK)	300-73210

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Heat Shrinkable Tubing 2:1 flexible and coloured

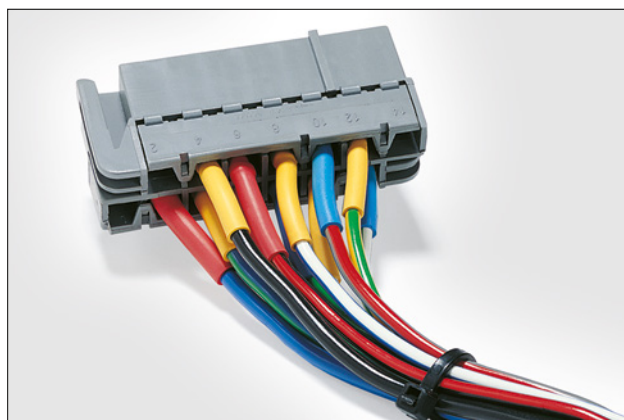
HFT-A - self extinguishing

This high performance thin wall tubing is used extensively for electrical and mechanical protection. It is also well proven for sleeve marking to identify wiring circuits. It shrinks uniformly to form a permanent insulation covering.

The transparent version is used for bundling and cable protection where visual inspection is required. It is often used as a see through protective sleeve over cable markers.

Features and Benefits

- Flexible heat shrink tubing
- Fast shrinking, easy handling, good mechanical strength
- Easy to print on
- Wide range of colours
- Internal diameters up to 4 inches (101.6 mm)
- UL-224 ,CSA listed and VG approved



HFT-A conforms to major standards used in all Defence industries.

i Standard sizes available in colours black, red, blue, yellow, white and green-yellow.



Heat Shrinkable Tubing 2:1

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +135 °C
Minimum Shrink Temperature	+100 °C
Longitudinal change after shrinkage	+5 %/-10 %
Dielectric Strength	20 kV/mm according to IEC 60684 P2
Flammability	Self extinguishing
Specifications	ASN-E0126, CSA, DEF STAN 59-97/3, LEA, MIL-DTL-23053/5C, NF F 00-608, NSA937211, PAN6493, SAE - AMS - DTL-23053/5C, UL224 125 °C 600V, VG 95343



TYPE	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
HFT-A-1.2/0.6	1.2	3/64 "	0.6	0.40	400 m	Black (BK)	VG 95343 T05 A 001 A	305-01200
HFT-A-1.6/0.8	1.6	1/16 "	0.8	0.40	400 m	Black (BK)	VG 95343 T05 A 002 A	305-01600
HFT-A-2.4/1.2	2.4	3/32 "	1.2	0.50	400 m	Black (BK)	VG 95343 T05 A 003 A	305-02400
HFT-A-3.2/1.6	3.2	1/8 "	1.6	0.50	400 m	Black (BK)	VG 95343 T05 A 004 A	305-03200
HFT-A-4.8/2.4	4.8	3/16 "	2.4	0.50	300 m	Black (BK)	VG 95343 T05 A 005 A	305-04800
HFT-A-6.4/3.2	6.4	1/4 "	3.2	0.60	300 m	Black (BK)	VG 95343 T05 A 006 A	305-06400
HFT-A-9.5/4.8	9.5	3/8 "	4.8	0.60	150 m	Black (BK)	VG 95343 T05 A 007 A	305-09500
HFT-A-12.7/6.4	12.7	1/2 "	6.4	0.60	100 m	Black (BK)	VG 95343 T05 A 008 A	305-12700
HFT-A-19.0/9.5	19.0	3/4 "	9.5	0.80	50 m	Black (BK)	VG 95343 T05 A 009 A	305-19000
HFT-A-25.4/12.7	25.4	1 "	12.7	0.90	50 m	Black (BK)	VG 95343 T05 A 010 A	305-25400
HFT-A-38.0/19.0	38.0	1-1/2 "	19.0	1.00	50 m	Black (BK)	VG 95343 T05 A 011 A	305-38100
HFT-A-50.8/25.4	51.0	2 "	25.4	1.10	35 m	Black (BK)	VG 95343 T05 A 012 A	305-50800
HFT-A-76.0/38.0	76.0	3 "	38.0	1.30	25 m	Black (BK)	VG 95343 T05 A 013 A	305-76200
HFT-A-101.6/50.8	101.6	4 "	50.8	1.40	25 m	Black (BK)	VG 95343 T05 A 014 A	305-91600

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



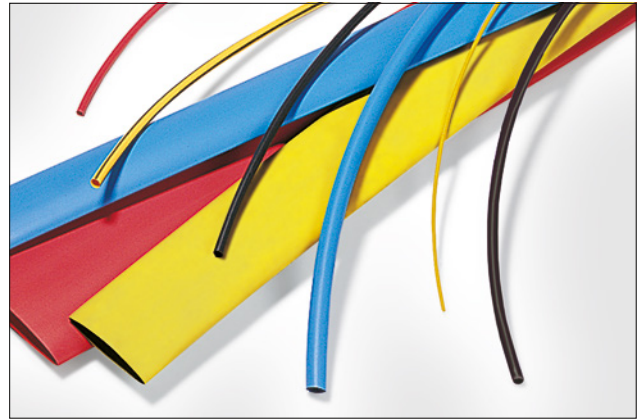
Heat Shrinkable Tubing 2:1 flexible and coloured

TF21

Due to its versatility TF21 is suitable for a wide range of applications like electrical insulations, mechanical protection and marking.

Features and Benefits

- Thin walled, flexible polyolefin tubing
- Fast shrinking and low shrink temperature
- Meets and exceeds lots of industrial standards
- Big variety of different colours and sizes
- Printable
- Flame retarded and UL224 VW1 listed



TF21 – available in a wide range of colours and sizes.



Detailed Information about Heatguns please refer to page 242.



Cut lengths available on request. Please contact us!



One Step to the Web!



Heat Shrinkable Tubing 2:1

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +135 °C
Minimum Shrink Temperature	+90 °C
Longitudinal change after shrinkage	+/-5 %
Dielectric Strength	37 kV/mm
Flammability	ASTM D876
Specifications	CSA, JAR/FAR 25.853, NF F 00-608, SAE - AMS - DTL-23053/5 Class 1, UL224 125 °C 600V VW-1



TYPE	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TF21-1.2/0.6	1.2	3/64 "	0.6	0.41	100 m	Blue (BU)	309-20126
	1.2	3/64 "	0.6	0.41	100 m	Red (RD)	309-20122
	1.2	3/64 "	0.6	0.41	100 m	White (WH)	309-20129
	1.2	3/64 "	0.6	0.41	100 m	Yellow (YE)	309-20124
	1.2	3/64 "	0.6	0.41	300 m	Black (BK)	309-10120
TF21-1.6/0.8	1.6	1/16 "	0.8	0.43	100 m	Blue (BU)	309-20166
	1.6	1/16 "	0.8	0.43	100 m	Red (RD)	309-20162
	1.6	1/16 "	0.8	0.43	100 m	White (WH)	309-20169
	1.6	1/16 "	0.8	0.43	100 m	Yellow (YE)	309-20164
	1.6	1/16 "	0.8	0.43	300 m	Black (BK)	309-10160

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.

Heat Shrinkable Tubing 2:1 flexible and coloured

TF21

TYPE	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TF21-2.4/1.2	2.4	3/32 "	1.2	0.51	100 m	Blue (BU)	309-20246
	2.4	3/32 "	1.2	0.51	100 m	Green-Yellow (GNYE)	309-40247
	2.4	3/32 "	1.2	0.51	100 m	Red (RD)	309-20242
	2.4	3/32 "	1.2	0.51	100 m	White (WH)	309-20249
	2.4	3/32 "	1.2	0.51	100 m	Yellow (YE)	309-20244
	2.4	3/32 "	1.2	0.51	300 m	Black (BK)	309-10240
TF21-3.2/1.6	3.2	1/8 "	1.6	0.51	100 m	Blue (BU)	309-20326
	3.2	1/8 "	1.6	0.51	100 m	Green-Yellow (GNYE)	309-40327
	3.2	1/8 "	1.6	0.51	100 m	Red (RD)	309-20322
	3.2	1/8 "	1.6	0.51	100 m	White (WH)	309-20329
	3.2	1/8 "	1.6	0.51	100 m	Yellow (YE)	309-20324
	3.2	1/8 "	1.6	0.51	300 m	Black (BK)	309-10320
TF21-4.8/2.4	4.8	3/16 "	2.4	0.51	60 m	Blue (BU)	309-50486
	4.8	3/16 "	2.4	0.51	60 m	Green-Yellow (GNYE)	309-50487
	4.8	3/16 "	2.4	0.51	60 m	Red (RD)	309-50482
	4.8	3/16 "	2.4	0.51	60 m	White (WH)	309-50489
	4.8	3/16 "	2.4	0.51	60 m	Yellow (YE)	309-50484
	4.8	3/16 "	2.4	0.51	75 m	Orange (OG)	309-20483
	4.8	3/16 "	2.4	0.51	300 m	Black (BK)	309-10480
TF21-6.4/3.2	6.4	1/4 "	3.2	0.64	60 m	Blue (BU)	309-50646
	6.4	1/4 "	3.2	0.64	60 m	Green-Yellow (GNYE)	309-50647
	6.4	1/4 "	3.2	0.64	60 m	Red (RD)	309-50642
	6.4	1/4 "	3.2	0.64	60 m	White (WH)	309-50649
	6.4	1/4 "	3.2	0.64	60 m	Yellow (YE)	309-50644
	6.4	1/4 "	3.2	0.64	300 m	Black (BK)	309-10640
TF21-9.5/4.8	9.5	3/8 "	4.8	0.64	50 m	Blue (BU)	309-20956
	9.5	3/8 "	4.8	0.64	50 m	Green-Yellow (GNYE)	309-50957
	9.5	3/8 "	4.8	0.64	50 m	Orange (OG)	309-20953
	9.5	3/8 "	4.8	0.64	50 m	Red (RD)	309-20952
	9.5	3/8 "	4.8	0.64	50 m	White (WH)	309-20959
	9.5	3/8 "	4.8	0.64	50 m	Yellow (YE)	309-20954
	9.5	3/8 "	4.8	0.64	150 m	Black (BK)	309-10950
TF21-12.7/6.4	12.7	1/2 "	6.4	0.64	50 m	Blue (BU)	309-21276
	12.7	1/2 "	6.4	0.64	50 m	Green-Yellow (GNYE)	309-41277
	12.7	1/2 "	6.4	0.64	50 m	Red (RD)	309-21272
	12.7	1/2 "	6.4	0.64	50 m	White (WH)	309-21279
	12.7	1/2 "	6.4	0.64	50 m	Yellow (YE)	309-21274
	12.7	1/2 "	6.4	0.64	100 m	Black (BK)	309-11270

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Heat Shrinkable Tubing 2:1 flexible and coloured

TF21

TYPE	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TF21-19.0/9.5	19.1	3/4 "	9.5	0.76	25 m	Orange (OG)	309-21903
	19.1	3/4 "	9.5	0.76	50 m	Black (BK)	309-11900
	19.1	3/4 "	9.5	0.76	50 m	Blue (BU)	309-11906
	19.1	3/4 "	9.5	0.76	50 m	Green-Yellow (GNYE)	309-11907
	19.1	3/4 "	9.5	0.76	50 m	Red (RD)	309-11902
	19.1	3/4 "	9.5	0.76	50 m	White (WH)	309-11909
	19.1	3/4 "	9.5	0.76	50 m	Yellow (YE)	309-11904
TF21-25.4/12.7	25.4	1 "	12.7	0.89	50 m	Black (BK)	309-12540
	25.4	1 "	12.7	0.89	50 m	Blue (BU)	309-12546
	25.4	1 "	12.7	0.89	50 m	Green-Yellow (GNYE)	309-12547
	25.4	1 "	12.7	0.89	50 m	Red (RD)	309-12542
	25.4	1 "	12.7	0.89	50 m	White (WH)	309-12549
	25.4	1 "	12.7	0.89	50 m	Yellow (YE)	309-12544
TF21-38.0/19.0	38.1	1-1/2 "	19.1	1.02	60 m	Black (BK)	309-13810
	38.1	1-1/2 "	19.1	1.02	60 m	Blue (BU)	309-13816
	38.1	1-1/2 "	19.1	1.02	60 m	Green-Yellow (GNYE)	309-13817
	38.1	1-1/2 "	19.1	1.02	60 m	Red (RD)	309-13812
	38.1	1-1/2 "	19.1	1.02	60 m	White (WH)	309-13819
	38.1	1-1/2 "	19.1	1.02	60 m	Yellow (YE)	309-13814
TF21-50.8/25.4	50.8	2 "	25.4	1.14	60 m	Black (BK)	309-15080
	50.8	2 "	25.4	1.14	60 m	Blue (BU)	309-15086
	50.8	2 "	25.4	1.14	60 m	Green-Yellow (GNYE)	309-15087
	50.8	2 "	25.4	1.14	60 m	Red (RD)	309-15082
	50.8	2 "	25.4	1.14	60 m	White (WH)	309-15089
	50.8	2 "	25.4	1.14	60 m	Yellow (YE)	309-15084
TF21-76.0/38.0	76.2	3 "	38.1	1.27	30 m	Black (BK)	309-17600
	76.2	3 "	38.1	1.27	30 m	Blue (BU)	309-17606
	76.2	3 "	38.1	1.27	30 m	Red (RD)	309-17602
	76.2	3 "	38.1	1.27	30 m	White (WH)	309-17609
	76.2	3 "	38.1	1.27	30 m	Yellow (YE)	309-17604
TF21-101.6/50.8	101.6	4 "	50.8	1.40	15 m	Black (BK)	309-11020
	101.6	4 "	50.8	1.40	15 m	Blue (BU)	309-11026
	101.6	4 "	50.8	1.40	15 m	Red (RD)	309-11022
	101.6	4 "	50.8	1.40	15 m	White (WH)	309-11029
	101.6	4 "	50.8	1.40	15 m	Yellow (YE)	309-11024

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Detailed Information about Heatguns please refer to page 242.



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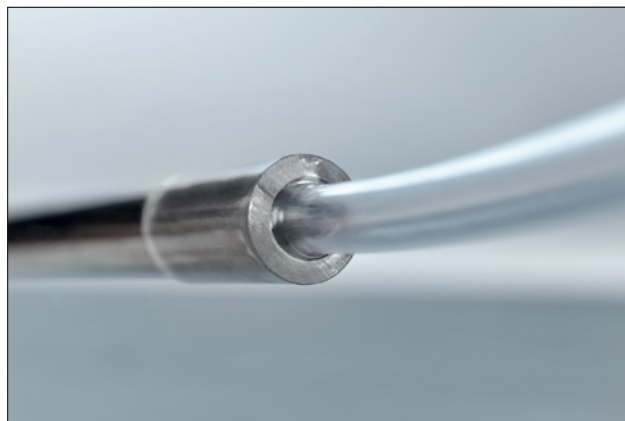
Heat Shrinkable Tubing 2:1 flexible and transparent

TF24

Protects wire and cable markers subject to abuse, while permitting inspectability of each item covered. Protects electronic components while permitting their identification and inspection.

Features and Benefits

- Transparent, flexible polyolefin tubing
- Protects identification marking perfect
- Halogen free
- Good mechanical and chemical resistance
- VG-approval and additional industrial approvals



TF24 transparent tubing with 2:1 shrink ratio.



Cut lengths available on request.
Please contact us!



One Step to the Web!

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +135 °C
Minimum Shrink Temperature	+110 °C
Longitudinal change after shrinkage	+/- 5 % max.
Dielectric Strength	≥ 30 kV/mm min. according to ASTM D2171
Flammability	not flame retarded
Specifications	DEF STAN 59-97 Type 2B, SAE - AMS - DTL-23053/5 Class 2, VG 95343



TYPE	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
TF24-1.2/0.6	1.2	3/64 "	0.6	0.41	100 m	Transparent (CL)	VG 95343 T05 B 001 M	309-40123
TF24-1.6/0.8	1.6	1/16 "	0.8	0.43	100 m	Transparent (CL)	VG 95343 T05 B 002 M	309-40163
TF24-2.4/1.2	2.4	3/32 "	1.2	0.51	100 m	Transparent (CL)	VG 95343 T05 B 003 M	309-40243
TF24-3.2/1.6	3.2	1/8 "	1.6	0.51	100 m	Transparent (CL)	VG 95343 T05 B 004 M	309-40323
TF24-4.8/2.4	4.8	3/16 "	2.4	0.51	60 m	Transparent (CL)	VG 95343 T05 B 005 M	309-50483
TF24-6.4/3.2	6.4	1/4 "	3.2	0.64	60 m	Transparent (CL)	VG 95343 T05 B 006 M	309-50643
TF24-9.5/4.8	9.5	3/8 "	4.8	0.64	50 m	Transparent (CL)	VG 95343 T05 B 007 M	309-40953
TF24-12.7/6.4	12.7	1/2 "	6.4	0.64	50 m	Transparent (CL)	VG 95343 T05 B 008 M	309-41273
TF24-19.1/9.5	19.1	3/4 "	9.5	0.76	50 m	Transparent (CL)	VG 95343 T05 B 009 M	309-31903
TF24-25.4/12.7	25.4	1 "	12.7	0.89	50 m	Transparent (CL)	VG 95343 T05 B 010 M	309-32543
TF24-38.1/19.1	38.1	1-1/2 "	19.1	1.02	60 m	Transparent (CL)	VG 95343 T05 B 011 M	309-33813
TF24-50.8/25.4	50.8	2 "	25.4	1.14	60 m	Transparent (CL)	VG 95343 T05 B 012 M	309-35083
TF24-76.2/38.1	76.2	3 "	38.1	1.27	30 m	Transparent (CL)	VG 95343 T05 B 013 M	309-37603
TF24-101.6/50.8	101.6	4 "	50.8	1.40	15 m	Transparent (CL)	VG 95343 T05 B 014 M	309-31023

All dimensions in mm. Subject to technical changes.
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Please note! Not all products listed on this page may have this approval.



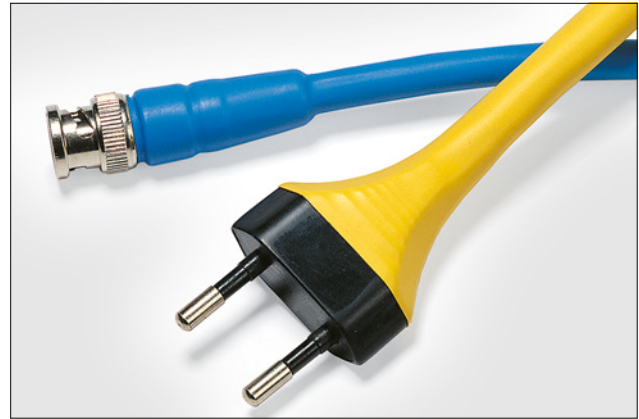
Heat Shrinkable Tubing 3:1 flexible and coloured

TF31

If higher fire protection is a requirement heat shrinkable tubing TF31 is a good choice. It is used for protection insulation and identification wires, cables and light duty harnesses.

Features and Benefits

- Thin walled, very flexible polyolefin tubing
- Few sizes cover a wide range of diameters allowing reduced inventory
- Fast shrinking and low shrink temperature
- Flame-retardant, UL224 VW1 listed



TF31 with 3:1 shrink ratio allowing for a wider range of application.



**Cut lengths available on request.
Please contact us!**

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	3:1
Operating Temperature	-55 °C to +135 °C
Minimum Shrink Temperature	+90 °C
Longitudinal change after shrinkage	+5 %/-15 %
Dielectric Strength	37 kV/mm
Flammability	ASTM D876
Specifications	CSA, UL224 125 °C 600V VW-1

RoHS ✓



TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TF31-1.5/0.5	1.5	0.5	0.50	30 m	Black (BK)	333-30150
	1.5	0.5	0.50	30 m	Blue (BU)	333-30156
	1.5	0.5	0.50	30 m	Green (GN)	333-30155
	1.5	0.5	0.50	30 m	Green-Yellow (GNYE)	333-30157
	1.5	0.5	0.50	30 m	Red (RD)	333-30152
	1.5	0.5	0.50	30 m	White (WH)	333-30159
	1.5	0.5	0.50	30 m	Yellow (YE)	333-30154
	1.5	0.5	0.50	300 m	Black (BK)	333-20150

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Please note! Not all products listed on this page may have this approval.

Heat Shrinkable Tubing 3:1 flexible and coloured

TF31



Heat Shrinkable Tubing 3:1

TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TF31-3/1	3.0	1.0	0.60	30 m	Black (BK)	333-30300
	3.0	1.0	0.60	30 m	Blue (BU)	333-30306
	3.0	1.0	0.60	30 m	Green (GN)	333-30305
	3.0	1.0	0.60	30 m	Green-Yellow (GNYE)	333-30307
	3.0	1.0	0.60	30 m	Red (RD)	333-30302
	3.0	1.0	0.60	30 m	White (WH)	333-30309
	3.0	1.0	0.60	30 m	Yellow (YE)	333-30304
		3.0	1.0	0.60	150 m	Black (BK)
TF31-6/2	6.0	2.0	0.70	30 m	Black (BK)	333-30600
	6.0	2.0	0.70	30 m	Blue (BU)	333-30606
	6.0	2.0	0.70	30 m	Green (GN)	333-30605
	6.0	2.0	0.70	30 m	Green-Yellow (GNYE)	333-30607
	6.0	2.0	0.70	30 m	Red (RD)	333-30602
	6.0	2.0	0.70	30 m	White (WH)	333-30609
	6.0	2.0	0.70	30 m	Yellow (YE)	333-30604
		6.0	2.0	0.70	150 m	Black (BK)
TF31-9/3	9.0	3.0	0.80	30 m	Black (BK)	333-30900
	9.0	3.0	0.80	30 m	Blue (BU)	333-30906
	9.0	3.0	0.80	30 m	Green (GN)	333-30905
	9.0	3.0	0.80	30 m	Green-Yellow (GNYE)	333-30907
	9.0	3.0	0.80	30 m	Red (RD)	333-30902
	9.0	3.0	0.80	30 m	White (WH)	333-30909
	9.0	3.0	0.80	30 m	Yellow (YE)	333-30904
		9.0	3.0	0.80	150 m	Black (BK)
TF31-12/4	12.0	4.0	0.85	30 m	Black (BK)	333-31200
	12.0	4.0	0.85	30 m	Blue (BU)	333-31206
	12.0	4.0	0.85	30 m	Green (GN)	333-31205
	12.0	4.0	0.85	30 m	Green-Yellow (GNYE)	333-31207
	12.0	4.0	0.85	30 m	Red (RD)	333-31202
	12.0	4.0	0.85	30 m	White (WH)	333-31209
	12.0	4.0	0.85	30 m	Yellow (YE)	333-31204
		12.0	4.0	0.85	100 m	Black (BK)

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Heat Shrinkable Tubing 3:1 flexible and coloured

TF31



Heat Shrinkable Tubing 3:1

TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TF31-18/6	18.0	6.0	1.00	30 m	Black (BK)	333-31800
	18.0	6.0	1.00	30 m	Blue (BU)	333-31806
	18.0	6.0	1.00	30 m	Green (GN)	333-31805
	18.0	6.0	1.00	30 m	Green-Yellow (GNYE)	333-31807
	18.0	6.0	1.00	30 m	Red (RD)	333-31802
	18.0	6.0	1.00	30 m	White (WH)	333-31809
	18.0	6.0	1.00	30 m	Yellow (YE)	333-31804
	18.0	6.0	1.00	60 m	Black (BK)	333-41800
TF31-24/8	24.0	8.0	1.20	30 m	Black (BK)	333-32400
	24.0	8.0	1.20	30 m	Blue (BU)	333-32406
	24.0	8.0	1.20	30 m	Green (GN)	333-32405
	24.0	8.0	1.20	30 m	Green-Yellow (GNYE)	333-32407
	24.0	8.0	1.20	30 m	Red (RD)	333-32402
	24.0	8.0	1.20	30 m	White (WH)	333-32409
	24.0	8.0	1.20	30 m	Yellow (YE)	333-32404
	24.0	8.0	1.20	60 m	Black (BK)	333-42400
TF31-40/13	40.0	13.0	1.25	30 m	Black (BK)	333-34000
	40.0	13.0	1.25	30 m	Blue (BU)	333-34006
	40.0	13.0	1.25	30 m	Green (GN)	333-34005
	40.0	13.0	1.25	30 m	Red (RD)	333-34002
	40.0	13.0	1.25	30 m	White (WH)	333-34009
	40.0	13.0	1.25	30 m	Yellow (YE)	333-34004
	40.0	13.0	1.25	30 m	Black (BK)	333-34000
	40.0	13.0	1.25	60 m	Black (BK)	333-24000

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.

Heat Shrinkable Tubing 3:1 flexible and transparent

TF34

Protects wire and cable markers subject to abuse, while permitting inspectability of each item covered. Protects electronic components while permitting their identification and inspection.

Features and Benefits

- Transparent, flexible polyolefin tubing
- Protects identification marking perfect
- Few sizes cover a wide range of diameters allowing reduced inventory
- Halogen free



TF34 transparent tubing with 3:1 shrink ratio allowing for a wider range of application.



**Cut lengths available on request.
Please contact us!**



One Step to the Web!

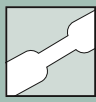
MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	3:1
Operating Temperature	-55 °C to +135 °C
Minimum Shrink Temperature	+110 °C
Longitudinal change after shrinkage	-5 % max.
Dielectric Strength	46 kV/mm
Flammability	not flame retarded



Heat Shrinkable Tubing 3:1

TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Article-No.
TF34-1.5/0.5	1.5	0.5	0.50	30 m	Transparent (CL)	333-30153
TF34-3/1	3.0	1.0	0.50	30 m	Transparent (CL)	333-30303
TF34-6/2	6.0	2.0	0.70	30 m	Transparent (CL)	333-30603
TF34-9/3	9.0	3.0	0.80	30 m	Transparent (CL)	333-30903
TF34-12/4	12.0	4.0	0.85	30 m	Transparent (CL)	333-31203
TF34-18/6	18.0	6.0	1.00	30 m	Transparent (CL)	333-31803
TF34-24/8	24.0	8.0	1.20	30 m	Transparent (CL)	333-32403
TF34-40/13	40.0	13.0	1.25	30 m	Transparent (CL)	333-34003

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Heat Shrinkable Tubing adhesive lined

EPS-300 - 3:1 shrink ratio

EPS-400 - 4:1 shrink ratio

Heat shrinkable tubing EPS seals and protects a wide variety of electrical applications like back end connector sealing, connector-to-cable transitions and splices.

Features and Benefits

- Flexible, thin walled polyolefin heat shrink tubing
- With coextruded hot melt adhesive inner wall
- Protects against moisture
- Provides an environmental sealing of complex parts



PTA300 and PTA400 offer high shrink ratios and protection against humidity.



**Cut lengths available on request.
Please contact us!**



Heat Shrinkable Tubing 3:1 with adhesive



Heat Shrinkable Tubing 4:1 with adhesive

MATERIAL	Polyolefin, cross-linked (PO-X)
Operating Temperature	-55 °C to +125 °C
Minimum Shrink Temperature	+120 °C
Longitudinal change after shrinkage	-10 % max.
Softening Point Adhesive	+90 °C
Dielectric Strength	15 kV/mm according to IEC 60684 P2
Flammability	ASTM D2671 (outer layer only)
Specifications	SAE - AMS - DTL-23053 / 4



TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Shrink Ratio	Article-No.
EPS-300-3/1	3.0	1.0	1.00	400 m	Black (BK)	3:1	340-03010
EPS-300-6/2	6.0	2.0	1.00	300 m	Black (BK)	3:1	340-06020
EPS-300-9/3	9.0	3.0	1.40	150 m	Black (BK)	3:1	340-09030
EPS-300-12/4	12.0	4.0	1.80	100 m	Black (BK)	3:1	340-12040
EPS-300-19/6	19.0	6.0	2.20	50 m	Black (BK)	3:1	340-19060
EPS-300-24/8	24.0	8.0	2.50	25 m	Black (BK)	3:1	340-24080
EPS-300-40/13	40.0	13.0	2.50	25 m	Black (BK)	3:1	340-40130

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.

TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Shrink Ratio	Article-No.
EPS-400-4/1	4.0	1.0	1.00	300 m	Black (BK)	4:1	341-04010
EPS-400-8/2	8.0	2.0	1.00	150 m	Black (BK)	4:1	341-08020
EPS-400-12/3	12.0	3.0	1.40	100 m	Black (BK)	4:1	341-12030
EPS-400-16/4	16.0	4.0	1.80	100 m	Black (BK)	4:1	341-16040
EPS-400-24/6	24.0	6.0	2.20	50 m	Black (BK)	4:1	341-24060
EPS-400-32/8	32.0	8.0	2.50	25 m	Black (BK)	4:1	341-32080

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.

Heat Shrinkable Tubing adhesive lined - 1.2 m lengths

SA47 - standard wall, 4:1 shrink ratio

SA47 is a semi-rigid halogen free polyolefin tubing with a thick inner liner of hot melt adhesive. It has excellent tensile strength and strain relief. The adhesive liner provides excellent moisture protection. Ideal for electrical connections and splices in automobiles. Tubing is clear and hot melt adhesive is black.

Features and Benefits

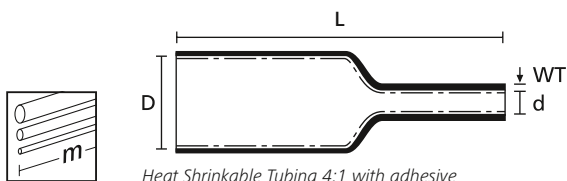
- Flexible, standard wall polyolefin heat shrink tubing
- Excellent tensile strength and strain relief
- Provides excellent moisture protection
- Tubing is clear and hot melt adhesive black
- Provides an environmental sealing of complex parts
- Halogen free



Heat shrink tubing SA47 for splice application.

