



Grinnell

GRINNELL MECHANICAL PRODUCTS

General Catalog



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GRINNELL MECHANICAL PRODUCTS

GRINNELL, a premium brand of Tyco International, delivers quality piping solutions for a full range of mechanical, HVAC, mining, commercial, industrial, institutional, and governmental applications. Available products offer contractors, engineers, and distributors faster, more cost-effective tools for joining pipe over traditional welding methods. Innovative GRINNELL products include couplings, fittings, mechanical tees, valves, and accessories as well as complete systems for joining copper, stainless steel, plain end, G-PRESS press-fit, HDPE, and G-MINE PVC components. Comprehensive, competitively priced engineering and planning support services provide labor and cost savings. All GRINNELL products are backed by an industry-leading, 10-year limited warranty except for G-MINE products, which carry a six-month warranty. For more information, visit www.grinnell.com.



-  Regional Headquarters
-  Corporate Headquarters
-  Research and Development

MAKING CONNECTIONS...

Global Headquarters

Lansdale, Pennsylvania, USA

Research and Development

Cranston, Rhode Island, USA

REGIONAL HEADQUARTERS

North Asia

Shanghai, China

South Asia

Singapore

Australia

Sunshine, Victoria

Middle East

Dubai, United Arab Emirates

Europe

Enschede, The Netherlands

Paris, France

Manchester, U.K.

Rodgau, Germany

Budapest, Hungary

Milan, Italy

Wien, Austria

Mechelen, Belgium

Madrid, Spain

Lørenskog, Norway

Lammhult, Sweden

South America, Central America, and Caribbean

Pompano, Florida, USA

Mexico

Tlalnepantla, Mexico

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BUILDING SOLUTIONS



Why Grooved?

Reduced Installation Time and Cost

Methods such as welding and soldering are labor intensive and can be very expensive in high-cost regions. Pipe grooving reduces installation cost by up to 30%, allowing contractors to minimize labor costs and remain within budget.



Retrofits and Repairs

When an owner is faced with the issue of not being able to shut down a facility for important retrofits, GRINNELL Mechanical Products is the right solution. GRINNELL Couplings and Fittings allow an installer to fabricate on-site and around complex problems and obstacles. Fire permits are not required and building residents do not have to evacuate due to welding fumes.



Pipe Expansion Support

GRINNELL Flexible Couplings absorb linear and angular movements of pipe work due to temperature changes, eliminating or minimizing the use of braided and bellow type flex connectors. GRINNELL Mechanical Services offers customers assistance with designing flexible couplings into thermal expansion projects.



No Special Tools

Grooved Products are assembled onto a standard groove. No special tools or additional training to complete the job are required.



Compatibility With Hazardous Environments

Grooved Pipe does not require welding, threading, or cutting, eliminating cutting oils, fumes, and flames.

It is the ideal method for joining pipe in enclosed, flammable, or hazardous sites like tunnels and mines. And it doesn't require burn or hot-works permits.



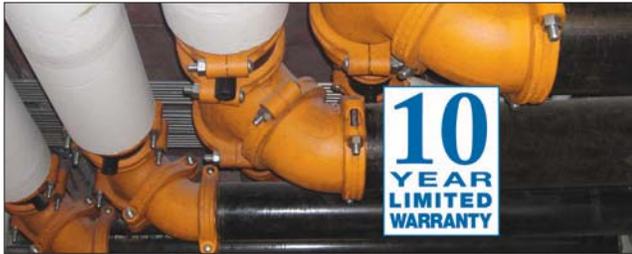
Connection Consistency

When construction calls for robust piping applications, GRINNELL Grooved Products maintain high pressures at each connection without sacrificing quality and reliability.

GRINNELL Grooved Systems allow for quick assembly that is simple and consistent from one worker to the next.

Projects are completed on time, and crews can readily move on to their next installations.





Why GRINNELL?

The Best Warranty in the Industry

GRINNELL Mechanical Products are backed by a 10-Year Limited Warranty, except for G-MINE which is 6 months. Our customers are proud to work with products manufactured by a market leader with an established brand name and a consistent history.



GRINNELL Mechanical Services

Our Services Group works seamlessly with engineers and contractors to create the most cost-effective and time-efficient piping solutions from design...to build. Our experts specialize in CAD blocks, cost comparisons, thermal movement analysis, and BIM.



Green Solutions

All GRINNELL Mechanical Products cast in our Anniston, Alabama Plant are manufactured with 90% recycled metal that would otherwise contribute to our world's solid waste stream. All waste paper, used cardboard, scrap wood, and EPDM waste from our plants is recycled.



Industry Pioneer

GRINNELL Mechanical Products has been in the pipe-joining business for over 160 years. We have strategic stocking locations throughout the world to serve our customers. We have the best channel partners who are focused, as we are, on innovation and growth.



Global Presence

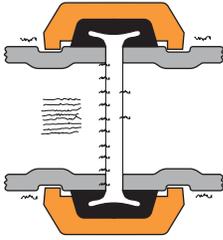
You can find our products in buildings and installations all over the world. We provide global solutions that flexibly address the challenges our customers face, including design in one country for construction in another.



Great Service

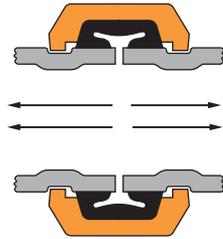
At GRINNELL Mechanical Services, the customer always comes first. We pride ourselves on providing knowledgeable sales support, timely technical service, and quality customer care to all global customers.

Product Features and Benefits



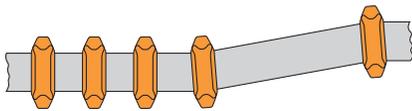
NOISE AND VIBRATION

The resiliency of GRINNELL Grooved Couplings and versatility of various available gaskets provide excellent noise and vibration dampening. The engineered design of these couplings provides for pipe end gapping that helps to dissipate, isolate, and minimize noise and vibration transmission throughout the piping system.



DEPENDABILITY

The coupling housings are designed to engage into the grooves and provide a secure joint. The pipe ends are sealed by a pressure responsive gasket that is encapsulated by the ductile iron housing.



MISALIGNMENT

GRINNELL Flexible Couplings will accommodate misalignments. The maximum deflection information per coupling can be found in this catalog.



SUPERIOR QUALITY

GRINNELL Piping Products are manufactured according to the ISO 9001:2000 Quality Assurance standard.



LONGEVITY AND PERFORMANCE

GRINNELL Piping Products are designed to last the lifetime of the pipeline and have been tested and approved by prominent approval agencies. Rolled grooving does not remove any metal from the pipe. Therefore, pipe integrity is fully maintained when grooved systems are used to join pipe.



CLEAN

Unlike with welding, GRINNELL Piping Products do not lead to hazardous fumes or to the possible introduction of foreign materials in the pipeline.

Agency Listings and Approvals

Our products bear the seal of approval from the following agencies, associations and laboratories.

General Code Groups, Associations, Laboratories, Government Agencies, and Approval Bodies

ACS
ACTIVFIRE

Active Fire Protection
Product Certification


AP SAD

AMERICAN BUREAU OF SHIPPING (ABS)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
AMERICAN WATER WORKS ASSOCIATION (AWWA) AWWA C-606
AMERICAN PETROLEUM INSTITUTE (API) API Std. 5L, Sect. 7.5
AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE)
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

- Power Piping, B-31.1
- Chemical Plant and Petroleum Refinery Piping, B-31.3
- Refrigeration Piping, B-31.5
- Building Services Piping, B31.9
- Elevator, Escalator, A17.1

ARPA
ARPA
BUILDING OFFICIALS AND CODE ADMINISTRATORS (BOCA)
BUREAU VERITAS (BV)

CNBOP

Centrum Naukowo-Badawcze
Ochrony Przeciwpozarowe


COAST GUARD

Approved each vessel individually

CORPS OF ENGINEERS (COE) GEGS 15000
CRN

Canadian Registration Number

CSTB

DNV

Det Norske Veritas


DVGW

Deutscher Verein des
Gas-und Wasserfaches e.V.


FACTORY MUTUAL ENGINEERING CORP. (FM)

Approved for Fire Protection Services


FEDERAL AVIATION ADMINISTRATION (FAA) HVAC, Plumbing and Fire Protection
FEDERAL HOUSING ADMINISTRATION (FHA)
GENERAL SERVICES ADMINISTRATION (GSA) 15000 Series
GERMANISCHER LLOYD

Germanischer Lloyd


INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS (IAPMO)

ICC-ES

National Evaluation Service, Inc.

IPC

Association Connecting
Electronics Industries

LLOYD'S

Lloyd's Register
of Shipping


LOSS PREVENTION CERTIFICATION BOARD (LPCB)

Approved for Fire Protection Services


MATERIAL EQUIPMENT AND ACCEPTANCE (MEA)
MILITARY SPECIFICATIONS (MIL)

- MIL-P – 10388 Fittings
- MIL-C – 10387 Couplings
- MIL-P – 11087A (CE) Steel Pipe
- Grooved MIL-I – 45208 Inspection

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)
NATIONAL INSTITUTE OF HEALTH (NIH)

Department of Health – 5000 Series

NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)

NFGS 15000 Series

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
NATIONAL SANITATION FOUNDATION (NSF)

The Public Health and Safety Company


PAVUS

PCT

PRESSURE EQUIPMENT DIRECTIVE
RINA

Registro Italiano Navale


T/S/U

SOUTHERN BUILDING CODE CONGRESS INTERNATIONAL (SBCCI) Standard Plumbing
UNDERWRITERS LABORATORIES, INC. (UL)

Listed for Fire
Protection Services


UNDERWRITERS LABORATORIES OF CANADA (ULC)

Listed for Fire Protection Services


UNIFORM PLUMBING CODE (UPC)

VERBAND DER SACHVERSICHERE E.V. (VdS)

Approved for Fire Protective Service


VETERANS AFFAIRS (VA)

15000 Series

WATERMARK

Pending Approved for Potable Water
Service (AU)

WRAS

Water Regulations
Advisory Scheme (UK)


WSD

Pending Approved for Potable Water
Service (HK)

97/23/EC


Refer to back cover for country-specific customer care numbers.

