

Logistics Guidelines Hansgrohe SE

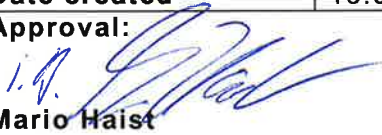
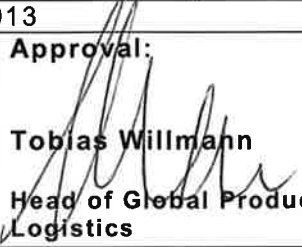
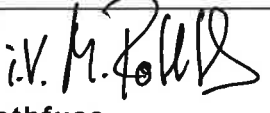
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List of Abbreviations

COD	Cash on delivery
EPAL	European Pallet Association
FEFCO Code	International fibreboard case code
HG	Hansgrohe SE
HGB	German Commercial Code
IPPC	International Plant Protection Convention
ISPM	International Standard of Phytosanitary
KLT	Hand Held Tote
QC	Quantity Contract
SLT	Special Containers
SNC	Supplier Network Collaboration
ULT	Universal Multi-use Packaging
VDA	German Association of the Automobile Industry

1 Introduction

The purpose of this document is to define guidelines for the stream-lining of logistics processes from the supplier to the assembly, taking into account the following:

- necessary protection of the parts
- cost-effectiveness
- compliance with standard process specifications defined by HG

Aim

To ensure the provision of materials for the assembly process which meet the requirements of production.

2 Communication

The supplier's contact person must be available at all times during specified business hours on working days. In emergencies and during delivery bottlenecks a qualified contact person must be available at any time, e.g. with a mobile number.

2.1 Response Time & Escalation Plan

For escalation enquiries, e.g. a looming delivery bottleneck, a response within one hour by the supplier is essential. Alternate contacts must also be established for all supplier's contact persons.

During extended periods of supply difficulties, a recovery plan must be provided. This plan must be approved by the MRP Controller responsible for the parts.

2.2 Information Policy

Discrepancies in a delivery which are outside the specified tolerances (under-delivery/over delivery) as well as each and every delivery bottleneck must be immediately communicated by the supplier to the responsible MRP Controller.

Additional requirements will be indicated in good time to the supplier by the responsible MRP Controller including quantity and delivery date. The supplier must inform the MRP Controller within one (1) working day whether the demand for additional requirements can be met. If this is not possible, the supplier must provide to the MRP Controller the best possible alternative delivery date or when only partial quantities are available, a detailed delivery plan.

2.3 Holiday Shut-down of the Supplier

During a holiday shut-down at the supplier, the supplier must still ensure delivery according to the order release schedule. HG is not responsible for planning in advance for the time of the holiday shut-down at the supplier.

2.4 Forwarding Requirements

The suppliers will receive requests in the form of call-off orders relevant to the quantity contract or individual orders within the agreed delivery schedule.

In principle, call-off orders and individual orders are only deemed legally binding if they are forwarded in written form (fax, email) or transmitted via the supplier portal. The delivery times stated in the call-off denote the date of delivery at HG.

2.5 Packaging Specifications

Valid packaging specifications are included in the order form by HG. In case of irregularities in this respect, the supplier is obligated to notify the responsible MRP Controller without delay.

The supplier will deliver the parts in accordance to the packaging specifications outlined in the packaging definitions and the instructions of the logistics guidelines.

In case a delivery is damaged, incorrectly employed containers or containers used contrary to regulations HG reserves the right to charge the supplier for additional expenses (repackaging, repairs etc.).

3 Returnable Packaging Management

3.1 Returnable Packaging Exchange & Entries

The available stock of returnable packaging and quantities in circulation is controlled by the returnable packaging management department at HG. The following overview lists all types of returnable packaging approved by HG and the type of accounting for empty containers.

Figure 1: Overviews Returnable Packaging

Returnable Packaging Type	Interchangeable	Account keeping
KS 001	no	supplier
KS 01	no	supplier
KS 02	no	supplier
KS 04	no	supplier
KS 06	no	supplier
KS 10	no	supplier
Pallet top cap	no	supplier
Tie down	no	supplier
Lid for KS container	no	supplier
Wire basket	no	supplier
Wire pallet box	yes	haulage company
Euro pallet	yes	haulage company

3.1.1 Interchangeable Packaging

When interchangeable packaging such as Euro pallets and wire pallet boxes are used, then the step-by-step exchange with the freight carrier of the commissioned haulage company applies.

Regarding the Euro Pallets the following quality requirements apply:
Pallets of good quality have the following attributes:

- Existing, normal nail pattern
- Visible markings on the long side of the pallet blocks:
 - Left:** Marking of the European Pallet Association
 - Middle:** Marking from a European railway company with the country and manufacturers code.
 - Right:** Marking of the European Pallet Pool

Figure 2: Markings on a Euro Pallet



- Fixed deck boards
- No rough edges
- No mold
- Repaired pallets possess an inspection tag and repair marking nail

Used pallets are sorted into the following classes depending on wear.

Table 1: List of Pallet Classes

Criteria	New	Class A	Class B	Class C
Four-way, flat wood pallet (EUR 800mm x 1200 mm)	X	X	X	X
No missing components, ex. deck boards, runners, blocks	X	X	X	X
No rotten, wet, or putrefied components	X	X	X	X

No non-standard components	x	x	x	x
No protruding or broken deck boards	x	x	x	x
No twisted pallet blocks > 1 cm over the Length / Width	x	x	x	x
No splintering, chipping with visible fastening elements i.e. nail shaft.	x	x	x	x
No wet surfaces i.e. by weather, normal or inappropriate use.	x	x	x	x
No contaminates that could affect the loaded goods i.e.: paint, oil, smells etc.	x	x	x	x
No attachment of packaging materials i.e.: Foil, Paperboard or Banding.	x	x	x	x
Normal wear and tear		x	x	x
Each required marking is readable in at least one place on the pallet	x	x	x	x
All required markings are readable	x	x	x	
No protruding splinters as a result of use	x	x	x	
No protruding fasteners i.e. Nail heads	x	x	x	
Light Wood	x	x		

The above pallet classes will be accepted by HG, but only Class B or higher will be exchanged.

The following attributes make the EU Pallets non-interchangeable:

- Required markings missing.
- A missing deck board or pallet block.
- More than one nail shaft is visible.
- Broken deck boards.
- At least one pallet block is twisted.
- The pallet is dirty and the dirt can contaminate the goods.
- Pallet surface is rotten, wet or putrefied.
- Rough edges are present.
- Show signs of heavy splintering.
- The deck boards are too thin or the pallet blocks too narrow and it results in a reduction in weight capacity.
- Miscellaneous unrepairable damage.

These will not be accepted by HG.

3.1.2 Non-Interchangeable Returnable Packaging

If the returnable packaging is not interchangeable, such as the Hansgrohe-owned hand held containers, a container account is kept directly with the supplier.