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	4:1
Operating Temperature	-40 °C to +125 °C
Minimum Shrink Temperature	+110 °C
Melting Point	starting from +110 °C
Longitudinal change after shrinkage	-10 % max.
Dielectric Strength	>20 kV/mm

i SA47 has been developed with our Automotive partners to eliminate the risk of corrosion around cable splices and terminations.



i Cut lengths available on request. Please contact us!

TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Length (L)	Colour	Article-No.
SA47 5,75/1,25	5.75	1.25	1.15	1.2 m	Clear (CL)	301-10000
SA47 7,5/1,65	7.5	1.65	1.40	1.2 m	Clear (CL)	301-10001
SA47 11,0/2,4	11.0	2.4	1.80	1.2 m	Clear (CL)	301-10002
SA47 18,3/4,35	18.3	4.35	2.20	1.2 m	Clear (CL)	301-10003
SA47 24/6	24.0	6.0	2.54	1.2 m	Clear (CL)	301-10005
SA47 32/8	32.0	8.0	2.54	1.2 m	Clear (CL)	301-10004

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Heat Shrinkable Tubing adhesive lined - 1.2 m lengths

SA47-LA - standard wall, 4:1 shrink ratio

SA47-LA is a semi-rigid halogen free polyolefin tubing with an inner liner of hot melt adhesive. It has excellent tensile strength and strain relief. The adhesive liner provides excellent moisture protection. Ideal for electrical connections and splices in automobiles. Tubing is clear and hot melt adhesive is black.

SA47-LA is specially designed with less adhesive for cable connections.

Features and Benefits

- Flexible, standard wall polyolefin heat shrink tubing
- Excellent tensile strength and strain relief
- Provides excellent moisture protection
- Tubing is clear and hot melt adhesive black
- Provides an environmental sealing of complex parts
- Halogen free



Heat shrink tubing SA47-LA for cable connection.

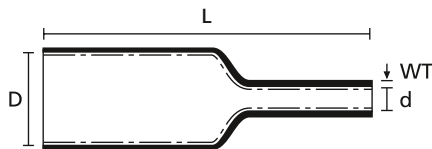
MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	4:1
Operating Temperature	-40 °C to +125 °C
Minimum Shrink Temperature	+110 °C
Melting Point	starting from +110 °C
Longitudinal change after shrinkage	-10 % max.
Dielectric Strength	>20 kV/mm



SA47 has been developed with our Automotive partners to eliminate the risk of corrosion around cable splices and terminations.



Cut lengths available on request. Please contact us!



Heat Shrinkable Tubing 4:1 with adhesive



TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Length (L)	Colour	Article-No.
SA47-LA 5,75/1,25	5.75	1.25	1.15	1.2 m	Clear (CL)	301-10020
SA47-LA 7,5/1,65	7.5	1.65	1.40	1.2 m	Clear (CL)	301-10021
SA47-LA 11,0/2,4	11.0	2.4	1.80	1.2 m	Clear (CL)	301-10022
SA47-LA 18,3/4,35	18.3	4.35	2.20	1.2 m	Clear (CL)	301-10023
SA47-LA 24/6	24.0	6.0	2.54	1.2 m	Clear (CL)	301-10024
SA47-LA 32/8	32.0	8.0	2.54	1.2 m	Clear (CL)	301-10025
SA47-LA 52/13	52.0	13.0	3.00	1.2 m	Clear (CL)	301-10026

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.

Heat Shrinkable Tubing adhesive lined - 1.2 m lengths

SA47-HT - standard wall, 4:1 shrink ratio

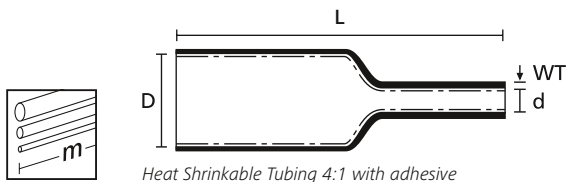
SA47-HT is a semi-rigid flame retardant polyolefin tubing with a thick inner liner of hot melt adhesive. The tubing has excellent tensile strength and strain relief. The adhesive liner provides excellent moisture protection. Ideal for electrical connections and splices in automobiles. Suitable for high temperature applications up to 150 °C. Tubing is black and hot melt adhesive is black.

Features and Benefits

- Flexible, standard wall polyolefin heat shrink tubing
- Excellent tensile strength and strain relief
- Provides excellent moisture protection
- Tubing and hot melt adhesive is black
- Provides an environmental sealing of complex parts
- For high temperature applications up to 150 °C
- Flame retardant

i SA47 has been developed with our Automotive partners to eliminate the risk of corrosion around cable splices and terminations.

i Cut lengths available on request. Please contact us!



Heat shrink tubing SA47-HT for 150 °C application.



SA47-HT provides optimum protection against moisture in high temperature applications.

MATERIAL	Polyolefin, cross-linked (PO-X)
Shrink Ratio	4:1
Operating Temperature	-40 °C to +150 °C
Minimum Shrink Temperature	+130 °C
Melting Point	starting from +120 °C
Longitudinal change after shrinkage	-10 % max.
Dielectric Strength	>20 kV/mm
Flammability	Self extinguishing

RoHS ✓

TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Length (L)	Colour	Article-No.
SA47-HT 7,6/1,7	7.6	1.7	1.52	1.2 m	Black (BK)	301-10010
SA47-HT 9,0/2,3	9.0	2.3	1.52	1.2 m	Black (BK)	301-10011
SA47-HT 11,6/2,5	11.6	2.5	2.29	1.2 m	Black (BK)	301-10012
SA47-HT 17,8/4,4	17.8	4.4	2.54	1.2 m	Black (BK)	301-10013
SA47-HT 24/6	24.0	6.0	2.54	1.2 m	Black (BK)	301-10015
SA47-HT 32/8	32.0	8.0	2.54	1.2 m	Black (BK)	301-10014

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Heat Shrinkable Tubing 2:1 - Elastomer

SE28

SE28 is used for long-term protection of cables and wire harnesses in military equipment, motor sports, and aviation.

Features and Benefits

- Flexible, high performance elastomeric heat shrink tubing
- Used in aerospace, defence, railway and automotive applications
- Resistant to diesel fuel, aviation and hydraulic fluids
- Provides a reliable protection against abrasion and mechanical damage
- Very suitable for protecting cables and wire harnesses



SE28 tubing.

MATERIAL	Elastomer, cross-linked (POA)
Shrink Ratio	2:1
Operating Temperature	-75 °C to +150 °C
Minimum Shrink Temperature	+170 °C
Longitudinal change after shrinkage	-10 % max.
Dielectric Strength	20 kV/mm
Flammability	VG 95343
Specifications	NF F 00-608, SAE - AMS - DTL-23053, VG 95343



SE28 is mainly used in high performance applications.



TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
SE28 3,2/1,6	3.2	1.6	0.70	150 m	Black (BK)	VG 95343 T05 D 001 A	342-20000
SE28 4,8/2,4	4.8	2.4	0.80	60 m	Black (BK)	VG 95343 T05 D 002 A	342-20010
SE28 6,4/3,2	6.4	3.2	0.90	60 m	Black (BK)	VG 95343 T05 D 003 A	342-20020
SE28 9,5/4,8	9.5	4.8	1.00	60 m	Black (BK)	VG 95343 T05 D 004 A	342-20030
SE28 12,7/6,4	12.7	6.4	1.20	60 m	Black (BK)	VG 95343 T05 D 005 A	342-20040
SE28 19,0/9,5	19.0	9.5	1.40	30 m	Black (BK)	VG 95343 T05 D 006 A	342-20050
SE28 25,4/12,7	25.4	12.7	1.80	30 m	Black (BK)	VG 95343 T05 D 007 A	342-20060
SE28 38,0/19,0	38.0	19.0	2.40	30 m	Black (BK)	VG 95343 T05 D 008 A	342-20070
SE28 51,0/25,4	51.0	25.4	2.80	30 m	Black (BK)	VG 95343 T05 D 009 A	342-20080
SE28 76,0/38,0	76.0	38.0	3.20	15 m	Black (BK)	VG 95343 T05 D 010 A	342-20090
SE28 101,2/51,0	102.0	51.0	3.50	10 m	Black (BK)	VG 95343 T05 D 011 A	342-20100

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Heat Shrinkable Tubing 2:1 - PVDF

TK20

Typical applications of this translucent tubing are where high-temperature performance is required. Also very suitable for applications that ask for visual inspection of covered components, or if a low friction surface is needed. TK20 is also used as oil stop for energy cables.

This thin walled, translucent heat shrink tubing is often used for chemical applications.

Features and Benefits

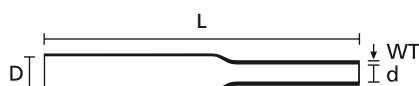
- Semi-rigid heat shrinkable tubing made of PVDF
- Thin walled and tough
- For higher temperature applications
- Very good mechanical strength, abrasion resistance and chemical resistance
- Meets various industrial standards
- Self extinguishing, UL 224 VW1 listed



This thin walled, translucent heat shrink tubing is often used for chemical applications.

Detailed Information about Heatguns please refer to page 242.

MATERIAL	Polyvinylidene Fluoride (PVDF)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +175 °C
Minimum Shrink Temperature	+175 °C
Longitudinal change after shrinkage	+/-10 % max
Dielectric Strength	≥ 30 kV/mm min. according to ASTM D2171
Flammability	UL224 VW-1
Specifications	ASN-E0718, PAN6491, SAE - AMS - DTL-23053 / 8, UL224 150 °C 600V VW-1, VG 95343



Heat Shrinkable Tubing 2:1

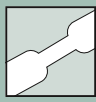


TYPE	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Length (L)	Colour	Designation as per VG-Norm	Article-No.
TK20-1.2/0.6	1.2	3/64 "	0.6	0.25	1.2 m	Transparent (CL)	VG 95343 T05 F 001 M	331-00129
TK20-1.6/0.8	1.6	1/16 "	0.8	0.25	1.2 m	Transparent (CL)	VG 95343 T05 F 002 M	311-00169
TK20-2.4/1.2	2.4	3/32 "	1.2	0.25	1.2 m	Transparent (CL)	VG 95343 T05 F 003 M	311-00249
TK20-3.2/1.6	3.2	1/8 "	1.6	0.25	1.2 m	Transparent (CL)	VG 95343 T05 F 004 M	311-00329
TK20-4.8/2.4	4.8	3/16 "	2.4	0.25	1.2 m	Transparent (CL)	VG 95343 T05 F 005 M	311-00489
TK20-6.4/3.2	6.4	1/4 "	3.2	0.30	1.2 m	Transparent (CL)	VG 95343 T05 F 006 M	311-00649
TK20-9.5/4.8	9.5	3/8 "	4.8	0.30	1.2 m	Transparent (CL)	VG 95343 T05 F 007 M	311-00959
TK20-12.7/6.4	12.7	1/2 "	6.4	0.30	1.2 m	Transparent (CL)	VG 95343 T05 F 008 M	311-01279
TK20-19.1/9.5	19.1	3/4 "	9.5	0.43	1.2 m	Transparent (CL)	VG 95343 T05 F 009 M	311-01909
TK20-25.4/12.7	25.4	1 "	12.7	0.48	1.2 m	Transparent (CL)	VG 95343 T05 F 010 M	311-02549
TK20-38.1/19.1	38.1	1-1/2 "	19.1	0.51	1.2 m	Transparent (CL)	-	311-03819
TK20-50.8/25.4	50.8	2 "	25.4	0.51	1.2 m	Transparent (CL)	-	311-05089

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Heat Shrinkable Tubing 2:1 - Fluoroelastomer

Viton®-E

Viton®-E is used for reliable protection against aggressive chemicals in high temperature environments like engine compartments and turbines. It is also used when protective tubings are required to remain flexible at low temperatures.

Features and Benefits

- High temperature resistant fluoroelastomeric heat shrink tubing
- Very good electrical, chemical and mechanical features
- Resistant to many fuels, oils and lubricants
- Flexible even at very low temperatures



Viton®-E for flexibility and protection against aggressive chemicals.



Detailed Information about Heatguns please refer to page 242.

MATERIAL	Fluoropolymer cross-linked (FPMX)
Shrink Ratio	2:1
Operating Temperature	-55 °C to +220 °C
Minimum Shrink Temperature	+175 °C
Longitudinal change after shrinkage	-10 % max.
Dielectric Strength	15 kV/mm
Flammability	VG 95343
Insulation Class	C (VDE 0530)
Specifications	LEA, VG 95343

RoHS ✓



TYPE	Supplied Ø D min.	Size (imperial)	Recov. Ø d max.	Wall (WT)	Reel Length	Colour	Designation as per VG-Norm	Article-No.
VITON®-E-3.2/1.6	3.2	1/8 "	1.6	0.70	50 m	Black (BK)	VG 95343 T05 E 001 A	330-00320
VITON®-E-4.8/2.4	4.8	3/16 "	2.4	0.80	50 m	Black (BK)	VG 95343 T05 E 002 A	330-00480
VITON®-E-6.4/3.2	6.4	1/4 "	3.2	0.90	50 m	Black (BK)	VG 95343 T05 E 003 A	330-00640
VITON®-E-9.5/4.8	9.5	3/8 "	4.8	1.00	25 m	Black (BK)	VG 95343 T05 E 004 A	330-00950
VITON®-E-12.7/6.4	12.7	1/2 "	6.4	1.20	25 m	Black (BK)	VG 95343 T05 E 005 A	330-01270
VITON®-E-19.0/9.5	19.0	3/4 "	9.5	1.40	25 m	Black (BK)	VG 95343 T05 E 006 A	330-01900
VITON®-E-25.4/12.7	25.4	1 "	12.7	1.80	25 m	Black (BK)	VG 95343 T05 E 007 A	330-02540
VITON®-E-38.0/19.0	38.0	1-1/2 "	19.0	2.40	15 m	Black (BK)	VG 95343 T05 E 008 A	330-03810
VITON®-E-50.8/25.4	50.8	2 "	25.4	2.80	15 m	Black (BK)	VG 95343 T05 E 009 A	330-05080

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



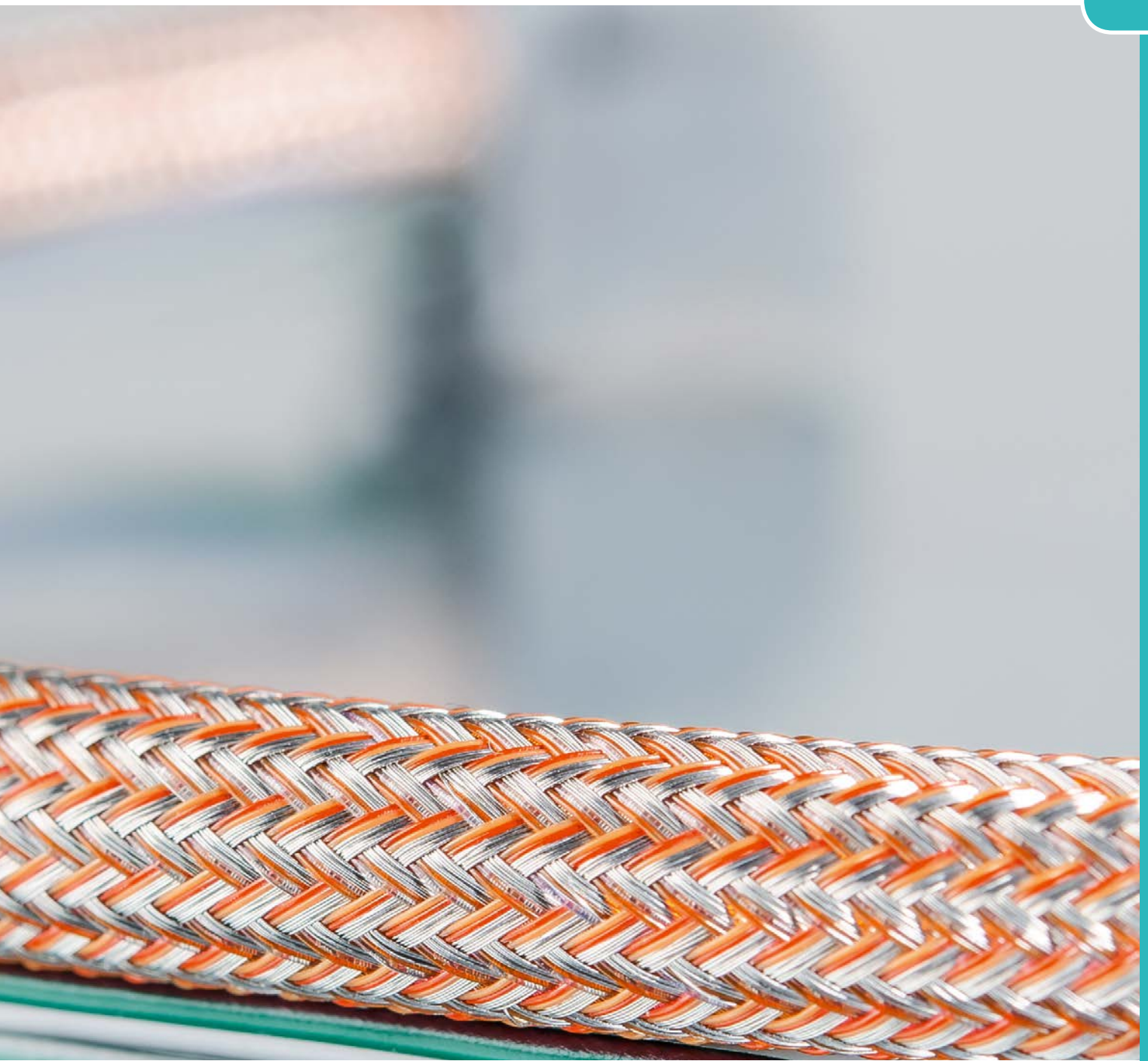
Please note! Not all products listed on this page may have this approval.

Heat Shrinkable Moulded Shapes



The moulded shapes catalogue offers a wide range of 42 moulded parts. The extensive product line includes low profile, bulbous and lipped types for use on circular and D-type connectors as well as complex multiway transitions. They can be sealed with our special adhesives and encapsulants to ensure the proper degree of mechanical support, strain relief and environmental protection. A range of specially formulated materials is available to meet a variety of performance requirements.





Protective Sleeves

Expandable Braided Sleeves

HEGP standard polyester	172
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HEGPL polyester, light weight	177
HEGSAS polyester, noise-protection	178

Open Woven Sleeves

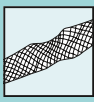
Twist-In self-closing polyester sleeving	179
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Electromagnetic Shielding Sleeves

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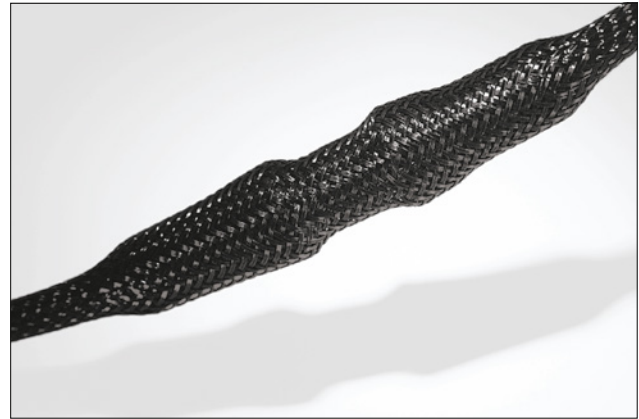
Standard polyester braided sleeving

Helagain HEGP

Helagain HEGP braided sleeving is used in the automotive industry and in machine construction. It is also used for smaller electrical appliances to avoid pockets of high temperature. HEGP fulfils the strict requirement of DIN5510-2 and is therefore also optimal for railway applications.

Features and Benefits

- Made of sturdy polyester
- Highly flexible
- High abrasion resistance
- Very high surface coverage
- 13 sizes for diameters from 1 - 66 mm for an optimal fit



Helagain HEGP braided sleeving.



To prevent fraying, the sleeve can be cut with the hot cutting tool HSG0. See page 244.

MATERIAL	Polyester (PET)
Operating Temperature	-50 °C to +150 °C, intermittent +220 °C
Melting Point	+250 °C
Flammability	UL94 V2, FMVSS 302
Specifications	EN 45545: 2013

HF ✓

RoHS ✓

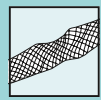
TYPE	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HEGP03	1.0	5.0	Black (BK)	200 m	170-10300
HEGP04	2.0	7.0	Black (BK)	200 m	170-10400
HEGP05	3.0	9.0	Black (BK)	200 m	170-10500
HEGP06	4.0	11.0	Black (BK)	100 m	170-10600
HEGP08	5.0	12.0	Black (BK)	100 m	170-10800
HEGP10	7.0	15.0	Black (BK)	100 m	170-11000
HEGP12	8.0	17.0	Black (BK)	100 m	170-11200
HEGP15	10.0	20.0	Black (BK)	100 m	170-11500
HEGP20	14.0	26.0	Black (BK)	50 m	170-12000
HEGP25	18.0	34.0	Black (BK)	50 m	170-12500
HEGP30	20.0	40.0	Black (BK)	50 m	170-13000
HEGP40	30.0	50.0	Black (BK)	50 m	170-14000
HEGP50	40.0	66.0	Black (BK)	50 m	170-15000

All dimensions in mm. Subject to technical changes.

Colour grey available on request. Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



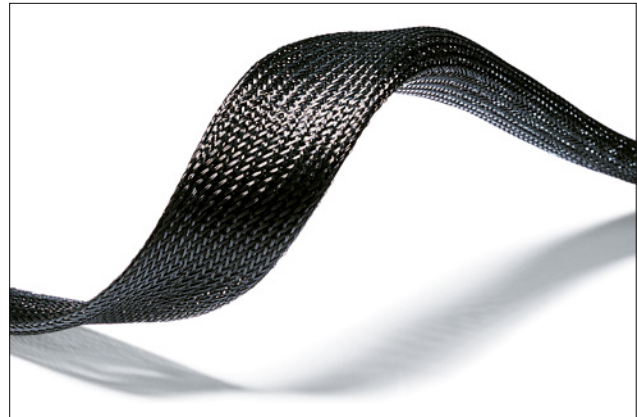
Standard polyester braided sleeving, expansion rate: 3:1

Helagaine HEGPX

Helagaine HEGPX is used whenever a higher expansion rate is required. HEGPX is particularly suitable for use in the automotive industry and in electrical appliances.

Features and Benefits

- Made of sturdy polyester
- Highly flexible
- Expansion rate of 3:1
- Easy to apply over irregular shapes
- Good abrasion resistance



Helagaine HEGPX braided sleeving.

MATERIAL	Polyester (PET)
Operating Temperature	-50 °C to +150 °C, intermittent +220 °C
Melting Point	+250 °C
Flammability	UL94 V2, FMVSS 302
Specifications	EN 45545: 2013, UL-Recognised



To prevent fraying, the sleeve can be cut with the hot cutting tool HSG0. See page 244.

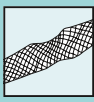
TYPE	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HEGPX06	3.0	10.0	Black (BK)	200 m	170-00060
HEGPX09	5.0	16.0	Black (BK)	100 m	170-00090
HEGPX12	6.0	19.0	Black (BK)	100 m	170-00120
HEGPX20	13.0	32.0	Black (BK)	100 m	170-00200
HEGPX30	19.0	45.0	Black (BK)	50 m	170-00300
HEGPX40	32.0	70.0	Black (BK)	50 m	170-00400

All dimensions in mm. Subject to technical changes.

Colour grey available on request. Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Polyester braided sleeving, UL94V0 classification

Helagain HEGPV0

HEGPV0 braided sleeveings are used wherever fire protection is important such as control cabinets, robotics and automatic equipment. Also HEGPV0 is suitable for railway vehicle manufacturing as it conforms to the strict requirements of DIN5510-2 and NFF-16 101.

Features and Benefits

- Made of sturdy polyester
- Self-extinguishing according to UL94 V0 for enhanced fire protection
- Highly flexible
- High abrasion resistance
- High surface coverage



Helagain HEGPV0 braided sleeving.

MATERIAL	Polyester (PBT)
Operating Temperature	-50 °C to +150 °C, intermittent +200 °C
Melting Point	+225 °C
Flammability	UL94 V0, FMVSS 302
Specifications	NF F 16-101



To prevent fraying, the sleeve can be cut with the hot cutting tool HSG0. See page 244.

TYPE	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HEGPV004	3.0	7.0	Black with White Identification Yarn (BKIDWH)	100 m	170-30400
HEGPV006	5.0	11.0	Black with White Identification Yarn (BKIDWH)	100 m	170-30600
HEGPV008	7.0	13.0	Black with White Identification Yarn (BKIDWH)	100 m	170-30800
HEGPV012	11.0	17.0	Black with White Identification Yarn (BKIDWH)	50 m	170-31200
HEGPV015	13.0	20.0	Black with White Identification Yarn (BKIDWH)	50 m	170-31500
HEGPV020	18.0	25.0	Black with White Identification Yarn (BKIDWH)	50 m	170-32000
HEGPV030	27.0	40.0	Black with White Identification Yarn (BKIDWH)	50 m	170-33000
HEGPV040	35.0	50.0	Black with White Identification Yarn (BKIDWH)	50 m	170-34000
HEGPV050	40.0	60.0	Black with White Identification Yarn (BKIDWH)	50 m	170-35000

All dimensions in mm. Subject to technical changes.

Colour grey available on request. Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



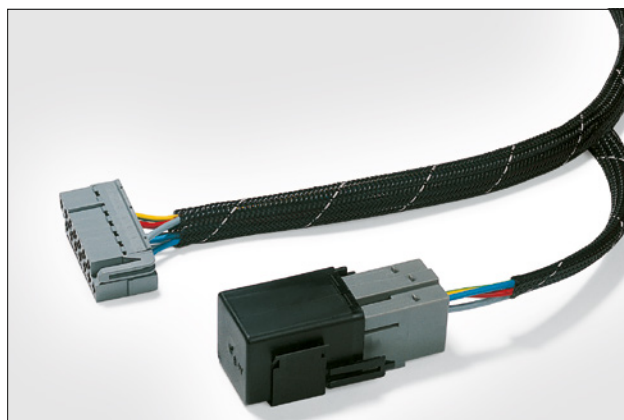
Polyester braided sleeving, expansion rate: 3:1, UL94V0 classification

Helagaine HEGPV0X

Helagaine HEGPV0X is especially suitable for areas wherever fire protection is important as well as a higher expansion ratio of the braided sleeve. Helagaine HEGPV0X offers superior cable protection for machine tools, robotics and automatic equipment. Helagaine HEGPV0X had been successfully tested to DIN5510-2 and NF F 16-101 and can thus be used in many railway applications.

Features and Benefits

- Made of sturdy polyester
- Self-extinguishing according to UL94 V0 for enhanced fire protection
- Highly flexible
- Expansion ratio of 3:1
- Easy to apply over irregular shapes
- Good abrasion resistance



Helagaine HEGPV0X braided sleeving.

MATERIAL	Polyester (PBT)
Operating Temperature	-50 °C to +150 °C, intermittent +200 °C
Melting Point	+225 °C
Flammability	UL94 V0, FMVSS 302
Specifications	NF F 16-101, UL-Recognised

RoHS ✓



To prevent fraying, the sleeve can be cut with the hot cutting tool HSG0. See page 244.

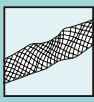
TYPE	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HEGPV0X03	2.0	6.0	Black with White Identification Yarn (BKIDWH)	200 m	170-50030
HEGPV0X06	3.0	10.0	Black with White Identification Yarn (BKIDWH)	200 m	170-50060
HEGPV0X09	5.0	16.0	Black with White Identification Yarn (BKIDWH)	100 m	170-50090
HEGPV0X12	6.0	19.0	Black with White Identification Yarn (BKIDWH)	100 m	170-50120
HEGPV0X20	12.0	32.0	Black with White Identification Yarn (BKIDWH)	100 m	170-50200
HEGPV0X30	19.0	45.0	Black with White Identification Yarn (BKIDWH)	50 m	170-50300
HEGPV0X40	32.0	70.0	Black with White Identification Yarn (BKIDWH)	50 m	170-50400
HEGPV0X50	38.0	76.0	Black with White Identification Yarn (BKIDWH)	50 m	170-50500

All dimensions in mm. Subject to technical changes.

Colour grey available on request. Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Polyamide braided sleeving for excellent abrasion

Helagaine HEGPA66

Helagaine HEGPA66 is particularly suitable for vehicle manufacturing as well as plant construction.

Features and Benefits

- Made from heavy-duty polyamide yarn
- Excellent abrasion resistance
- Highly flexible
- Easy to apply over irregular shapes
- Eases application by expanding when compressed
- Very high surface covering



Various types of Helagaine braided sleeving.

MATERIAL	Polyamide 6.6 (PA66)
Operating Temperature	-60 °C to +150 °C, intermittent +200 °C
Melting Point	+255 °C
Flammability	UL94 V2, FMVSS 302
Specifications	EN 45545: 2013

HF ✓

RoHS ✓



To prevent fraying, the sleeve can be cut with the hot cutting tool HSG0. See page 244.

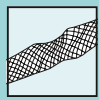
TYPE	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HEGPA6604	3.0	6.0	Black (BK)	200 m	170-40400
HEGPA6606	4.0	8.0	Black (BK)	100 m	170-40600
HEGPA6608	5.0	10.0	Black (BK)	100 m	170-40800
HEGPA6610	7.0	12.0	Black (BK)	100 m	170-41000
HEGPA6612	8.0	14.0	Black (BK)	100 m	170-41200
HEGPA6616	12.0	18.0	Black (BK)	50 m	170-41600
HEGPA6620	15.0	23.0	Black (BK)	50 m	170-42000
HEGPA6625	18.0	28.0	Black (BK)	50 m	170-42500
HEGPA6630	25.0	32.0	Black (BK)	50 m	170-43000
HEGPA6640	30.0	44.0	Black (BK)	50 m	170-44000
HEGPA6650	40.0	55.0	Black (BK)	50 m	170-45000
HEGPA6660	50.0	65.0	Black (BK)	50 m	170-46000

All dimensions in mm. Subject to technical changes.