Product Design and Testing

Pre-Manufactured/Product Design

All GRINNELL Mechanical Products are designed and tested at our state-of-the-art Research and Development Technology Center in Cranston, Rhode Island, USA.

Foundry and Assembly



Casting

GRINNELL castings poured at our foundry are made of ductile iron ASTM A536m, Grade 65-45-12. A rigorous quality control program monitors all steps of the manufacturing process. Samples are continuously tested chemically and physically to ensure all products meet our high material specifications.



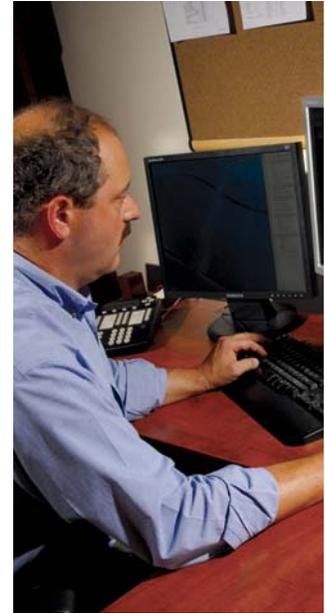
Rubber Injection

We manufacture our gaskets using rubber injection presses and tooling to mold different types of rubber compounds specifically designed for the many applications required by our customers. Physical tests are performed on finished gasket samples to verify compliance with specifications including ASTM D 2000.



Paint Process

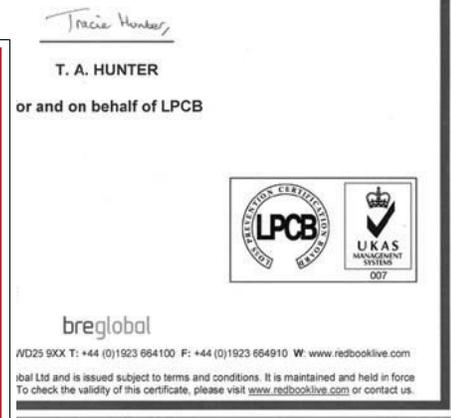
Using a computer controlled process, each product is spray-washed, dried, pre-heated, dipped, and fully cured prior to assembly or packaging. All integral parts are inspected to maintain consistent paint coverage and surface condition.



Tooling

Using product designs from our Research and Development Department, our pattern center and contracted pattern makers design and build patterns and molds that produce products to the highest tolerances. Tooling is continually inspected by our in-house certified specialists to ensure finished products meet our specifications and requirements of approving agencies.

ISO 9001:2000 Certified



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GRINNELL Website www.grinnell.com

To learn more about GRINNELL Mechanical Products, visit www.grinnell.com. Our Website provides a wide variety of tools and information at your fingertips.

Browse These Website Features

My Submittals Tab

This tool, useful in bidding, allows you to sign-up for a GRINNELL account. You can then create, save, print, and manage project submittals. Your account information is available 24/7 through our website.

Resources Tab

Useful for everyday operations, the Resources tab includes a conversion calculator to convert many units of measurement and a Product Cross Reference tool to search for GRINNELL Mechanical Product equivalents.

Literature Tab

The Literature tab showcases all marketing materials for viewing, downloading, or saving to your preferred location. Marketing literature includes catalogs, brochures, installation manuals, flyers, and price books.

Products Tab

The Products tab organizes all product information such as pricing, technical data, 3D CAD drawings, and part summary sheets. All product information is available for printing and saving to your preferred location. Searching for any product by name or figure number and downloading custom submittal sheets are also available through this tab.

Tech Data

The Tech Data icon provides direct access to technical information on all of our products. It also provides access to online registration for automatic e-mail updates.



GRINNELL Home Page



Grooved Couplings Table of Contents

GRINNELL Couplings are designed for grooved end pipe and are available in nominal sizes of 1" (25mm) to 24" (600mm) including BS, ISO, and JIS outside diameters.

The GRINNELL Coupling Design provides economical advantages when compared to welded or flanged systems. GRINNELL Couplings provide a universal method for connecting pipe, fittings, and pipe system components.

GRINNELL Couplings and Gaskets permit a wide selection of combinations for specific applications.

Field modifications are easily accommodated with GRINNELL Mechanical Products as the couplings can be easily rotated, eliminated and/or added to facilitate necessary modifications.

	Figure 772 Rigid Couplings Pages 18 - 19		Figure 640 Pivot-Bolt Rigid Couplings Page 120
	Figure 707 Heavy Duty Flexible Couplings Pages 20 - 21		Figure 672 Rigid Couplings Page 121
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			Figure 9094 HDPE Flange Couplings Page 173



Full contact between Figure 772 Coupling key and groove diameter

Additional Features:

- Two-piece, tongue-and-groove design allows for fast and easy installation.
- Standard industry groove does not require special tools.
- Backed by the industry's best 10-Year Limited Warranty, except for G-MINE which is 6 months. Review terms and conditions of sale on www.grinnell.com.



MATERIAL SPECIFICATIONS

Ductile Iron Housing Specifications

- ASTM A 536 – Standard specification for ductile iron castings, Grade 65-45-12
- Tensile strength, minimum 65,000 psi (4481.6 bar)
- Yield strength, minimum 45,000 psi (3102.6 bar)
- Elongation in 2" (50mm), minimum 12%
- ASTM A 153 – Standard specification for hot-dip galvanizing

Bolt/Nut Specifications

- **ANSI:** Carbon steel oval neck bolts and nuts are heat-treated and conform to the physical properties of ASTM A 183 Grade 2 and SAE J429 Grade 5 with a minimum tensile strength of 110,000 psi (7584.2 bar). Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 183 Grade 2 and SAE J995 Grade 5. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.
- **Metric:** Carbon steel oval neck track head bolts (Gold color coded) are heat treated and conform to the physical properties of ASTM F 568 M with a minimum tensile strength of 760 MPa. Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 563 M Class 9. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.
- Stainless steel bolts and nuts are available upon request.

Coatings

- Orange – Non-lead paint (standard)
- Red – Non-lead paint (optional, regional)
- Hot-Dipped, Zinc Galvanized (optional)

Warning: For a one time field test only the maximum joint working pressure may be increased to 1½ x the figures shown.

Refer to back cover for country-specific customer care numbers.

Gasket Specifications

- **Grade "E" EPDM** gaskets have a Green color code identification and conform to ASTM D 2000 for service temperatures from -30°F to 230°F (-34°C to 110°C). They are recommended for hot water not to exceed 230°F (110°C), plus a variety of dilute acids, oil free air, and many chemical services. They are not recommended for petroleum services. For low temperature and vacuum systems, a Tri-Seal Grade "E" EPDM gasket with a rigid coupling is recommended.
- **Grade "T" Nitrile** gaskets have an Orange color code identification and conform to ASTM D 2000 for service temperatures from -20°F to 180°F (-29°C to 82°C). They are recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapors.
- **Grade "L" Silicone** gaskets are Red and conform to ASTM D 2000 for service temperatures from -30°F to 350°F (-34°C to 177°C). They are recommended for air without hydrocarbons, or dry heat.
- **Grade "O" Fluoroelastomer** gaskets have a Blue color code and conform to ASTM D 2000 for service temperatures from +20°F to 300°F (-7°C to 149°C). They are recommended for oxidizing acids, petroleum products, hydraulic fluids, lubricants, and halogenated hydrocarbons.
- **Grade "EN" NSF-61 Approved** gaskets have a Copper color code and are for potable water systems up to 180°F (82°C). They are not recommended for petroleum service.
- **Grade "EHT" EPDM NSF-61 Certified** center-stop, push-on style gaskets for copper tubing systems, have a Red and Copper stripped color code. For closed-loop heating systems from -30°F to 250°F (-34°C to 120°C) and potable water systems up to 180°F (up to 82°C). Recommended for use in low temperature and vacuum systems. They are not recommended for petroleum service.

Figure 772 Rigid Couplings

(Page 1 of 2)

Tech Data Sheet: G141

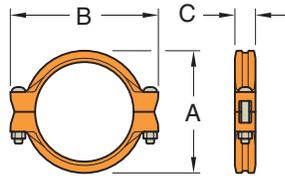
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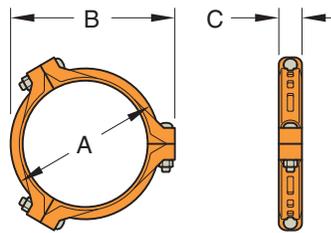
The GRINNELL Figure 772 Rigid Coupling provides a rigid joint by firmly gripping along the full 360° circumference of the pipe grooves. This coupling offers a dependable method of joining pipe and is an economical alternative to welding, threading, or using flanges. The GRINNELL Figure 772 Rigid Coupling is UL Listed for grounding and bonding, and is suitable for bonding systems with a maximum service entrance capacity of 200 amps. Sizes 1¼" – 8" (32mm – 200mm) feature a clamshell design that makes installation easier and faster.