3.2 Management of Hansgrohe Hand Held Containers

The Hansgrohe-owned hand held containers must be exclusively used for the purpose of storing finished goods at the supplier and transporting them to plants of HG via a haulage company. It is the supplier's responsibility to make sure that there is sufficient stock of HG hand held totes at all times, so that the supply of components to HG is always guaranteed.

In principle, the quantity of revolving stock of HG hand held totes must be agreed upon with the supplier and approved by HG. HG will track the trend of the container stock. Use of HG hand held containers to ship goods to a sub-contractor must be approved by HG. In this case the supplier will be responsible for the stock of the entire delivery chain.

3.2.1 Management Revolving Stock Hansgrohe Hand Held Containers

The quantity of revolving stock at the supplier's may only be increased when a larger number of HG hand held containers becomes necessary due to an increase in quantity or an expansion in the range of parts. The supplier must inform the Hansgrohe container management (E-Mail: behaeltermangement.wsw@hansgrohe.com) in advance of these additional requirements and state the reasons.

3.2.2 Management of Bottlenecks

Delivery bottlenecks must be communicated to the HG container management by the supplier without delay. If this notification is not done in time, HG reserves the right to invoice the supplier for the costs of the replacement order.

If the notification is on time but there are no containers available then the delivery must be made in the corresponding container conforming cartons (see Section 7). In these cases, an e-mail should be sent to returnable container management (behaeltermangement.wsw@hansgrohe.com) to avoid any notice of defects.

3.3 Returnable Container Audits

HG reserves the right to carry out regular audits in order to evaluate the empty container management at the supplier based on the following criteria:

- Earmarked use of Hansgrohe-owned returnable packaging
- Random stocktaking and inventory adjustment with the HG system

- Organization of empty container control in respect of stock, tidiness & cleanliness and sound processes

3.4 Purchasing and Financing

Costs will be charged according to the type of returnable packaging as described below.

These instructions contain explicit allocation of responsibilities between HG and our suppliers.

3.4.1 Types of Returnable Packaging

There are essentially three different types of returnable packaging in the HG network defined below in detail.

Universal Multi-use Packaging (ULT)

The term ULT is used for the following two types of interchangeable or multi-use packaging: Euro pallets and Euro Wire pallet boxes. Further technical data can be accessed on the homepage of HG (www.hansgrohe.com/en/12464.htm), the supplier portal, as well as from chapter 6 of these Logistics Guidelines.

Hansgrohe-owned returnable packaging

This type of returnable packaging refers to all items which are obtained from HG and for which the inventory management is handled by HG. Included are all Hansgrohe-owned hand held containers, returnable dunnage and inserts.

Special Containers (SLT)

All returnable packaging which is not interchangeable, universal or owned by Hansgrohe come under this category. Expendable packaging materials like cotton cloths, bubble wrap, transparent display windows, cloth bags, padding made of fleece or a similar material, as well as returnable packaging owned by the supplier (returnable containers, dunnage, inserts, etc.) fall under this category.

3.4.2 Responsibilities Purchasing/Financing

The responsibility for purchasing and financing returnable packaging refers to the initial stock of packaging when starting a production run as well as coverage of additional requirements from increased production at the supplier.

The purchasing and absorption of costs of returnable packaging depends on the category.

Figure 3: Overviews of Procurement and Financing

Type	Procurement	Financing
Universal Multi-use Packaging (Wire pallet boxes, pallets)	supplier	supplier
HG Returnable Packaging (HG dunnage, inserts, KLTs)	Hansgrohe SE	Hansgrohe SE
Special Containers (inserts, boxes)	supplier	supplier

Universal Multi-use Packaging (ULT)

The purchasing and financing of universal multi-use packaging is carried out under the responsibility of the supplier. Here the multi-use packaging is purchased on the open market.

HG Returnable Packaging

Hansgrohe-owned returnable packaging will be purchased, managed and made available to the supplier by HG returnable container management.

Special Containers (SLT)

In the case of special containers, the supplier is exclusively responsible for purchasing and absorption of costs.

4 Transport and Delivery Procedure

4.1 Means of Transport

Only vehicles, able to use a ramp, will be unloaded at HG. The use of vehicles not able to be unloaded at a ramp must be agreed upon in advance with the responsible MRP Controller.

4.2 Delivery Times

Deliveries outside the scheduled times are only acceptable in exceptional circumstances and only following arrangements with the responsible MRP Controller and receiving department. Exceptions require special arrangements otherwise the shipment of goods will not be unloaded. HG reserves the right to charge the supplier for additional costs based on late deliveries.

4.3 Special Trips & Return Deliveries

Transport costs incurred due to negligence on the part of the supplier (special trips due to quality defects, delayed delivery, return delivery due to early or over delivery), will be charged to the supplier.

4.4 Documents & Delivery Notes

Delivery documents must be presented in full to the receiving department when delivering a shipment of goods. It is the responsibility of the supplier to complete the delivery documents in the proper form. Deliveries without the specified information will not be accepted and returned at the expense of the supplier.

4.4.1 Content of Delivery Notes

Suppliers linked to the HG SNC will use the SNC document generated following notification of delivery. **One delivery note** must be attached visibly and securely to the pallet load or shipping unit.

Suppliers who are not linked to the HG SNC must include the following information on the delivery note.

- Delivery destination address
- Delivery note number in bar code and text
- Date of delivery note
- Reference to the order number/call-off regarding the quantity contract as bar code and text
- Type of packaging
- Quantity as bar code and text
- Delivery unit

- Material number as bar code and text
- Material description
- Different revision status of materials
- Delivery date
- Sender
- Recipient

The bar code formats accepted by HG are 2/5 Interleaved and Code 128.

Do not modify any delivery notes by hand. All documents attached to the shipment have to have the same delivery destination.

Only one delivery note per mixed pallet is needed. Violation of these guidelines may result in claims and contractual penalties according to the individual agreements of each framework supply agreement.

4.4.2 Content of Freight Forwarding Orders

It is the responsibility of the supplier to notify the haulage company with adequate time prior to a delivery to HG.

In consultation with the haulage company, the supplier must ensure that the freight lists contains the following information:

- Recipient
- Sender
- Type of container(s)
- Number of containers
- Contents (goods, return delivery, empty containers, other)
- Weight
- Delivery number
- Cash on delivery (COD)
- Freight terms

4.4.3 Bill of Lading for HG Returnable Packaging

Hansgrohe-owned containers used in the scope of delivery and Hansgrohe transportation inserts must be listed by the supplier. The Returnable Packaging Bill of Lading must be accessed from the HG homepage (www.hansgrohe.com/en/12464.htm) by the supplier. The following information must be included

- Number of containers/transport inserts as bar code and text
- Identification of container/insert
- Quantity as bar code and text
- Delivery address
- Sender

- Recipient
- Individualized number of receipt as bar code and text

Universal Multi-use packaging (pallets and wire pallet boxes) do not have to be indicated. These will be exchanged directly by HG with the haulage company.