Colour grey available on request. Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Light weight standard polyester braided sleeving

Helagain HEGPL

Helagain HEGPL is used primarily in automobile interiors, motor compartments, car bodies and underfloors.

Features and Benefits

- Made of sturdy polyester
- Expansion rate of 3:1
- Easier application over irregular shapes
- Highly flexible
- Good abrasion resistance



Helagain HEGPL braided sleeving.

MATERIAL	Polyester (PET)
Operating Temperature	-50 °C to +150 °C, intermittent +220 °C
Melting Point	+250 °C
Flammability	UL94 V2, FMVSS 302, Type B

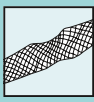


To prevent fraying, the sleeve can be cut with the hot cutting tool HSG0. See page 244.

TYPE	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HEGPL03	3.0	8.0	Black (BK)	1,000 m	170-80503
HEGPL06	5.0	12.0	Black (BK)	400 m	170-80506
HEGPL12	8.0	21.0	Black (BK)	300 m	170-80512
HEGPL20	12.0	30.0	Black (BK)	300 m	170-80520
HEGPL30	18.0	55.0	Black (BK)	200 m	170-80530
HEGPL40	24.0	66.0	Black (BK)	150 m	170-80540
HEGPL50	30.0	82.0	Black (BK)	150 m	170-80550

All dimensions in mm. Subject to technical changes.

Colour grey available on request. Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Polyester braided sleeving for reduction of vibration noise

Helagaine HEGSAS

Helagaine HEGSAS is used primarily in the automotive sector and wherever vibration noise must be reduced. Helagaine HEGSAS can be supplied in pre-cut lengths on request.

Features and Benefits

- Superior noise reduction
- Made of sturdy polyester
- Highly flexible
- Expansion rate of 3:1
- Easy to apply over irregular shapes due
- High surface coverage
- Excellent abrasion resistance



Helagaine HEGSAS braided sleeving.

MATERIAL	Polyester (PET)
Operating Temperature	-50 °C to +150 °C, intermittent +200 °C
Melting Point	+250 °C
Flammability	FMVSS 302

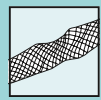


To prevent fraying, the sleeve can be cut with the hot cutting tool HSG0. See page 244.

TYPE	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HEGSAS04	2.0	8.0	Black (BK)	200 m	170-60401
HEGSAS06	4.0	11.0	Black (BK)	200 m	170-60600
HEGSAS09	6.0	16.0	Black (BK)	100 m	170-60900
HEGSAS12	8.0	20.0	Black (BK)	100 m	170-61200
HEGSAS15	10.0	24.0	Black (BK)	50 m	170-61500
HEGSAS20	13.0	30.0	Black (BK)	50 m	170-62000
HEGSAS30	20.0	40.0	Black (BK)	25 m	170-63000
HEGSAS40	30.0	50.0	Black (BK)	25 m	170-64000

All dimensions in mm. Subject to technical changes.

Colour grey available on request. Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Polyester self-closing sleeving

Helagaine Twist-In

Helagaine Twist-In is used to bundle and protect pre-terminated cables in machine-building and automation, electrical installations and automobile and truck manufacturing.

Helagaine Twist-In is also available in practical 2 m and 5 m lengths for use in the home or office.

Features and Benefits

- Self-closing sleeve made of polyester
- Very good protection against abrasion
- Ideal for retro-fitting
- Quick and easy installation and removal
- Allows to bundle for inspection, maintenance and assembly
- Small range of sizes covers a wide range of applications



Application video: Twist-In



Helagaine Twist-In gives easy access to cables and wires for inspection, maintenance and assembly.

MATERIAL	Polyester (PET)
Operating Temperature	-70 °C to +125 °C
Melting Point	+255 °C
Flammability	Self extinguishing, FMVSS 302
Specifications	UL-Recognised



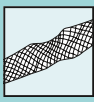
To prevent fraying, the sleeve can be cut with the hot cutting tool HSG0. See page 244.

TYPE	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
Twist-In 05	4.0	5.0	Black (BK)	150 m	170-01000
Twist-In 08	5.0	8.0	Black (BK)	100 m	170-01001
Twist-In 13	10.0	13.0	Black (BK)	50 m	170-01002
Twist-In 19	16.0	19.0	Black (BK)	25 m	170-01004
Twist-In 25	19.0	25.0	Black (BK)	25 m	170-01005
Twist-In 29	25.0	29.0	Black (BK)	15 m	170-01006
Twist-In 32	29.0	32.0	Black (BK)	15 m	170-01007
Twist-In 38	32.0	38.0	Black (BK)	15 m	170-01008
Twist-In 50	38.0	50.0	Black (BK)	15 m	170-01010

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



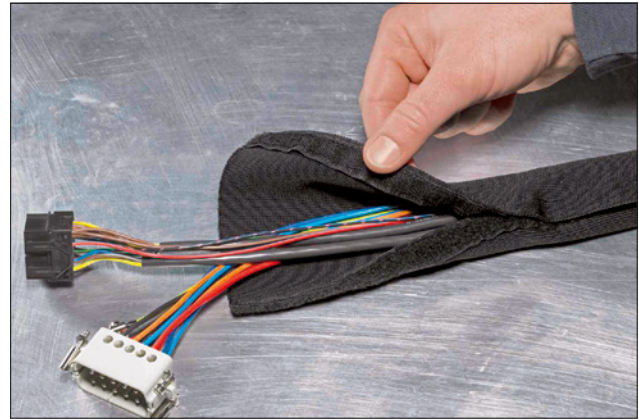
Re-sealable protective sleeving for post-termination cable organisation

HELAHOOK

HELAHOOK is used in industrial machines, electrical appliances, shipbuilding, railway vehicles and in the aerospace industry. HELAHOOK is also employed in automobiles or commercial vehicles. It is the ideal solution for post-termination cable organisation and wherever repeated use is a necessity.

Features and Benefits

- Re-sealable cable protection made of polyester
- Very elastic, fits snugly around the cables
- Hook and loop sealing system can be used for retro-fitting
- High abrasion-resistance



HELAHOOK protective sleeving allows for retrospective fitting and repeated use.

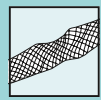
MATERIAL	Polyester (PET)
Operating Temperature	-50 °C to +150 °C
Flammability	UL94 V2, FMVSS 302



One Step to the Web!

TYPE	Bundle Ø min.	Bundle Ø max.	Colour	Reel Length	Article-No.
HELAHOOK10	3.0	15.0	Black (BK)	25 m	170-05100
HELAHOOK15	10.0	20.0	Black (BK)	25 m	170-05150
HELAHOOK20	15.0	30.0	Black (BK)	25 m	170-05200
HELAHOOK25	20.0	40.0	Black (BK)	25 m	170-05250
HELAHOOK30	25.0	50.0	Black (BK)	25 m	170-05300

All dimensions in mm. Subject to technical changes.
Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Burst Protection Sleeving for Hydraulic Hoses

Helagain HEGWS

HEGWS is a highly abrasion and tear-resistant burst protection sleeve. HEGWS is used to protect hydraulic hoses and prevent injuries due to leaks emitting high-pressure liquid jets. HEGWS fulfils the standards of Earth Moving Machinery EN ISO 3457 and Mechanical Vibration and Shock EN 1299.

Features and Benefits

- Exceptional tear-resistance
- Very good protection against abrasion
- Optimal protection of hydraulic hoses
- Reduces risk of liquid-jet injuries
- Fullfils the standards of Earth Moving Machinery EN ISO 3457 and Mechanical Vibration and Shock EN 1299



Helagain HEGWS burst protection sleeving made of polyamide 6 offers excellent abrasion protection.

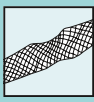
MATERIAL	Polyamide 6 (PA6)
Operating Temperature	-60 °C to +125 °C
Melting Point	+220 +/- 10 °C
Flammability	UL94 V2, FMVSS 302, Type B



Helagain HEGWS: The ideal protective sleeve for hydraulic hoses.

TYPE	Inside Ø (ID)	Wall (WT)	Colour	Reel Length	Article-No.
HEGWS20	12	1.10	Black (BK)	50 m	170-01300
HEGWS25	15	1.10	Black (BK)	50 m	170-01301
HEGWS30	19	1.10	Black (BK)	50 m	170-01302
HEGWS35	22	1.10	Black (BK)	50 m	170-01303
HEGWS40	25	1.10	Black (BK)	50 m	170-01304
HEGWS45	28	1.10	Black (BK)	50 m	170-01305
HEGWS50	31	1.10	Black (BK)	50 m	170-01306
HEGWS60	38	1.10	Black (BK)	50 m	170-01307
HEGWS70	44	1.10	Black (BK)	50 m	170-01308
HEGWS80	50	1.10	Black (BK)	50 m	170-01309
HEGWS90	57	1.10	Black (BK)	50 m	170-01310
HEGWS100	60	1.10	Black (BK)	50 m	170-01311
HEGWS115	70	1.10	Black (BK)	50 m	170-01312
HEGWS145	90	1.10	Black (BK)	50 m	170-01313
HEGWS176	110	1.10	Black (BK)	50 m	170-01314
HEGWS200	125	1.10	Black (BK)	50 m	170-01315

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



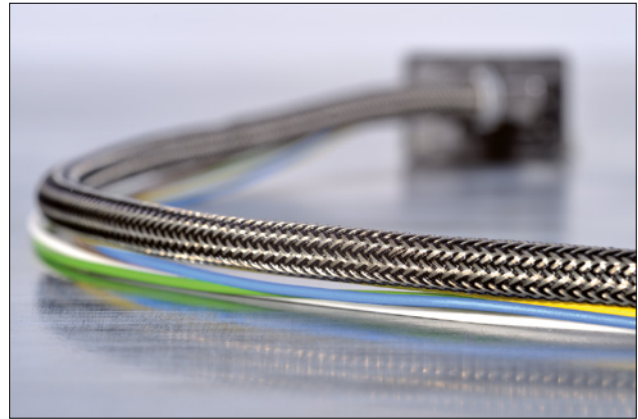
Electromagnetic protection braided sleeving

Helagaine HEGEMIP

Helagaine HEGEMIP braided sleeving is used for highly sensitive electronics, such as electrical appliances and machines, radio equipment, military and automotive engineering.

Features and Benefits

- Excellent electromagnetic protection
- Extremely flexible, expandable and easy to apply
- Superior abrasion protection
- No kinks or tears, even when bending the sleeve 90°
- Particularly suitable for applications with restricted space or requiring movement
- Inner disposable tube protects sleeve from deformation and allows for easy insertion of cables
- Fulfils the requirements of IEC CISPR25 for radio disturbances in vehicles, boats and engines



HEGEMIP braided sleeving: reliable protection from electromagnetic radiation.

MATERIAL	Polyester (Halogen free), Tin Plated copper
Operating Temperature	-40 °C to +175 °C, intermittent +200 °C
EMI requirements	10 KHz to 1 GHz according to CISPR25 (DIN VDE 0879-2)
Flammability	UL94 V2, FMVSS 302



TYPE	Ø D	Bundle Ø min.	Bundle Ø max.	Colour	Weight	Reel Length	Article-No.
HEGEMIP04	4.0	4.0	6.0	Tin coloured and Black	21.5 g/m	100 m	173-00400
HEGEMIP06	6.0	5.0	10.0	Tin coloured and Black	28.5 g/m	100 m	173-00600
HEGEMIP08	8.0	8.0	11.0	Tin coloured and Black	35.7 g/m	100 m	173-00800
HEGEMIP10	10.0	8.0	13.0	Tin coloured and Black	43.5 g/m	50 m	173-01000
HEGEMIP12	12.0	10.0	15.0	Tin coloured and Black	48.0 g/m	50 m	173-01200
HEGEMIP14	14.0	12.0	18.0	Tin coloured and Black	58.0 g/m	100 m	173-01400
HEGEMIP16	16.0	14.0	20.0	Tin coloured and Black	72.5 g/m	100 m	173-01600
HEGEMIP18	18.0	16.0	22.0	Tin coloured and Black	78.6 g/m	50 m	173-01800
HEGEMIP20	20.0	18.0	25.0	Tin coloured and Black	100.0 g/m	50 m	173-02000

All dimensions in mm. Subject to technical changes.
Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Electromagnetic protection braided sleeving for hybrid automobiles

Helagain HEGEMIP-HY

Helagain HEGEMIP-HY provides electromagnetic protection in hybrid automobiles.

Features and Benefits

- Excellent electromagnetic protection
- Extremely flexible, expandable and easy to apply
- No kinks or ruptures even when bent at sharp angles
- Superior abrasion protection
- Special copper alloy for enhanced protection against salt spray
- Particularly suitable for applications with restricted space or requiring movement
- Inner disposable tube protects sleeve from deformation and allows for easy insertion of cables
- Fulfils the requirements of IEC CISPR25 for radio disturbances in vehicles, boats and engines



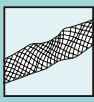
HEGEMIP-HY braided sleeving: EMI protection for hybrid automobiles.

MATERIAL	Polyester (PET), Tin Plated copper
Operating Temperature	-40 °C to +150 °C
EMI requirements	10 kHz to 1 GHz according to CISPR25 (DIN VDE 0879-2)
Flammability	UL94 V2, FMVSS 302

RoHS

TYPE	Ø D	Bundle Ø min.	Bundle Ø max.	Colour	Weight	Reel Length	Article-No.
HEGEMIP-HY20	20.0	19.0	27.0	Silver (SR), Orange (OG)	72 g/m	50 m	173-02001
HEGEMIP-HY30	30.0	25.0	35.0	Silver (SR), Orange (OG)	101 g/m	50 m	173-03000
HEGEMIP-HY35	35.0	30.0	40.0	Silver (SR), Orange (OG)	120 g/m	50 m	173-03501
HEGEMIP-HY40	40.0	30.0	50.0	Silver (SR), Orange (OG)	180 g/m	50 m	173-04000
HEGEMIP-HY50	50.0	40.0	60.0	Silver (SR), Orange (OG)	193 g/m	50 m	173-05000

All dimensions in mm. Subject to technical changes.
Cuts in any lengths. Minimum Order Quantity (MOQ) may differ from package content.



Electromagnetic protection braided sleeving for defence applications

Helagain HEGEMIP-VG

Helagain HEGEMIP-VG provides electromagnetic protection for the defence industry.

Features and Benefits

- Excellent electromagnetic protection
- Very flexible, expandable and easy to apply
- Especially suitable for applications in tight areas or requiring movement
- Inner disposable tube protects sleeve from deformation and allows for easy insertion of cables
- Very good abrasion resistance
- Approved to military norm VG 96936-10 / Type A



HEGEMIP-VG braided sleeving with VG approval for defence applications.

MATERIAL	Tin Plated copper
Operating Temperature	-65 °C to +150 °C
Flammability	UL94 V2, FMVSS 302
Specifications	VG 96936-10



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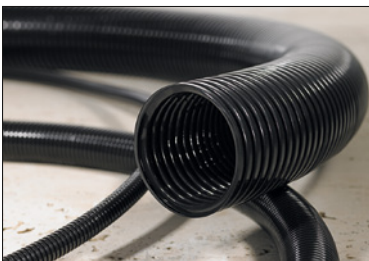
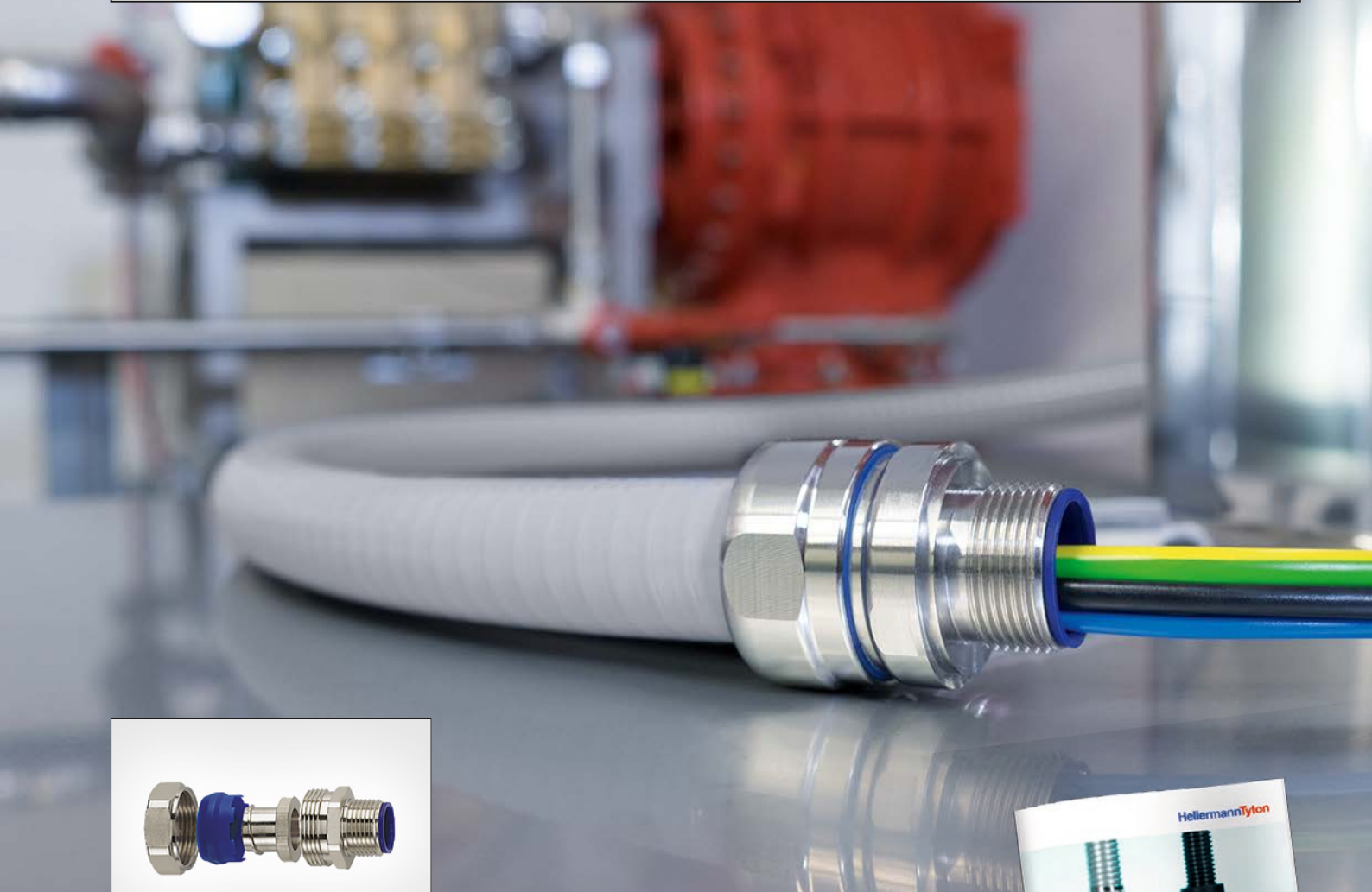
TYPE	Ø D	Bundle Ø min.	Bundle Ø max.	Colour	Weight	Reel Length	Article-No.
HEGEMIP-VG03	3.0	3.5	5.0	Metal (ML)	18.5 g/m	500 m	173-00200
HEGEMIP-VG04	4.0	4.5	7.0	Metal (ML)	30.0 g/m	500 m	173-00201
HEGEMIP-VG06	6.0	5.5	8.5	Metal (ML)	36.5 g/m	500 m	173-00202
HEGEMIP-VG07,5	7.5	7.5	13.5	Metal (ML)	71.0 g/m	500 m	173-00203
HEGEMIP-VG10	10.0	13.0	17.5	Metal (ML)	95.5 g/m	250 m	173-00204
HEGEMIP-VG12,5	12.5	15.0	19.5	Metal (ML)	100.0 g/m	200 m	173-00205
HEGEMIP-VG20	20.0	19.0	30.0	Metal (ML)	264.5 g/m	100 m	173-00206

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.

HelaGuard Flexible Conduits and Fittings



For more information on our complete HelaGuard range of non-metallic and metallic conduits and fittings, please see our new HelaGuard catalogue.

Order your HelaGuard catalogue today!





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Bonding properties of labels

The great variety places where adhesive labels can be used require a broad range of different materials and adhesives. The information given below will explain all the important aspects of this adhesion.

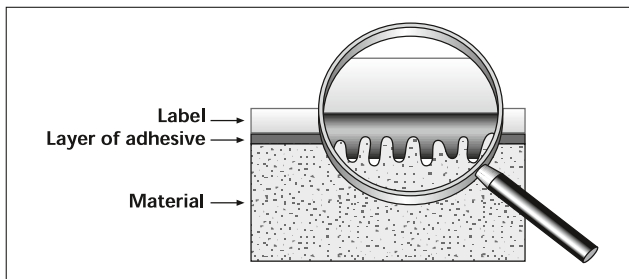
To enable you to make the right choice for your particular application quickly and efficiently, we have set out the most important selection criteria diagrammatically in our flowchart.

Initial and final bonding

In principle there are two different bonding conditions for labels: The initial bonding which occurs immediately after the label and surface are brought together and the final bonding which represents the permanent bonding status between label and surface following the application, pressing on and curing of the adhesive. The bonding of labels is measured in a defined test process (FINAT FTM) and stated in N/mm.

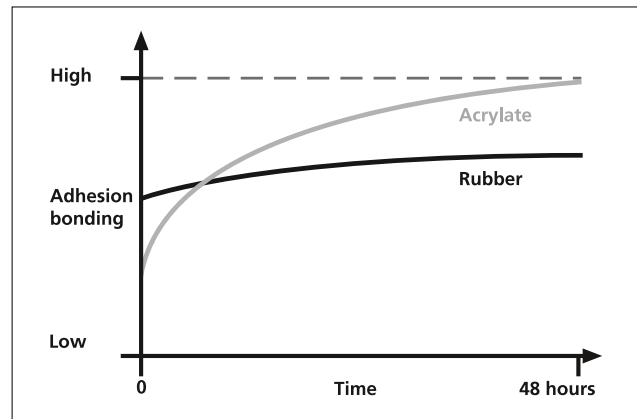
The initial bonding (or tack) describes the bonding ability of the label after it has been applied to the surface, without being pressed down.

The final bonding of labels is ultimately affected by the combined factors of material quality, adhesive basis, curing time, pressure applied and surface tension.



Adhesion: powers of attraction between two materials

Adhesion can be described, in principle, as the ability of the adhesive to form a bond with the substrate; the substrate is the surface of the material you need the label applied to. The influencing factors for optimum bonding are the quality of the material's surface and the creep ability of the adhesive. The crucial factor is the proportion of the surface which is actually to be 'wetted' by the adhesive. Most surfaces appear – from a microscopic point of view – like a mountain range with peaks and valleys; i.e. the effective surface is much bigger than that seen by the naked eye. No matter how smooth and flat a substrate may appear to be, there is always some roughness. The better the adhesive flows into the valleys, the more bonding points it can form and the better the adhesive will bond to the surface. A thicker layer of adhesive does allow these uneven areas to be filled in better, but a thicker coat of adhesive has negative effects when labels are processed by machine (e.g. leakage of the adhesive or limited storage life).



Adhesive basis

HellermannTyton currently uses acrylate and synthetic rubber as adhesive bases. Acrylate adhesives belong to the family of thermoplastic resins and at normal temperatures they provide high and lasting adhesion. When considering the final bonding of acrylate adhesives, however, it must be noted that the relatively high final bonding is only attained after a certain curing period. This is especially true of labelling materials which may be used for rating plates. Normally you must wait for at least 48 hours in a dry office environment.

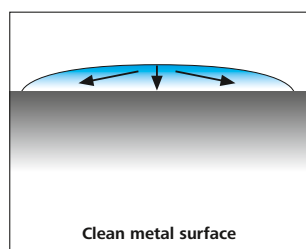
Synthetic rubber-based adhesives, unlike acrylate-based adhesives, are distinguished by their high initial bonding. But this adhesive technology does not achieve a final bonding comparable to acrylate adhesives (see graph). Special mixtures of synthetic rubber are used in labelling technology, for example for removable labels, e.g. HellermannTyton material type 270.



Effect of surface energy on bonding properties

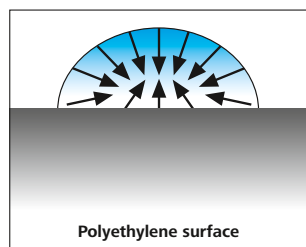
The surface energy (also known as surface tension) is an important factor in the selection of the right adhesive. Because of their chemical formulation, all surfaces have their own polarity and surface tension. The cause of surface tensions is the tendency of liquids to reduce their surface as far as possible, thus to form drops. When a surface which is to be marked (substrate) is wetted with an adhesive, in addition to the adhesive formulation and the surface quality (material, roughness, dampness etc.) the surface energy is also a decisive factor in the maximum attainable bonding force of the adhesive.

As a basic rule, it can be noted that the surface energy of the adhesive must be less than the surface energy of the material to be bonded (substrate). The adhesive should completely wet the substrate and not form any drops.



Flat drops

- High surface energy
- Good wetting
- Good bonding properties



Rounded drops

- Low surface energy
- Poor wetting
- Weak bonding properties

The material combination is the decisive factor

An acrylate-based adhesive is polar and therefore has a relatively high surface energy. Acrylate-based adhesives achieve optimum final bonding on polar substrates (e.g. glass or metals) with a high surface energy. More critical is the application of labels using acrylate-based adhesives on materials with low surface energy (apolar substrates) such as, for example, silicone, polyethylene and polypropylene. The surface tensions of an acrylate-based adhesive can be reduced for particular applications by the addition of specific additives. However, this step brings with it some drawbacks, for example, a free-flowing adhesive and thus a limited life and storage ability of the labels. The lower bonding force of low-energy surfaces must therefore be taken into account of when considering the end use. For optimum marking using acrylate-based adhesive labels, HellermannTyton uses an improved adhesive formulation, which is co-ordinated to the most common materials in industry. In most cases it is possible to guarantee very good application of these labels. In borderline cases, a modified adhesive formulation may be necessary. Talk to us, we'll be delighted to advise you.

Surface energies of different materials

MATERIAL	Surface energy [mN/m]*
Polytetrafluorethylene (PTFE)	18
Silicon (Si)	24
Polyvinyl fluoride (PVF)	25
Natural rubber (CR)	25
Polypropylene (PP)	29
Polyethylene (PE)	35
Polymethyl methacrylate, Acryl (PMMA)	36
Epoxy (EP)	36
Polyoxymethylene, Acetal (POM)	36
Polystyrene (PS)	38
Polyvinyl chloride (PVC)	39
Vinylidene chloride (VC)	40
Polyester (PET)	41
Polyimide (PI)	41
Polyarylsulfone (PAS)	41
Phenolic resin	42
Polyurethane (PUR)	43
Polyamide 6 (PA 6)	43
Polycarbonate (PC)	46
Lead (Pb)	450
Aluminium (Al)	840
Copper (Cu)	1100
Chromium (Cr)	2400
Iron (Fe)	2550

*The values stated are non-binding reference values and for guidance purposes only.

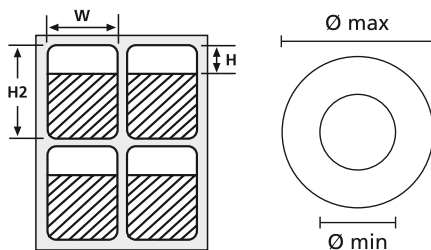
Instructions for using cable markers with protective laminate

Cable markers with protective laminate (also known as cable laminators) have a white or coloured label field which can be written on either manually using a marker pen (see RiteOn and HELASIGN) or using a matrix, laser or thermal transfer printer (see Helatag). Depending on the design for the respective type of printing, the title block has a special surface finish to achieve the optimum print anchorage to the label substrate. This results in long-lasting, clear, sharp writing with text, graphics or barcode. A special feature is that the HellermannTyton protective laminate comes with rounded corners. This achieves greater final adhesion of the protective laminate and counteracts any undesirable removal of the label, especially with cables of small diameter and in heavy-duty applications.

When calculating the minimum and maximum diameters, the following formula has been used:

$$\text{Diameter} = \frac{\text{Length of laminate}}{\pi}$$

Pi (π) is the constant 3.14.



Helatag self-laminating labels.

Minimum diameter:

To save time, when wrapping the cable with the cable laminator, a limit of max. 2 windings has been set. The protective laminate length is calculated from: Height H_2 – height H

By applying the “diameter” formula this produces the approx. minimum diameter:

$$\text{Diameter}_{\min} = \frac{H_2 - H}{2 \cdot \pi}$$

Example: TAG136LA4 ($H = 19.05$ mm; $H_2 = 67.7$ mm)

$$\text{Diameter}_{\min} = \frac{67.7 - 19.05}{2 \cdot 3.14}$$

Maximum diameter:

In this case the minimum requirement is complete coverage of the label field with the protective laminate with a single winding. The length of the protective laminate is again obtained from the formula: $H_2 - H$.

By applying the “diameter” formula this produces the approx. maximum diameter, which also corresponds to double the minimum diameter:

$$\text{Diameter}_{\max} = \frac{H_2 - H}{\pi} = 2 \cdot \text{Diameter}_{\min}$$

Example: TAG136LA4 ($H = 19.05$ mm; $H_2 = 67.7$ mm)

$$\text{Diameter}_{\max} = \frac{67.7 - 19.05}{3.14} = 2 \cdot \text{Diameter}_{\min}$$



Interesting facts about thermal transfer films (colour ribbons)

The thermal transfer ribbon is perhaps the most important consumable that is used in this printing system - using the right ribbon for a particular application is extremely important.

Not every transfer ribbon is equally suited to any purpose. Depending on the printing requirements (e.g. smudge or scratchproof) to be met, what type of labels will be used, an appropriate thermal transfer ribbon must be used.

Another important consideration for the thermal transfer ribbon is the electrostatic charging which can arise during the printing process. Some transfer ribbons become statically charged during the printing process, which can damage an ESD-sensitive printer head in the long run.