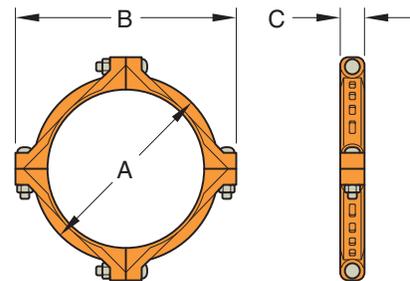
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1¼" - 14" (32mm - 350mm)



16" - 18" (400mm - 450mm)



20" - 24" (500mm - 600mm)

Pipe Size		Max.† Pressures psi bar	Max.† End Load Lbs. kN	Max.*‡ End Gap Inches mm	Dimensions - Inches mm			Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm				A	B	C	Qty.	Size Inches mm	
1¼	1.660	750	1,623.2	0.06	2.75	4.38	1.81	2	¾ x 2¼	2.0
32	42,4	51,7	722	1,5	69,9	111,3	46,0	2	M10 x 57	0,9
1½	1.900	750	2,126.5	0.08	3.00	4.62	1.81	2	¾ x 2¼	2.2
40	48,3	51,7	946	2,0	76,2	117,3	46,0	2	M10 x 57	1,0
2	2.375	750	3,322.6	0.13	3.41	5.70	1.88	2	½ x 3	3.0
50	60,3	51,7	1478	3,3	86,6	145,0	47,8	2	M12 x 89	1,4
2½	2.875	750	4,868.9	0.13	3.91	6.30	1.88	2	½ x 3	3.3
65	73,0	51,7	2166	3,3	99,3	160,0	47,8	2	M12 x 89	1,5
76,1mm	3.000	750	5,301.4	0.13	4.19	6.43	2.00	2	–	3.4
65	76,1	51,7	2358	3,3	106,4	163,0	50,8	2	M12 x 89	1,5
3	3.500	750	7,215.8	0.13	4.63	6.93	1.88	2	½ x 3	4.0
80	88,9	51,7	3210	3,3	117,6	176,0	47,8	2	M12 x 89	1,8
4	4.500	750	11,928.2	0.19	5.81	8.07	1.97	2	½ x 3	4.6
100	114,3	51,7	53,06	4,8	147,6	205,0	50,0	2	M12 x 89	2,1
139,7mm	5.500	750	17,818.7	0.19	7.02	9.72	2.06	2	–	7.5
125	139,7	51,7	79,26	4,8	178,3	246,9	52,3	2	M16 x 83	3,4
5	5.563	750	18,229.3	0.19	7.09	9.71	2.04	2	⅝ x 3¼	7.5
125	141,3	51,7	81,09	4,8	180,1	246,6	51,8	2	M16 x 83	3,4
165,1mm	6.500	700	23,228.2	0.19	8.09	10.53	2.13	2	–	7.6
150	165,1	48,3	103,18	4,8	205,5	267,5	54,1	2	M16 x 83	3,4
6	6.625	700	24,130.1	0.19	8.09	10.53	2.13	2	⅝ x 3¼	7.6
150	168,3	48,3	107,34	4,8	205,5	267,5	54,1	2	M16 x 83	3,4
8	8.625	600	35,055.8	0.19	10.56	13.56	2.62	2	¾ x 4¾	16.9
200	219,1	41,4	155,94	4,8	268,2	344,4	66,5	2	M20 x 121	7,7

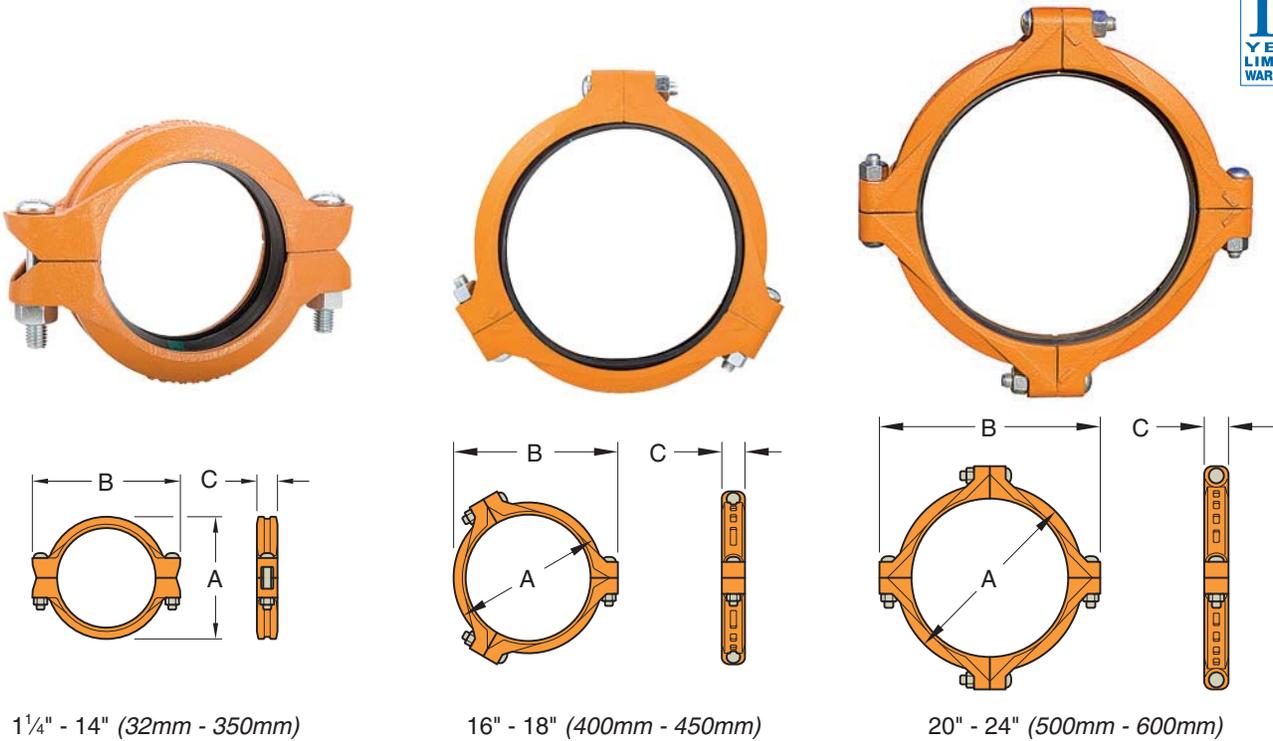
Figure 772 Rigid Couplings

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Tech Data Sheet: G141

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GROOVED COUPLINGS



Pipe Size		Max.† Pressures psi bar	Max.† End Load Lbs. kN	Max.*‡ End Gap Inches mm	Dimensions - Inches mm			Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm				A	B	C	Qty.	Size Inches mm	
10	10.750	500	45,381.3	0.13	12.84	16.41	2.62	2	1 x 6 1/2	25.9
250▶	273,0	34,5	201,87	3,3	326,1	416,8	66,5	2	M24 x 165	11,7
12	12.750	400	51,070.5	0.13	15.41	18.84	2.62	2	1 x 6 1/2	35.4
300▶	323,9	27,6	227,17	3,3	391,4	478,5	66,5	2	M24 x 165	16,0
14	14.000	300	46,181.4	0.13	16.68	20.38	2.93	2	1 x 5 1/2•	45.0
350	355,6	20,7	205,43	3,3	423,7	517,6	74,4	2	-	20,4
16	16.000	300	60,318.6	0.13	18.50	22.64	2.93	3	1 x 5 1/2•	60.6
400	406,4	20,7	268,31	3,3	469,9	575,1	74,4	3	-	27,5
18	18.000	300	76,340.7	0.25	21.31	25.12	3.06	3	1 x 5 1/2•	79.0
450	457,2	20,7	339,58	6,4	541,3	638,0	77,7	3	-	35,8
20	20.000	300	94,247.8	0.25	23.50	27.88	3.06	4	1 1/8 x 5 3/4•	97.0
500	508,0	20,7	419,23	6,4	596,9	708,2	77,7	4	-	44,0
24	24.000	250	113,097.3	0.25	27.63	32.00	3.19	4	1 1/8 x 5 3/4•	120.0
600	609,6	17,2	503,08	6,4	701,8	812,8	81,0	4	-	54,4

* Maximum available gap between pipe ends. Minimum gap = 0.

† Maximum Pressure and End Load are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ for other pipe materials and/or wall thicknesses. Contact GRINNELL Mechanical Products for details.

‡ Max End Gap is for cut grooved standard weight pipe. Values for roll grooved pipe will be half that of cut grooved.

• Only available in ANSI bolt sizes.

▶ Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 17 for coupling specifications and pages 191 - 198 for gasket information.

Figure 707 Heavy Duty Flexible Couplings

(Page 1 of 2)

Tech Data Sheet: G130

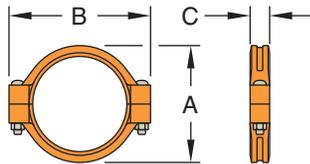
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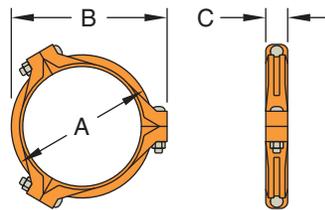
The GRINNELL Figure 707 Heavy Duty Flexible Coupling allows for angular and linear deflection, thermal expansion and contraction, and misalignments of the pipe. Flexible couplings can act as an "expansion joint", allowing linear and angular movement of the pipes when properly installed. This coupling is capable of pressures up to 1,000 psi (68,9 bar), depending on pipe size and wall thickness. Suitable for use in a variety of applications, the Figure 707 Coupling provides a dependable method of joining pipe.



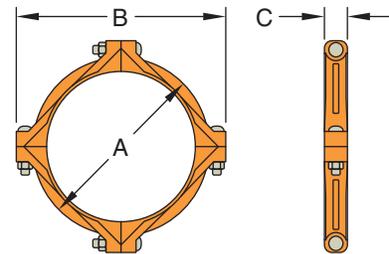
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1" - 12" (25mm - 300mm)



14" - 18" (350mm - 450mm)



20" - 24" (500mm - 600mm)