4.4.4 Labeling Requirements

Placement of Labels

The correctly completed goods label, in line with VDA 4902, must be attached to each pallet load or shipping unit in a clearly visible and secure manner. Additionally a goods label must be attached to each small container or package. Labels and dockets which are not relevant must be removed.

The goods label must contain the following information:

- Material number in bar code and text
- Material description
- Name of supplier
- Accounts payable number in bar code and text
- Order number in bar code and text
- Quantity in bar code and text
- Delivery note number in bar code and text
- Country of origin in bar code and text
- Current revision status on each container label (inserted in the input field “change status construction”)

Figure 4: Example of Label according to VDA 4902

(1) Warenempfänger InfoTec EDV Consulting & Solutions Dieselstr. 14 76275 Ettlingen		(2) Abladestelle - Lagerort - Verbrauchsstelle -		
(3) Lieferschein-Nr. (N) 12354862 		(4) Lieferantenanschrift (Kurzname, Werk, PLZ, Ort) InfoTec, Ettlingen		
		(5) Gewicht netto (KG) 250	(6) Gewicht brutto (KG) 270	(7) Anzahl Packstücke 1
(8) Sach-Nr. Kunde (P) 765432123 				
(9) Füllmenge (Q) 10 ST 		(10) Bezeichnung Lieferung LabelServe OEM Pakete		
(12) Lieferanten-Nr. (V) 0100254 		(11) Sach-Nr. Lieferant IT0001 		
		(13) Versanddatum D 01.01.08		(14) Änderungsstand Konstruktion
(15) Packstücknummer (S.M.G.) 44001030001 		(16) Chargen-Nr. (H) 5554321 		

Figure 5: Label for Containers according to VDA 4902

(1) Wareneinfänger Audi AG Ettinger Strasse Tor 10 85045 Ingolstadt	(2) Abteilungs- / Lager- / Verbrauchsteile 60163 A43 Halle A43	(3) Lieferschein-Nr. (N) 12345678
(8) Sach-Nr. Kunde (P) 3N1 867 818 AH DNZ		
(9) Füllmenge (Q) 20 ST	(10) Bezeichnung Lieferung, Leistung ELEKTR. STEUERGERAET	
(12) Lieferanten-Nr. (V) 011874902	(11.2) Packmaßtyp 00641	
(15) Palettennummer (S.M.G) S123456789	(13) Verpackdatum U 99.12.19	(14) Anfertigungsdatum Konstruktion KAM3A0042
	(16) Chargen-Nr. (R) 1234567	

4.4.5 Consignment Delivery Requirements

The following requirements are valid when delivering to the consignment warehouse.

- Numbering and labeling of single cartons:
Each carton label must contain a running number, material number, and material description.
- Numbering and labeling of the pallet load
Each packing list (see attachments 1 and 2) must contain:
 - A running pallet number
 - The quantity and running number of cartons per pallet
 - The material number
 - Quantity of articles
- On the master delivery note described in section 4.4.1, a pallet number for each material number must be listed. Additional for overseas shipments the invoice and sea container numbers must also be listed.

Figure 6: Example of Delivery to the consignment warehouse



4.5 Milk Run

The supplier must have the goods called-off the previous day by HG ready for delivery and on the dock at the arranged time for the milk run truck. Notification to the haulage company is not necessary, due to the fixed route and pick up time. Delays in the provision of material have to be clarified directly with the milk run head of service.

Additionally, in case of delays or other disruptions, the supplier is obligated to immediately notify the responsible HG MRP Controller.

4.6 Subcontracting

For subcontracted components, HG issues the delivery papers for the supply. The component subcontractor must immediately carry out an inspection upon receipt of goods according to §377 in the HGB (German Commercial Code). This includes an inspection of the delivery for any obvious damage incurred during transport.

The responsible MRP Controllers must be informed immediately in case of discrepancies.

5 Packaging Specifications for Inbound Material

5.1 Supplier Responsibility

The foremost responsibility of the supplier is to package parts in a manner that preserves part quality during transport to HG. The packaging proposal from HG is provided for guidance only.

The supplier must present a packaging concept that adheres to the packaging specifications detailed in these Guidelines. When special packaging (insert, bulk container, etc.) is required that is not a HG Standard or currently used to ship goods to HG, then the supplier must submit a packaging data sheet (Attachment 3). The packaging data sheet should be sent to the HG Packaging Planner for approval. Generally, all packaging proposals need to be presented to HG prior to the shipment of Null Series parts.

All parts should be quoted including packaging unless otherwise directed by HG. All costs for returnable packaging that are specific to a part or supplier will also be borne by the supplier. HG will cover the costs only for HG standard containers and inserts (Attachments 4 and 5 as well as section 3.5). The supplier must also consider any legal requirements regarding the environmental impact and recyclability of packaging.

5.2 Design Requirements and Objectives

The packaging design should consider part protection, assembly, logistical processes, environmental impact, and cost.

Part Protection

Parts must be protected against mechanical and environmental influences as well as loss of contents. Any HG Norms (i.e. HG730) should also be considered during the packaging design process.

Assembly

Parts must be easily removed from their packaging during the assembly process. Ideally this means, the parts can be removed with one hand directly from the packaging. Parts should never be completely wrapped in packaging materials (i.e. plastic or cloth bags, paper, bubble wrap, etc.). Bulk Containers, like wire baskets or wooden crates, should be avoided whenever possible.

Logistical processes

Parts should be packed to maximize the container contents while minimizing the volume. The maximum weight of hand held containers should also be strictly followed (see section 6.6). Standard returnable or expendable packaging outlined in sections 6 and 7 should be used.

Environmental Impact

Returnable packaging should be used whenever feasible. In the event, that disposable packaging is used, it must not be made of mixed materials. Non-like materials laminated together (i.e. foam on corrugated board) should not be used. Additional packaging materials, such as individual cartons for parts, cloth bags, and bubble wrap, should be avoided.

Health

The packaging should be design to avoid adverse health effects when opening the goods or handling them thereafter. Use of any dangerous packaging materials must be avoided.

Cost

The packaging may not be larger or more expensive than absolutely necessary to protect the components. Pack density must also be optimized to keep freight costs to a minimum.