To clarify: The thermal transfer printer head is in physical contact with the back of the thermal transfer ribbon and consists solely of electronic, voltage-sensitive elements, which are known as dots.

These can become damaged when the thermal transfer ribbon causes discharges, which usually results in dot drop-outs. At points where the print head is damaged, no more colour is transferred. This leaves gaps on the label.

Thermal transfer films usually consist of three layers:

- A polyester strip as supporting material
- A protective, gliding backing layer on one side
- A colour layer on the other side.

The colour remains solid at room temperature, but liquefies under the effect of heat. To manufacture the colour ribbons, the polyester ribbon is coated with a special backing and then the respective coloured ink is applied. Print characteristics and bonding ability on various materials depend mainly on the chemical composition of this colour ink.

The main distinguishing feature of thermal transfer ribbons is the so-called quality of the coating. There are two basic types of thermal transfer ribbons:

Wax-resin-based films – good synthesis

With this quality of a wax-resin mixture, the good print characteristics of the wax are essentially retained, but the resin content increases mechanical strength. The print image produced has high resistance to heat, solvents, abrasion and scratching and high print quality, e.g. for barcodes. These colour ribbons are suitable for use on synthetic materials. They can be used for most applications at standard print temperatures.

- TT932DOUT
- TT822OUT8

Resin-based films – for very heavy-duty purposes

The colour layer at this quality level is based entirely on synthetic resins, developed for industrial applications and extreme conditions. Resin-based colour ribbons guarantee maximum readability, even on the most difficult materials (e.g. barcodes). Depending on the backing material, medium to high print temperatures and slow print speeds are necessary when using these thermal transfer films. In return, a print image is obtained which stands out for its high resistance to abrasion and scratching and great solvent and heat resistance.

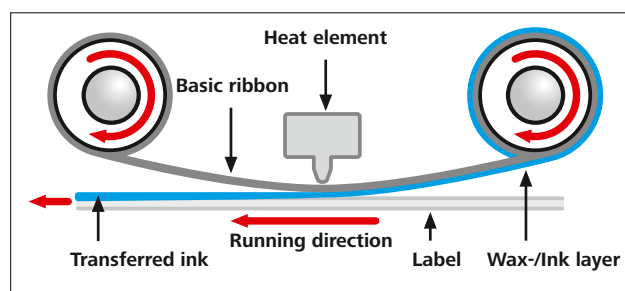
- TT822OUT
- TTRW
- TTDTHOUT
- TTRHT

Interesting facts about thermal transfer printing

Thermal transfer printing plays a central role, especially in the field of printing variable data, single-proofs and even for small series. This is largely due to the fact that thermal transfer printing is a non-impact printing (NIP) process. Unlike traditional printing processes, such as offset-printing, a NIP printing process does not require a fixed printing block and can therefore print out different data with consistent quality from print to print.

Due to the increasing spread and importance of one and two-dimensional barcodes in goods inventory systems, logistics and in the field of component identification, the market potential of thermal transfer printing is growing all the time. The same is also true of incremental serial numbers, inventory designations, entrance tickets, rating plates, wine labels and many more.

Good print quality, high print speeds and the option of printing almost all backing materials permanently – these are the critical advantages of thermal transfer printing. It's good readability, resistance and abrasion resistance allow thermal transfer printing to be put to use in applications where the print results from laser, inkjet or dot matrix printers are not satisfactory.



Heated dots strike a special colour ribbon, the thermal transfer film, which transfers liquefied colour ink at exactly that point onto the backing material (labels, tubes, rating plates). Our modern printers use what is known as "thin film technology", in which the very brief liquid phase of the ink produces faster print speeds and better and more precise images than with the "thick film technology" formerly used.

Moreover, the linear orientation of the labels or of the heatshrink tubing makes it possible to print on demand. The printing is then carried out as required. This is especially useful in the production of rating plates in series production.

In thermal transfer printing, the print image is defined by the three components: printer, label material and thermal transfer film (colour ribbon).

The advantages at a glance:

- High print quality with a resolution of 8-12 dots/mm (12 dots/mm corresponds to approx. 300 dpi)
- Barcode printing in excellent quality, hence good optical readability
- High print speeds of between 30mm/sec and 150mm/sec
- Individual graphics capability
- Problem free and rapid realisation of self designed drafts
- Quiet and service friendly printers
- Prints are UV fast and permanent with high definition and contrast and good resistance to mechanical and chemical influences.



Shrinkable markers "Continuous Tube", thermal transfer

TULT - 3:1 Military and Electronics

TULT is a UL recognized 3:1 heatshrink material supplied as a continuous tube and printable on both sides. The supplied accessories allow users to either perforate the tubing at pre-determined lengths (P4000), or fully sever the markers (S4000) whilst printing with the TrakMark DS or TT4000+ printer. Print with HellermannTyton's premium range of thermal printers and ribbons.

Printers: TrakMark DS, TT4000+ and TT430

Ribbons: TTRC+, TTDTHOUT, TTRW, TT822OUT8

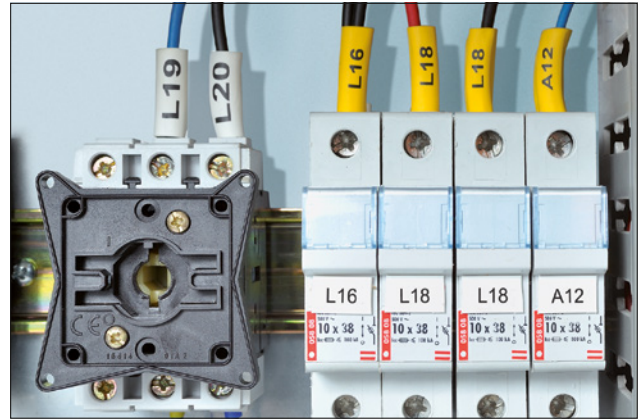
Accessories for TrakMark DS and TT4000+: Perforator (P4000), Cutter (S4000)

Accessories for TT430: Cutter (S430), Perforator (P430)

Software: TagPrint Pro 3.0

Features and Benefits

- Shrink ratio 3:1
- Available in black, blue, red, white and yellow
- Cable range from 39 mm to 1 mm
- Good mechanical strength and resistance to organic solvents and chemicals
- Highly flexible
- Fulfils UL224 VW-1 and CSA requirements
- Delivery in convenient storage boxes
- Easy label design with TagPrint Pro 3.0



TULT – 5 colours of UL recognised printable tube to cover a wide range of diameters.

MATERIAL	Polyolefin, cross-linked (PO-X)
Operating Temperature	-55 °C to +135 °C
Minimum Shrink Temperature	+90 °C
Shrink Ratio	3:1
Recommended Ribbon Type	TTRC+, TTDTHOUT, TTRW, TT822OUT8
Specifications	CSA, UL-Recognised



TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Pack Cont.	Colour	Article-No.
TULT3-1BK	3.0	1.0	0.60	176 m	Black (BK)	553-40300
TULT3-1BU	3.0	1.0	0.60	176 m	Blue (BU)	553-40306
TULT3-1RD	3.0	1.0	0.60	176 m	Red (RD)	553-40302
TULT3-1WH	3.0	1.0	0.60	176 m	White (WH)	553-40309
TULT3-1YE	3.0	1.0	0.60	176 m	Yellow (YE)	553-40304
TULT4.8-1.6BK	4.8	1.6	0.65	110 m	Black (BK)	553-40480
TULT4.8-1.6BU	4.8	1.6	0.65	110 m	Blue (BU)	553-40486
TULT4.8-1.6RD	4.8	1.6	0.65	110 m	Red (RD)	553-40482
TULT4.8-1.6WH	4.8	1.6	0.65	110 m	White (WH)	553-40489
TULT4.8-1.6YE	4.8	1.6	0.65	110 m	Yellow (YE)	553-40484
TULT6-2BK	6.0	2.0	0.70	110 m	Black (BK)	553-40600
TULT6-2BU	6.0	2.0	0.70	110 m	Blue (BU)	553-40606
TULT6-2RD	6.0	2.0	0.70	110 m	Red (RD)	553-40602

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Shrinkable markers "Continuous Tube", thermal transfer

TULT - 3:1 Military and Electronics

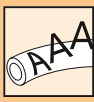


TYPE	Supplied Ø D min.	Recov. Ø d max.	Wall (WT)	Pack Cont.	Colour	Article-No.
TULT6-2WH	6.0	2.0	0.70	110 m	White (WH)	553-40609
TULT6-2YE	6.0	2.0	0.70	110 m	Yellow (YE)	553-40604
TULT9-3BK	9.0	3.0	0.80	72 m	Black (BK)	553-40900
TULT9-3BU	9.0	3.0	0.80	72 m	Blue (BU)	553-40906
TULT9-3RD	9.0	3.0	0.80	72 m	Red (RD)	553-40902
TULT9-3WH	9.0	3.0	0.80	72 m	White (WH)	553-40909
TULT9-3YE	9.0	3.0	0.80	72 m	Yellow (YE)	553-40904
TULT12-4BK	12.0	4.0	0.85	54 m	Black (BK)	553-41200
TULT12-4BU	12.0	4.0	0.85	54 m	Blue (BU)	553-41206
TULT12-4RD	12.0	4.0	0.85	54 m	Red (RD)	553-41202
TULT12-4WH	12.0	4.0	0.85	54 m	White (WH)	553-41209
TULT12-4YE	12.0	4.0	0.85	54 m	Yellow (YE)	553-41204
TULT18-6BK	18.0	6.0	1.00	26 m	Black (BK)	553-41800
TULT18-6BU	18.0	6.0	1.00	26 m	Blue (BU)	553-41806
TULT18-6RD	18.0	6.0	1.00	26 m	Red (RD)	553-41802
TULT18-6WH	18.0	6.0	1.00	26 m	White (WH)	553-41809
TULT18-6YE	18.0	6.0	1.00	26 m	Yellow (YE)	553-41804
TULT24-8BK	24.0	8.0	1.20	26 m	Black (BK)	553-42400
TULT24-8BU	24.0	8.0	1.20	26 m	Blue (BU)	553-42406
TULT24-8RD	24.0	8.0	1.20	26 m	Red (RD)	553-42402
TULT24-8WH	24.0	8.0	1.20	26 m	White (WH)	553-42409
TULT24-8YE	24.0	8.0	1.20	26 m	Yellow (YE)	553-42404
TULT39-13BK	39.0	13.0	1.25	10 m	Black (BK)	553-43900
TULT39-13BU	39.0	13.0	1.25	10 m	Blue (BU)	553-43906
TULT39-13RD	39.0	13.0	1.25	10 m	Red (RD)	553-43902
TULT39-13WH	39.0	13.0	1.25	10 m	White (WH)	553-43909
TULT39-13YE	39.0	13.0	1.25	10 m	Yellow (YE)	553-43904

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Identification tags for cable bundle, thermal transfer

TIPTAG PU - UV-stabilised Tiptags, Polyurethane

These Tiptags are designed for use in identifying wire and cable bundles in electronics and general cabling environments. The labels are applied to cables and harness assemblies with cable ties, and are also suitable for retrofit purposes. Secured to bundles using Cable Ties up to T50R width maximum.

Printers: TT4000+ and TT430

Ribbon: TTRC+

Software: TagPrint Pro

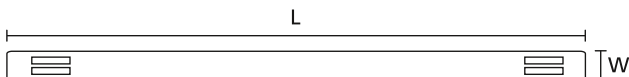
Features and Benefits

- Identification tags TIPTAG, Polyurethane
- Very tough and flexible material
- For bigger cable bundles and wires
- For cable ties up to 4.7 mm width
- Print with TT4000+ and TT430 for best results
- Delivery on reel, perforated
- Flame retardant
- Weather resistant
- Abrasion resistant
- Good resistance to chemicals
- Special lengths and colours available on request



The printed mark has a tattoo-like permanency.

MATERIAL	Polyurethane (PUR)
Operating Temperature	-65 °C to +120 °C, intermittent 150 °C
Flammability	Self extinguishing, UL94 V0 (3 mm)
Recommended Ribbon Type	TTRC+



TYPE	Length (L)	Width (W)	Pack Cont.	Colour	Article-No.
TTAGPU11X65WH	65.0	11.0	190 pcs.	White (WH)	556-25012
TTAGPU11X65YE	65.0	11.0	190 pcs.	Yellow (YE)	556-25019
TTAGPU15X65WH	65.0	15.0	190 pcs.	White (WH)	556-25007
TTAGPU15X65YE	65.0	15.0	190 pcs.	Yellow (YE)	556-25011
TTAGPU11X100WH	100.0	11.0	125 pcs.	White (WH)	556-25021
TTAGPU11X100YE	100.0	11.0	125 pcs.	Yellow (YE)	556-25020
TTAGPU15X100WH	100.0	15.0	125 pcs.	White (WH)	556-25006
TTAGPU15X100YE	100.0	15.0	125 pcs.	Yellow (YE)	556-25010

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Identification tags for cable bundle "Ladder Style", thermal transfer

TAGHT - High Temperature Tiptags "Ladder Style"

TAGHT is a high temperature, flame retardant, cross linked polyvinylidene fluoride (PVDFX) Tiptag used to identify cables and wire harnesses. The labels are applied to cables and harness assemblies with cable ties, and are also suitable for retrofit purposes. The material has been conditioned for printing on both thermal transfer and laser beam printers. The Tiptags are supplied on a continuous material roll. Simply print and press out the required Tiptag and apply with cable ties. Print with HellermannTyton's premium range of thermal printers and ribbons or a laser beam marking device.

Printers: TT4000+ and TT430

Ribbon: TTRHT

Accessories for TT4000+: Cutter (S4000)

Accessories for TT430: Cutter (S430)

Software: TagPrint Pro

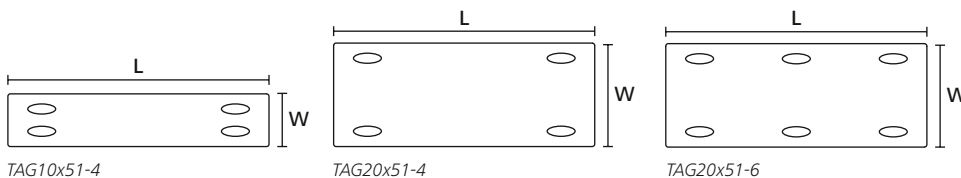
Features and Benefits

- TAGHT is a high temperature Tiptag
- Thermal transfer or laser beam printable
- Available in white
- Meets SAE AS-81531 and MIL-STD 202G Method 215 mark permanence tests
- Mark permanence tests of SAE AS-81531 4.6.2 and MIL-STD 202G Method 215; Laser beam YAG (unaffected), thermal transfer ribbon TTRHT (legible)
- Fulfils UL224 VW-1 and CSA requirements
- Good mechanical strength and highly flexible
- Delivery in convenient storage boxes
- Easy label design with TagPrint Pro



TAGHT.

MATERIAL	Polyvinylidene Fluoride cross-linked (PVDFX)
Operating Temperature	-55 °C to +225 °C
Flammability	UL224 VW-1
Recommended Ribbon Type	TTRHT
Specifications	MIL-STD-202G Method 215K, SAE - AS81531

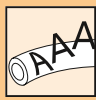


TYPE	Length (L)	Width (W)	Pack Cont.	Colour	Article-No.
TAGHT10X51-4WH	51.0	10.0	2,000 pcs.	White (WH)	556-80000
TAGHT10X51-4YE	51.0	10.0	2,000 pcs.	Yellow (YE)	556-80001
TAGHT20X51-4WH	51.0	20.0	1,000 pcs.	White (WH)	556-80004
TAGHT20X51-4YE	51.0	20.0	1,000 pcs.	Yellow (YE)	556-80005
TAGHT20X51-6WH	51.0	20.0	1,000 pcs.	White (WH)	556-80002
TAGHT20X51-6YE	51.0	20.0	1,000 pcs.	Yellow (YE)	556-80003

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.



Please note! Not all products listed on this page may have this approval.



Self-laminating labels, thermal transfer

Helatag 323 (White-Transparent), high temperature

The specially formulated adhesive labels give the highest quality print clarity when printed on thermal transfer printers. The range of materials and ribbons have been developed to suit the needs of most users. Designing and printing labels is simple and users can quickly print out professional labels in a matter of moments when using TagPrint Pro labelling software.

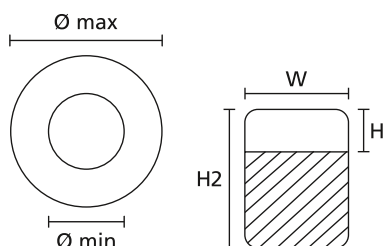
Features and Benefits

- High temperature self-laminating labels with a white inscription field
- Survives 5 years external weathering in central European climate
- Material is UL94 V0
- Excellent print performance using TT932DOUT ribbon
- Print with TT4000+, TT430 for best results
- Easy label design with TagPrint Pro
- Yellow and other colours available on request



Easy marking of flexible, semi-rigid and rigid cables and wires.

MATERIAL	Type 323, Polyvinylidene Fluoride (PVDF), white/transp. (WH/CL), yellow/transp. (YE/CL)
Operating Temperature	-40 °C to +140 °C
Curing Temperature	from +10 °C
Adhesive	Acrylic
Thickness of Foil (µm)	25 µm
Chem. Material Properties	Excellent resistance against water, UV radiation, weather influence and solvents based on petroleum.
Recommended Ribbon Type	TT932DOUT



TYPE	Bundle Ø min.	Bundle Ø max.	Width (W)	Height (H)	Height (H2)	Width of Liner (WL)	Labels per Row	Pack Cont.	Colour	Article-No.
TAG51TD3-323-WHCL	1.4	3.0	25.4	8.8	19.1	85.0	3	5,000 pcs.	White (WH), Transparent (CL)	596-51320
TAG26TD6-323-WHCL	1.5	3.0	12.7	9.5	19.1	85.0	6	10,000 pcs.	White (WH), Transparent (CL)	596-26320
TAG36TD7-323-WHCL	2.0	4.7	12.7	9.0	23.8	95.0	7	10,000 pcs.	White (WH), Transparent (CL)	596-36320
TAG2TD6-323-WHCL	3.5	7.6	12.7	12.7	36.5	82.0	6	5,000 pcs.	White (WH), Transparent (CL)	596-02320
TAG22TD3-323-WHCL	3.5	7.6	25.4	12.7	36.5	82.0	3	2,500 pcs.	White (WH), Transparent (CL)	596-22320
TAG24TD1-323-WHCL	3.5	7.6	50.8	12.7	36.5	55.0	1	1,000 pcs.	White (WH), Transparent (CL)	596-24320
TAG23TD5-323-WHCL	4.5	10.0	19.1	12.7	44.5	101.6	5	5,000 pcs.	White (WH), Transparent (CL)	596-23320
TAG25TD3-323-WHCL	4.5	10.0	25.4	12.7	44.5	82.0	3	2,500 pcs.	White (WH), Transparent (CL)	596-25320
TAG9TD3-323-WHCL	5.5	12.1	25.4	19.1	57.1	82.0	3	2,500 pcs.	White (WH), Transparent (CL)	596-09320
TAG10TD2-323-WHCL	5.5	12.1	49.5	19.1	57.1	101.6	2	1,000 pcs.	White (WH), Transparent (CL)	596-10320
TAG1TD2-323-WHCL	8.5	18.2	48.2	19.1	79.2	101.6	2	1,000 pcs.	White (WH), Transparent (CL)	596-01320
TAG3TD3-323-WHCL	10.0	22.2	25.4	25.4	95.3	82.0	3	1,000 pcs.	White (WH), Transparent (CL)	596-03320
TAG6TD1-323-WHCL	10.0	22.2	50.8	25.4	95.3	55.0	1	500 pcs.	White (WH), Transparent (CL)	596-06320
TAG107TD3-323-WHCL	12.0	37.5	25.4	31.8	149.9	82.0	3	1,000 pcs.	White (WH), Transparent (CL)	596-10732
TAG38TD3-323-WHCL	20.8	47.5	25.4	38.1	187.2	82.0	3	1,000 pcs.	White (WH), Transparent (CL)	596-38320
TAG07TD1-323-WHCL	20.8	47.5	50.8	25.4	187.2	55.0	1	250 pcs.	White (WH), Transparent (CL)	596-07320

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Identification ties and plates for marking cable bundles

IT Ties

One of the major benefits is the ability to both secure and identify cable bundles at different times.

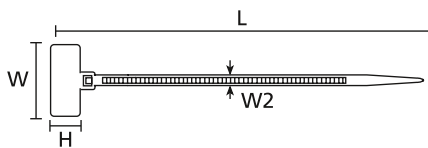
Features and Benefits

- Identification ties made of Polyamide 6.6
- For simple identification and securing of cable bundles in one step
- Printable labels are available for a professional finish
- Manual or temporary marking is possible with an indelible pen (T82S-BK / T82R-RD)

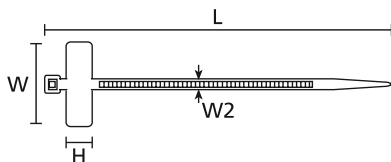


One operation with two benefits.

MATERIAL	Polyamide 6.6 (PA66)
Operating Temperature	-40 °C to +85 °C
Flammability	UL94 V2
Specifications	Cage Code 53421, DNV GL, MS3368, SAE - AS33681, UL-ZODZ2.E64139, DNV GL, UL-Recognised



IT18FL



IT18R

TYPE	Bundle Ø min.	Bundle Ø max.	Width (W)	Height (H)	Length (L)	Width (W2)		Recommended Labels	Pack Cont.	Colour	Article-No.
IT18FL	1.5	19.0	20.5	9.0	110.0	2.5	80	TAG18-07TD1	100 pcs.	Natural (NA)	111-81919
IT18R	6.0	22.0	25.0	8.0	100.0	2.3	80	TAG23-06TD1	100 pcs.	Natural (NA)	111-81821

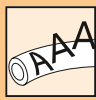
All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

= Minimum Loop Tensile Strength for Cable Ties (Newton)

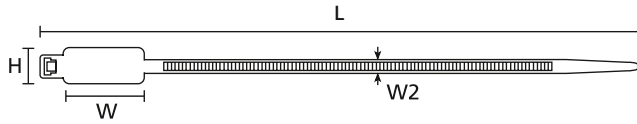


Please note! Not all products listed on this page may have this approval.

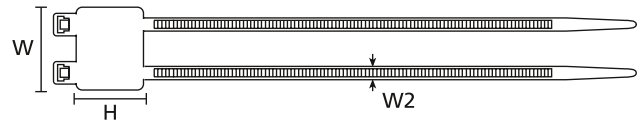


Identification ties and plates for marking cable bundles

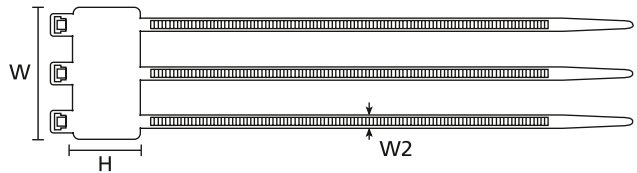
IT Ties



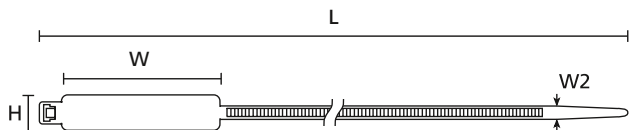
IT50R



IT50RD



IT50RT



IT50L

TYPE	Bundle Ø min.	Bundle Ø max.	Width (W)	Height (H)	Length (L)	Width (W2)		Recommended Labels	Pack Cont.	Colour	Article-No.
IT50R	9.5	44.5	28.0	12.9	203.0	4.6	225	TAG23-10TD1	100 pcs.	Natural (NA)	111-85019
IT50RD	10.0	44.0	29.0	26.3	205.0	4.7	225	TAG26-21TD1	50 pcs.	Natural (NA)	111-85219
IT50RT	10.0	44.0	46.0	26.3	205.0	4.7	225	TAG43-21TD1	50 pcs.	Natural (NA)	111-85119
IT50L	19.0	100.0	56.0	12.8	390.0	4.7	225	TAG52-10TD1	100 pcs.	Natural (NA)	111-85319

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

TYPE	Description	Colour	Pack Cont.	Article-No.
T825-BK	Indelible Marker Pen	Black (BK)	2 pcs.	500-50820
T82R-RD	Indelible Marker Pen	Red (RD)	2 pcs.	500-50822

Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Please note! Not all products listed on this page may have this approval.



Labels for IT ties, IMP plates and Q-tags, thermal transfer

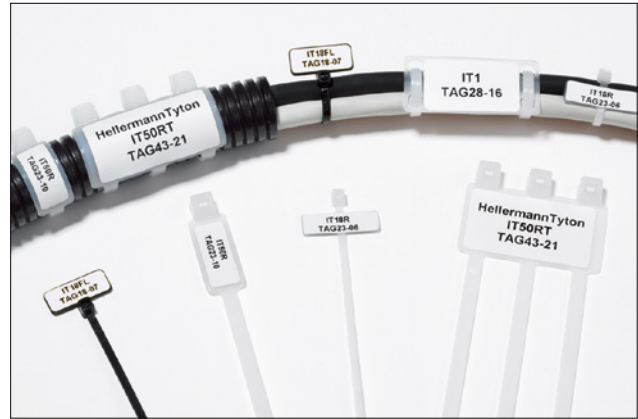
Helatag 892 (White)

These labels are specially tailored to the sizes used in the IT marking tie and IMP/IT as well as Q-tag range. The flexible material sticks to the marking tie or tag, even on rounded surfaces. Using unique numbering, graphics or barcodes the labels give excellent asset identification possibilities. This solution produces professional marking of tubes, pipes, cables and other parts.

For problem-free printing, we recommend TagPrint Pro software, TT4000+ and TT430 printers with TT822OUT ribbons.

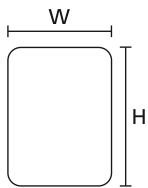
Features and Benefits

- Suited to the slightly rough surfaces of Q-tags, IT ties and IMP/IT plates
- Adheres to rounded surfaces
- Excellent print performance using TT822OUT ribbon
- Print with TT4000+, TT430 for best results
- Easy label design with TagPrint Pro



Identification ties and tags.

MATERIAL	Type 892, Vinyl (PVC), white (WH)
Operating Temperature	-40 °C to +80 °C
Curing Temperature	from 0 °C
Adhesive	Acrylic
Thickness of Foil (µm)	83 µm
Chem. Material Properties	Good resistance against water, oils and most solvents.
Recommended Ribbon Type	TT822OUT



TYPE	Width (W)	Height (H)	Width of Liner (WL)	Labels per Row	For Size	Pack Cont.	Colour	Article-No.
TAG18-07TD1-892-WH	18.0	7.0	24.0	1	IT18FL	5,000 pcs.	White (WH)	596-12253
TAG18-16TD1-892-WH	18.0	16.0	24.0	1	IMP1.5	2,500 pcs.	White (WH)	596-12254
TAG23-06TD1-892-WH	23.0	6.0	30.0	1	IT18R	5,000 pcs.	White (WH)	596-12255
TAG23-10TD1-892-WH	23.0	10.0	30.0	1	IT50R	5,000 pcs.	White (WH)	596-12256
TAG26-21TD2-892-WH	26.0	21.0	57.0	2	IT50RD	2,500 pcs.	White (WH)	596-12257
TAG28-16TD1-892-WH	28.0	16.0	34.0	1	IT1, IMP2	2,500 pcs.	White (WH)	596-12258
TAG43-16TD1-892-WH	43.0	16.0	50.0	1	IMP2.5	2,500 pcs.	White (WH)	596-12259
TAG43-21TD1-892-WH	43.0	21.0	50.0	1	IT50RT	2,500 pcs.	White (WH)	596-12260
TAG43-41TD1-892-WH	43.0	41.0	50.0	1	IMP2.5W1.75	1,000 pcs.	White (WH)	596-12261
TAG52-10TD1-892-WH	52.0	10.0	58.0	1	IT50L	5,000 pcs.	White (WH)	596-12262
TAG63TD1-892-WH	63.5	38.1	70.0	1	QT7040R, QT7040S	1,000 pcs.	White (WH)	596-12263
TAG68-16TD1-892-WH	68.0	16.0	74.0	1	IMP3.5, QT7016R	2,500 pcs.	White (WH)	596-12264
TAG102-64TD1-892-WH	102.0	64.0	106.0	1	QT10065R	250 pcs.	White (WH)	596-12265

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Type label identification, thermal transfer

Helatag 1204 (Silver)

Scratch-resistant type plates for the industry. The high temperature range suits a wide range of applications on flat surfaces. The adhesive is also suitable for critical surfaces like plastic and paint.

Designing and printing labels is simple and users can quickly print out professional labels in a matter of moments when using TagPrint Pro labelling software.

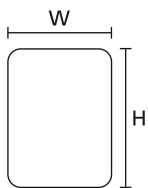
Features and Benefits

- Marking labels made of matt silver Polyester
- Replacement option for aluminium plates
- Print labels with customer unique references
- Use text, graphics and barcodes as required
- Excellent print performance using TT822OUT ribbon
- Print with TT4000+, TT430 for best results
- Easy label design with Tagprint Pro



Professional type plate on a heating unit.