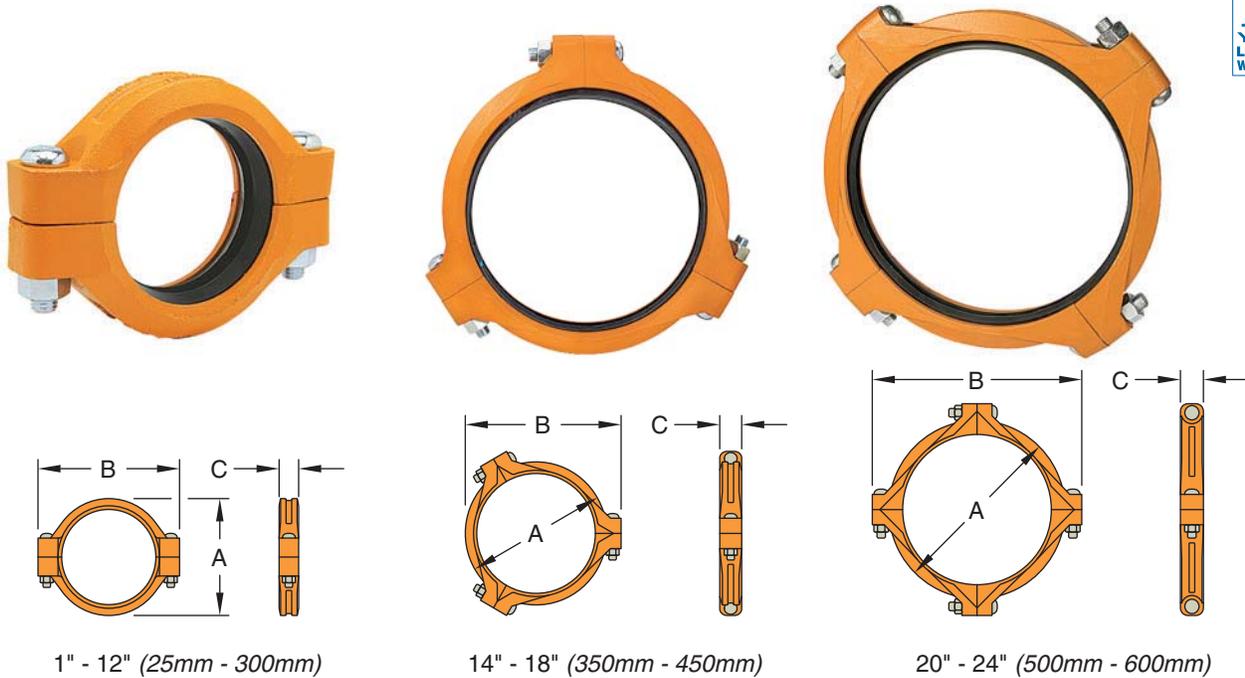
Pipe Size		Max.† Pressures psi bar	Max.† End Load Lbs kN	Max.*‡ End Gap Inches mm	Deflection ‡		Dimensions - Inches mm			Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm				Degrees Per Coupling	Inches/Ft mm/m	A	B	C	Qty.	Size Inches mm	
1	1.315	1000	1,360.0	0.13	5° 26'	1.14	2.38	4.00	1.81	2	1/2 x 3	2.0
25	33,7	68,9	6,10	3,3							98,4	60,5
1 1/4	1.660	1000	2,164.9	0.13	4° 19'	0.90	2.76	4.37	1.81	2	1/2 x 3	2.2
32	42,4	68,9	9,63	3,3							75,0	70,0
1 1/2	1.900	1000	2,835.3	0.13	3° 46'	0.79	2.97	4.63	1.81	2	1/2 x 3	2.5
40	48,3	68,9	12,61	3,3							65,8	75,4
2	2.375	1000	4,430.1	0.13	3° 1'	0.63	3.54	5.25	1.88	2	1/2 x 3	3.0
50	60,3	68,9	19,71	3,3							52,5	89,9
2 1/2	2.875	1000	6,491.8	0.13	2° 29'	0.52	4.06	5.75	1.88	2	1/2 x 3	3.5
65	73,0	68,9	28,88	3,3							43,3	103,1
76,1mm	3.000	1000	7,068.6	0.13	2° 23'	0.50	4.19	5.75	1.88	2	-	4.0
65	76,1	68,9	31,44	3,3							41,7	106,4
3	3.500	1000	9,621.1	0.13	2° 3'	0.43	4.69	6.38	1.88	2	1/2 x 3	4.0
80	88,9	68,9	42,80	3,3							35,8	119,1
4	4.500	1000	15,904.3	0.25	3° 11'	0.67	5.95	8.25	2.06	2	5/8 x 3 1/4	7.0
100	114,3	68,9	70,75	6,4							55,8	151,1
139,7mm	5.500	1000	23,758.3	0.25	2° 30'	0.52	7.02	10.00	2.04	2	3/4 x 4 3/4	8.3
125	139,7	68,9	105,6	6,4							43,6	178,3
5	5.563	1000	24,305.7	0.25	2° 35'	0.54	7.08	10.00	2.06	2	3/4 x 4 3/4	10.0
125	141,3	68,9	108,12	6,4							45,1	179,8
165,1mm	6.500	1000	33,183.1	0.25	2° 12'	0.46	8.19	11.25	2.06	2	-	12.0
150	165,1	68,9	147,61	6,4							38,4	208,0
6	6.625	1000	34,471.6	0.25	2° 10'	0.45	8.30	11.25	2.06	2	3/4 x 4 3/4	11.1
150	168,3	68,9	153,34	6,4							37,8	210,8
8	8.625	800	46,741.0	0.25	1° 40'	0.35	10.68	14.00	2.47	2	7/8 x 6 1/2	21.4
200	219,1	55,2	207,91	6,4							29,2	271,3

Figure 707 Heavy Duty Flexible Couplings

(Page 2 of 2)

Tech Data Sheet: G130

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Pipe Size		Max.† Pressures psi bar	Max.† End Load Lbs kN	Max.*‡ End Gap Inches mm	Deflection ‡		Dimensions - Inches mm			Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O. D. Inches mm				Degrees Per Coupling	Inches/Ft mm/m	A	B	C	Qty.	Size Inches mm	
10	10.750	800	72,610.1	0.25	1° 20'	0.28	13.06	16.44	2.63	2	1 x 6¹/₂	29.0
250	273,0	55,2	322,99	6,4			23,3	331,7	417,6		66,8	M24 x 165
12	12.750	800	102,141.0	0.25	1° 7'	0.23	15.39	18.84	2.63	2	1 x 6¹/₂	37.0
300	323,9	55,2	454,35	6,4			19,5	390,9	478,5		66,8	M24 x 165
14	14.000	300	46,181.4	0.25	1° 2'	0.22	16.67	20.38	2.94	3	1 x 5¹/₂•	46.0
350	355,6	20,7	205,43	6,4			18,0	423,4	517,7		74,7	–
16	16.000	300	60,318.6	0.25	0° 54'	0.19	18.83	22.64	2.94	3	1 x 5¹/₂•	59.0
400	406,4	20,7	268,31	6,4			15,8	478,3	575,1		74,7	–
18	18.000	300	76,340.7	0.25	0° 48'	0.17	21.31	25.12	3.06	3	1 x 5¹/₂•	78.0
450	457,2	20,7	339,58	6,4			14,0	541,3	638,0		77,7	–
20	20.000	300	94,247.8	0.25	0° 43'	0.15	23.47	27.88	3.06	4	1¹/₈ x 5³/₄•	89.0
500	508,0	20,7	419,23	6,4			12,5	596,1	708,2		77,7	–
24	24.000	250	113,097.3	0.25	0° 36'	0.13	27.58	32.00	3.19	4	1¹/₈ x 5³/₄•	112.0
600	609,6	17,2	503,08	6,4			10,5	700,5	812,8		81,0	–

* Maximum available gap between pipe ends. Minimum gap = 0.

† Maximum Pressure and End Load are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ for other pipe materials and/or wall thicknesses. Contact GRINNELL Mechanical Products for details.

‡ Max End Gap and Deflection is for cut grooved standard weight pipe. Values for roll grooved pipe will be half that of cut grooved.

• Only available in ANSI bolt sizes.

▶ Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 17 for coupling specifications and pages 191 - 198 for gasket information.

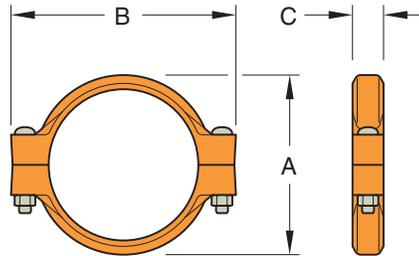
Figure 705 Flexible Couplings

Tech Data Sheet: G110

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The GRINNELL Figure 705 Flexible Coupling allows for angular and linear deflection, thermal expansion and contraction, and misalignments of pipe. It is capable of pressures up to 500 psi (34,5 bar), depending on pipe size and wall thickness. Suitable for use in a variety of applications, the GRINNELL Figure 705 Coupling provides a dependable method of joining pipe.



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com

Pipe Size		Max.† Pressures psi bar	Max.† End Load Lbs. kN	Max.*‡ End Gap Inches mm	Deflection ‡		Dimensions - Inches mm			Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm				Degrees Per Coupling	Inches/Ft mm/m	A	B	C	Qty.	Size Inches mm	
1	1.315	500	410.0	0.13	5° 30'	1.16	2.24	3.94	1.81	2	3/8 x 1 3/4	1.3
25	33.7	34,5	1,86	3,3		96,7	56,9	100,1	46,0		M10 x 44	0,6
1 1/4	1.660	500	1,082.1	0.13	4° 19'	0.90	2.56	4.19	1.81	2	3/8 x 2 1/4	1.8
32	42,4	34,5	4,81	3,3		75,0	65,0	106,4	46,0		M10 x 57	0,8
1 1/2	1.900	500	1,417.6	0.13	3° 46'	0.79	2.75	4.44	1.81	2	3/8 x 2 1/4	1.8
40	48,3	34,5	6,30	3,3		65,8	69,9	112,8	46,0		M10 x 57	0,8
2	2.375	500	2,215.1	0.13	3° 1'	0.63	3.25	4.88	1.88	2	3/8 x 2 1/4	1.8
50	60,3	34,5	9,85	3,3		52,5	82,6	124,0	47,8		M10 x 57	0,8
2 1/2	2.875	500	3,245.9	0.13	2° 29'	0.52	3.69	5.50	1.88	2	3/8 x 2 1/4	2.0
65	73,0	34,5	14,43	3,3		43,3	93,7	139,7	47,8		M10 x 57	0,9
76,1mm	3.000	500	3,534.3	0.13	2° 23'	0.50	4.00	5.75	1.88	2	-	3.1
65	76,1	34,5	15,72	3,3		41,7	101,6	146,10	47,8		M12 x 89	1,4
3	3.500	500	4,810.6	0.13	2° 3'	0.43	4.38	6.50	1.88	2	1/2 x 3	3.3
80	88,9	34,5	21,39	3,3		35,8	111,3	165,1	47,8		M12 x 89	1,5
4	4.500	500	7,952.2	0.25	3° 11'	0.67	5.69	7.75	2.06	2	1/2 x 3	4.0
100	114,3	34,5	35,35	6,4		55,6	144,5	196,9	52,3		M12 x 89	1,8
139,7mm	5.500	450	10,691.2	0.25	2° 36'	0.55	6.81	9.75	2.06	2	-	6.6
125	139,7	31	47,56	6,4		45,5	173,0	247,7	52,3		M16 x 83	3,0
5	5.563	450	10,937.6	0.25	2° 35'	0.54	6.88	9.75	2.06	2	5/8 x 3 1/4	6.6
125	141,3	31	48,63	6,4		45,0	174,8	247,7	52,3		M16 x 83	3,0
165,1mm	6.500	450	14,932.4	0.25	2° 12'	0.46	7.75	10.69	2.06	2	-	7.0
150	165,1	31	66,36	6,4		38,3	196,9	271,5	52,3		M16 x 83	3,2
6	6.625	450	15,512.2	0.25	2° 10'	0.45	7.94	10.69	2.06	2	5/8 x 3 1/4	7.0
150	168,3	31	68,97	6,4		37,8	201,7	271,5	52,3		M16 x 83	3,2
8	8.625	450	26,291.8	0.25	1° 40'	0.35	10.19	13.56	2.50	2	3/4 x 4 3/4	11.8
200	219,1	31	116,89	6,4		29,2	258,8	344,4	63,5		M20 x 121	5,4
10	10.750	350	31,766.9	0.25	1° 20'	0.28	12.69	16.38	2.63	2	1 x 6 1/2	26.8
250	273,0	24,1	141,31	6,4		23,3	322,3	416,1	66,8		M24 x 165	12,2
12	12.750	350	44,686.7	0.25	1° 7'	0.23	14.94	18.88	2.63	2	1 x 6 1/2	32.2
300	323,9	24,1	198,78	6,4		19,5	379,5	479,6	66,8		M24 x 165	14,6