5.3 Development Process

The packaging development process begins at the time of the offer. The supplier will receive a rough packaging concept from HG. The concept will contain the respective KLT and thereby the maximum acceptable dimensions of the packaging. If the supplier is not a member of the Returnable Container Management

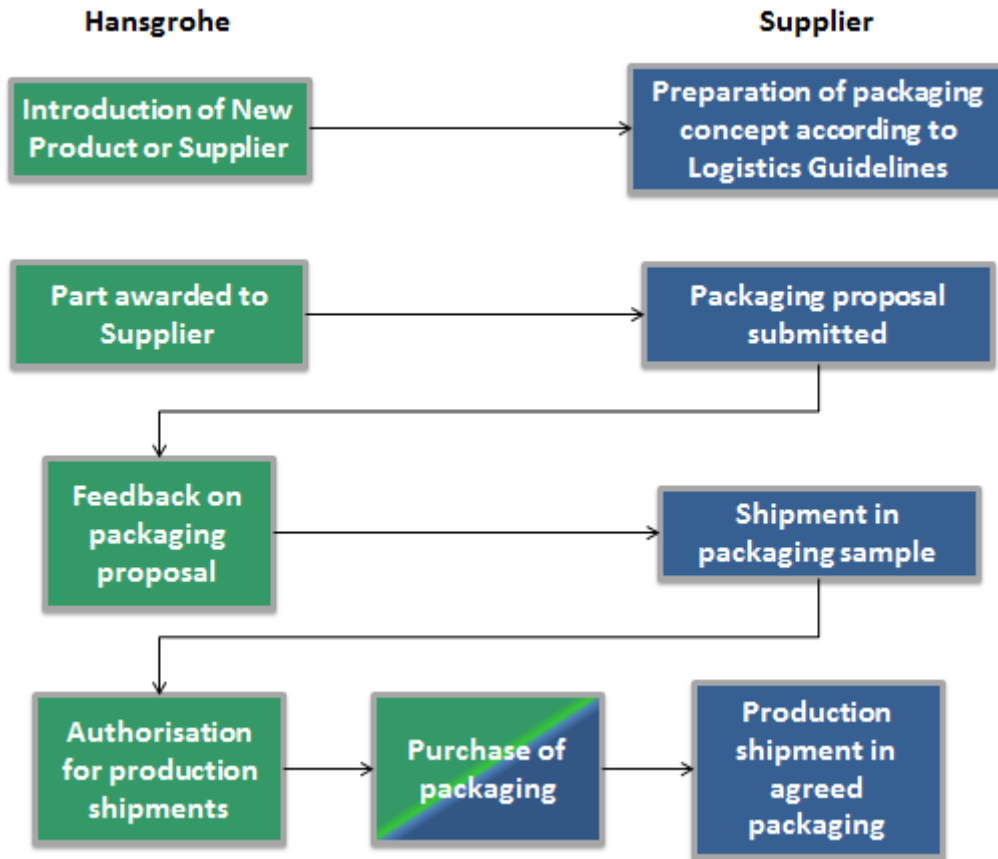
System then a packaging concept in accordance with HG Packaging Specifications for Returnable or Expendable Packaging (Sections 6-8) must be presented. This concept must be agreed by HG prior to the first sample shipment (PPAP). The packaging cost at the piece price level should also be submitted for each material number.

The approved HG universal multi-use packaging, hand held totes (KLT), returnable inserts and other packaging materials can be found on the Supplier Portal or HG homepage (www.hansgrohe.com/en/12464.htm), as well as in the Appendix. When an alternative solution (special insert, special container etc.) is necessary to adequately protect a component, the packaging must be verified by the HG Packaging Planner. In this case it will be necessary to complete a packaging data sheet (see Attachment 3).

Packaging is part of the qualifying process (see Figure 6). The supplier introduces the packaging within the framework of the first sampling process by the Department of Quality Assurance at HG.

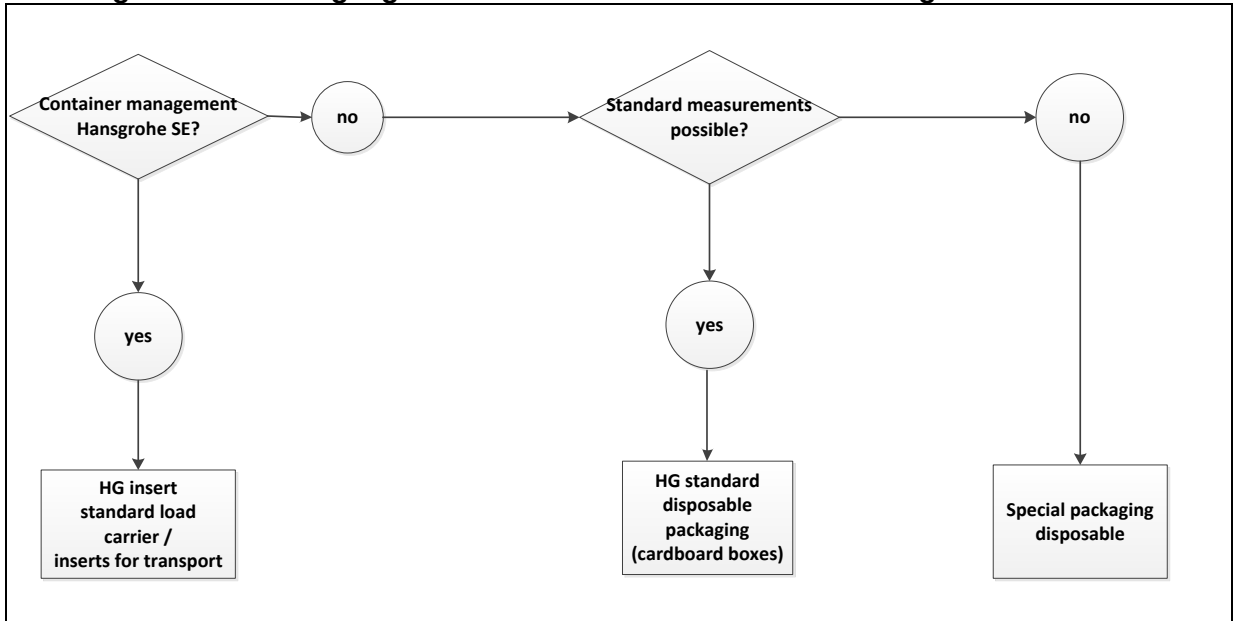
The approved packaging concept represents a binding agreement between HG and the supplier. Any deviations to the approved packaging could lead to additional costs for the supplier as outlined in the respective framework supply agreement. This also applies to part revisions when the geometry of the part is not significantly changed. Furthermore, the usage of obsolete or unmaintained Packaging Specification is not allowed.

Figure 7: Packaging Approval Process



To assist in the decision of whether returnable or expendable packaging should be used please consult section 6 as well as the following Figure.

Figure 8: Packaging Definition Decision Process Diagram



The following figure defines the HG requirements regarding inner packaging and part protection.

Figure 9: Inner Packaging Part Protection Rating

Protection rating	Type	Container management	No container management
0	bulk	no inserts required	no inserts required
1	machining: surface components	reusable inserts	expendable inserts

6 HG Returnable Packaging

Returnable packaging should be used whenever economically feasible. Suppliers close to HG production locations, currently using returnable containers for other HG components or are already part of the Milk Run (see 4.5) are the most suitable candidates.

Hand held totes shall be used in favor of bulk containers, such as wire pallet boxes. The only exception is for parts that are physically too large to fit into a hand held tote.