MATERIAL	Type 1204, Polyester (PET), silver matt (SR)
Operating Temperature	-40 °C to +150 °C
Curing Temperature	from 0 °C
Adhesive	Acrylic
Thickness of Foil (µm)	55 µm
Chem. Material Properties	Excellent resistance to water, alcohol, most oils, greases, fuel, aliphatic solvents, weak acids, salts and alkalis.
Recommended Ribbon Type	TT822OUT
Specifications	UL-Recognised



TYPE	Width (W)	Height (H)	Width of Liner (WL)	Labels per Row	Pack Cont.	Colour	Article-No.
TAG71TD6-1204-SR	12.7	11.1	101.6	6	15,000 pcs.	Silver (SR)	596-12071
TAG13TD4-1204-SR	19.1	6.4	101.6	4	10,000 pcs.	Silver (SR)	596-12043
TAG34TD3-1204-SR	25.4	9.5	85.1	3	7,500 pcs.	Silver (SR)	596-34120
TAG15TD3-1204-SR	25.4	12.7	85.1	3	7,500 pcs.	Silver (SR)	596-12045
TAG35TD3-1204-SR	31.8	9.5	101.6	3	7,500 pcs.	Silver (SR)	596-12035
TAG17TD2-1204-SR	38.1	6.4	85.1	2	5,000 pcs.	Silver (SR)	596-12047
TAG27TD2-1204-SR	38.1	19.1	85.1	2	5,000 pcs.	Silver (SR)	596-27120
TAG67TD2-1204-SR	38.1	31.8	85.1	2	1,000 pcs.	Silver (SR)	596-12067
TAG69TD2-1204-SR	40.6	22.9	89.0	2	2,500 pcs.	Silver (SR)	596-12069
TAG77TD1-1204-SR	50.8	22.9	55.0	1	2,000 pcs.	Silver (SR)	596-12077
TAG73TD1-1204-SR	50.8	25.4	55.0	1	2,000 pcs.	Silver (SR)	596-73124
TAG66TD1-1204-SR	50.8	36.5	56.8	1	1,000 pcs.	Silver (SR)	596-12066
TAG63TD1-1204-SR	63.5	38.1	70.0	1	1,000 pcs.	Silver (SR)	596-12063
TAG76TD1-1204-SR	63.5	50.8	70.0	1	500 pcs.	Silver (SR)	596-12076

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.

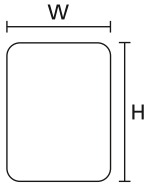


Please note! Not all products listed on this page may have this approval.



Type label identification, thermal transfer

Helatag 1204 (Silver)



TYPE	Width (W)	Height (H)	Width of Liner (WL)	Labels per Row	Pack Cont.	Colour	Article-No.
TAG72TD1-1204-SR	69.9	31.8	76.0	1	1,000 pcs.	Silver (SR)	596-12072
TAG65TD1-1204-SR	76.2	36.5	82.0	1	1,000 pcs.	Silver (SR)	596-12065
TAG62TD1-1204-SR	76.2	50.8	82.0	1	500 pcs.	Silver (SR)	596-12062
TAG64TD1-1204-SR	88.9	36.5	95.0	1	1,000 pcs.	Silver (SR)	596-12064
TAG97TD1-1204-SR	101.6	74.0	106.0	1	500 pcs.	Silver (SR)	596-71204
TAGR3TD1-1204-SR	104.0	-	108.0	1	75.0 m	Silver (SR)	596-31204
TAG02TD1-1204-SR	104.0	12.0	104.0	1	5,000 pcs.	Silver (SR)	596-21204

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Please note! Not all products listed on this page may have this approval.

Asset identification label, thermal transfer

Helatag 1206 (White)

Scratch-resistant general identification for industrial applications. The high temperature range suits a wide range of applications on flat surfaces. The adhesive is also suitable for critical surfaces such as plastic and paint coated.

Features and Benefits

- Ideal for machinery operating in high temperature areas (up to +150 °C)
- Barcodes and alphanumeric text remain pin sharp on this high quality material
- Excellent print performance using TT822OUT ribbon
- Print with TT4000+, TT430 for best results
- Easy label design with Tagprint Pro



Helatag label for a permanent asset identification.

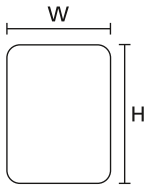
MATERIAL	Type 1206, Polyester (PET), white gloss (GSWH)
Operating Temperature	-40 °C to +150 °C
Curing Temperature	from 0 °C
Adhesive	Acrylic
Thickness of Foil (µm)	50 µm
Chem. Material Properties	Excellent resistance to water, alcohol, most oils, greases, fuel, aliphatic solvents, weak acids, salts and alkalis.
Recommended Ribbon Type	TT822OUT
Specifications	UL-Recognised





Asset identification label, thermal transfer

Helatag 1206 (White)



TYPE	Width (W)	Height (H)	Width of Liner (WL)	Labels per Row	Pack Cont.	Colour	Article-No.
TAG71TD6-1206-WH	12.7	11.1	101.6	6	15,000 pcs.	White gloss (GSWH)	596-12671
TAG13TD4-1206-WH	19.1	6.4	101.6	4	10,000 pcs.	White gloss (GSWH)	596-12061
TAG16TD3-1206-WH	22.9	6.4	80.0	3	10,000 pcs.	White gloss (GSWH)	596-12616
TAG61TD3-1206-WH	25.4	4.8	89.0	3	10,000 pcs.	White gloss (GSWH)	596-12661
TAG01TD3-1206-WH	25.4	6.4	89.0	3	7,500 pcs.	White gloss (GSWH)	596-01120
TAG34TD3-1206-WH	25.4	9.5	85.1	3	7,500 pcs.	White gloss (GSWH)	596-12634
TAG15TD3-1206-WH	25.4	12.7	85.1	3	7,500 pcs.	White gloss (GSWH)	596-12615
TAG31TD3-1206-WH	25.4	19.1	85.1	3	5,000 pcs.	White gloss (GSWH)	596-12631
TAG35TD3-1206-WH	31.8	9.5	101.6	3	7,500 pcs.	White gloss (GSWH)	596-12635
TAG17TD2-1206-WH	38.1	6.4	85.1	2	5,000 pcs.	White gloss (GSWH)	596-12617
TAG27TD2-1206-WH	38.1	19.1	85.1	2	2,500 pcs.	White gloss (GSWH)	596-12627
TAG67TD2-1206-WH	38.1	31.8	85.1	2	2,500 pcs.	White gloss (GSWH)	596-12667
TAG69TD2-1206-WH	40.6	22.9	89.0	2	2,500 pcs.	White gloss (GSWH)	596-12669
TAG77TD1-1206-WH	50.8	22.9	55.0	1	2,000 pcs.	White gloss (GSWH)	596-71206
TAG68TD1-1206-WH	63.5	25.4	69.0	1	2,000 pcs.	White gloss (GSWH)	596-12668
TAG63TD1-1206-WH	63.5	38.1	70.0	1	1,000 pcs.	White gloss (GSWH)	596-12663
TAG76TD1-1206-WH	63.5	50.8	70.0	1	500 pcs.	White gloss (GSWH)	596-61206
TAG4TD1-1206-WH	65.0	20.0	70.0	1	2,500 pcs.	White gloss (GSWH)	596-41206
TAG72TD1-1206-WH	69.9	31.8	76.0	1	1,000 pcs.	White gloss (GSWH)	596-12672
TAG65TD1-1206-WH	76.2	36.5	82.0	1	1,000 pcs.	White gloss (GSWH)	596-12665
TAG64TD1-1206-WH	88.9	36.5	95.0	1	1,000 pcs.	White gloss (GSWH)	596-12664

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Please note! Not all products listed on this page may have this approval.



Tamper evident security labelling, thermal transfer

Helatag 1208 (White), fragmenting

The specially formulated adhesive labels give the highest quality print clarity when printed on thermal transfer printers. The range of materials and ribbons have been developed to suit the needs of most users. Designing and printing labels is simple and users can quickly print out professional labels in a matter of moments when using TagPrint Pro labelling software.

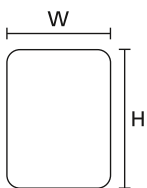
Features and Benefits

- A security label that fragments on removal
- Designed weak spots makes label removal time consuming
- Excellent print performance using TT822OUT ribbon
- Print with TT4000+, TT430 for best results
- Easy label design with Tagprint Pro



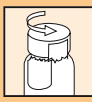
A secure way of identifying if an asset label has been tampered with.

MATERIAL	Type 1208, Acetate foil (CA), white (WH), tamper-proof
Operating Temperature	-40 °C to +150 °C
Curing Temperature	from +4 °C
Adhesive	Acrylic
Thickness of Foil (µm)	56 µm
Chem. Material Properties	Resistant to oils, water and solvents
Recommended Ribbon Type	TT822OUT



TYPE	Width (W)	Height (H)	Width of Liner (WL)	Labels per Row	Pack Cont.	Colour	Article-No.
TAG71TD6-1208-WH	12.7	11.1	101.6	6	15,000 pcs.	White (WH)	596-20871
TAG15TD3-1208-WH	25.4	12.7	85.1	3	7,500 pcs.	White (WH)	596-12080
TAG27TD2-1208-WH	38.1	19.1	85.1	2	2,500 pcs.	White (WH)	596-12082
TAG67TD2-1208-WH	38.1	31.8	85.1	2	2,500 pcs.	White (WH)	596-12087
TAG69TD2-1208-WH	40.6	22.9	89.0	2	2,500 pcs.	White (WH)	596-12089
TAG73TD1-1208-WH	50.8	25.4	55.0	1	2,000 pcs.	White (WH)	596-31208
TAG66TD1-1208-WH	50.8	36.5	56.8	1	1,000 pcs.	White (WH)	596-12086

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Tamper evident security labelling, thermal transfer

Helatag 951 (Silver, Transparent), 2 parts

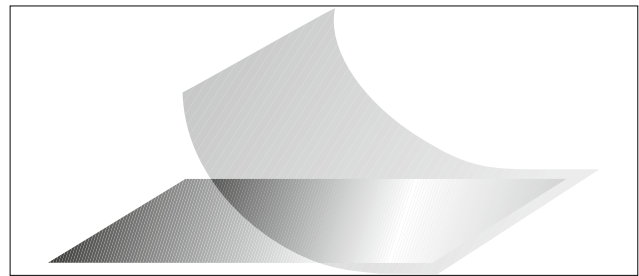
For automotive and electric industries for tamper-proof applications. Particularly suitable as a type label according to norms of German Kraftfahrtbundesamt (KBA).

Features and Benefits

- 2-part label, delivered on reel together with the protective label
- Designed for highly visible and rugged identification on trucks and trailers
- Tamper evident, when pulled off a checkered pattern will be visible as evident
- High durability in outside use
- Meets requirements of the KBA (Kraftfahrtbundesamt [German Federal Motor Transport Authority])
- Thickness of 951A label 36 µm, and 951B laminate 25 µm
- Particularly suitable as type label for vehicles
- Excellent print performance using TT822OUT ribbon
- Print with TT4000+, TT430 for best results
- Easy label design with TagPrint Pro

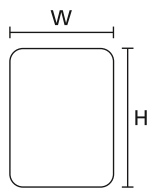


Type plate of an HGV trailer with protective laminate.



The printed silver type plate (Mat. 951A) is protected by the transparent laminate (Mat 951B).

MATERIAL	Type 951, Polyester (PET), silver (SR) and Polyester (PET), transparent (CL)
Operating Temperature	-40 °C to +150 °C
Curing Temperature	from 0 °C (label), from +4 °C (laminate)
Adhesive	Acrylic
Thickness of Foil (µm)	36 µm, 25 µm
Chem. Material Properties	Excellent resistance to water, alcohol, most oils, greases, fuel, aliphatic solvents, weak acids, salts and alkalis.
Recommended Ribbon Type	TT822OUT
Specifications	KBA (Kraftfahrzeugbundesamt) Germany, UL-Recognised



TYPE	Width (W)	Height (H)	Width of Liner (WL)	Labels per Row	Pack Cont.	Colour	Article-No.
TAG25.4-12.7TD1-951 SET	25.4	12.7	31.5	1	1,000 pcs.	Silver (SR)	596-44951
TAG50.8-25.4TD1-951 SET	50.8	25.4	56.8	1	1,000 pcs.	Silver (SR)	596-43951
TAG63.5-50.8TD1-951 SET	63.5	50.8	69.5	1	500 pcs.	Silver (SR)	596-42951
TAG101-74TD1-951 SET	101.6	74.0	107.0	1	250 pcs.	Silver (SR)	596-41951
TAG101-160TD1-951 SET	101.6	160.0	105.8	1	250 pcs.	Silver (SR)	596-40951

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Please note! Not all products listed on this page may have this approval.



Stainless Steel Printing System

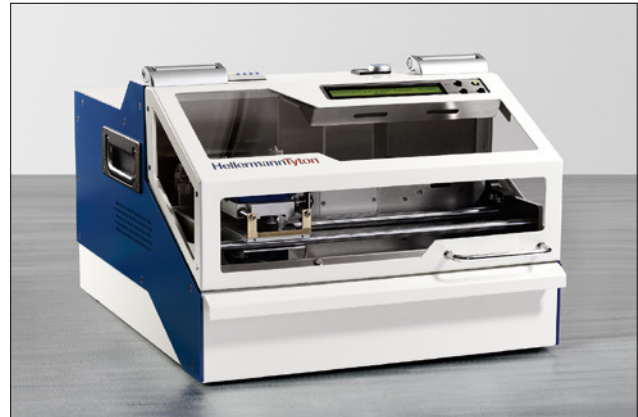
M-BOSS Compact

M-BOSS Compact is a quiet easy-to-use metal plate embossing printer with a small production footprint. It is simple to install and operate and only needs a standard electrical supply and a PC. Texts are created with Tagprint Pro 3.0. Simply open the easy to use program to create print lists. Improved cooling system now ensures a continuous operation between 8-10 hours.

Marker plates are attached to pipes and cables using 4.6 mm width MBT cable ties and a MK9SST hand tool.

Features and Benefits

- Small and easy to use metal plate embosser
- Quiet embossing mechanism suited to production and office environments
- Emboss first marker within a minute of power up
- Embossed characters have been tested to withstand 1.5 million strikes each
- Improved cooling systems allows 8-10 hours continuous printing
- Use Tagprint Pro 3.0 labelling software with pre-loaded templates to simplify print jobs
- Powered by a standard electrical supply
- Organiser is available to manage printed output (UNS: 544-21000), increases printer weight to 45 kg
- Printer is delivered with the following 45 piece 4 mm character set:
Letters: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Numbers: 0 1 2 3 4 5 6 7 8 9
Symbols: & - / . , ' Ä, Ö, Ü



A quiet, durable, and easy to use metal plate embossing printer.

Print Method	Embossed
Power Supply	110 Volt AC- 240 Volt AC 50/60 Hz
Cycle Time	1 second per character
Printer Interfaces	USB 2.0
System Requirements	MS Windows XP, W7
Dimensions W x H x D	480 mm x 360 mm x 570 mm
Weight	41 kg
Specifications	CE



TYPE	Pack Cont.	Article-No.
M-BOSS Compact	1 pcs.	544-20000

Subject to technical changes.



1.5 million strikes per character without maintenance



Please note! Not all products listed on this page may have this approval.

M-BOSS Compact and Organiser

M-BOSS Compact and Organiser system gives the added advantage of a self-contained storage system within the print unit.

The organiser is a 10 container carousel storage system that can be programmed to hold either an individual or a pre-defined set of marker plates. This means that users have the flexibility to manage how they work with the printed output. A simple input screen on the top of the machine is used to specify the quantity per container within the carousel. The carousel drawer when opened extends 430mm from the front of the printer.

Features and Benefits

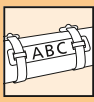
- Ability to manage how the printed marker plates are organised
- Carousel system under the printer has 10 removable marker plate containers
- Flexible output means all marker plates or a set amount can be sent to each container
- Carousel system will hold up to 400 markers
- Each container can hold 40 marker plates



A simple solution to managing your printer output.

TYPE	Pack Cont.	Article-No.
M-BOSS Compact Organiser	1 pcs.	544-21000

Subject to technical changes.



Stainless Steel Printing System

M-BOSS Compact Markers

M-BOSS Markers are used in all areas where severe mechanical or chemical conditions occur e.g. offshore industry, marine engineering, petrochemical industry, mining, underground or on radio and cellular masts where mark permanence is critical.

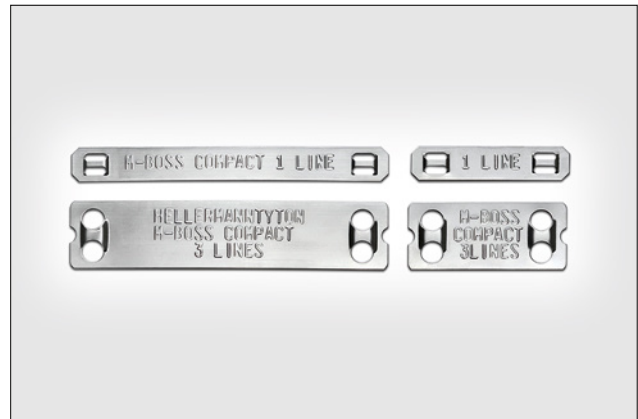
The raised surface of the embossed print ensures that the text remains visible even with dirt, grease, and paint cover the marker. The physical characteristics of the metal and the height of the embossed mark allows users to apply a stiff or metallic brush to the surface and remove excess layers of paint or grease without damaging the integrity of the text.

Features and Benefits

- Raised marking ensure text visibility even when covered in dust, debris, grease and oil
- Stainless steel grade SS316 is suited for use in harsh environments
- Marker plates are designed for use with stainless steel cable ties with a 4.6 mm strap width
- Apply ties with a MK9SST



One Step to the Web!

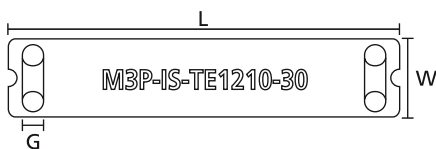


A range of metal plate sizes to suit your needs.



Identification for hazardous environments: M-BOSS Compact stainless steel markers.

MATERIAL	Stainless Steel (SS316)
Operating Temperature	-80 °C to +538 °C

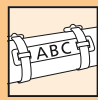


MBML

TYPE	Strap Width max. (G)	Number of lines	Characters per line	Number of characters	Width (W)	Length (L)	Pack Cont.	Article-No.
MBML10X45	4.6	1	8	8	10.0	45.0	1,000 pcs.	544-80101
MBML10X90	4.6	1	23	23	10.0	90.0	500 pcs.	544-80102
MBML20X45	4.6	3	8	24	20.0	45.0	1,000 pcs.	544-80201
MBML20X90	4.6	3	23	69	20.0	90.0	500 pcs.	544-80202

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Identification plates for marking cable bundles

HFTP PEEK

PEEK tags have been specifically designed for use in high temperature environments. The HFTP tags are applied to cables and harness assemblies with cable ties, and are also suitable for retrofit purposes. The material has been conditioned for printing with a laser beam and gives both excellent print definition and print durability.

Features and Benefits

- HFTP is an aerospace standard Tiptag
- Laser beam printable
- Available in beige
- Fixed with PEEK cable ties

Features Material PEEK

- -55 °C to +240 °C operating temperature
- Excellent resistance against chemicals and gamma radiation



A clearly better way of identifying cables and pipes.



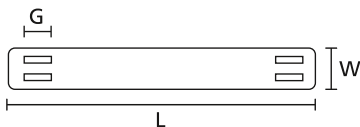
Other dimensions are available on request.



Material specification please see page 16.



Please find more PEEK products for your system solutions: see page 38, 62, 65.

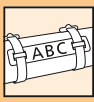


HFTP48

TYPE	Length (L)	Width (W)	Pack Cont.	Colour	Material	Article-No.
HFTP48	48.0	9.5	2,500	Beige (BGE)	PEEK	151-00911

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Protective Laminates, thermal transfer

Helatag 323 (Transparent), high temperature

The specially formulated adhesive labels give the highest quality print clarity when printed on thermal transfer printers. The range of materials and ribbons have been developed to suit the needs of most users. Designing and printing labels is simple and users can quickly print out professional labels in a matter of moments when using TagPrint Pro labelling software.

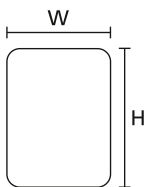
Features and Benefits

- High temperature transparent material
- Ideal as a protective laminate or as a printed label
- Survives 5 years external weathering in central European climate
- Material is UL94 V0
- Excellent print performance using TT822OUT ribbon
- Print with TT4000+, TT430 for best results
- Easy label design with TagPrint Pro



Helatag protective laminates.

MATERIAL	Type 323, Polyvinylidene Fluoride (PVDF), transparent (CL)
Operating Temperature	-40 °C to +140 °C
Curing Temperature	from +10 °C
Adhesive	Acrylic
Thickness of Foil (µm)	25 µm
Chem. Material Properties	Excellent resistance against water, UV radiation, weather influence and solvents based on petroleum.
Recommended Ribbon Type	TT822OUT



TYPE	Width (W)	Height (H)	Width of Liner (WL)	Labels per Row	Pack Cont.	Colour	Article-No.
TAG0623TL3-323-CL	27.9	11.4	101.6	3	5,000 pcs.	Transparent (CL)	596-23321
TAG0638TL2-323-CL	43.2	11.4	94.9	2	5,000 pcs.	Transparent (CL)	596-38321
TAG1351TL1-323-CL	55.9	17.8	62.0	1	2,000 pcs.	Transparent (CL)	596-51321
TAG2551TL1-323-CL	55.9	30.5	62.0	1	1,000 pcs.	Transparent (CL)	596-52321
TAG3863TL1-323-CL	68.6	43.2	75.0	1	1,000 pcs.	Transparent (CL)	596-63321

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



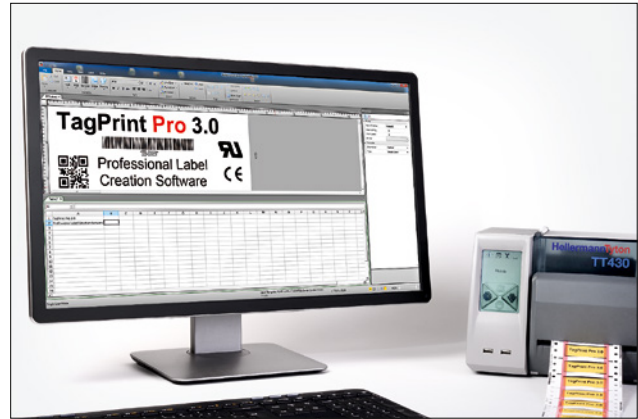
Labelling software

TagPrint Pro 3.0

Easily import a variety of image types into the label design. Use any Windows based font in the label design for complete customization. Layer objects like professional page layout programs. Rulers on top and side allow for exact placement of object. Easily change text colour, fill colour and border colour to make text stand out and accomplish "full reverse" printing. Allow text characters to be stretched or compressed to almost any height or width. Draw lines, circles and boxes on the label as a simple way of making the label look more professional.

Features and Benefits

- Alphanumeric sequences
- Print to multiple printers at one time
- Save jobs in a queue and print all at one time with "Print later" function
- Print faster
- Connect or import directly from other databases including Excel, Access, text files
- More bar code types
- Inverse, flip, and mirror image options for graphic images
- Multi-lingual
- Print log available
- Manually adjust font size to 1/10 of a point
- Customize height and width of characters
- Customize line spacing
- And much more!



The easy to use software speeds up production of markers, labels and identification tags.

System Requirements	PC running Microsoft Windows XP SP3, Vista SP1 or later, Windows 7 .NET Framework 4, Windows 8 512 MB RAM (XP SP3) 1.0 GB RAM (Vista/Windows 7/Windows 8) 500 MB available hard disk space
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TYPE	Pack Cont.	Article-No.
TagPrint Pro 3.0 EMEA	1 pcs.	556-00051

Subject to technical changes.

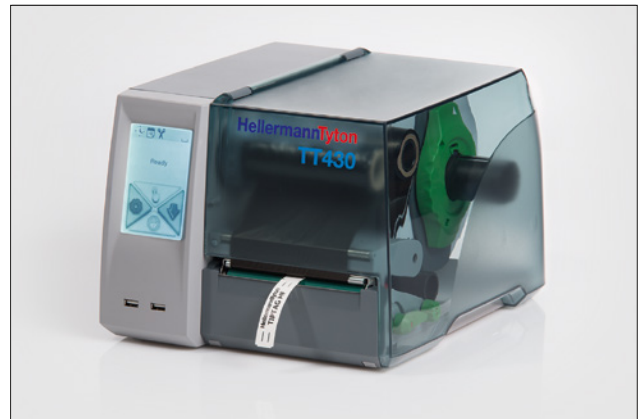


Thermal transfer printer

TT430

Features and Benefits

- Medium volume single sided printing
- Print on THTT DS, TLFX DS, TDRT DS and TULT DS (Ladder Products)
- Print on THTT, TLFX, TDRT, TULT, and TCGT (Continuous Tubing)
- Print on TAGHT, TAGLF, TAGDR, TAGUL, TAGPU, Tiptags
- Print on Adhesive Labels
- Uses standard ribbons
- Barcodes: standard and 2D
- Print speed up to 125 mm/s (30mm/s recommended for Ladder Products and Tubing)
- Adjustable label sensor
- Multiple language selection
- Windows drivers: 32/64 bit for Windows XP, Windows Vista, Windows 7 and Windows 8
- Options: External Reel Holder, Cutter (S430) and Perforator (P430)



TT430 thermal transfer printer.

Print Method	Thermal Transfer
Print Head Type	300 dpi, flat type
Print Speed	up to 125 mm/s
Max. Print Width	106 mm
Label Height Max (metric)	1,000 mm
Printer Interfaces	USB 2.0, Ethernet 10/100 Base T
Supported Barcodes, Printer	Standard and 2D
Printer Memory	64 MB RAM
Dimensions W x H x D	253 mm x 189 mm x 322 mm
Weight	4 kg
Specifications	CE, FCC, UL



One Step to the Web!



TYPE	Pack Cont.	Article-No.
TT430	1 pc.	556-00450

Subject to technical changes.

TYPE	Description	Pack Cont.	Article-No.
S430 Cutter	Cutter for TT430	1 pc.	556-00452
TT External Reel Holder	External Reel Holder	1 pc.	556-00451
TT430 300dpi Printhead	Printhead for TT430	1 pc.	556-00453
TT430 Print Roller	Print Roller for TT430	1 pc.	556-00454

Subject to technical changes.



Please note! Not all products listed on this page may have this approval.



Thermal transfer printer

TT4000+

Features and Benefits

- High volume single sided printing
- Print on THTT DS, TLFX DS, TDRT DS and TULT DS (Ladder Products)
- Print on THTT, TLFX, TDRT, TULT, and TCGT (Continuous tubing)
- Print on TAGHT, TAGLF, TAGDR, TAGUL, TAGPU, Tiptags
- Print on Adhesive Labels
- Uses standard 300 m ribbons
- Barcodes: standard and 2D
- Print speed up to 125 mm/s (30 mm/s recommended for Ladder Products and Tubing)
- Multiple language selection
- Windows drivers: 32 / 64 bit for Windows XP, Windows Vista, Windows 7 and Windows 8
- Options: External Reel Holder (556-00451), Cutter (S4000), Perforator (P4000)



TT4000+ series printer.

Print Method	Thermal Transfer
Print Head Type	300 dpi, flat type
Print Speed	30, 40, 50, 75, 100, 125 mm/s
Max. Print Width	105.6 mm
Label Height Max (metric)	4,000 mm
Printer Interfaces	RS232 C, USB 2.0, Ethernet 10/100 Base T
Supported Barcodes, Printer	Standard, 2D
Printer Memory	64 MB RAM
Dimensions W x H x D	242 mm x 274 mm x 446 mm
Weight	10 kg
Specifications	CE, FCC, UL

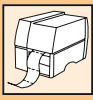


TYPE	Pack Cont.	Article-No.
TT4000+ 300dpi	1 pc.	556-04000

Subject to technical changes.

TYPE	Description	Pack Cont.	Article-No.
S4000 Cutter	S4000 Cutter for TT4000+ and TrakMark DS	1 pc.	556-04025
P4000 Perforator	Perforator for TT4000+ and TrakMark DS	1 pc.	556-04024
TT External Reel Holder	External Reel Holder	1 pc.	556-00451
300dpi Printhead for TT4000 & TT4000+	Printhead for TT4000+	1 pc.	556-04004
Printer Roller TT4000	Printer Roller for TT4000+	1 pc.	556-04005

Subject to technical changes.



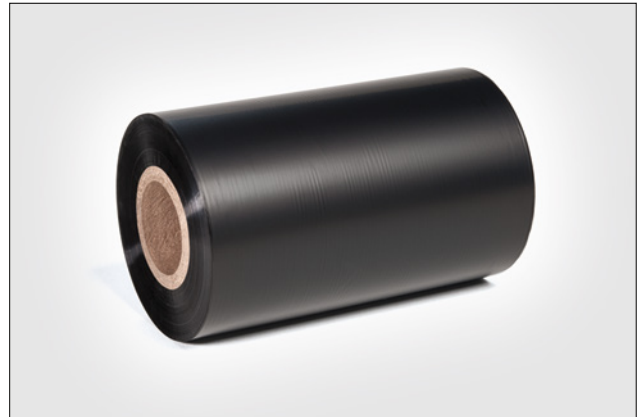
Thermal transfer ribbons for

Adhesive Labels

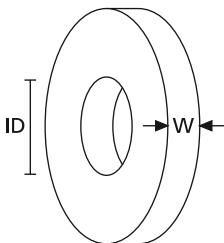
The thermal transfer print technology is based on heating up certain dots in the print head. This transfers the ink very precisely from the ribbon onto the surface of the printed material.

Features and Benefits

- Thermal transfer ribbons for highest quality and performance of printed labels
- Ribbons are specifically designed to maximise print performance for the recommended material



Ribbons for printing on Adhesive Labels.



ID: The standard inside core diameter is 25.4 mm.

TYPE	Recommended Material	Colour	Width (W)	Reel Length	Article-No.
TT822OUT 60MM	323/823/880/951/1203/1204/1206/1208/1210/1211/1213/1216/1220/1221	Black (BK)	60.0	300 m	556-00111
TT822OUT 110MM	323/823/880/951/1203/1204/1206/1208/1210/1211/1213/1216/1220/1221	Black (BK)	110.0	300 m	556-00101
TT932DOUT 85MM	323/1209	Black (BK)	85.0	300 m	556-00117
TT932DOUT 110MM	323/1209	Black (BK)	110.0	300 m	556-00118

All dimensions in mm. Subject to technical changes.

Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.



Please note! Not all products listed on this page may have this approval.