* Maximum available gap between pipe ends. Minimum gap = 0.

† Maximum Pressure and End Load are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ for other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

‡ Max End Gap and Deflection is for cut grooved standard weight pipe. Values for roll grooved pipe will be half that of cut grooved.

* Maximum available gap between pipe ends. Minimum gap = 0.

‡ Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 17 for coupling specifications and pages 191 - 198 for gasket information.

Figure 770 High Pressure Rigid Couplings

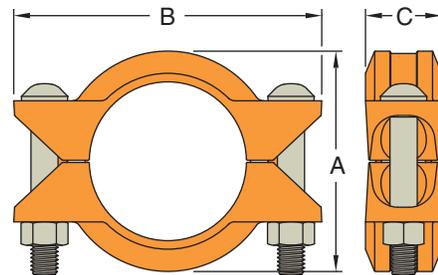
Tech Data Sheet: G138

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The Figure 770 Rigid Coupling provides a rigid joint by firmly gripping along the circumference of the pipe grooves. This coupling offers a dependable method for joining pipe and is an economical alternative to welding, threading, or using flanges. It is capable of pressures up to 1000 psi (68,9 bar) depending on pipe size and wall thickness.

Additional Features:

- Full 360° gripping of the groove circumference provides a strong rigid connection.
- Tongue-and-groove design simplifies installation.
- Backed by the industry's best 10-Year Limited Warranty.



Pipe Size		Max.† Pressures psi bar	Max.† End Load Lbs. kN	Max.*‡ End Gap Inches mm	Dimensions - Inches mm			Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm				A	B	C	Qty.	Size Inches mm	
2	2.375	1000	4,430.1	0.14	3.53	5.72	1.88	2	5/8 x 2 3/4	3.4
50	60,3	68,9	19,71	3,6	89,7	145,3	47,8	2	M16 x 70	1,5
2 1/2	2.875	1000	6,491.8	0.14	4.06	6.00	1.88	2	5/8 x 3 1/2	4.0
65	73,0	68,9	28,88	3,6	103,1	152,4	47,8	2	M16 x 89	1,8
3	3.500	1000	9,621.1	0.14	4.78	6.76	1.88	2	5/8 x 3 1/2	5.3
80	88,9	68,9	42,79	3,6	121,4	171,7	47,8	2	M16 x 89	2,4
4	4.500	1000	15,904.3	0.25	6.01	8.50	2.10	2	3/4 x 4 1/4	7.3
100	114,3	68,9	70,74	6,4	152,7	215,9	53,3	2	M20 x 108	3,3
6	6.625	1000	34,471.6	0.25	8.51	11.25	2.10	2	7/8 x 5 1/2	15.0
150	168,3	68,9	153,33	6,4	216,2	285,8	53,3	2	M22 x 140	6,8
8	8.625	800	46,741.0	0.25	10.93	13.75	2.60	2	1 x 5 1/2	25.0
200	219,1	55,2	207,90	6,4	277,6	349,3	66,0	2	M24 x 140	11,3
10	10.750	800	72,610.1	0.25	13.46	16.00	2.60	2	1 x 6 1/2	34.0
250	273,0	55,2	322,97	6,4	341,9	406,4	66,0	2	M24 x 165	15,4
12	12.750	800	102,141.0	0.25	15.52	18.00	2.60	2	1 x 6 1/2	40.0
300	323,9	55,2	454,32	6,4	394,2	457,2	66,0	2	M24 x 165	18,1

* Maximum available gap between pipe ends. Minimum gap = 0.

† Maximum Pressure and End Load are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ for other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

‡ Max End Gap and Deflection is for cut grooved standard weight pipe. Values for roll grooved pipe will be half that of cut grooved.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 17 for coupling specifications and pages 191 - 198 for gasket information.

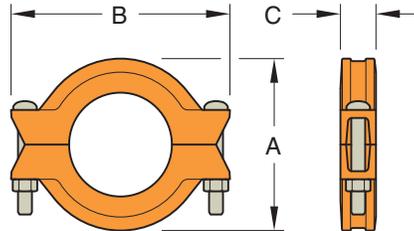
Figure 716 Flexible Reducing Couplings

Tech Data Sheet: G120

10
YEAR
LIMITED
WARRANTY



The GRINNELL Figure 716 Flexible Reducing Coupling allows for a direct transition between two different pipe sizes and replaces two couplings and a reducing fitting. It is capable of pressures up to 500 psi (34,5 bar) depending on pipe size and wall thickness. A flexible reducing coupling is not recommended for low-temperature applications.



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com

Pipe Size		Max. † Pressures psi bar	Max. † End Load Lbs./kN	Max. †‡ End Gap Inches mm	Deflection †		Dimensions Inches mm			Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm				Degrees Per Coupling	Inches/Ft mm/m	A	B	C	Qty.	Size Inches mm	
2 x 1½	2.375 x 1.900	500	1,417.6	0.13	1° 53'	0.39	3.50	5.06	1.88	2	¾ x 2¼	2.8
50 x 40	60,3 x 48,3	34,5	6,31	3,3		32,9	88,9	128,5	47,8	2	M10 x 57	1,3
2½ x 2	2.875 x 2.375	500	2,215.1	0.13	1° 33'	0.32	4.00	5.50	1.88	2	¾ x 2¼	3.3
65 x 50	73,0 x 60,3	34,5	9,85	3,3		27,1	101,6	139,7	47,8	2	M120 x 57	1,5
76.1 x 2	3.000 x 2.375	500	2,215.1	0.13	1° 34'	0.33	4.19	5.88	1.88	2	-	3.3
65 x 50	76,1 x 60,3	34,5	9,85	3,3		27,3	106,4	149,4	47,8	2	M12 x 89	1,5
3 x 2	3.500 x 2.375	500	2,215.1	0.13	1° 17'	0.27	4.69	6.50	1.88	2	½ x 3	4.3
80 x 50	88,9 x 60,3	34,5	9,85	3,3		22,4	119,1	165,1	47,8	2	M12 x 89	2,0
3 x 2½	3.500 x 2.875	500	3,245.9	0.13	1° 17'	0.27	4.69	6.50	1.88	2	½ x 3	3.9
80 x 65	88,9 x 73,0	34,5	14,44	3,3		22,4	119,1	165,1	47,8	2	M12 x 89	1,8
3 x 76,1mm	3.500 x 3.000	500	3,534.3	0.13	1° 17'	0.27	4.69	6.50	1.88	2	-	4.2
80 x 65	88,9 x 76,1	34,5	15,72	3,3		22,4	119,1	165,1	47,8	2	M12 x 89	1,9
4 x 2	4.500 x 2.375	500	2,215.1	0.19	2° 38'	0.55	6.00	8.13	2.00	2	⅝ x 3¼	5.2
100 x 60	114,3 x 60,3	34,5	9,85	4,8		46,0	152,4	206,5	50,8	2	M16 x 83	2,4
4 x 2½	4.500 x 2.875	500	3,245.9	0.19	2° 38'	0.55	6.00	8.13	2.00	2	⅝ x 3¼	6.7
100 x 65	114,3 x 73,0	34,5	14,44	4,8		46,0	152,4	206,5	50,8	2	M16 x 83	3,0
114,3 x 76,1mm	4.500 x 3.000	500	3,534.3	0.19	2° 38'	0.55	6.00	8.13	2.00	2	-	6.2
100 x 65	114,3 x 76,1	34,5	15,72	4,8		46,0	152,4	206,5	50,8	2	M16 x 83	2,8
4 x 3	4.500 x 3.500	500	4,810.6	0.19	2° 38'	0.55	6.00	8.13	2.00	2	⅝ x 3¼	6.2
100 x 80	114,3 x 88,9	34,5	21,40	4,8		46,0	152,4	206,5	50,8	2	M16 x 83	2,8
139,7mm x 4	5.500 x 4.500	500	7,952.2	0.25	2° 38'	0.55	7.06	9.50	2.06	2	-	9.6
125 x 100	139,7 x 114,3	34,5	35,37	6,4		46,0	179,3	241,3	52,3	2	M20 x 121	4,4
5 x 4	5.563 x 4.500	500	7,952.2	0.25	2° 5'	0.44	7.13	9.56	2.06	2	¾ x 4¾	9.6
125 x 100	141,3 x 114,3	34,5	35,37	6,4		36,4	181,1	242,8	52,3	2	M20 x 121	4,4
165mm x 4	6.500 x 4.500	400	6,361.7	0.25	1° 50'	0.38	8.18	10.81	2.06	2	-	12.8
150 x 100	165,1 x 114,3	27,6	28,30	6,4		32,0	207,8	274,6	52,3	2	M20 x 121	5,8
6 x 4	6.625 x 4.500	400	6,361.7	0.25	1° 44'	0.36	8.38	10.88	2.06	2	¾ x 4¾	12.8
150 x 100	168,3 x 114,3	27,6	28,30	6,4		30,0	212,9	276,4	52,3	2	M20 x 121	5,8
6 x 5	6.625 x 5.563	400	9,722.3	0.25	1° 44'	0.36	8.38	10.88	2.06	2	¾ x 4¾	13.8
150 x 125	168,3 x 141,3	27,6	43,25	6,4		30,0	212,9	276,4	52,3	2	M20 x 121	6,3
8 x 6	8.625 x 6.625	400	13,788.6	0.25	1° 15'	0.26	10.69	13.75	2.25	2	⅞ x 6½	20.0
200 x 150	219,1 x 168,3	27,6	61,33	6,4		21,0	271,5	349,3	57,2	2	M22 x 165	9,1

* Maximum available gap between pipe ends. Minimum gap = 0.