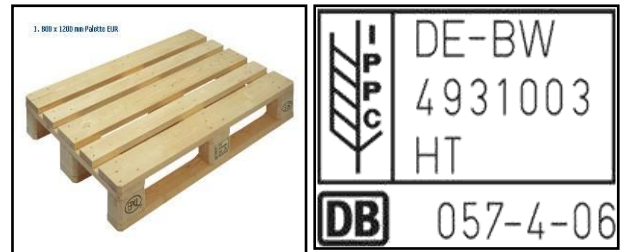
6.1 Universal Multi-use Packaging (ULT)

DB/EURO-pallets are used as a matter of preference. Expendable pallets are only acceptable if they comply with the module measurements of Euro pallets and can be fed into secondary usage. Both types of pallets must be treated according to the ISPM 15 Norm (IPPC Norm), when required by international laws. All reusable pallets must be interchangeable.

EURO POOL flat pallet

HG no. 70007148

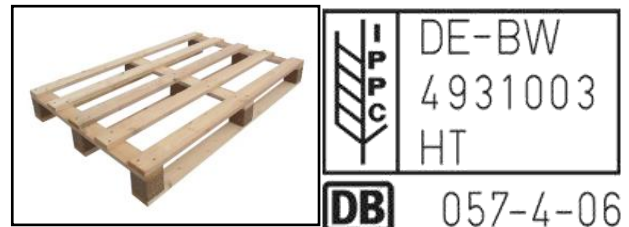
Outside measurements in mm: 1200 x 800 x 144
 Tare weight in kg: 20 - 24
 Load capacity in kg: 800
 Quality norm: according to EPAL



IPPC flat pallet

HG no. 70007219

Outside measurements in mm: 1200 x 800 x 144
 Tare weight in kg: 20 - 24
 Load capacity in kg: 800
 Quality Norm: according to ISPM 15 Norm



DB Wire Pallet Box

HG mat. No. 70007149

Outside measurements in mm: 1240 x 835 x 970
 Inside measurements in mm: 1210 x 800 x 800
 Tare weight in kg: 85
 Load capacity in kg: 800
 Quality norm: DIN 15155



6.2 Hand Held Totes (KLT)

The preferred returnable container is the HG Hand Held Tote. The modular containers are based on the Euro and ISO standard pallet and can be handled mechanically as well as manually. A detailed overview of all HG KLTs can be found in attachment 4.

Table 2: Standard Hand Held Totes

Container Code	Outer Dimensions mm	Inner Dimensions mm	Empty Weight kg	Maximum net Fill Weight kg	Containers Per Layer	Layers per Pallet	Number per Pallet
KS001	355 x 185 x 85	346x175x75	0,43	4,31	ship inside a KS 02 (3 pieces)		
KS 01	400x300x120	367x267x87	1,17	11,83	8	9	72
KS 02	600x400x120	566x367x87	2,02	12,98	4	9	36
KS 04	600x400x170	566x367x135	2,2	12,8	4	6	24
KS 06	600x400x320	566x367x287	3,23	11,77	4	3	12

6.3 Special Containers (SLT)

Special containers are an exception at HG. Examples of Special Containers include metal racks, wooden crates, extended length hand held totes and EPP container trays. Awkward, big or heavy components which cannot be transported in a standard returnable container may be transported in appropriate special containers.

The construction (strength of material, center of gravity, etc.) must be defined by the supplier in coordination with HG. In case the material selected is wood, it must be treated in accordance with the equivalent of Norm ISPM 15.

All Special containers need to be marked with the name of the owner of the packaging and return to location. The marking needs to be durable so that it is not easily removed over time.

6.4 Returnable Inserts

The standard measurements for inserts are the following:

Footprint in mm (Totes):	555x355
Height in mm:	varies depending on height of container

Examples of returnable inserts include soft and ridged foam inserts, partition sets, thermo-formed trays and foam compression pads. Interior packaging may be owned by the supplier or HG. In general, HG only purchases standard returnable inserts that can be used across the supply base for multiple part numbers. The list of standard returnable inserts can be found in Attachment 5.

Returnable inserts should be designed to hold only one layer of product whenever possible. In addition, the packing method should try to avoid that the A surface comes into direct contact with the insert material.

Each insert must be labeled with the owner name and insert code. HG does not assign codes to inserts from supplier. Nevertheless, a code must be included to identify it from other similar inserts. The identification markings should be on the bottom part of the insert.

For direct deliveries the colour “black” is preferred. The colours “red” and “white” are already pre-assigned and cannot be used.

6.5 Expendable Packing Materials

The use of expendable packing material, such as a top layer cover or space fillers, may be required to properly protect parts during shipment. Examples of these materials include micro foam, small air bags and bubble wrap. Such materials require prior approval by HG and the costs will be the responsibility of the supplier.

6.6 Maximum Weight of Pallets and Containers

For the containers in use the following maximum weight limit applies. Maximum weight includes the container and its contents.

Universal pallet load and Euro Pallets

For all pallet loads in use the maximum weight of up to 800 kg applies.

Hand Held Totes

KS 001 container:	max. 4.32 kg
KS 01 container:	max. 10.7 kg
KS 02 /KS 04 /KS 06	max. 15.0 kg
Special Hand Held Totes	max. 15.0 kg

Special containers

For all other special containers, that will not be manually transported by hand, the maximum weight should be determined by the HG Packaging Planner (E-Mail: packaging@hansgrohe.de).

7 Expendable Packaging

Suppliers shipping from further distances or Overseas will need to ship in expendable packaging. Expendable packaging should mostly be comprised of corrugated board. This includes inner packaging as well.

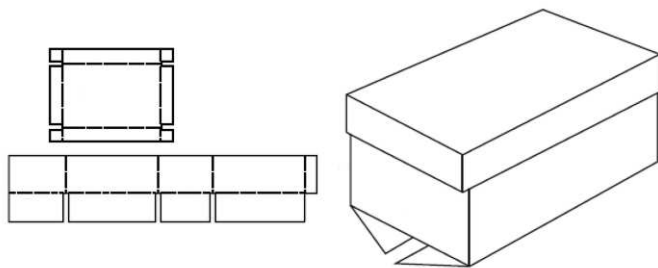
7.1 Expendable Boxes

Expendable boxes must be designed to minimize the effort required to pack and unpack the parts especially during the assembly process. Containers must be composed of a box and lid that is not taped or banded in order to eliminate the need for knives in the assembly or logistics processes. Exceptions to the closure of cartons with tape must be approved on an individual basis by HG.

Figure 10: Example 1 Box Style



Not Acceptable!!
Boxes with taped closures
(i.e. FEFCO 201)



Acceptable
Cartons with lids (i.e.
FEFECO 312)

Examples of acceptable carton styles include but are not limited to the following:

- FEFCO 200 or with 422 lid**
- FEFCO 312 Tray/lid combination**

More information on the FEFCO codes can be found under: (<http://www.fefco-esbo-codes.com>) If there are any questions please contact the HG Packaging Planner.

7.2 Expendable Box Size Requirements

Parts must be packed into a HG standard, container conforming box size. Container conforming boxes should be approximately 1 cm less than the interior dimensions of the HG KLT. The corrugated boxes must therefore be shaped in such a way that they can be directly transferred into a KLT.