Thermal printer ribbons for

Heatshrink and TipTags

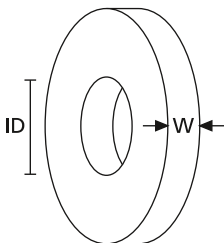
The TTDTHOUT ribbon consists of a special resin composition. In combination with our identification materials the printing is high resistant against high temperatures, scratches and chemicals. The thermal transfer print technology is based on heating up certain dots in the print head. This transfers the ink very precisely from the ribbon onto the surface of the printed material.

Features and Benefits

- Thermal transfer ribbons for high quality print results on heatshrink tubing and TIPTAG identification tags
- Ribbons are specifically designed to maximise print performance for the recommended material



Ribbons for printing on Tubing and TipTags.



ID: The standard inside core diameter is 25.4 mm.

TYPE	Recommended Material	Colour	Width (W)	Reel Length	Article-No.
TTDTHOUT 60MM	TCGT/TULT/TLFX/TDRT/TIPTAG	Black (BK)	60.0	300 m	556-00140
TTDTHOUT 100MM	TCGT/TULT/TLFX/TDRT/TIPTAG	Black (BK)	100.0	300 m	556-00141
TTRHTBK 70MM	THTT/THTT DS/TAGHT	Black (BK)	70.0	300 m	556-00204
TTRHTBK 100mm	THTT/THTT DS/TAGHT	Black (BK)	100.0	300 m	556-00210
TTRHTWH 70mm	THTT/THTT DS/TAGHT	White (WH)	70.0	300 m	556-00209
TTRHTWH 100mm	THTT/THTT DS/TAGHT	White (WH)	100.0	300 m	556-00211

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content. Other packaging options may also be available.





Automatic Cable Tying System

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Application Tooling for Cable Ties

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Application Tooling for Cutting Plastic Ties

Manual Cutting Tool for Plastic Ties	
CUTties	240



Application Tooling for Snappers

Manual Tool	
ASNP, MSNP snapper tools	241



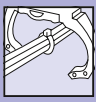
Application Tooling for Heat Shrinkable Tubing

Gas powered Hot Air Tool	
E4500	242
Electrical Hot Air Tool	
H5002 - handy tool	243
H5004 - for professional use	243



Application Tooling for Braided Sleeves

Helagaine Braided Sleeving	
HSG0 hot cutting tool	244



Automatic bundling up to Ø 20 mm

Autotool 2000 CPK

The reliability, ergonomics, simple handling and flexibility makes the Autotool 2000 CPK ideal for a variety of high volume applications, e.g. in cable assemblies for automotive, brown and white goods industry, electronics, TV and domestic appliances, sealing of bags and the bundling of parts. Overall the Autotool 2000 CPK gives full, flexible and cost effective utilization of labour and maximises efficiency.

With the Bench Mount Kit CPK or the Overhead Suspension CPK the Autotool 2000 CPK can be used stationary or mobile, depending on the customer's application.

Another option is to integrate the AT2000 CPK into a fully automated production line by using the Power Pack with integrated Control Box, which is the interface between the AT2000 CPK and your production line.

Features and Benefits

- Evolutionary model combining long-term customer experience and requirements
- Electronically operated automatic bundling system
- Speeds up the bundling process
- Consistency and quality in the process of threading, tensioning and cutting
- Bundling with flush cut off / optional with excess tail
- Several languages available
- Service Software - Extensive data analysis with included PC software possible, Production Data Acquisition (PDA)
- Tensioning drive completely controlled and monitored electronically
- High reproducibility of the bundling results
- Adjustable cycle time settings between 0.8 - 1.4 sec.
- Removable handle for full automation
- Troubleshooting via menu navigation



Autotool 2000 CPK.



Autotool 2000 CPK Service Software.



One Step to the Web!

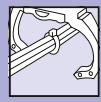


Power Pack CPK for Autotool 2000 CPK.

TYPE	Article-No.
Autotool 2000 CPK	106-00000

Subject to technical changes.

Power Supply	Electronically, with Power Pack CPK
Cycle Time	adjustable 0.8 sec to 1.4 sec.
Weight	1.8 kg
Tension Force	adjustable



Automatic bundling up to Ø 20 mm

Accessories for Autotool 2000 CPK

Features and Benefits

- Supports the main features of the Autotool 2000 CPK
- Power Pack - Input 100-240 V a.c. 50/60 Hz; Output 25,2 V d.c., max. 150 W
- Bench Mount Kit CPK for stationary usage
- Overhead Suspension CPK for flexible usage
- Power Pack CPK with Control Box for full automation usage
- Stand-off HH20 - used as a spacer for optimal bundling support

TYPE	Description	Article-No.
Bench Mount Kit CPK	Bench Mount Kit CPK	106-00040
Overhead Suspension CPK	Overhead Suspension CPK	106-00050
Power Pack CPK	Power Pack CPK	106-00100
Power Pack CPK with Control Box	Power Pack CPK with Control Box	106-00110
HH20	Stand Off HH20	120-00080

Subject to technical changes.



Bench Mount Kit CPK included Foot Pedal, Autotool 2000 CPK, Power Pack CPK and T18RA3500.



Application with the Bench Mount Kit CPK.



Overhead Suspension CPK, Autotool 2000 CPK, Power Pack CPK and T18RA3500.



Application Tooling

Automatic Cable Tying System

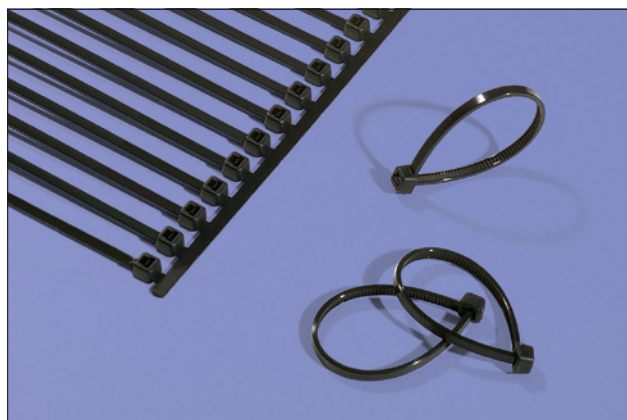
Automatic bundling up to Ø 20 mm

Cable ties for Autotool 2000 Series

For bundling and securing cables, pipes and hoses, especially in applications that require high volumes of cable ties, e.g. in cable assembly, automotive, industrial equipment and the packaging sector.

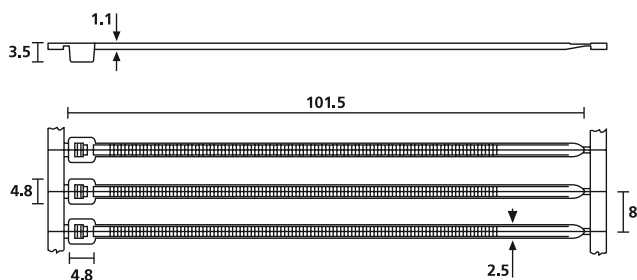
Features and Benefits

- Made from 100% high quality plastic, can be easily recycled
- Provides a secure hold around bundles
- Available in natural and black
- Other colours available on request
- Bandoleers of 50 cable ties or reels of 3,500 available



Cable ties for Autotool 2000 Series.

MATERIAL	Polyamide 6.6, heat stabilised (PA66HS)	Polyamide 6.6, heat and UV-resistant (PA66HSW)	Polyamide 4.6 (PA46)
Operating Temperature	-40 °C to +105 °C, (+145 °C, 500 h)		-40 °C to +150 °C, (+195 °C, 500 h)
Flammability	UL94 V2		UL94 V2, Limited Fire Hazard, Low generation of toxic gases and corrosive acid, Low smoke generation



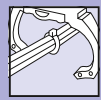
Bandoleer T18RA

TYPE	Bundle Ø max.	N	Colour	Material	Pack Cont.	Article-No.
T18RA50	20.0	80	Black (BK)	PA66HSW	2,000 pcs.	120-40020
T18RA3500	20.0	80	Black (BK)	PA66HSW	3,500 pcs.	120-50010
	20.0	80	Natural (NA)	PA46	3,500 pcs.	120-46009
T18RA50	20.0	80	Natural (NA)	PA66HS	2,000 pcs.	120-40019
T18RA3500	20.0	80	Natural (NA)	PA66HS	3,500 pcs.	120-50009

All dimensions in mm. Subject to technical changes. Minimum Order Quantity (MOQ) may differ from package content. More colours on request. Please contact us!

Halogen-free according to the interdictions of the GADSL list and compulsory registration of the SVHC list.

= Minimum Loop Tensile Strength for Cable Ties (Newton)

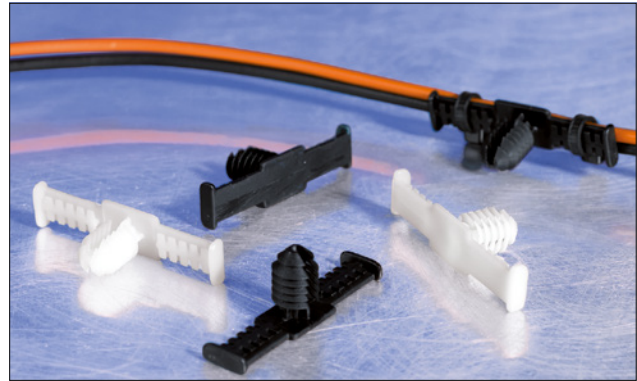


Automatic bundling

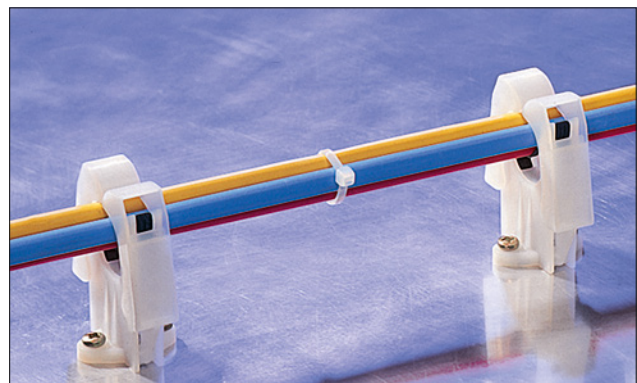
Bundling Clips for Automatic Cable Tying Systems

Features and Benefits

- Optimized for Automatic Cable Tying Systems
- Easy to fix



Bundling Clips ATSBCFT6LG.



Harness board accessory HH20.

TYPE	Drawing	Panel Thickness	Hole Ø (FH)	Colour	Material	Article-No.
ATSBCEC35		1.5 - 4.0	-	Black (BK)	PA66HIRHS	102-68355
ATSBCSFT6.5		2.3 - 3.3	6,3 - 6,7	Black (BK)	PA66HIRHS	102-69066
ATSBCSFT6.5-MD		2.0 - 3.0	6,3 - 6,7	Black (BK)	PA66HIRHS	102-69065
ATSBCEC36		1.5 - 4.0	-	Black (BK)	PA66HIRHS	102-68365
ATSBCEC37		1.5 - 4.0	-	Black (BK)	PA66HIRHS	102-68375
ATSBCT6LG		0.6 - 5.1	6,3 - 7,0	Black (BK)	PA66HIRHS	102-67065
ATSBCEC38		1.5 - 4.0	-	Black (BK)	PA66HSW	102-68385
ATSBCKSFT6,5		0.7 - 1.3	6,3 - 6,7	Black (BK)	PA66HIRHS	102-69067
ATSBCKSFT6,5		1.7 - 2.3	6,3 - 6,7	Black (BK)	PA66HIRHS	102-69068
ATSBKOWSFT6,5		2.3 - 3.3	6,3 - 6,7	Grey (GY)	PA46	102-69070
ATSBKSFT6,5PT2,3-3,3		2.3 - 3.3	6,3 - 6,7	Grey (GY)	PA46	102-69069

All dimensions in mm. Subject to technical changes.



Waste free bindings up to Ø 80 mm

Autotool System 3080

By assembling the ATS3080 into different devices, the tool can be customised for various customer applications. For example, with the horizontal bench mount kit, plastic bags can be closed in seconds. Also, because of the unique closing mechanism, the plastic tie closing the bag can serve as a tamper evident seal and is compatible material for recycling.

HellermannTyton developed an innovative solution for harnesses in the Automotive industry. With the ATS3080, it is now possible to fasten fixings, also known as foot parts, at the same time as the automatic binding. This simplifies the final assembly of harnesses, because the pre-assembled harness can be fixed directly to the metal edge or into a hole! This means that you can now produce a complex harness completely automatically.

Features and Benefits

- Electrical bundling system from HellermannTyton
- Waste free fastenings every time with a completely flush cut
- No lost time for emptying or cleaning waste boxes
- Bundling diameter up to 80 mm
- Processes outside serrated Nylon 6.6 strap and closures on "endless reels"
- Outstanding innovation: double play between tool and material
- Usable with overhead dispenser or bench mount system
- Can be integrated into fully automated production line
- Flexible tool especially for automotive, packaging and white and brown goods industries
- High-capacity tool
- Short cycle time (0.8 - 1.3 sec. - depending on bundle diameter)
- Jaws available in 3 different diameters: 30, 50, 80 mm
- Material available in reels of 500 m straps and 5000 pcs closures

TYPE	Article-No.
Autotool System 3080	102-00000

Subject to technical changes.



One Step to the Web!



Autotool System 3080.



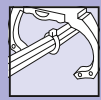
Autotool System 3080 with three Jaw sizes - to optimise the cycle time for the different bundling diameters.



Switching Power Pack for ATS3080.

Power Supply	Electrical, with Switching Power Pack
Cycle Time	approx. 1.3 sec. (50 mm jaw)
Weight	1.9 kg
Tension Force	Continuously adjustable





Waste free bindings up to Ø 80 mm

Accessories for Autotool System 3080

Features and Benefits

- For stationary or mobile use of the ATS3080 in bench mount kit or overhead dispenser
- Integrates ATS3080 into a fully automated production line
- Switching Power Pack - Input: 230/150 VAC, 50/60 Hz; Output: 48 VDC, max. 50 W
- Bench Mount Kit - tool and tie reel stand including foot pedal
- Overhead dispenser and tie reel stand including balancer



Optional: Bench Mount Kit with plate.



Packaging application with the Bench Mount Kit Horizontal.



Bench Mount Kit with ATS3080, Switching Power Pack, Foot Pedal and consumables.



Overhead Suspension with ATS3080 and consumables.

TYPE	Description	Article-No.
Bench Mount Kit Automatic	Bench Mount Kit Automatic	102-00042
Bench Mount Kit Horizontal	Bench Mount Kit Horizontal	102-00041
Bench Mount Kit Movable	Bench Mount Kit Movable	102-00040
Overhead Suspension	Overhead Suspension	102-00050
Power Pack	Power Pack ATS 3080	102-00010

Subject to technical changes.



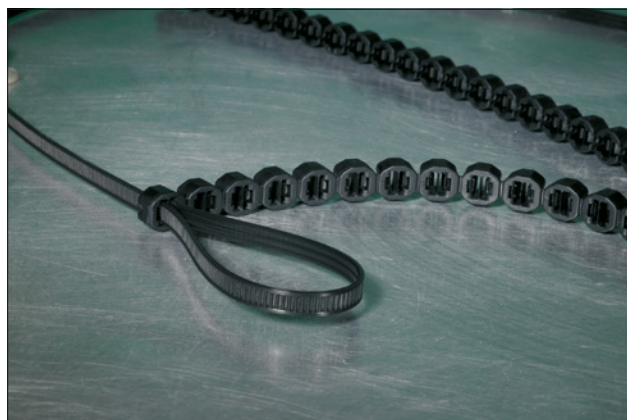
Waste free bindings up to Ø 80 mm

Cable ties for Autotool System 3080

For bundling and securing cables, hoses and pipes or closing plastic bags. Ideal for applications where large volumes of cable ties are required, e.g. in cable assembly, automotive, industrial equipment and packaging sectors.

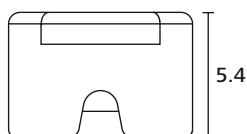
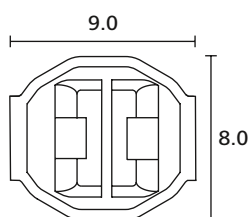
Features and Benefits

- Innovative strap and closures
- Two-piece consumable parts
- Waste-free and optimised material utilisation guaranteed
- No time lost through emptying and cleaning waste boxes
- Mechanically detected bundle diameter
- Flush cut-off of fastenings
- Outside serrated strap prevents damage to wire insulation
- Available in reels of 500 m strap and 5000 pcs closures

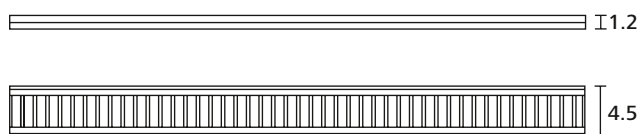


Closures and strap for ATS3080.

MATERIAL	Polyamide 6.6, high impact modified, heat and UV stabilised (PA66HIRHSUV)	Polyamide 6.6, heat and UV stabilised (PA66HSUV)
Operating Temperature	-40 °C to +95 °C, (+105 °C, 5000 h)	-40 °C to +105 °C, (+145 °C, 500 h)
Flammability	UL94 HB	UL94 V2



Closure ATS3080



Strap ATS3080

TYPE	Description	Bundle Ø max.	N	Colour	Material	Pack Cont.	Article-No.
Closures Black ATS3080	Closure Black ATS3080	80.0	225	Black (BK)	PA66HSUV	5,000 pcs.	102-66210
Closures Natural ATS3080	Closure Natural AST3080	80.0	225	Natural (NA)	PA66HSUV	5,000 pcs.	102-66209
Strap Black ATS3080	Strap Black ATS3080	80.0	225	Black (BK)	PA66HIRHSUV	500 m	102-66110
Strap Natural ATS3080	Strap Natural ATS3080	80.0	225	Natural (NA)	PA66HIRHSUV	500 m	102-66109

All dimensions in mm. Subject to technical changes.
Minimum Order Quantity (MOQ) may differ from package content.

N = Minimum Loop Tensile Strength for Cable Ties (Newton)

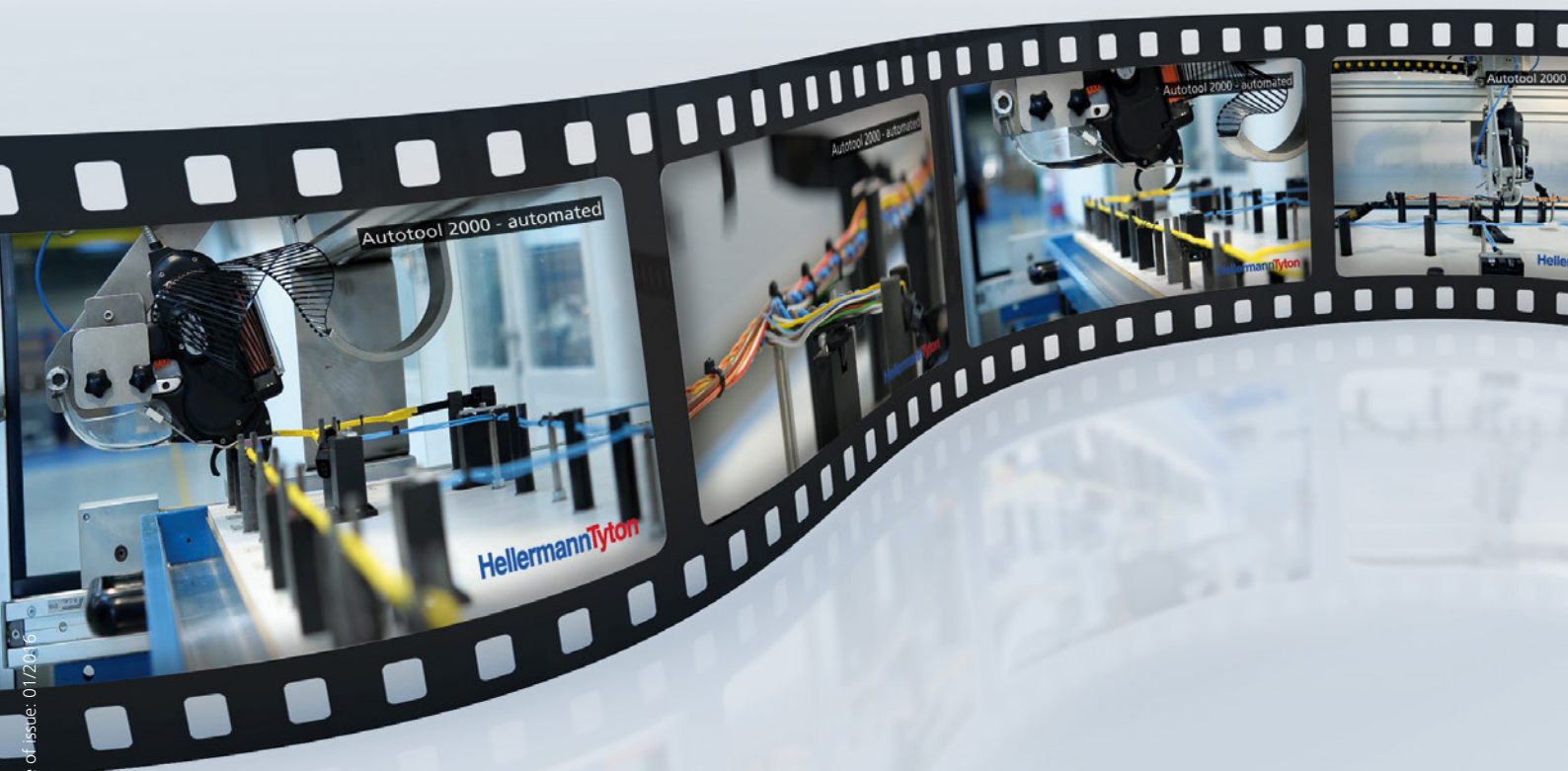


Please find the corresponding Bundling Clips on page 108, 109, 111, 117.

Autotool Systems – automated solutions



■ For more information
please contact us!



Tensioning Tools for Cable Ties



MK3SP.
See page 229

4



MK3PNSP2.
See page 229

5



EVO7/EVO7SP.
See page 230

6



MK7HT.
See page 231

7



MK7P.
See page 232

8



MK6.
See page 233

9



MK9.
See page 233

10



MK9HT.
See page 234

11



MK9P.
See page 235

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Tensioning Tools for Cable Ties KR-Series



KR6/8.
See page 236

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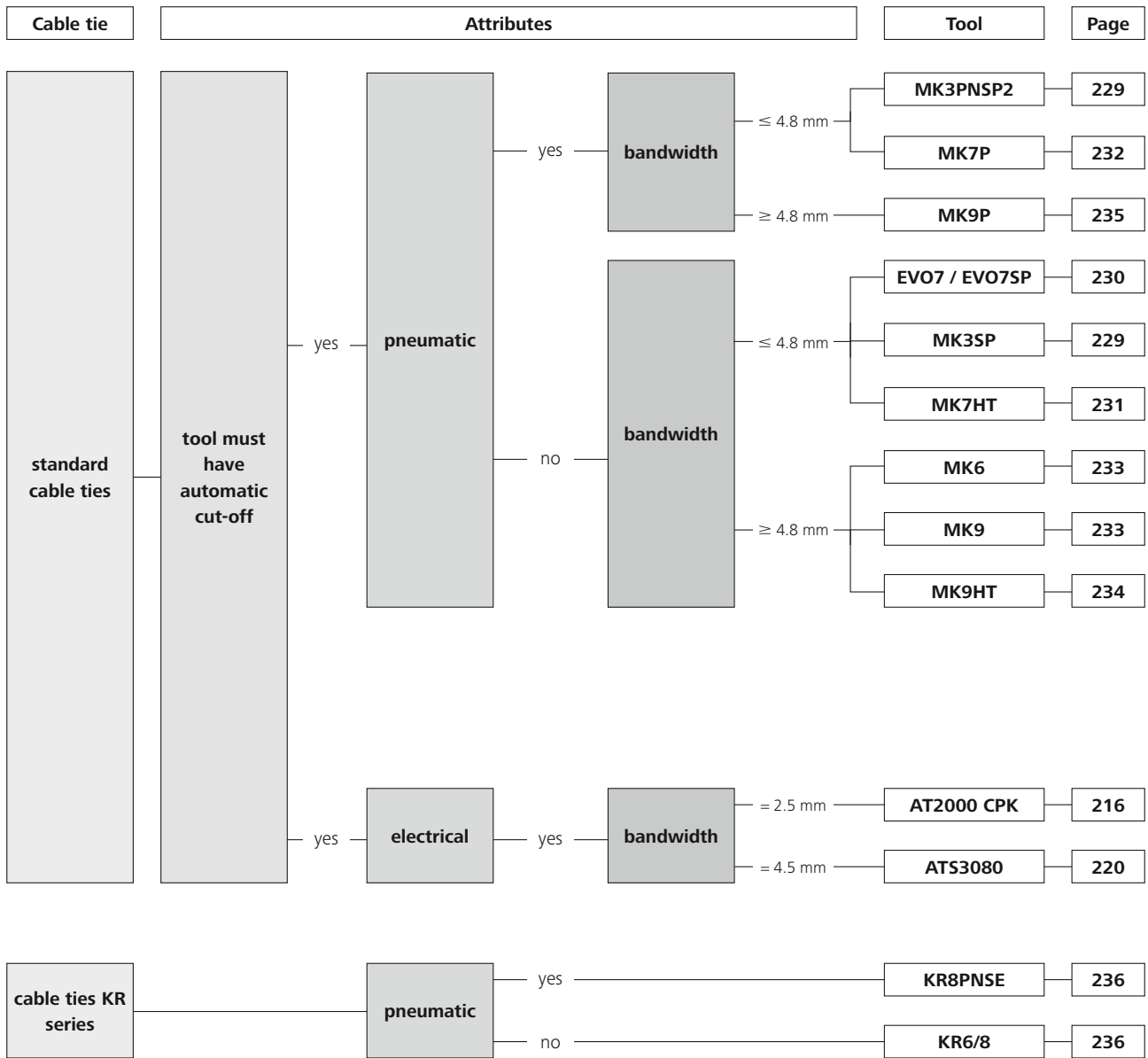


KR8PNSE.
See page 236

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Flowchart for optimum tool selection



Tensioning Tools for Metal Ties



MK9SST.
See page 237

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MK9PSST.
See page 237

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KST-STG200.
See page 238

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MST6.
See page 239

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MST9.
See page 239

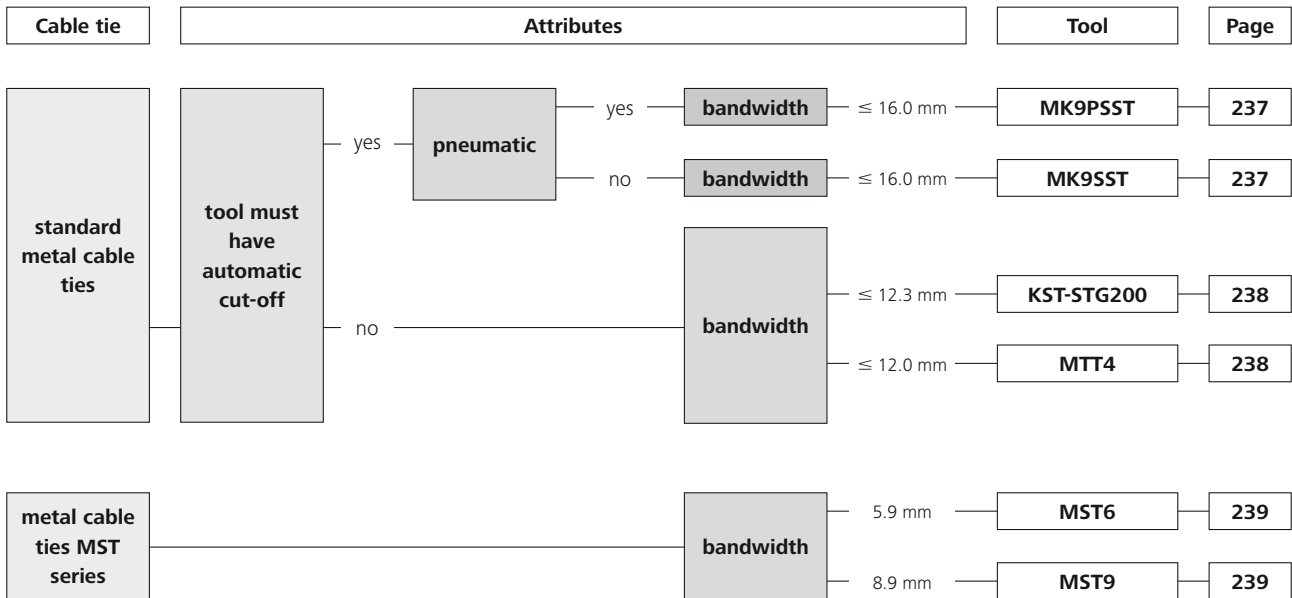
20



MTT4.
See page 238

21

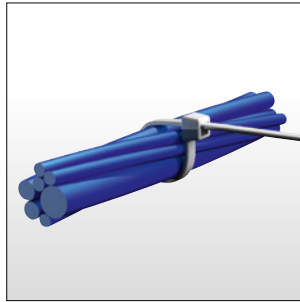
Flowchart for optimum tool selection



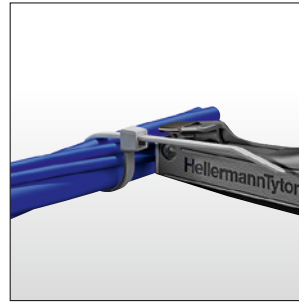
How to use a cable tie tool (using an EVO7 as an example)



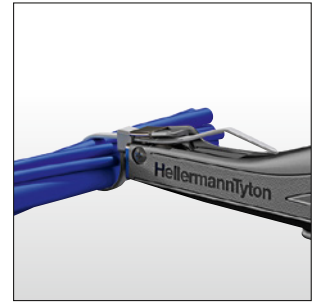
1. Use tension adjustment knob to select your desired tension setting.