† Maximum Pressure and End Load are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ on other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

‡ Max End Gap and Deflection is for cut grooved standard weight pipe. Values for roll grooved pipe will be half that of cut grooved.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 17 for coupling specifications and pages 191 - 198 for gasket information.

Figure 780 Grooved Snap Couplings

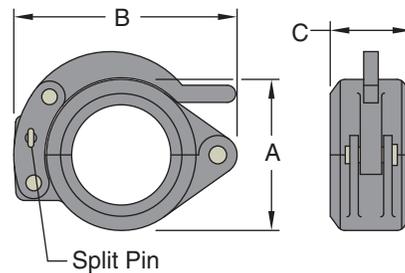
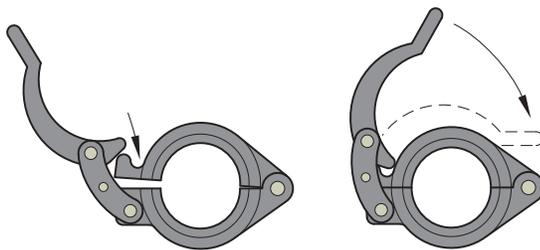
Tech Data Sheet: G145

10
YEAR
LIMITED
WARRANTY

The GRINNELL Figure 780 Grooved Snap Coupling is designed for quickly connecting and disconnecting cut or rolled grooved piping systems. It utilizes a hinged lever mechanism for quickly joining grooved piping segments securely without nuts and bolts. Coupling housing segments are locked in place using a split pin.

Additional Features:

- Unique two-step closing feature allows for safe and quick installation.
- Sizes 5" to 8" (125mm to 200mm) feature a cross-ribbed housing design for extra strength.
- Rated for pressures up to 300 psi (20,7 bar).
- Backed by the industry's best 10-Year Limited Warranty.



Pipe Size		Max. † * Working Pressure psi bar	Max. * End Load Lbs. kN	Max. End Gap Inches mm	Dimensions - Inches mm			Deflection		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm				A	B	C	Degrees Per Coupling	Inches/Ft mm/m	
1½	1.900	300	851	0.06	2.95	4.65	1.85	3° 48'	0.80	2.2
40	48,3	20,1	3,8	1,6	75,0	118,0	47,0		66,4	1,0
2	2.375	300	1,329	0.06	3.39	4.76	1.89	3° 31'	0.74	2.4
50	60,3	20,1	5,9	1,6	86,0	121,0	48,0		61,5	1,1
2½	2.875	300	1,947	0.06	3.62	5.91	1.89	2° 30'	0.52	3.1
65	73,0	20,1	8,7	1,6	92,0	150,0	48,0		43,7	1,4
76,1	3.000	300	2,121	0.06	3.62	5.91	1.89	2° 24'	0.50	3.1
65	76,1	20,1	9,4	1,6	92,0	150,0	48,0		41,9	1,4
3	3.500	300	2,886	0.06	4.69	6.42	1.89	2° 24'	0.50	4.0
80	88,9	20,1	12,8	1,6	119,0	163,0	48,0		41,9	1,8
4	4.500	300	4,771	0.13	6.50	8.07	2.05	3° 12'	0.67	5.9
100	114,3	20,1	21,2	3,2	165,0	205,0	52,0		55,9	2,7
139,7mm	5.500	300	7,127	0.13	7.44	9.96	2.05	2° 37'	0.55	10.8
125	139,7	20,1	31,7	3,2	189,0	253,0	52,0		45,7	4,9
5	5.565	300	7,289	0.13	7.44	9.96	2.05	2° 36'	0.54	10.8
125	141,3	20,1	32,4	3,2	189,0	253,0	52,0		45,4	4,9
165,1mm	6.500	300	9,955	0.13	8.39	10.94	2.05	2° 14'	0.47	12.8
150	165,1	20,1	44,3	3,2	213,0	278,0	52,0		39,0	5,8
6	6.625	300	10,341	0.13	8.50	11.06	2.05	2° 10'	0.45	12.8
150	168,3	20,1	46,0	3,2	216,0	281,0	52,0		37,8	5,8
8	8.625	300	17,528	0.13	10.95	14.02	2.44	1° 40'	0.35	20.5
200	219,1	20,1	78,0	3,2	278,0	356,0	62,0		29,1	9,3

† Pressure ratings listed are cold water pressure or maximum working pressure within the service temperature range of the gasket used in the coupling.

* Maximum Working Pressures and End Loads listed are total of internal and external pressures and loads based on Schedule 40 steel pipe grooved in accordance with Standard Cut Groove or Roll Groove Specifications.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 17 for coupling specifications and pages 191 - 198 for gasket information.

Figure 702 Mechanical Outlet Couplings

(Page 1 of 2)

Tech Data Sheet: G220

10
YEAR
LIMITED
WARRANTY



The GRINNELL Figure 702 Mechanical Outlet Coupling has the combined features of a coupling and a reducing outlet, eliminating the need for a mechanical tee or other associated couplings. The coupling is available in grooved, male-threaded, or female-threaded outlets. This design makes installation faster, safer, and more cost effective on the job site.

Additional features:

- Available in sizes 1½" to 6" (40mm - 150mm)
- Rated for pressures up to 500 psi (34,5 bar)
- Suitable for vacuum service up to 10" HG (254mm HG)

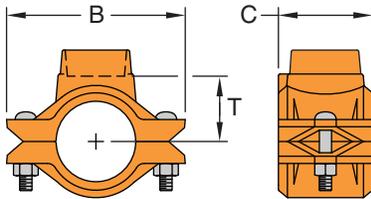


Figure 702
Outlet Coupling with Female NPT Outlet

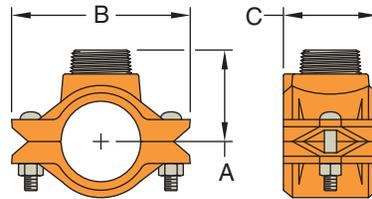


Figure 702
Outlet Coupling with Male NPT Outlet

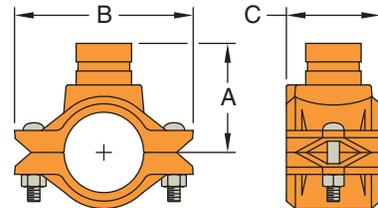


Figure 702
Outlet Coupling with Grooved Outlet

Run Pipe Size		Branch Size				End Gap Range Inches mm	Max. Run End Load Lbs. kN	Dimensions Inches mm				Coupling Bolt Size Inches	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	Female Thread Inches mm	Male Thread Inches mm	Grooved				A	B	C	T		
				Nominal Inches mm	O.D. Inches mm								
1½ 40	1.900 48,3	½	-	-	-	0.81-0.88	1418 6,3	-	4.50	2.75	2.06	¾ x 2 1/8 •	2.6
		21,3	-	-	-	20-22		-	114,3	70,0	52,0		1,2
		¾	-	-	-	0.81-0.88		-	4.50	2.75	2.06		2.6
		26,7	-	-	-	20-22		-	114,3	70,0	52,0		1,2
2 50	2.375 60,3	1	-	-	-	0.81-0.88	2215 9,9	-	4.50	2.75	1.94	¾ x 2 1/8 •	2.9
		33,7	-	-	-	20-22		-	114,3	70,0	49,0		1,3
		¾	-	-	-	0.81-0.88		-	5.00	2.75	2.32		3.1
		21,3	-	-	-	20-22		-	127,0	70,0	59,0		1,4
2½ 65	2.875 73,0	1	1	1	1.315	0.81-0.88	3246 14,4	3.50	5.00	2.75	2.20	½ x 2 3/8 •	3.3
		33,7	33,7	25	33,7	20-22		89,0	127,0	70,0	56,0		1,5
		¾	-	-	-	1.25-1.50		-	6.33	3.25	2.56		4.6
		26,7	-	-	-	32-38		-	161,0	83,0	65,0		2,1
		½	-	-	-	1.25-1.50		-	6.33	3.25	2.20		4.8
		21,3	-	-	-	32-38		-	161,0	83,0	56,0		2,2
		1	-	-	-	1.25-1.50		-	6.33	3.25	2.44		4.4
		33,7	-	-	-	32-38		-	161,0	83,0	62,0		2,2
-	1¼	1¼	1.660	1.25-1.50	-	3.70	6.33	3.25	-	5.1			
-	42,4	32	42,4	32-38	-	94,0	161,0	83,0	-	2,3			
-	1½	1½	1.900	1.25-1.50	-	3.70	6.33	3.25	-	5.9			
-	48,3	40	48,3	32-38	-	94,0	161,0	83,0	-	2,4			

Figure 702 Mechanical Outlet Couplings

(Page 2 of 2)

Tech Data Sheet: G220

10
YEAR
LIMITED
WARRANTY

GROOVED COUPLINGS

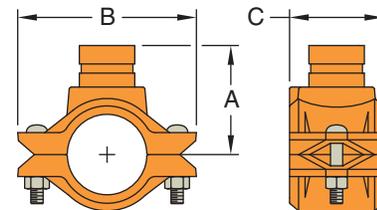
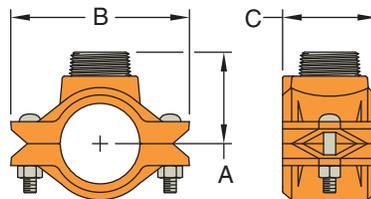
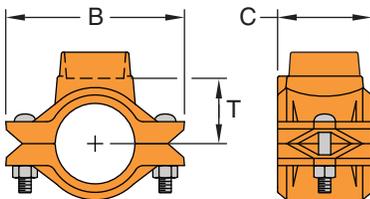