The length and width of the standard cartons have been designed to fit inside a HG-owned KLT while maximizing pallet and freight utilization (see Attachment 5). The length and width dimensions are fixed. The height of the boxes is flexible in order to optimize the number of boxes per pallet.

The external measurements of expendable packaging must conform to the following inside measurements of the container and must not exceed the upper weight limit.

Table 3: Container Conforming Box Sizes

Container Code	Outer Dimensions of Box L x W mm	Outer Height of Box mm	Maximum Weight kg
	Fixed	must not exceed	
KS 01	350x250	80	10,7
KS 02	550x350	80	13,0
KS 04	550x350	128	12,7
KS 06	550x350	280	11,6

7.3 Inner Packaging Requirements

The inner packaging should adequately protect the parts with minimal effort required for unpacking and disposal. Multiple layers inside one box should be avoided. Parts should never be completely wrapped in packaging materials such as plastic bags, bubble wrap bags, cloth bags, tissue paper or micro foam. Instead parts should be placed on thermoformed trays or in corrugated inserts with flat cloth to protect the surface of the parts. All exceptions to wrapping parts in packaging must be approved by HG.

Figure 11: Example for Inner Packaging



Not Acceptable!!
Parts wrapped in tissue paper



Acceptable
Parts on a thermoform tray



Not Acceptable!!
Parts wrapped in cloth bags



Acceptable
Parts on flat cloth over a partition set

7.4 Special Requirements for Overseas Shipments

In addition to the requirements for standard expendable packaging, suppliers shipping parts from overseas must consider the length of transport and shipping environment.

7.4.1 Desiccants

Desiccants should be used as required for part protection and generally for most shipments overseas. The main forms of desiccants are silica gel pouches and VCI paper. The material used for the desiccant must meet all requirements for shipping to the EU.

7.4.2 Packaging Materials

Due to long transit times and potentially damp conditions it is crucial that the appropriate packaging materials are selected. Materials made of paper and wood should be chosen over materials made of plastic whenever possible. Below are the minimum recommended corrugated board specifications.

Table 4: Box Material

Box Lid	B-Flute	135 KL – 135 M – 135 KL
Box Tray	B Flute	150 KL – 135 M – 150 KL
Box (FEFCO 200, 201)	B or C-Flute BC-Flute	150 KL – 135 M – 150 KL 135 KL – 110 M – 135 TL – 110 W – 135 KL
Layer Pads	B or C-Flute BC-Flute	135 KL – 110 M – 135 KL 135 KL – 110 M – 135 TL – 110 M – 135 KL
Partitions and Part trays	B or C-Flute BC-Flute	135 TL – 110 M – 135 TL 135 TL – 110 M – 135 TL – 110 M – 135 TL

KL – Kraft Linerboard, M- Corrugated Medium, TL – Test Linerboard
All weight in grams per square meter

Figure 12: B-, C- and BC-Flute



B-Flute,
ca. 2,5 mm



C-Flute,
ca. 4,0 mm



BC-Flute,
ca. 6,5 mm

In the event that Kraft linerboard is not available, paper with a heavier weight (g/m²) should be used. The supplier must verify that the paper is in accordance with the specification, especially in regards to the moisture intake properties of Kraft paper.

7.4.3 Air Freight Shipments

Standard packaging that is approved for sea freight may not be suitable for the air freight environment. Changes or improvements may need to be made to the packaging prior to shipment. Since requirements vary by air freight carrier, please consult your carrier before shipment.

7.4.4 Storage of Packaging Materials

Packaging materials should be stored in a cool, dry place, preferable in an enclosed structure protected from the elements.

7.4.5 Sea Container Loading and Inspection

The loading area or dock should be inside a building or in an area covered by a roof. It is recommended that each container be inspected for any defects prior to loading. In particular any defects (holes, wet floors, damaged door seal, etc.) that could result in moisture entering the container during transit.

7.5 Non-Standard Expendable Packaging

Some parts may be too large or heavy to pack in the standard expendable packaging. In these cases, the usage of non-standard expendable packaging must be specified and approved by HG.

7.5.1 Wooden Crates

Wooden crates are the exception at HG. In the case that wooden crates are used to package parts they need to be sealed and opened without the use of nails. If imported into the EU, the wood will have to meet all IPPC requirements for wood packaging materials.

7.5.2 Bulk Parts

In order to ensure there is no loss of material during transport and handling, bulk materials may be packed in a sealed carton (i.e. FEFCO 201). The size of the carton should follow the standard expendable box size guidelines shown in table 2.

8 Palletizing

Proper palletizing of product is required for part protection and efficient storage and handling.

8.1 Maximum Pallet Height

The maximum permitted height of a pallet/wire basket is 1.15m including the pallet. Goods which have been defined together with the supplier and are delivered to the Logistics Centre in Offenburg (LZO) are exempt. Here a pallet height of 1.50m is permitted.

8.2 External Measurements of Unit Loads

The maximum basic measurements of 1.20m in length and 0.80m in width apply without exception, i.e. no protrusions beyond the edges of the pallet are permitted. Special sizes must be jointly agreed upon with purchasing and logistics planning of HG.

8.3 KLT Palletizing Method

The pallet load must contain only containers of one type. In other words, a mixture of cardboard boxes and hand held totes KLT is not permitted. Differing types of HG-owned KLTs may be mixed on one pallet (e.g. KS02 with KS04). The top surface of a pallet must be level – if necessary, an empty container of the appropriate size must be added to create a level surface.

Table 5: Palletizing of Hand Held Totes (KLT)

Type of container	Container per level	Stacking height	Number per pallet
KS 01	(2x4) 8	9	72
KS 02	(2x2) 4	9	36
KS 04	(2x2) 4	6	24
KS 06	(2x2) 4	3	12
KS 10	(2x1) 2	2	4

8.4 Load Securement and Protection

Pallet loads should be secured with plastic banding or stretch wrap. Metal banding should not be used unless the weight of product makes it necessary. In these instances, suppliers must receive approval from HG to use metal banding. More-

over, all products and containers on the top level of the pallet must be covered to avoid contamination of the product (dust, wood chips, shavings, etc.).

8.5 Palletizing of Corrugated Finished Product Packaging

Packaging components for the finished product (i.e. photo packs, corrugated inserts, shipping carton etc.) need to be palletized in a manner that preserves part quality during shipping and storage.

8.5.1 Pallet Securement

Packaging components need to be secured using banding and/or stretch wrap. Banding must also be used in combination with edge protection where ever the banding has direct contact with the product.

8.5.2 Overhang

Packaging components with minimal overhang will be allowed only when a sheet of particle board is placed underneath and on top of the pallet. The particle board should be in good condition and comprised of only one piece. In cases where the overhang is more severe a special pallet will be necessary. Pallet design and requirements need to be closely coordinated with HG.