2. Fasten a nylon HellermannTyton cable tie around the bundle.



3. Insert strap of cable tie through side opening of nosepiece.



4. Place front of nosepiece flush to the head of the cable tie.



5. Pull trigger until cable tie tensions and cuts.

Tool testing - Determination of tensions

To date, no generally applicable test method has been established on the market. The companies within the HellermannTyton group work with a usual force meter with minimum 10 kHz frequency of data sampling to determine the tensile forces of the tools and to guarantee the quality of the tools.

It is more difficult to test cable tie tools than would appear at first glance. It is of supreme importance to comply with a standardised test procedure and consistent test conditions, e.g. the size and cross-section of the cable ties and the water content of the tie. A test using different ties and / or different conditioning can easily lead to different values.

In general, the speed of cut-off, the position of the tool with respect to the cable tie, the condition of the wearing parts in the tool and the state of the cable tie play a fundamental role in the determination of tensile forces.

Therefore we must point out that any values we provide must only ever be regarded as guide values for your information. The values cannot be transferred into practice "one for one".

In our user instructions, we specify an adjustment range for each type of cable tie. If tension values must be documented or comply with a specification, we recommend that you adjust them with the aid of the

force meter. Also, as a guideline, half the minimum holding strength of the cable tie should be used as tensile force.

The minimum tensile strength (also referred to as minimum unlocking strength) is the least force which the cable tie can withstand before it tears or stretches. This strength is determined using a threaded tie, hence the following formula should be used for guidance as to the correct tensile force of the tool:

$$\frac{\text{Min. tensile strength}}{2} = \text{rec. tensile force}$$

Example:

$$T50R = \frac{225 \text{ N min. tensile strength}}{2}$$

$$\frac{225 \text{ N}}{2} = 112.5 \text{ N rec. tensile force according to formula}$$

The tensile force can of course be adjusted up or down, in line with the corresponding application.

Please bear in mind that this statement applies only to HellermannTyton products. Cable ties from other manufacturers may require a higher or lower force setting.

In order to secure the device against manipulation or unintentional maladjustment after it has been adjusted using the force meter, HellermannTyton offers an adjustment safety cap (Art. No.: 110-07200 for MK7HT, MK7P, MK9, MK9HT, MK9SST, MK9P) which you can push

onto the device after removing the adjustment unit (loosening a screw is all it takes to remove).

After a period of time, to be defined, you test the device again and if necessary re-adjust it. The problem of determination of forces depends on the individual case and has no direct connection with the quality of our product. An exact value for each setting (e. g. in Newtons), without stating a tolerance, cannot be confirmed.

Test set-up with a usual force meter and EVO7 cable tie tool.



The following describes how to check the tension force of a manual tensioning tool.

1. Lay the cable tie (green) into the fixture (A).
2. Bring the nose piece of the tensioning tool (B) flush to the test block (C).
3. Insert the strap of the cable tie into the tensioning tool and pull the strap flush against the fixture (A).
4. Re-set the force meter (D) to zero.
5. Pull the trigger of the tensioning tool continuously until the cable tie is cut.
6. The tension force achieved at the cut off point is determined.



Manual Tensioning Tool with Metal Housing

MK3SP up to 4.8 mm strap width

This tough metal tool MK3SP is used by harness makers for the automotive and white goods industries, as well as in aerospace, railway and medical.

Features and Benefits

- Tough metal tool for HellermannTyton plastic cable ties up to 4.8 mm width
- For consistent tensioning and automatically flush cutting
- Infinitely adjustable tensioning force
- Reliable and low maintenance



MK3SP.

TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MK3SP	MK3SP	4.8	1.5	0.33 kg	110-03500
SP MK3SP replacement blade	Replacement Blade	-	-	0.01 kg	110-03524

All dimensions in mm. Subject to technical changes.

Pneumatic Tensioning Tool with Metal Housing

MK3PNSP2 up to 4.8 mm strap width

Features and Benefits

- Pneumatic tensioning tool
- Tough metal housing
- For cable ties up to 4.8 mm width
- For consistent tensioning and automatically flush cutting
- Infinitely adjustable tension force
- High application speed
- Reliable and low maintenance



MK3PNSP2.

Air Supply	Non oiled / oiled
Air Pressure (min.)	3 Bar
Air Pressure (max.)	6 Bar
Hose Internal Diameter	4.0 mm
L x H x W	approx. 225 x 140 x 40 mm
Specifications	CE, GS



TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MK3PNSP2	MK3PNSP2	4.8	1.5	0.56 kg	110-03400
SP compressed air hose	Air hose, complete	-	-	0.35 kg	110-30002
SP MK3PNSP2 cutting blade	Replacement Blade	-	-	0.01 kg	110-30101

All dimensions in mm. Subject to technical changes.



Please note! Not all products listed on this page may have this approval.



Manual Tensioning Tool with Plastic Housing

EVO7 up to 4.8 mm strap width

Features and Benefits

- Ergonomic, slip-proof handle for a comfortable and secure grip
- Extremely low maintenance
- Fast and precise application with minimum effort (TLC mechanism)
- Convenient and simple tension adjustment
- Extended, slim nose for use in narrow spaces
- Housing made of resilient and lightweight glass fibre-reinforced polyester
- Standard grip span (90 mm) and short grip span (80 mm) available



EVO7.

TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
EVO7	EVO7	4.8	1.5	0.28 kg	110-70129
EVO7SP	EVO7SP	4.8	1.5	0.28 kg	110-70130
BLADEKT	Replacement Blade	-	-	-	110-70106

All dimensions in mm. Subject to technical changes.

TLC-Technology: Tension – Lock – Cut

The new EVO7 protects muscles and joints and increases effectiveness

- Less recoil shock reduces impact to the operator's hand
- Application of force is significantly reduced



Application video: EVO7



1. Tension: Tie is tensioned as usual.

2. Lock: When the desired tension is met the locking mechanism locks the tie in place.



3. Cut: Innovative, effortless and less recoil shock cut-off function.



Please note! Not all products listed on this page may have this approval.



Manual Processing Tool with Plastic Housing

MK7HT up to 4.8 mm strap width

MK7HT application tool is mainly used to apply cable ties in harness making industries.

Features and Benefits

- Light glass-fibre-reinforced housing
- Ergonomic design
- For cable ties up to 4.8 mm width
- MK7 HighTension version with higher tension force than MK7
- Consistent tensioning and automatically flush cutting
- Infinitely adjustable tension force combined with three-step quick adjustment



MK7HT.

TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MK7HT	MK7HT	4.8	1.5	0.29 kg	110-07000
SP MK7HT replacement blade	Replacement Blade	-	-	0.01 kg	110-07511
SP lock cap tensioning knob	Lock cap tensioning knob	-	-	0.01 kg	110-07200

All dimensions in mm. Subject to technical changes.



Pneumatic Tensioning Tool with Plastic Housing

MK7P up to 4.8 mm strap width

The MK7P pneumatic bundling tool sets a new benchmark for the rational application of ties in the industrial production process. Improved compressed air supply moves the tensioning piston faster than in comparable tools.

Features and Benefits

- Pneumatic tensioning tool
- Light glass-fibre-reinforced housing
- For cable ties up to 4.8 mm width
- For consistent tensioning and automatically flush cutting
- Infinitely adjustable tension force
- High application speed



MK7P.



The easy to use quick-set-knob.

Air Supply	Non oiled / oiled
Air Pressure (min.)	3 Bar
Air Pressure (max.)	6 Bar
Hose Internal Diameter	4.0 mm
L x H x W	approx. 220 x 170 x 40 mm
Specifications	CE, GS



TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MK7P	MK7P	4.8	1.5	0.43 kg	110-07100
SP compressed air hose	Air hose, complete	-	-	0.35 kg	110-30002
SP MK7P replacement blade	Replacement Blade	-	-	0.01 kg	110-07111
SP lock cap tensioning knob	Lock cap tensioning knob	-	-	0.01 kg	110-07200

All dimensions in mm. Subject to technical changes.



Please note! Not all products listed on this page may have this approval.



Manual Tensioning Tool with Metal Housing

MK6 up to 9.0 mm strap width

Features and Benefits

- Tough metal tool
- For cable ties up to 9.0 mm width
- For consistent tensioning and automatically flush cutting
- Infinitely adjustable tension force
- Reliable and low maintenance



MK6.

TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MK6	MK6	9.0	2.0	0.52 kg	110-06000
SP MK6 replacement blade	Replacement Blade	-	-	0.01 kg	110-06026

All dimensions in mm. Subject to technical changes.

Manual Tensioning Tool with Plastic Housing

MK9 up to 13.5 mm strap width

MK9 tool is used to apply bigger cable ties as they are used in trucks and busses. MIL and VG certification allows the use of MK9 for military vehicle and aviation construction.

Features and Benefits

- Glass-fibre-reinforced housing
- Ergonomic design
- For HellermannTyton plastic cable ties up to 13.5 mm width
- Consistent tensioning and automatically flush cutting
- Infinitely adjustable tension force combined with two-step quick adjustment
- MIL and VG approved



MK9.

TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MK9	MK9	13.5	2.0	0.39 kg	110-09500
SP MK9 replacement blade	Replacement Blade	-	-	0.01 kg	110-09511
SP lock cap tensioning knob	Lock cap tensioning knob	-	-	0.01 kg	110-07200

All dimensions in mm. Subject to technical changes.



Please note! Not all products listed on this page may have this approval.



Manual Tensioning Tool with Plastic Housing

MK9HT up to 13.5 mm strap width

The MK9HT boasts especially high tensioning forces. Ideal for applications where larger cable ties need to be securely fastened, such as in truck and bus construction.

Features and Benefits

- Glass-fibre-reinforced housing
- Ergonomic design
- For cable ties up to 13.5 mm width
- MK9 HighTension version with higher tension force than MK9
- Consistent tensioning and automatically flush cutting
- Infinitely adjustable tension force combined with two-step quick adjustment



MK9HT.

TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MK9HT	MK9HT	13.5	2.0	0.39 kg	110-09000
SP MK9 replacement blade	Replacement Blade	-	-	0.01 kg	110-09511
SP lock cap tensioning knob	Lock cap tensioning knob	-	-	0.01 kg	110-07200

All dimensions in mm. Subject to technical changes.



Pneumatic Tensioning Tool with Plastic Housing

MK9P up to 13.5 mm strap width

The MK9P is constructed with heavy duty parts to ensure optimum performance. It is ideally designed to apply heavy-duty ties that are used in vehicle construction such as trucks, busses and railways.

Features and Benefits

- Pneumatic tensioning tool
- Glass-fibre-reinforced housing
- For cable ties up to 13.5 mm width
- For consistent tensioning and automatically flush cutting
- Infinitely adjustable tension force
- High application speed
- Holding ring for a balancer
- Option of lower or upper air attachment



MK9P.



MK9P is also available with upper air attachment.

Air Supply	Non oiled / oiled
Air Pressure (min.)	3 Bar
Air Pressure (max.)	6 Bar
Hose Internal Diameter	4.0 mm
L x H x W	approx. 280 x 200 x 55 mm
Specifications	CE, GS



TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Air att. Position	Article-No.
MK9P	MK9P	13.5	2.5	0.91 kg	Lower air connection	110-09100
	MK9P	13.5	2.5	0.91 kg	Top air connection	110-09110
SP compressed air hose	Air hose, complete	-	-	0.35 kg	-	110-30002
SP lock cap tensioning knob	Lock cap tensioning knob	-	-	0.01 kg	-	110-07200
SP MK9P replacement blade	Replacement Blade	-	-	0.01 kg	-	110-09111

All dimensions in mm. Subject to technical changes.



Please note! Not all products listed on this page may have this approval.



Manual Tensioning Tool for KR-Series

KR6/8

Application tool KR6/8 crimps the glass-fibre-reinforced locking pin of the KR seal and leads to plastic deformation of the tie ends. This produces a very permanent connection.

Features and Benefits

- Tough metal tool
- For applying KR-cable ties only
- For tensioning, fixing and cutting KR-cable ties
- Simply change the front plate to apply two different strap widths: 6 mm and 8 mm



KR6/8.

TYPE	Description	For Ties	Strap Width max.	Weight	Article-No.
KR6/8	KR6/8	KR6, KR8	8.0	0.52 kg	121-00680
SP KR6/8 replacement blade	Replacement Blade	KR6, KR8	-	0.01 kg	122-68019

All dimensions in mm. Subject to technical changes.

Pneumatic Tensioning Tool for KR-Series

KR8PNSE

Application tool KR8PNSE crimps the glass-fibre-reinforced locking pin of the KR seal and leads to plastic deformation of the tie ends. This produces a very permanent connection.

Features and Benefits

- Tough metal tool
- Pneumatic
- For applying KR-cable ties only
- For tensioning, fixing and automatically cutting KR-cable ties
- Tensioning force can be adapted with the air pressure
- Holding ring for a balancer



KR8PNSE.

Air Supply	Non oiled / oiled
Air Pressure (min.)	3 Bar
Air Pressure (max.)	4 Bar
Hose Internal Diameter	6.0 mm
L x H x W	approx. 320 x 210 x 50 mm
Specifications	CE, GS



TYPE	Description	For Ties	Strap Width max.	Weight	Article-No.
KR8PNSE	KR8PNSE	KR8	8.0	1.56 kg	121-00889
SP KR8PNSE replacement blade	Replacement Blade	KR8	-	0.01 kg	122-80032

All dimensions in mm. Subject to technical changes.



Please note! Not all products listed on this page may have this approval.



Manual Tensioning Tool for Metal Ties MBT-Series

MK9SST up to 16.0 mm strap width

The MK9SST is constructed with heavy duty parts to ensure optimum performance. It is designed to apply our MBT cable ties with a strap width of up to 16 mm. The tool is ideally suited for use in most arduous environments such as those found on board ships, oil rigs, construction sites or in nuclear power stations.

Features and Benefits

- Glass-fibre-reinforced housing
- Ergonomic design
- Consistent tensioning and automatic cutting of metal ties (MBT-Series)
- Infinitely adjustable tension force combined with two-step quick adjustment



MK9SST.

TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MK9SST	MK9SST	16.0	0.5	0.60 kg	110-95000
SP MK9SST replacement blade	Replacement Blade	-	-	0.01 kg	110-95273

All dimensions in mm. Subject to technical changes.

Pneumatic Tensioning Tool for Metal Ties MBT-Series

MK9PSST up to 16.0 mm strap width

The MK9 Pneumatic Stainless Steel Tool (MK9PSST) is constructed with heavy-duty parts to ensure optimum performance in demanding environments. It is ideally designed to apply stainless steel MBT-Series (Metal Ball Tie Series) up to 16.0 mm width.

Features and Benefits

- Unique levels of repeatability and accuracy
- High application speed and low maintenance
- Improved compressed air supply for faster tensioning piston movement
- Shorter processing time and greater volume of connecting tie application
- Ergonomic design
- Automatic ejection of cut-off cable tie end
- Ideally designed to apply stainless steel MBT-Series up to 16.0 mm width
- Air pressure between 3 and 6 bar



MK9PSST.

Air Supply	Non oiled / oiled
Air Pressure (min.)	3 Bar
Air Pressure (max.)	6 Bar
Hose Internal Diameter	4.0 mm
L x H x W	approx. 280 x 200 x 55 mm



TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MK9PSST	MK9PSST	16.0	0.5	0.91 kg	110-95350
SP MK9PSST replacement blade	Replacement Blade	-	-	0.01 kg	110-95307
SP lock cap tensioning knob	Lock cap tensioning knob	-	-	0.01 kg	110-07200

All dimensions in mm. Subject to technical changes.



Manual Tensioning Tool for Metal Ties MBT-Series

KST-STG200 up to 12.3 mm strap width

The KST-STG200 application tool is designed for installing heavy duty stainless steel cable ties within a range of industries such as shipbuilding, oil rigs, mining and mass transit. The tensioning strength can be adjusted while pulling the trigger. The tool is easy to handle and far more reliable than trying to tension the ties by hand.

Features and Benefits

- Tough metal tool
- Operator controlled tensioning
- Cut off by pulling the hand lever



KST-STG200.

TYPE	Strap Width max.	Strap Thickness max.	Weight	Article-No.
KST-STG200	12.3	0.3	0.56 kg	110-09950

All dimensions in mm. Subject to technical changes.

Manual Tensioning Tool for Metal Ties MLT-Series

MTT4 up to 12.0 mm strap width

The MTT4 tensioning tool is a lightweight manual processing tool which is easy to use for application of the MLT (releasable) series. The extended nose piece ensures the fixing length of the MLT cable tie. While using the ratchet system, the operator can easily cut off the tie at the correct length with the long cutter lever.

Features and Benefits

- Tough metal tool
- Simple ratchet operation, easy to use
- Operator controlled tensioning and cutting facility



MTT4.

TYPE	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MTT4	12.0	0.7	0.78 kg	110-04000

All dimensions in mm. Subject to technical changes.



Manual Tensioning Tool for Metal Ties MST-S Series

MST6 for 5.9 mm strap width

The MST6 tool has been specially developed for reliably applying HellermannTyton MST-Series metal cable ties. The punch-lock mechanism mechanically crimps the tie ensuring a reliable bundling with perfect resistance to vibration. The tension force is freely adjustable by the operator.

Features and Benefits

- Tough metal tool
- Ergonomic design
- Consistent tensioning and automatic cutting of metal ties
- Designed for use with MST-S Series ties (5.9 mm)



MST6.

TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MST6	MST6	5.9	0.3	0.53 kg	110-61000
SP MST6-P29 (Blade)	Replacement Blade	-	-	0.01 kg	110-61001
SP MST6-P30 (Punch)	Replacement Punch	-	-	0.01 kg	110-61002

All dimensions in mm. Subject to technical changes.



One Step to the Web!

Manual Tensioning Tool for Metal Ties MST-M Series

MST9 for 8.9 mm strap width

The MST9 tool has been specially developed for reliably applying HellermannTyton metal cable ties of the MST-M Series. The punch-lock mechanism mechanically crimps the tie ensuring a reliable bundling with perfect resistance to vibration. The tension force is freely adjustable by the operator.

Features and Benefits

- Tough metal tool
- Ergonomic design
- Consistent tensioning and automatic cutting of metal ties
- Designed for use with MST-M Series ties (8.9 mm)



MST9.

TYPE	Description	Strap Width max.	Strap Thickness max.	Weight	Article-No.
MST9	MST9	8.9	0.4	0.54 kg	110-13000
SP MST9-P29 (Blade)	Replacement Blade	-	-	0.01 kg	110-13001
SP MST9-P30 (Punch)	Replacement Punch	-	-	0.01 kg	110-13002

All dimensions in mm. Subject to technical changes.



Application Tooling

Application Tooling for Cutting Plastic Ties

Manual Cutting tool for plastic ties

CUTties

The CUTties is a cutting tool for removing plastic cable ties. It ensures the strap of the tie is cut while preserving the wires and harnesses from being damaged in the process. Its use is recommended in many applications for which wires and harnesses have a high added value, in particular for railway and aviation industries.

Features and Benefits

- Cutting tool for plastic ties
- Tie can be cut off at any part of the strap
- Ensures the cable isolation from being damaged
- Light-weight aluminium housing, ergonomically designed
- Single-handed operation
- Three tools for cable tie width from 2.3 to 4.8 mm
- Coloured push rods allows their identification



The CUTties is a precise cutting tool for plastic ties.



Bring the tool perpendicular to the tie...



... apply light pressure...



... press on the button whilst maintaining pressure on the tool...



... release the button and remove the tool, the tie is cut.

TYPE	For Cable Tie Width	Colour	Weight	Article-No.
CUTties-1	2,3 - 2,8	Blue (BU), Yellow (YE)	0.075 kg	110-05000
CUTties-3	3,3 - 3,8	Blue (BU), Green (GN)	0.085 kg	110-05001
CUTties-5	4,0 - 4,8	Blue (BU), Red (RD)	0.089 kg	110-05002

All dimensions in mm. Subject to technical changes.



Snapper Tools

ASNP2-22 for Snapper Size 2 to 22

ASNP24-70 for Snapper Size 24 to 70

MSNP1-70 for Snapper Size 1 to 70

Features and Benefits

- For efficient fixing of the snapper hose clips
- MSNP tool: handy for installation on site
- ASNP tool: suitable for series production. The retaining screw limits the draw-in area and prevents overstretching of the snapper



Snapper Application Tools MSNP1-70 and ASNP24-70.



Pneumatic Tools for Snapper are available on request. Contact us!



Snapper hose clips for tubes and harnesses see page 140.



Snapper Application Tool ASNP2-22.

TYPE	Application	Weight	Material	Colour	Article-No.
MSNP1-70	SNP-Series 1 up to 70	0.18 kg	Metal, Plastic	Yellow (YE)	191-01700
ASNP2-22	SNP-Series 2 up to 22	0.20 kg	Metal, Plastic	Blue (BU)	191-02220
ASNP24-70	SNP-Series 24 up to 70	0.25 kg	Metal, Plastic	Red (RD)	191-24700

Subject to technical changes.



Gas powered Hot Air Tool

E4500

The E4500 hot air gun starter kit is ideal for working in cramped spaces or where there is no power supply. The kit includes a E4500 hot air tool with protective spring, gas cartridge P445, reflector nozzle Z2 and flat nozzle Z3. The hot air tool is suitable for shrinking all types of heat shrink products including tubing, shapes and cable repair sleeves. It can also be used for the bending and shaping of PVC pipes, soft soldering of copper pipes, drying, defrosting (of locks), heating and paint stripping.

Features and Benefits

- Cordless hot air gun works with special gas cartridge
- Does not need any power supply
- Suitable for outdoor use
- Designed for heat shrink tubing, end caps and moulded shapes
- Supplied with protective spring, two nozzles and a gas cartridge
- Allows precise working in any position even in restricted spaces
- Can be operated on its stand for hands free use
- Light weight tool
- Operating time of cartridge: approx. 1.5 hours
- With easy Piezo ignition



E4500-H with heat protecting spring.



Practical hot air gun kit E4500 with accessories.



Gas cartridge P445.



One Step to the Web!

TYPE	Description	Article-No.
E4500	Hot air gun with protective spring incl. gas cartridge, reflector nozzle Z2 and flat nozzle Z3	391-90002
P445	P445 Refill Gas Cartridge (Butane, Propane, Propene)	391-90101

Subject to technical changes.



Electrical Hot Air Tool

H5002 - handy tool

For applying heat shrinkable products like thin walled shrink tubing and moulded shapes.

Features and Benefits

- Lightweight and compact hot air tool
- Enables comfortable, fatigue-free work
- Temperature electronically controlled from 100-600 °C, cold air step of 50 °C
- Air-flow regulation adjusted in two stages (300 l/min and 500 l/min)



H5002 - The light, convenient hot-air tool.

TYPE	Description	Air Flow l/min	Operating Temperature	Standby Temp. °C	Wattage	Operational Voltage	Weight	Article-No.
H5002	H5002	300 - 500 l/min	+100 °C to +600 °C	50 °C	2,000 W	230 V AC ~ / 230-240 V	0.9 kg	391-50200

Subject to technical changes.

Electrical Hot Air Tool

H5004 - for professional use

H5004 electrical hot air tool is designed for shrinking down many heat shrinkable products like thin wall tubing, with and without adhesive, end caps and moulded shapes.

Features and Benefits

- Professional hot air gun
- Temperature electronically controlled
- Air flow regulation
- Equipped with LED temperature indication enabling precise temperature adjustment



H5004 - for professional use.

TYPE	Description	Air Flow l/min	Operating Temperature	Standby Temp. °C	Wattage	Operational Voltage	Weight	Article-No.
H5004	H5004	150 - 500 l/min	+50 °C to +650 °C	50 °C	2,300 W	230-240V, 50Hz	1.13 kg	391-50400

Subject to technical changes.



Hot cutting tool

HSG0

The HSG0 hand tool is used to cut braided sleeving cleanly and without fraying.

Features and Benefits

- Light and sturdy
- Heats up quickly with the press of button and cuts in seconds
- The yarn melts and fuses together
- No fraying of the sleeving



The HSG0 hot cutting tool prevents the braided sleeving from fraying.



A replacement blade is available with the item number 170-99002.

TYPE	Weight	Colour	Article-No.
HSG0	1.15 kg	Blue (BU)	170-99001


Subject to technical changes.


The professional way to fasten metal cable ties








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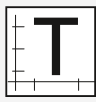
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Abbreviations Table for Product Materials and Colours

Abbreviation*	Material
ABS	Acrylonitrile Butadiene Styrene
ALU	Aluminium
AR	Acryl
CN	Cotton
CR	Chloroprene
CU	Copper
E/TFE	Ethylene-Tetrafluorineethylene
EPDM	Ethylen-Propylen-Dien-Terpolymer-Rubber
FPM	Fluoroelastomer (Viton)
HIR	Polyamide 6.6, high impact modified
HIRHS	Polyamide 6.6, high impact modified, heat stabilised
HL	Halar
HS	Polyamide 6.6, heat stabilised
HSW	Polyamide 6.6, heat stabilised and UV resistant on request
HV	Helvin
IIR	Butyl rubber
ML	Metal
NPB	Galvanised Metal
PA	Polyamide
PA11	Polyamide 11
PA12	Polyamide 12
PA46	Polyamide 4.6
PA6/PA66	Polyamide 6.6
PA66MP	Polyamide 6.6 with metal particles
PAP	Paper
PBT	Polyester
PC	Polycarbonate
PE	Polyethylene
PEEK	PolyEtherEtherKetone
PEN	Polyethylenaphtalat
PET	Polyester
PI	Polyimide
PK	Polyketone
PO	Polyolefin
POA	Elastomer modified
POM	Polyacetal
PO-X	Polyolefin, cross-linked
PP	Polypropylene
PPESB	Polyphenylenether, Polysterene
PPMOD	Polypropylene, modified
PPO	Noryl
PS	Polystyrene
PTFE	Polytetrafluoroethylene (Teflon)
PUR	Polyurethane
PVC	Polyvinylchloride
PVDF	Polyvinylidene fluoride
SI	Silicone
SP	Polyester
SS	Stainless Steel
ST	Steel
TPE	Thermoplastisc Elastomer
TPU	Thermoplastic Polyurethane
VO	Polyamide 6.6, Flamability according to UL94V0
W	Polyamide 6.6, UV resistant

*according to EN ISO 1043 Part 1 and ISO 1629

Abbreviation*	Colour
BK	Black
BN	Brown
BU	Blue
GD	Gold
GN	Green
GNYE	Green-Yellow
GY	Grey
OG	Orange
PK	Pink
RD	Red
SR	Silver
VT	Violet
WH	White

*according to DIN IEC 757

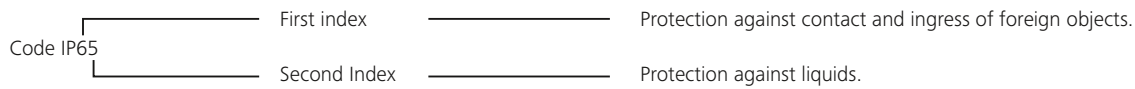
Abbreviation*	Colour
CL	Transparent
NA	Natural
YE	Yellow
BE	Beige
XX	Special colour
BV	Zinc-plated Metal
GC	Brass chromated
WC	White Chromated

*according to HellermannTyton

Definition of the degrees of protection according to DIN EN IEC 60529

The levels of protection are indicated by a code made up of two constant letters IP and two characteristic numbers for the degree of protection, e.g. IP54.

Example:



Degree of protection against access and foreign bodies















Index	Designation	Scope of protection
0	Non-protected	No special protection for persons against direct contact with live or moving parts. No protection of the equipment against ingress of solid foreign objects.
1	Protection against large foreign bodies	Protection against accidental contact of large areas with live and internal moving parts, e.g. back of hand, but not protection against deliberate access to the parts. Protection against ingress of solid foreign objects with a diameter greater than 50 mm.
2	Protection against medium-sized foreign bodies	Protection against contact between the finger and live or internal moving parts. Protection against ingress of solid foreign objects with a diameter greater than 12.5 mm.
3	Protection against small foreign bodies	Protection against contact between live or internal moving parts and tools, wires and the like with a thickness greater than 2.5 mm. Protection against ingress of solid foreign objects with a diameter greater than 2.5 mm.
4	Protection against granular foreign objects	Protection against contact between live or internal moving parts and tools, wires and the like with a thickness greater than 1 mm. Protection against ingress of solid foreign objects with a diameter greater than 1 mm.
5	Protection against dust deposits	Complete protection against contact with live or internal moving parts, protection against hazardous dust deposits. The ingress of dust is not completely prevented, but dust may not penetrate in such quantities as to impair the function.
6	Protection against dust entry	Complete protection against contact with live or internal moving parts. Protection against the ingress of dust.

Degrees of protection for water

Index	Designation	Scope of protection
0	Non-protected	No special protection.
1	Protection against vertically dripping water	Water dripping vertically must cause no damage.
2	Protection against dripping water (tilted)	Water dripping at an angle of 15° to the vertical from any direction must cause no damage.
3	Protection against spraying water	Water dripping at an angle of 60° to the vertical from any direction must cause no damage.
4	Protection against splashing water	Water that splashes against the equipment from any direction must cause no damage.
5	Protection against water jets	A water jet from a nozzle that is directed against the equipment from any direction must cause no damage.
6	Protection against flooding	Water must not penetrate the equipment in hazardous quantities in cases of temporary flooding, e.g. due to heavy seas.
7	Protection during temporary immersion	Water must not penetrate the equipment in hazardous quantities if the equipment is immersed in water under the specified conditions of pressure and time (1m for 30 min.).
8	Protection during continuous immersion	Water must not penetrate the equipment in hazardous quantities if the equipment is immersed in water (at least 2 bar for 2 h for HelaGuard IP68 non-metallic fittings and 5 bar for 5 h for HelaGuard IP68 metallic fittings.)
9k	Protection against high pressure/steam jet cleaning	Highly pressurised water directed at the enclosure from any direction must cause no damage.