Figure 702
Outlet Coupling with Female NPT Outlet

Figure 702
Outlet Coupling with Male NPT Outlet

Figure 702
Outlet Coupling with Grooved Outlet

Run Pipe Size		Branch Size				End Gap Range Inches mm	Max. Run End Load Lbs. kN	Dimensions Inches mm				Coupling Bolt Size Inches	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	Female Thread Inches mm	Male Thread Inches mm	Grooved				A	B	C	T		
				Nominal Inches mm	O.D. Inches mm								
3 80	3.500 88,9	3/4	-	-	-	1.25-1.50	21.4 4811	-	6.87	3.25	2.83	1/2 x 3 •	5.9
		26,7	-	-	-	32-38		-	175,0	83,0	72,0		2,4
		1	1	1	1.315	1.25-1.50		4.00	6.87	3.25	2.75		6.2
		33,7	33,4	25	33,7	32-38		102,0	175,0	83,0	70,0		2,8
		-	1 1/2	1 1/2	1.900	1.25-1.50		4.00	6.87	3.25	-		6.4
-	48,3	40	48,3	32-38	102,0	175,0	83,0	-	2,9				
4 100	4.500 114,3	3/4	-	-	-	1.63-1.81	35.4 7952	-	8.31	3.66	3.70	5/8 x 3 1/2 •	9.2
		26,7	-	-	-	41-46		-	211,0	93,0	94,0		4,2
		1	-	-	-	1.63-1.81		-	8.31	3.66	3.58		9.5
		33,7	-	-	-	41-46		-	211,0	93,0	91,0		4,3
		1 1/2	1 1/2	1 1/2	1.900	1.63-1.81		4.88	8.31	3.66	3.31		9.5
		48,3	48,3	40	48,3	41-46		124,0	211,0	93,0	84,0		4,3
-	2	2	2.375	1.63-1.81	4.88	8.31	3.66	-	9.9				
-	60,3	50	60,3	41-46	124,0	211,0	93,0	-	4,5				
6 150	6.625 168,3	-	-	-	-	1.63-1.81	76.7 17,235	-	10.86	3.70	-	5/8 x 3 1/2 •	13.2
		-	-	-	-	41-46		-	276,0	94,0	-		6,0
		1	-	-	-	1.63-1.81		-	10.86	3.70	4.76		13.2
		33,7	-	-	-	41-46		-	276,0	94,0	121,0		6,0
		1 1/2	1 1/2	1 1/2	1.900	1.63-1.81		6.06	10.86	3.70	4.76		13.6
		48,3	48,3	40	48,3	41-46		154,0	276,0	94,0	121,0		6,2
-	2	2	2.375	1.63-1.81	6.06	10.86	3.70	-	14.3				
-	60,3	50	60,3	41-46	154,0	276,0	94,0	-	6,5				

◆ Threads are NPT. Some size outlets are available with BSP threads. Contact GRINNELL Mechanical products for details.

• Only available in ANSI bolt sizes.

Flow characteristics chart is available in technical data sheet G220.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 17 for coupling specifications and pages 191 - 198 for gasket information.

Figure 71 Flange Adapters (ANSI Class 125/150)

(Page 1 of 2)

Tech Data Sheet: G150

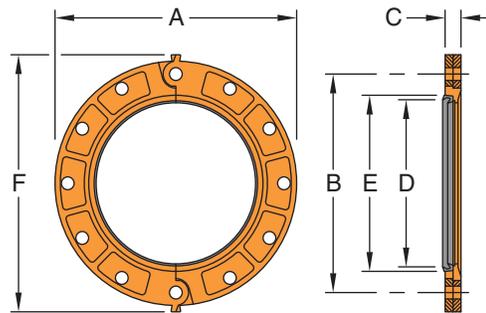


The Figure 71 Flange Adapter is capable of pressures up to 300 psi (20,7 bar) depending on pipe size and wall thickness. It provides a direct transition from flanged components to a grooved piping system. I.P.S. size flange bolt patterns conform to ANSI Class 125 and 150.

The gasket seal is designed with an optimal amount of rubber to provide a dependable seal and to avoid the gasket pocket from overfilling, which may cause assembly difficulties.



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com



Sizes 2" - 12" (50mm - 300mm)

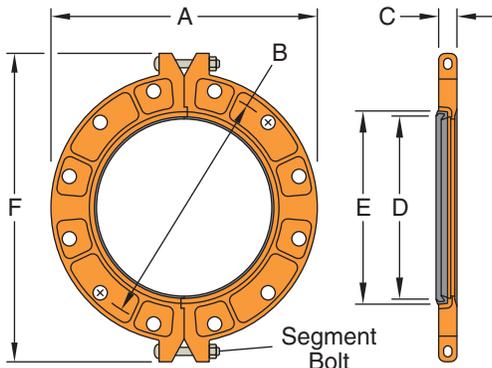
Pipe Size		Max † Pressure psi bar	Max End Load † Lbs. N	Dimensions - Inches mm						Recommended Flange Mating Bolts ‡			Approx. Wt. Lbs kg
Nominal Inches mm	O.D. Inches mm			A	B	C	*D	*E	F	Size Dia. x Lg Inches mm	Qty.	Bolt Torque Range Lbs.-ft. Nm	
2	2.375	300	1,324	6.38	4.75	0.75	2.38	3.41	7.25	5/8 x 3	4	110-140	4.1
50	60,3	20,7	5889	162,1	120,7	19,1	60,5	86,6	184,2	-	4	149-190	1,9
2½	2.875	300	1,948	7.00	5.50	0.88	2.88	3.91	7.88	5/8 x 3	4	110-140	5.4
65	73,0	20,7	8665	178,0	140,0	22,0	73,0	99,0	200,0	-	4	149-190	2,4
76,1mm	3.000	300	2,121	7.28	5.71	0.88	3.00	4.03	8.08	5/8 x 3	4	110-140	5.8
65	76,1	20,7	9435	184,9	145,0	22,0	76,1	102,4	205,2	-	4	149-190	2,6
3	3.500	300	2,886	7.50	6.00	0.94	3.50	4.53	9.88	5/8 x 3	4	110-140	6.0
80	88,9	20,7	12838	190,5	152,4	23,9	88,9	115,1	251,0	-	4	149-190	2,7
4	4.500	300	4,771	9.00	7.50	0.94	4.50	5.53	9.90	5/8 x 3	8	110-140	8.1
100	114,3	20,7	21,222	228,6	190,5	23,9	114,3	140,5	251,5	-	8	149-190	3,7
139,7mm	5.500	300	7,127	9.84	8.27	1.00	5.50	6.66	10.64	¾ x 3½	8	220-250	9.2
125	139,7	20,7	31,702	249,9	210,1	25,4	139,7	169,2	270,3	-	8	298-339	4,2
5	5.563	300	7,292	10.00	8.50	1.00	5.56	6.72	11.38	¾ x 3½	8	220-250	9.2
125	141,3	20,7	32,436	254,0	215,9	25,4	141,2	170,7	289,1	-	8	298-339	4,2
165,1mm	6.500	300	9,955	11.22	9.45	1.00	6.50	7.66	12.10	¾ x 3½	8	220-250	11.0
150	165,1	20,7	44,282	285,0	240,6	25,4	165,1	194,6	307,3	-	8	298-339	5,0
6	6.625	300	10,341	11.00	9.50	1.00	6.62	7.78	11.88	¾ x 3½	8	220-250	10.5
150	168,3	20,7	45,999	279,4	241,3	25,4	168,1	197,6	301,8	-	8	298-339	4,8
8	8.625	300	17,528	13.50	11.75	1.13	8.62	9.94	14.38	¾ x 3½	8	220-250	16.2
200	219,1	20,7	77,968	342,9	298,5	28,7	218,9	252,5	365,3	-	8	298-339	7,3
10	10.750	300	27,229	16.00	14.25	1.19	10.75	12.31	16.88	7/8 x 4	12	320-400	20.7
250	273,0	20,7	121,121	406,4	362,0	30,2	273,1	312,7	428,8	-	12	434-542	9,4
12	12.750	300	38,303	19.00	17.00	1.25	12.75	14.31	20.00	7/8 x 4	12	320-400	31.8
300	323,9	20,7	170,380	482,6	431,8	31,8	323,9	363,5	508,0	-	12	434-542	14,4

Figure 71 Flange Adapters (ANSI Class 125/150)

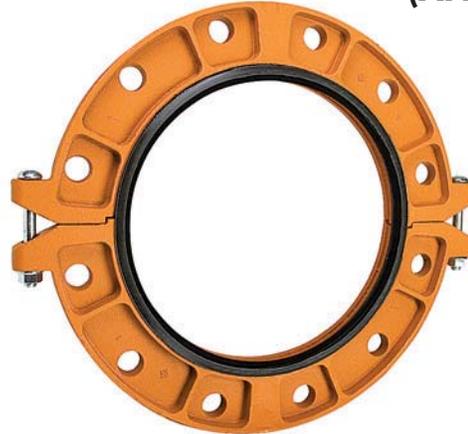
(Page 2 of 2)

Tech Data Sheet: G150

10
YEAR
LIMITED
WARRANTY



Sizes 14" - 24" (350mm - 600mm)



Pipe Size		Max † Pressure psi bar	Max End Load † Lbs. N	Dimensions - Inches mm						Recommended Flange Mating Bolts ‡			Approx. Wt. Lbs kg
Nominal Inches mm	O.D. Inches mm			A	B	C	*D	*E	F	Size Dia. x Lg Inches mm	Qty.	Bolt Torque Range Lbs.-ft. Nm	
14**	14.000	300	46,181	21.00	18.76	1.44	14.00	15.03	24.00	1 x 4 1/4 •	12	360-520	46.7
350	355,6	20,7	205,423	533,4	476,5	36,5	355,6	381,8	609,6	–		488-705	21,2
16**	16.000	300	60,315	23.50	21.26	1.50	16.00	17.00	26.50	1 x 4 1/4 •	16	360-520	59.0
400	406,4	20,7	268,294	596,9	540,0	38,10	406,4	431,7	673,1	–		488-705	26,8
18**	18.000	300	76,455	25.00	22.76	1.63	18.00	19.01	29.00	1 1/8 x 4 3/4 •	16	450-725	62.5
450	457,2	20,7	340,089	635,0	578,1	41,3	457,2	482,8	736,6	–		610-982	28,3
20**	20.000	300	94,245	27.50	25.00	1.75	20.00	21.03	31.50	1 1/8 x 4 3/4 •	20	450-725	73.3
500	508,0	20,7	419,223	698,5	635,0	44,5	508,0	534,2	800,1	–		610-982	33,2
24**	24.000	250	135,720	32.00	29.50	1.93	24.00	25.05	36.00	1 1/4 x 5 1/2 •	20	620-1000	100.6
600	609,6	17,2	603,713	812,8	749,3	49,0	609,6	636,3	914,4	–		841-1356	45,6

* Dimensions D and E represent minimum and maximum sealing surfaces.