8.5.3 Bulk Storage

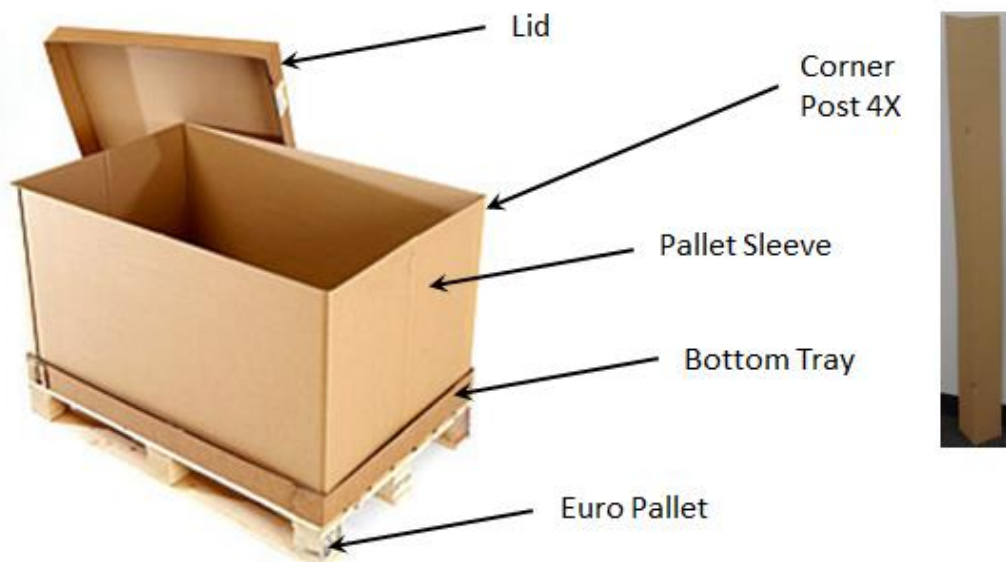
Packaging components that will be stored in bulk storage at a third party logistics warehouse must have a sheet of particle board on top.

8.6 Palletizing Requirements for Overseas Shipments

Pallets coming from overseas will require a lid, bottom tray and pallet sleeve. The additional packaging is required to prevent the load from shifting and to stack the pallets 2 high in the sea container. Corner posts consisting of formed paperboard or edge protection may be required depending on the weight of the pallet load.

Other than the pallet, no wood is allowed to be used as uprights or a top frame unless approved by HG. To protect the load from moisture during transport, it must be fastened to the pallet with stretch wrap or a combination of banding and edge protection.

Figure 13: Example for Overseas Palletizing Requirements



Pallet Sleeve Material Requirements

The corrugated board selected for the sleeve must be composed of material that is able to bear the load of two pallets stacked on top of each other. The specification must also consider the dynamic load and conditions during shipment overseas. The use of BC Flute is mandatory. If necessary triple wall board (i.e. BCB Flute) may also be used.

8.6.1 Pallet Maximum Height

The maximum height of pallet and product including pallet sleeve is 105 cm for overseas shipments. The reason is to facilitate double stacking in the sea container. Any exceptions must be approved by HG.

8.6.2 Pallet Securement

Pallets should be banded and not stretch wrapped whenever possible. Banding should be made of plastic and applied with 2 bands along the width and 2 bands along the length of the pallet. In the event that stretch wrap must be used, it should be done so sparingly. It is recommended that the top of the pallet and fork pockets be free of stretch wrap, as shown in Figures 13 and 14.

Figure 14: Fork pockets free of stretch wrap



Figure 15: Top of pallet free from stretch wrap



Appendix

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Attachment 1: Packing List for Labeling of Pallets for Consignment Warehouse

Packliste/ Packing List			
Palettennr. / Pallet #		von/ of	
Artikelbezeichnung und Materialnr./ Item and Mat. #	Menge/Quantity	Anzahl Kartons/ Quantity of Boxes	von Box Nr. - Box Nr./ from box # - to box #
<input type="checkbox"/>			
<input type="checkbox"/>			
<input type="checkbox"/>			
<input type="checkbox"/>			
<input type="checkbox"/>			
<input type="checkbox"/>			
Total			

Attachment 2: Example of Documents needed for Consignment

Invoice/ Delivery Note

PROFORMA INVOICE

INVOICE NO.:
TO MESSRS :

DATE:

DELIVERY TO:

COMMODITY :
SHIPPED PER:
FROM:
TO:

ATTN:
C.C.:
SAILING ON OR ABOUT ON:

DESCRIPTION	REV.	REFERENCE NO.	QUANTITY	UNIT PRICE	AMOUNT
-------------	------	---------------	----------	------------	--------

No. of Container

Material description and # - Revision - Quantity - Unit Price - Amount

Packing/ Weight List

PACKING/ WEIGHT LIST

INVOICE NO.:
TO MESSRS :

DATE:

DELIVERY TO:

COMMODITY :
SHIPPED PER:
FROM:
TO:

ATTN:
C.C.:
SAILING ON OR ABOUT ON:

C/NO.	DESCRIPTION	HS Code	QUANTITY	NET WEIGHT	GROSS WEIGHT	MEASUREMENT
-------	-------------	---------	----------	------------	--------------	-------------





No. of Container

Number of Boxes – Material description and # – Quantity - Net Weight- Gross Weight

Attachment 3: Packaging Data Sheet



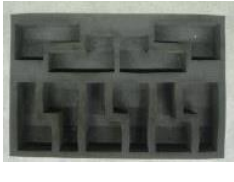
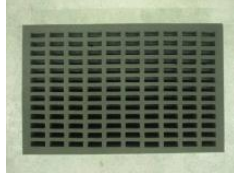


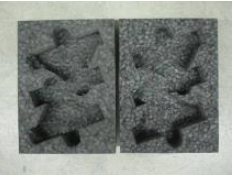
Contact	Material Number		Description			Supplier Name		Signature Supplier		Picture Part	
	Contact Name		E-Mail			Telephone		Signature HG			
Part	Reason	Revision	Date	Part Weight [g]	HG Delivery Point	Annual Requirement [pcs]					
Container	Container <input type="checkbox"/> single-use-packaging <input type="checkbox"/> multi-use-packaging										
	Outer Dimension [mm]			Container Type		HG Code		Material			
	L	W	H								
	Part Quantity/Container		Inner Packaging Weight in [g]		Weight (with parts) in [kg]						
	Inner Packaging										
	Specification			Description		Supplier Number	HG Number	Material	Qty.	Weight [g]	
Pallet	Pallet										
	Outer Dimensions [mm]			Pallet Name		Material		Standard		Pallet Weight [kg]	
	L	W	H								
Containers/Layer		Layers/Pallet	Part Qty./Pallet	Total Weight [kg]	Total Pallet Height[mm]	Securement					
			0			<input type="checkbox"/> Stretch Wrap		<input type="checkbox"/> Bottom Tray			
						<input type="checkbox"/> Banding		<input type="checkbox"/> Lid			
						<input type="checkbox"/> Pallet Sleeve		<input type="checkbox"/> Layer Pad			
						<input type="checkbox"/> Edge Protection		<input type="checkbox"/> other			
Comment											
submit to: packaging@hansgrohe.de											