Standards Overview

ABS	American Bureau of Shipping	USA	
ASN	AeroSpatiale Normalisation	France	
BV	Bureau Veritas	France	
CE	Conformité Européenne	Europe	
CSA	Canadian Standards Association	Canada	
DEF STAN	Defence Standard	Great Britain	
DNV	Det Norske Veritas	Norway	
DNVGL	Det Norske Veritas + Germanischer Lloyd	Norway	
EN	European Normative	Europe	
FCC	Federal Communications Commission	USA	
GL	Germanischer Lloyd	Germany	
GS	Geprüfte Sicherheit	Europe	
IEC	International Electrotechnical Commission	International	
JAR/FAR	Joint Aviation Regulations / Federal Aviation Regulations	Europe, USA	



Standards Overview

JN	Particular Specification developed for Eurofighter Program		
KBA	Kraftfahrt-Bundesamt	Germany	
LEA	Liste des Equivalences Approuvés	France	
LUL	London Underground Tested	Great Britain	
MIL	Military Specification	USA	
NF F	Norme Française Ferroviaire	France	
NSA	Norm Sud Aviation	France	
PAN	Panavia Aircraft GmbH	Germany	
SAE	Society of Automotive Engineers	USA	
STD	Standard for Dassault	France	
UL	Underwriters Laboratories	USA	
UL Recognized	Underwriters Laboratories Recognized	USA	
VDE	Verband der Elektrotechnik, Elektronik, Informationstechnik	Germany	
VG	Verteidigungsgerätenorm der Bundeswehr	Germany	



Standards for HellermannTyton Cable Ties and Fixings

Material	Colour	Specifications
CTT20R		
PA66	NA	UL62275
PA66HS	BK	
CTT60R		
PA66	BK	UL62275
KR6/35		
PA66	NA	DNV GL, EN 50149: 1999, IEC 62275
PA66W	BK	DNV GL, IEC 62275
KR8/21		
PA66	NA	DNV GL, EN 50149: 1999, IEC 62275
PA66W	BK	GL, EN 50149: 1999
KR8/33		
PA66	NA	DNV GL, EN 50149: 1999, IEC 62275
PA66W	BK	DNV GL
LFPC103		
PO	BK	DEF STAN 61-12
LFPC129		
PO	BK	DEF STAN 61-12
LFPC132		
PO	BK	DEF STAN 61-12
LFPC150		
PO	BK	DEF STAN 61-12
LFPC163		
PO	BK	DEF STAN 61-12
LFPC70		
PO	BK	DEF STAN 61-12
LFPC83		
PO	BK	DEF STAN 61-12
MBT14H		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MBT14S		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MBT14XH		
SS316	ML	BV, ABS, GL, IEC 62275
MBT20H		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MBT20S		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MBT20XH		
SS316	ML	BV

Material	Colour	Specifications
MBT27H		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MBT27S		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MBT27XH		
SS316	ML	BV
MBT33H		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MBT33S		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MBT33XH		
SS316	ML	BV
MBT5S		
SS316	ML	BV, ABS, IEC 62275
MBT8H		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MBT8S		
SS316	ML	BV, Det Norske Veritas, ABS, GL, IEC 62275
MLT12SS10		
SS316	NA	BV
MLT12SS5		
SS316	NA	BV
MLT12SSC10		
SS316, SP	BK	BV
MLT12SSC5		
SS316, SP	BK	BV
MLT16SS10		
SS316	NA	BV
MLT16SS5		
SS316	NA	BV
MLT16SSC10		
SS316, SP	BK	BV
MLT16SSC5		
SS316, SP	BK	BV
MLT24SS10		
SS316	NA	BV
MLT24SS5		
SS316	NA	BV
MLT24SSC10		
SS316, SP	BK	BV
MLT24SSC5		
SS316, SP	BK	BV



Standards for HellermannTyton Cable Ties and Fixings

Material	Colour	Specifications
MLT8SS10		
SS316	NA	BV
MLT8SS5		
SS316	NA	BV
MLT8SSC10		
SS316, SP	BK	BV
MLT8SSC5		
SS316, SP	BK	BV
MST200S		
SS304	ML	Det Norske Veritas
MST360S		
SS304	ML	Det Norske Veritas
MST500S		
SS304	ML	Det Norske Veritas
MST700S		
SS304	ML	Det Norske Veritas
PT220		
PEEK	BGE	GL, GL 19 329-11 HH, VDE
PT2A		
PEEK	BGE	GL 19 329-11 HH, VDE, PAN6481, GL
PT3B		
PEEK	BGE	PAN6481
T120I		
PA66HIR(S)	BK	BV 03856/H0 BV
PA66W		DNV GL, IEC 62275
T120L		
PA66HIR(S)	BK	BV 03856/H0 BV
PA66HS		BV 03856/H0 BV, DNV GL
PA66W	BK	DNV GL
T120M		
PA66HS	BK	BV 03856/H0 BV
PA66W		DNV GL, IEC 62275
T120R(E)		
PA46	NA	BV 03856/H0 BV
PA66HIR(S)	BK	
PA66HS	NA	
PA66W	BK	UL-ZODZ2.E64963, GL 87 847-88 HH, GL 86 137-81 HH, BV 03856/H0 BV
T120ROS		
PA66HS	BK	PAN6481

Material	Colour	Specifications
T120S		
PA66HS	BK	UL-ZODZ2.E64963, BV 03856/H0 BV
	NA	UL-ZODZ2.E64963, BV 03856/H0 BV, DNV GL
PA66W	BK	DNV GL, EN 50149: 1999, IEC 62275
T120XM		
PA66HS	BK	BV 03856/H0 BV
	NA	
T150L		
PA66HS	BK	UL-ZODZ2.E64139, MIL 53421
PA66W		DNV GL, IEC 62275
T150M		
PA66HS	BK	UL-ZODZ2.E64139
PA66W		DNV GL
T150R(H)		
PA66HS	BK	UL-ZODZ2.E85319, VG U48/04101
	NA	
PA66W	BK	UL-ZODZ2.E85319, GL 86 137-81 HH
T150XL		
PA66HS	BK	UL-ZODZ2.E64139
PA66W		UL-ZODZ2.E64139, DNV GL
T150XLL		
PA66W	BK	UL-ZODZ2.E64139, DNV GL
T18I		
PA66HS	BK	UL-ZODZ2.E85319
	NA	UL-ZODZ2.E85319, DNV GL
PA66W	BK	DNV GL, IEC 62275
T18L		
PA66HS	BK	UL-ZODZ2.E85319
	NA	UL-ZODZ2.E85319, DNV GL
PA66W	BK	DNV GL
T18R		
PA66HS	BK	UL-ZODZ2.E85319, VG U48/04101
	NA	UL-ZODZ2.E85319, VG U48/04101, Det Norske Veritas, STD78750, DNV GL
PA66W	BK	DNV GL, IEC 62275
T250R		
PA66HIRHSUV	BK	UL-ZODZ2.E64139
T250X		
PA66W	BK	UL-ZODZ2.E64139
T25LL		
PA66W	BK	DNV GL, IEC 62275



Standards for HellermannTyton Cable Ties and Fixings

Material	Colour	Specifications
T30L		
PA66HS	BK	UL-ZODZ2.E85319
	NA	UL-ZODZ2.E64963, BV 03856/H0 BV
PA66W	BK	DNV GL, IEC 62275
T30LL		
PA66HS	BK	BV 03856/H0 BV
	NA	BV 03856/H0 BV, DNV GL
PA66W	BK	DNV GL, IEC 62275
T30LOS		
PA66HS	BK	PAN6481
T30R		
PA66HS	BK	BV 03856/H0 BV
	NA	UL-ZODZ2.E85319, VG U48/04101, STD78750, DNV GL
PA66W	BK	DNV GL, IEC 62275
T30ROS		
PA66HS	BK	PAN6481
T40R		
PA66HS	BK	UL-ZODZ2.E64963, BV 03856/H0 BV
	NA	
PA66W	BK	DNV GL, IEC 62275
T50I		
PA46	NA	BV 03856/H0 BV
PA66HIR(S)	BK	
PA66HS	BK	UL-ZODZ2.E85319, BV 03856/H0 BV
	NA	VG U48/04102, BV 03856/G0 BV, BV 03856/H0 BV
PA66W	BK	DNV GL, IEC 62275
T50IDH		
PA66	NA	UL
PA66HS	BK	
PA66W		
T50L		
PA66HIR(S)	BK	BV 03856/H0 BV
PA66HS		UL-ZODZ2.E85319, VG U48/04101
		NA
PA66W	BK	DNV GL, IEC 62275
T50LDH		
PA66	NA	UL
PA66HS	BK	

Material	Colour	Specifications
T50LL		
PA66W	BK	BV 03856/H0 BV
T50LOS		
PA66HS	BK	PAN6481
T50M		
PA66W	BK	DNV GL, IEC 62275
T50MOS		
PA66HS	BK	PAN6481
T50R		
PA66HIR(S)	BK	BV 03856/H0 BV
PA66HS		
PA66W	BK	DNV GL, IEC 62275
T50RDH		
PA46	GY	Det Norske Veritas
T50S		
PA66HS	BK	BV 03856/H0 BV
	NA	BV 03856/H0 BV, DNV GL
PA66W	BK	DNV GL, IEC 62275
T50SOS		
PA66HS	BK	PAN6481
T80I		
PA66HS	BK	UL-ZODZ2.E85319
	NA	
PA66W	BK	DNV GL, IEC 62275
T80L		
PA66HS	BK	UL-ZODZ2.E85319, VG U48/04101
	NA	UL-ZODZ2.E85319, VG U48/04101, STD78750
PA66W	BK	DNV GL, IEC 62275
T80R		
PA66HS	BK	UL-ZODZ2.E85319, VG U48/04101
	NA	UL-ZODZ2.E85319, VG U48/04101, STD78750
PA66W	BK	DNV GL, IEC 62275

HellermannTyton UL-File No:

E 64 13 9	E 65 34 4
E 64 96 2	E 85 31 9
E 64 96 3	E 19 38 18



Standards for HellermannTyton Heatshrinkable Tubing

Type	Specifications
EPS-300	SAE - AMS - DTL-23053 / 4
EPS-400	
HFT-A**	ASN-E0126, CSA, DEF STAN 59-97/3, LEA, MIL-DTL-23053/5C, NF F 00-608, NSA937211, PAN6493, SAE - AMS - DTL-23053 / 5C, UL224 125 °C 600V, VG 95343
SE28	NF F 00-608, SAE - AMS - DTL-23053, VG 95343
TCN20	CSA, UL224 125 °C 600V VW-1
TCN20 overexpanded	
TF21	CSA, JAR/FAR 25.853, NF F 00-608, SAE - AMS - DTL-23053/5 Class 1, UL224 125 °C 600V VW-1
TF24	DEF STAN 59-97 Type 2B, SAE - AMS - DTL-23053/5 Class 2, VG 95343
TF31	CSA, UL224 125 °C 600V VW-1
TK20**	ASN-E0718, NSA937494, PAN6491, SAE - AMS - DTL-23053 / 8, UL224 150 °C 600V VW-1, VG 95343
Viton®-E**	LEA, VG 95343
TR27	DEF STAN 59-97 Type 8, EN 45545: 2013, LUL Engineering Standard E1042:A6

HellermannTyton UL-File No:

E 14 35 29 E 19 80 24

E 19 80 23

** Specifications apply to limited article numbers. Pls. contact our sales desk for further information.



Standards for HellermannTyton Cable Protection

Type	Specifications
Helagaine HEGP	EN 45545: 2013
Helagaine HEGPX	EN 45545: 2013, UL-Recognised
Helagaine HEGPV0	NF F 16-101
Helagaine HEGPV0X	NF F 16-101, UL-Recognised
Helagaine HEGPA66	EN 45545: 2013
Helagaine Twist-In	UL-Recognised
Helagaine HEGEMIP-VG	VG 96936-10

Standards for HellermannTyton Identification Systems

Type	Specifications
3:1 TULT	CSA, UL-Recognised
IT Ties	Cage Code 53421, DNV GL, MS3368, SAE - AS33681, UL-Recognised, UL-ZODZ2.E64139
M-BOSS Compact	CE
M-BOSS Compact Organiser	
Plain Labels - 1204	UL-Recognised
Plain Labels - 1206	
Plain Labels - 951	KBA (Kraftfahrzeugbundesamt) Germany, UL-Recognised
TAGHT	MIL-STD-202G Method 215K, SAE - AS81531
Thermal Transfer Ribbons Adhesive Labels	UL-Recognised
TT4000+ Printer	CE, FCC, UL
TT4000 Accessories	CE
TT430 Printer	CE, FCC, UL
TT430 Accessories	CE

Standards for HellermannTyton Application Tooling

Type	Specifications
EVO7	SAE - AS90387, Cage Code 53421
KR8PNSE	CE, GS
MK3PNSP2	
MK7P	
MK9	SAE - AS90387, Cage Code 53421
MK9P	CE, GS

Article-No. 553-40904 – 596-73124

Article-No.	Type	Page	Article-No.	Type	Page
553-40904	TULT9-3YE	193	596-12259	TAG43-16TD1-892-WH	199
553-40906	TULT9-3BU	193	596-12260	TAG43-21TD1-892-WH	199
553-40909	TULT9-3WH	193	596-12261	TAG43-41TD1-892-WH	199
553-41200	TULT12-4BK	193	596-12262	TAG52-10TD1-892-WH	199
553-41202	TULT12-4RD	193	596-12263	TAG63TD1-892-WH	199
553-41204	TULT12-4YE	193	596-12264	TAG68-16TD1-892-WH	199
553-41206	TULT12-4BU	193	596-12265	TAG102-64TD1-892-WH	199
553-41209	TULT12-4WH	193	596-12615	TAG15TD3-1206-WH	202
553-41800	TULT18-6BK	193	596-12616	TAG16TD3-1206-WH	202
553-41802	TULT18-6RD	193	596-12617	TAG17TD2-1206-WH	202
553-41804	TULT18-6YE	193	596-12627	TAG27TD2-1206-WH	202
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1. General

- 1.1 The following General Terms of Sale and Supply hereinafter referred to as "GTSS") apply to all current and future supplies and other services including any consultancy services and information of HellermannTyton GmbH (hereinafter referred to as "the Seller"). This will also apply even if the Seller does not refer the Customer to them again in subsequent transactions. The Customer's terms and conditions shall not form part of a contract even if the Seller does not expressly raise objections. Instead, these GTSS shall apply exclusively.
- 1.2 These General Terms of Sales shall apply only to companies, legal persons under private law or special funds under public law within the meaning of Section 310 paragraph 1 German Civil Code (BGB).
- 1.3 Quotations by the Seller are made without obligation. A duty to supply will not exist until the Seller issues a written confirmation of order.
- 1.4 All agreements that are made between the Seller and the Customer shall be put in writing in the contract.
- 1.5 In case of doubt, Incoterms 2010 shall prevail for the interpretation of trade terms.
- 1.6 The Customer may only assign to third parties claims against the Seller arising from this contract with the prior express consent of the Seller.
- 1.7 Where individual provisions of these GTSS are or become ineffective, this shall not affect the validity of the rest of the provisions. The invalid provision shall be replaced by such existing provision as is common practice in the trade for this event and, where there is no permissible provision that is common practice in the trade, the corresponding statutory provision.

2. Prices and payment conditions

- 2.1 Unless otherwise agreed in writing, prices quoted are ex works or ex Seller's warehouse exclusive of ancillary costs such as freight, customs clearance, packaging and insurance. Turnover Tax at the current statutory rate will apply. For minimum orders under 150 Euros (net less Turnover Tax) the Seller will charge a minimum order surcharge of 25 Euros (net) per delivery.
- 2.2 All invoices – subject to any divergent written agreement in individual cases – are payable within thirty days of date of invoice.
- 2.3 Payments must be made free of charge, in the agreed currency and with provision of the account number, exclusively to the Seller's accounts shown in the invoice. They must be made on the date due free of charge and without any deduction. Completion for payments of all types is the date on which the Seller has unrestricted access to the payment.
- 2.4 The Seller is not obliged to accept bills of exchange or cheques. If permitted they will only be accepted subject to possible discounting against payment of all charges. The Seller is not obliged to submit bills of exchange or cheques on time or to lodge protests.
- 2.5 In the event of payment default by the Customer, default interest of 9 (nine) percentage points p.a. over the current basic interest rate according to § 247 BGB [German Civil Code] shall be chargeable. The claiming of further loss caused by default shall remain reserved.
- 2.6 Rights of set-off or retention shall be available to the Customer only if its counterclaims are legally established, unchallenged or recognised by the Seller. This restriction shall not apply to the right of retention pursuant to § 320 BGB.
- 2.7 In the event of a petition to commence insolvency proceedings against the Customer's assets, if the Customer has initiated out-of-court proceedings to settle the debt or has stopped payments, or if the Seller is aware of other circumstances which substantially reduce the creditworthiness of the Customer and appear to threaten fulfilment by the Customer of the counter-performance, the Seller is entitled to seek security by advance payment or bank guarantee (at the Customer's choice) for outstanding supplies by fixing a period of at least one week and to delay supply until the security is made. The Seller is further entitled after the fruitless expiry of a reasonable period of grace to withdraw from this contract or to demand compensation for non-fulfilment of contract. In this case the Seller may also withdraw the authority to resell together with the authorisation to collect under 5.3 and 5.6 and the right to handle and process, combine and mix goods already supplied under 5.2 and 5.3 and also to demand the return of the goods supplied.

3. Supply and acceptance

- 3.1 The Seller's duty to supply is conditional on it receiving delivery that is complete, correct and on time in as far as the Seller obtains the goods as complete or as components of the goods from a subcontractor. This shall not apply if the Seller is responsible for non-delivery or delay. Failure to supply for which the Seller is not responsible shall entitle the Seller to withdraw from the Contract.
- 3.2 The Customer shall bear the risk and cost of shipment of the goods ex works/ ex warehouse (EXW) as well as the cost of any transport insurance. This shall also apply if shipment is by a carrier chosen by the Seller.

- 3.3 The risk passes to the Customer directly on leaving the Seller's premises – even in the case of carriage-paid deliveries.

- 3.4 Should the goods be ready to be shipped, and dispatch or assignment of space and/or acceptance is delayed on grounds beyond the Seller's control, the risk shall pass to the Customer upon receipt by the Customer of notification of readiness to ship.

- 3.5 The customer may not return excesses or shortfalls in supply of a reasonable size and must pay for such deliveries immediately upon receipt. Objection to an excess or shortfall in supply shall not entitle the Customer to refuse further shipments under the same or a different contract. The Seller reserves the right to oversupply or undersupply by 10% of the quantity ordered in the case of special orders. The actual quantity supplied will be invoiced in each case.

- 3.6 The Customer will also be in default of acceptance when the goods are ready for shipment if, in the case of delivery EXW or an agreed obligation to collect by the Seller, the delivery is merely offered in writing by the Seller or the Customer has declared that it will not accept the delivery.

- 3.7 The Customer must promptly accept goods notified as ready for shipment under the terms of the contract. Otherwise the Seller is entitled either to ship the goods at the risk and cost of the Customer or place the goods in store and to invoice after a grace period of one week has elapsed, as the Seller chooses. The same will apply if the goods have not been retrieved in full or in part within the period agreed for retrieval.

- 3.8 If the Customer falls more than one month behind in fulfilling the obligations resulting from the above arrangements, the Seller can, notwithstanding rights that extend further, demand from the Customer a contractual penalty of 5 (five) percent of the invoice value in place of fulfilment of contract, and sell the goods stored elsewhere. The contractual penalty must be calculated against the compensation the Customer would have to pay if the situation arose. The Customer must repay any quantity discount granted on earlier deliveries.

- 3.9 The Customer has to provide certificates of delivery. To this end, the Customer has to prove that goods have been delivered by sending the relevant original document to the Seller within four weeks of collection/shipment of the goods. If the document is not received by the Seller within this period, the Seller shall be entitled to invoice the Customer for the turnover tax applicable to the net value of goods at the moment in time.

4. Delivery periods and deadlines

- 4.1 Observance of delivery periods and dates is subject to the timely fulfilment of contractual obligations on the part of the Customer. Delivery periods start with the date of the Seller's confirmation of order but not before clarification of all details for execution of the order and receipt of all materials required for execution of the order and of other details to be supplied by the Customer and the receipt of any payment agreed. The delivery period will also be considered to have been met if the goods leave the works or warehouse at the time agreed or notification of readiness to ship has been sent to the Customer but the goods have not been shipped on time for reasons for which the Seller is not responsible. The above arrangements shall apply to the delivery dates correspondingly.

- 4.2 Unforeseeable events beyond the control of the Seller such as war, risk of war, unrest, the use of violence by third parties against persons or property, intervention involving sovereignty including currency and commercial policy measures, employment disputes at the Seller's company or its suppliers or shipping companies, interruptions to the transport links provided, fire, shortages of raw materials, shortage of energy and other non-fault operating problems at the Seller's company or its suppliers will extend fixed delivery periods and dates by the duration of the obstruction. This shall also apply to the extent that the Seller is already in default of delivery or to the extent that the foregoing obstructions to delivery were already present before conclusion of the contract but the Seller was not aware of them. The Seller shall advise the Customer immediately of obstructions of the type mentioned above.

- 4.3 If delivery delays caused by the obstructions last longer than two months, both parties shall be entitled to withdraw from the contract. The Customer may only withdraw if the Seller, at the former's request, fails to state within a week whether it wishes to withdraw or make delivery within a reasonable period. The same right to withdraw shall arise independently of the above period, if completion of the contract has become unreasonable for one of the parties in view of the delay that has occurred.

5. Reservation of ownership

- 5.1 All goods delivered shall remain the property of the Seller (reserved goods) until complete and final fulfilment of all claims arising from the business connection for whatever legal reason. The same shall also apply in respect of any future or conditional claims arising from contracts entered into concurrently or later within the context of the business connection. For current invoices, the reserved property shall serve as collateral for the receivables of the Seller from a current account relationship.

- 5.2 Treatment and processing of reserved goods shall be performed for the Seller as manufacturer within the meaning of Section 950 BGB, without placing any obligation on the Seller. In the event of treatment/processing, linking or mixing of the reserved goods by the Customer with other goods not belonging to the Seller, the Seller shall have joint ownership of the new item in the ratio of the invoice value of the reserved goods to the invoice value of the other goods used. If ownership by the Seller of the reserved goods expires by linking, mixing or treatment/processing of the reserved goods the Customer will transfer the title it holds in the new part or item to the extent of the invoice value of the reserved goods and will hold it for the Seller free-of-charge with the due care of a prudent businessman. If the Seller acquires ownership or joint ownership of the new item, it shall transfer its ownership or joint ownership of the new item to the Customer under the condition of precedent that the full purchase price will be paid.
- 5.3 The Customer may only sell the reserved goods in the normal course of its business and only on its normal terms of business provided that concurrently the claims under the resale pass to the Seller as per 5.4 to 5.6. The Customer is not entitled to any other dispositions of the reserved goods, in particular to a pledge or transfer by way of security. The above authorisation will expire in the event of the Customer's default of payment. The authorisation may also be cancelled by the Seller in the cases listed in No. 2.6, by a breach of the foregoing obligations and in the case of non-payment of an invoice when due. In such cases, the Customer is also prohibited from treating and processing the reserved goods and linking or mixing them with other goods.
- 5.4 The demands and other claims including the Customer's collateral rights arising from the resale of the reserved goods are now, i.e. with the agreement of these GTSS, assigned to the Seller, which hereby accepts the assignment. They shall serve to secure the Seller's claims to the same extent as the reserved goods. If the reserved goods are sold by the Customer with other goods not supplied by the Seller, the claim arising from the resale shall be assigned in the ratio of the invoice value of the reserved goods to the invoice value of the other goods. When goods are sold to which the Seller has joint title under 5.2, the Seller shall be assigned a part corresponding to its share under the joint title.
- 5.5 The Customer is entitled to collect receivables from the resale. The Customer shall notify the Seller immediately of any detriment to its rights through third parties by delivering any documents required for intervention. Any intervention costs incurred shall be borne by the Customer.
- 5.6 The Seller may, if the Customer is more than two weeks in arrears with its payment obligations to the Seller, demand the return of the reserved goods and collect the demands and other claims assigned to the Seller. Furthermore, the Seller may use the reserved goods to satisfy its claims as soon as the Seller has withdrawn from the contract or the conditions for a claim for compensation on the grounds of non-fulfilment have arisen.
- 5.7 If the collectible value of the existing securities exceeds the secured claims by a total of 10 (ten) percent, the Seller, at the Customer's request, will undertake to release securities to extent selected by the Seller.
- 6. Nature of the goods and warranty**
- 6.1 To the extent that the Seller places test pieces or samples at the disposal of the Customer or receives them from the Customer, or quotes analyses, DIN provisions, other domestic or foreign quality standards or gives other details on the quality of the goods, these shall merely serve to specify in more detail the services to be provided by the Seller. No guarantee of quality is associated with these details.
- 6.2 In particular, the Seller does not undertake to assess whether the goods meet or are suitable for the specific purpose intended by the Customer. Contrary to the rule above, in case of new parts to be developed for the Customer in accordance with the Customer's requests, an individual agreement relating to the specific purpose is required.
- 6.3 The Customer shall inspect the goods delivered without delay with the care it considers reasonable and (if necessary by way of a test process) check the quality of the goods supplied and raise a claim for any identifiable defects without delay but no later than 7 (seven) days of receipt of the goods in writing (as far as possible and reasonable, enclosing samples) quoting the invoice, manufacturing and shipping numbers. Hidden defects must be similarly notified immediately when they are detected during the normal course of business. Otherwise the goods will be deemed approved without reservation. Any further obligations of the Customer under Section 377 HGB [German Commercial Code] shall not be affected.
- 6.4 No claims for defects will apply if the Customer fails to grant third party rights of recourse, processes defective goods without prior quality control or supplies goods claimed as defective to third parties without giving the Seller the opportunity to check the defects constituting the claim. The same shall apply to inappropriate or improper use of the goods, faulty assembly or commissioning by the Customer or third parties, improper modifications to the goods supplied, natural wear and tear and faulty or careless handling.
- 6.5 If claims for defects or complaints are justified, the Seller undertakes at its choice either to repair or remedy the defect or supply a replacement. Sorting measures by the Customer shall be agreed in writing with Seller prior to their commencement. In the event of repair, the Customer shall pay any extra costs arising from the goods supplied being taken to a place other than the place of performance.
- 6.6 If the repair chosen by the Seller should repeatedly be unsuccessful; if it should be unreasonable to expect such of the Customer; if it should be refused by the Seller or be delayed beyond a reasonable period on grounds within the Seller's control, the Customer may – notwithstanding any claims for damages – withdraw from the contract or reduce the purchase price.
- 6.7 Warranty claims for defective goods shall expire within one year after passing of the risk. This shall not apply where the law prescribes longer time limits pursuant to § 438, sub-section 1, No. 2 BGB (Building Works and Items for Building Works), § 479 sub-section 1 BGB (Recourse Claim) and § 634 a sub-section 1 No. 2 BGB (Structural Defects) or where the Seller is liable due to wilful intent.
- 6.8 Furthermore, any claims for damages are limited according to No. (7).
- 7. Limitation of claims for damages and reimbursement of expenses**
- 7.1 The Customer's claims for damages and reimbursement of expenses against the Seller or the Seller's employees, representatives and vicarious agents, on whatever legal grounds, are precluded, unless the aforementioned are held liable for wilful intent, gross negligence, the acceptance of a guarantee given, the acceptance of a risk of sourcing, harm to life, limb and health or fundamental contractual duties. This shall also apply to any claims for damages arising from incorrect supplier declarations. This ruling does not shift the burden of proof to the detriment of the Customer.
- 7.2 The Customer's claims for damages and reimbursement of expenses against the Seller or the Seller's employees, representatives and vicarious agents due to the infringement of essential contractual obligations are limited to the foreseeable damage typical of the contract. Essential contractual obligations will be deemed to mean such obligations as those which, when violated, threaten the purpose of the contract, e.g. in cases of substantial delay, considerable infringement of cooperation, notification or confidentiality obligations or in the case of considerable violation of obligations that may determine the success or failure of the contract. This above provision does not in any way shift the burden of proof to the detriment of the Customer.
- 7.3 Apart from cases involving wilful intent, gross negligence or injury to life, limb and health, when determining the amount of damages to be paid by the Seller due consideration adequately in favour of the Seller shall be given as to the economic capabilities of the Seller as well as to the nature, scope and duration of the business relations between the contractual partners as well as to a particularly unfavourable situation of installation of the part supplied. Especially damages, cost and expenditures which shall be paid by the Seller must be in reasonable ratio to the value of the part supplied.
- 7.4 Contractual claims for damages and reimbursement of expenses against the Seller or its employees, representatives and vicarious agents, on whatever legal grounds, shall expire after one year at the latest. The special regulation for warranty claims for defective goods in No. (6.7) is not affected.
- 7.5 Where the Seller is mandatorily liable under the Product Liability Act of 15 December 1989 for damage to property or personal injury caused by a product's defects, the provisions of the Product Liability Act shall prevail. The foregoing rules shall still apply to an internal settlement under § 5 sentence 2 of the Product Liability Act.
- 8. Intellectual property rights**
- The Seller reserves the copyright to drawings and other design materials. Such materials must not be made accessible to third parties. Where the Seller manufactures goods to the Customer's drawings, samples or other details and infringes third-party intellectual property rights thereby, the Customer shall indemnify the Seller against all claims associated with such infringements.
- 9. Place of performance, jurisdiction and applicable law**
- 9.1 Tornesch shall be the place of performance for delivery and payment.
- 9.2 Itzehoe shall be the forum for any legal disputes arising from or about the existence and validity of this contract including those arising from cheques or bills of exchange – insofar as the Customer is a trader or a special fund under public law. However, the Seller may instigate legal proceedings against the Seller at any other jurisdiction that is given under the Code of Civil Procedure.
- 9.3 The contractual relationship shall be governed by the law of the Federal Republic of Germany. The provisions of the UN Treaty on International Trade (CISG) are excluded.

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
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