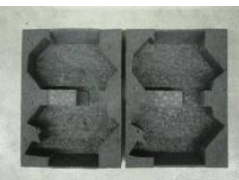

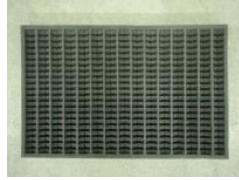

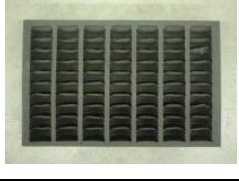
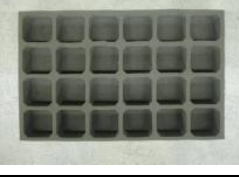
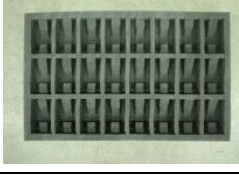
Attachment 4: HG Standard Container Overview

<p>Green box 02 70007142</p> 	<p>Dimensions (mm): External 600x400x120 Internal 566x367x87</p> <p>Empty weight: 2.02 kg</p> <p>Max. fill weight (net): 12.98 kg</p> <p>Boxes per Pallet: 36</p>	<p>Suitable cardboard box: # 90759602 FEFCO 200 with 422 lid FEFCO 312</p> <p>External dimensions (mm): Less than 550x350x80 Internal dimensions approx. 540x340x60</p> <p>Max. Fill Weight (gross): 12,98 kg</p>
<p>Green box 04 70007169</p> 	<p>Dimensions (mm): External 600x400x170 Internal 566x367x135</p> <p>Empty weight: 2.20 kg</p> <p>Max. fill weight (net): 12.80 kg</p> <p>Boxes per Pallet: 24</p>	<p>Suitable cardboard box: # 90772102 FEFCO 200 with 422 lid FEFCO 312</p> <p>External dimensions (mm): Less than 550x350x128 Internal dimensions approx. 540x340x110</p> <p>Max. Fill Weight (gross): 12,80 kg</p>
<p>Green box 06 70007141</p> 	<p>Dimensions (mm): External 600x400x320 Internal 566x367x287</p> <p>Empty weight: 3.23 kg</p> <p>Max. fill weight (net): 11.77 kg</p> <p>Boxes per Pallet: 12</p>	<p>Suitable cardboard box: # 90660502 FEFCO 200 with 422 lid FEFCO 312</p> <p>External dimensions (mm): Less than 550x350x280 Internal dimensions 540x340x260</p> <p>Max. Fill Weight (gross): 11.77 kg</p>
<p>Green box 01 70007279</p> 	<p>Dimensions (mm): External 400x300x120 Internal 367x267x87</p> <p>Empty weight: 1.17 kg</p> <p>Max. fill weight (net): 9.55 kg</p> <p>Boxes per Pallet: 72</p>	<p>Suitable cardboard box: FEFCO 200 with 422 lid FEFCO 312</p> <p>External dimensions (mm): Less than 350x250x80 Internal dimensions approx. 340x240x60</p> <p>Max. Fill Weight (gross): 9,55 kg</p>

<p>Inset box 001 70007146 Ships in a 70007142 (3 Pcs)</p> 	<p>Dimensions (mm): External 355x185x85 Internal 346x175x75</p> <p>Empty weight: 0.43 kg</p> <p>Max. fill weight (net): 3.89 kg</p>	<p>Suitable cardboard box: FEFCO 200 with 422 lid FEFCO 201 FEFCO 312</p> <p>External dimensions (mm): Less than 330x160x75</p> <p>Max. Fill Weight (gross): 3.89 kg</p>
<p>Wire Basket 70007149</p> 	<p>Dimensions (mm): External 1240x835x970 Internal 1200x800x800</p> <p>Empty weight: 85 kg</p> <p>Maximum fill weight: Ca. 715 kg</p>	
<p>EURO-Pool wooden pallet 70007148</p> 	<p>External dimensions (mm): 1200x800x144</p> <p>Empty weight: 28 kg</p> <p>Maximum Load weight Ca. 772 kg</p>	
<p>Mini Wire Basket 70007150</p> 	<p>Dimensions (mm): External 515x405x300</p> <p>Empty weight: 5,9 kg</p> <p>Maximum fill weight (net): 14,1 kg</p>	

Attachment 5: HG Standard Returnable Inserts Overview

hansgrohe						
Material-number	Description	Photo	Dim. (mm)	Cells/Insert	Drawing	Insert Category
70007127	Transport Insert Nr.27 black		Outer 555x355x58 per Cell 105x77x42	18	Z70007127	Standard
70007128	Transport Insert NR.28		Outer 555x355x56 per Cell 66x62x48	35	Z70007128	Standard
70007129	Transport Insert NR.29 black		Outer 555x355x83 per Cell 170x90x60	10	Z70007129	Standard
70007130	Transport Insert NR.30 black		Outer 555x355x58 per Cell 40x15x40	130	Z70007130	Standard
70007133	Transport Insert Nr.33 black		Outer 555x355x75 per Cell 58x55x60	40	Z70007133	Standard
70007138	Transport Insert NR.38 black		Outer 555x355x75	N.A	Z70007138	Standard
70007172	Transport Insert NR.22 black		Outer 355x255x72 per Cell 195x45x60	3	Z70007172	Standard

hansgrohe						
Material-number	Description	Photo	Dim. (mm)	Cells/Insert	Drawing	Insert Category
70007177	Transport Insert NR.16 black		Outer 355x255x75 per Cell 185x130x65	4	Z70007177	Standard
70007187	Transport Insert 19		Outer 780x50x20 per Cell D25	25	Z70007187	Standard
70007188	Transport Insert 20		Outer 555x355x40 per Cell 30x6x32	300	Z70007188	Standard
70007189	Transport Insert NR.21		Outer 555x355x76 per Cell 71x8x70	48	Z70007189	Standard
70007193	Transport Insert NR.23 black		Outer 555x355x70 per Cell 60x27x60	70	Z70007193	Standard
70007194	Transport Insert NR.24 black		Outer 555x355x76 per Cell 80x76x60	24	Z70007194	Standard
70007195	Transport Insert NR.25 black		Outer 555x355x50 per Cell 94x55x44	24	Z70007195	Standard

hansgrohe						
Material-number	Description	Photo	Dim. (mm)	Cells/Insert	Drawing	Insert Category
70007201	Compression Pad		Outer 585x385x29	N.A	Z70007201	Standard
70007301	Universal Partition Set Variant 1		Outer 560x360x125 per Cell 166x63x125	16	Z70007301	Standard
70007302	Universal Partition Set Variant 2		Outer 560x360x125 per Cell 330x63x125	8	Z70004302	Standard
70007304	Universal Partition Set Variant 4		Outer 560x360x240 per Cell 330x63x240	8	Z70007304	Standard
70007323	Transport Insert 323 black		Outer 263x176x69 per Cell 149x42x60	5	Z70007323	Standard
70007324	Transport Insert 324 black		Outer 263x176x69 per Cell 55x47,5x60	10	Z70007324	Standard