** For segment bolt torque recommendations, refer to Table A below.

• Metric segment bolt are available upon request.

† Maximum Pressure and End Load are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ on other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

‡ Mating bolts and nuts are not supplied. Flange mating bolts must be at least SAE J429, Grade 5 or stronger. Bolt lengths are standard; responsibility lies with the purchaser to verify the correct length for the intended application.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 17 for coupling specifications and pages 191 - 198 for gasket information.

See page 33 for Flange Adapter Washers and page 226 Flange Drilling Specifications.

TABLE A SEGMENT BOLT TORQUE	Pipe Size		Segment Bolts	
	Nominal Inches mm	O.D. Inches mm	Size - Dia. x Lg Inches mm	Bolt Torque Range Lbs.-ft. Nm
	14	14.000	5/8 x 4 3/4	100-130 149-190
	350	355,6		
	16	16.000	–	
	400	406,4		
	18	18.000	3/4 x 4 3/4	130-180 176-244
	450	457,2		
20	20.000	–		
500	508,0			
24	24.000	–		
600	609,6			

Figure 71 Flange Adapters (PN10/PN16)

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Tech Data Sheet: G150

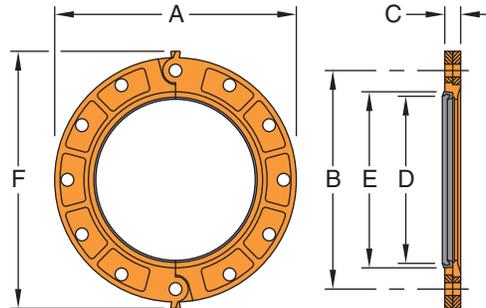


The Figure 71 Flange Adapter is capable of pressures up to 300 psi (20,7 bar) depending on pipe size and wall thickness. It provides a direct transition from flanged components to a grooved piping system. I.P.S. size flange bolt patterns conform to PN10/PN16

The gasket seal is designed with an optimal amount of rubber to provide a dependable seal and to avoid the gasket pocket from overfilling, which may cause assembly difficulties.



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com



Sizes 2" - 12" (50mm - 300mm)

Pipe Size		PN10/ PN16	Max † End Load Lbs. N	Dimensions - Inches mm						Recommended Flange Mating Bolts ‡			Approx. Wt. Lbs kg
Nominal Inches mm	O. D. Inches mm			A	B	C	*D	*E	F	Size Dia. x Lg Inches mm	Qty.	Bolt Torque Range Nm	
2	2.375	PN10 / PN16	1,324	6.38	4.92	0.75	2.38	3.41	7.25	-	4	110-140	4.0
50	60,3		5889	162,1	125,0	19,1	60,5	86,6	184,2	M16 x 76		149-190	1,8
2½	2.875	PN10 / PN16	1,948	7.00	5.50	0.88	2.88	3.91	5.13	-	4	110-140	5.4
65	73,0		8665	177,8	139,7	22,4	73,6	99,3	130,3	M16 x 76		149-190	2,4
76,1mm	3.000	PN10	1,948	7.28	5.71	0.88	3.00	4.03	8.09	-	4	110-140	5.7
65**	76,1		8665	184,9	145,0	22,4	76,1	102,4	205,5	M16 x 76		149-190	2,6
76,1mm	3.000	PN16	1,948	7.28	5.70	0.88	3.00	4.03	8.08	-	4	110-140	5.6
65**	76,1		8665	184,9	144,8	22,4	76,1	102,4	205,2	M16 x 76		149-190	2,5
3**	3.500	PN10	2,886	7.26	5.76	0.94	3.50	4.53	7.86	-	4	110-140	5.4
80	88,9		12,838	184,4	146,3	23,9	88,9	115,1	199,6	M16 x 76		149-190	2,4
3**	3.500	PN16	2,886	7.88	6.30	0.94	3.50	4.53	8.76	-	8	110-140	5.6
80	88,9		12,838	200,2	160,0	23,9	88,9	115,1	222,5	M16 x 76		149-190	2,5
4**	4.500	PN10	4,771	8.50	7.00	0.94	4.50	5.53	9.26	-	8	110-140	7.8
100	114,3		21,222	215,9	177,8	23,9	114,3	140,5	235,2	M16 x 76		149-190	3,5
4**	4.500	PN16	4,771	8.66	7.09	0.94	4.50	5.53	9.43	-	8	110-140	8.0
100	114,3		21,222	219,9	180,1	23,9	114,3	140,5	239,5	M16 x 76		149-190	3,6
139,7mm	5.500	PN10	7,292	9.84	8.27	1.00	5.50	6.53	10.69	-	8	110-140	9.2
125**	139,7		32,436	249,9	210,1	25,4	139,7	165,9	271,5	M16 x 89		149-190	4,2
139,7mm	5.500	PN16	7,127	9.84	8.26	1.00	5.50	6.66	12.22	-	8	110-140	9.2
125**	139,7		31,702	249,9	209,8	24,5	139,7	169,2	310,4	M16 x 89		149-190	4,2
165,1mm	6.500	PN10	9,955	11.00	9.26	1.00	6.50	7.66	11.76	-	8	220-250	10.4
150**	165,1		44,282	279,4	234,2	24,5	165,1	194,6	298,7	M20 x 89		298-339	4,7
165,1mm	6.500	PN16	9,955	11.22	9.46	1.00	6.50	7.66	12.10	-	8	220-250	10.5
150**	165,1		44,282	285,0	240,3	24,5	165,1	194,6	307,3	M20 x 89		298-339	4,8
6	6.625	PN10 / PN16	17,528	11.00	9.49	1.00	6.62	7.78	11.88	-	8	220-250	10.6
150	168,3		77,968	279,4	241,1	25,4	168,1	197,6	301,8	M20 x 89		298-339	4,8

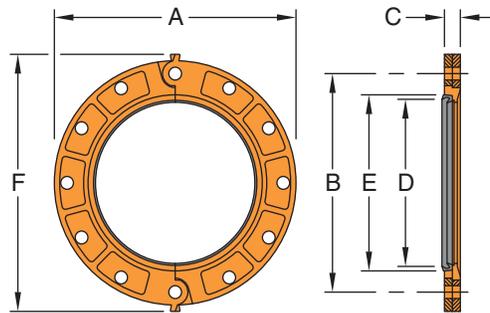
Figure 71 Flange Adapters (PN10/PN16)

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Tech Data Sheet: G150

10
YEAR
LIMITED
WARRANTY

GROOVED COUPLINGS



Sizes 2" - 12" (50mm - 300mm)

Pipe Size		PN10/ PN16	Max † End Load Lbs. N	Dimensions - Inches mm						Recommended Flange Mating Bolts ‡			Approx. Wt. Lbs kg
Nominal Inches mm	O. D. Inches mm			A	B	C	*D	*E	F	Size Dia. x Lg Inches mm	Qty.	Bolt Torque Range Nm	
8**	8.625	PN10	17,528	13.26	11.50	1.125	8.62	9.94	14.12	–	8	220-250	15.4
200	219,1		77,968	336,8	292,1	28,6	218,9	254,5	358,6	M20 x 89		298-339	6,9
8**	8.625	PN16	17,528	13.38	11.62	1.125	8.62	9.94	14.28	–	12	220-250	16.6
200	219,1		77,968	339,8	295,1	28,6	218,9	254,5	362,7	M20 x 89		298-339	7,5
10**	10.750	PN10	27,229	15.56	13.78	1.188	10.75	12.31	16.50	–	12	220-250	21.2
250	273,0		121,121	395,2	350,0	30,2	273,1	312,4	419,1	M20 x 102		298-339	9,6
10**	10.750	PN16	38,303	16.00	13.98	1.188	10.75	12.31	16.88	–	12	320-400	22.5
250	273,0		170,380	406,4	355,1	30,2	273,1	312,7	428,8	M22 x 102		434-542	10,2
12**	12.750	PN10	38,303	17.52	15.74	1.25	12.75	14.31	18.52	–	12	320-400	24.8
300	323,9		170,380	445,0	399,8	31,8	323,9	363,5	470,4	M22 x 102		434-542	11,2
12**	12.750	PN16	38,303	18.12	16.14	1.25	12.75	14.31	19.14	–	12	320-400	28.9
300	323,9		170,380	460,2	410,0	31,8	323,9	363,5	486,2	M22 x 102		434-542	13,1

Maximum Pressure rating is 300 psi (20,7 bar).

* Dimensions D and E represent minimum and maximum sealing surfaces.

** For noted sizes, PN10 and PN16 dimensional values differ.

† Maximum End Load is total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ on other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

‡ Mating Bolts and Nuts are not supplied. Flange Mating Bolts must be at least SAE J429, Grade 5 or stronger. Bolt lengths are standard; responsibility lies with the purchaser to verify the correct length for the intended application.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 17 for coupling specifications and pages 191 - 198 for gasket information.

See page 33 for Flange Adapter Washers and page 226 Flange Drilling Specifications.

Figure 71 Flange Adapters

(AS2129 Table E)

Tech Data Sheet: G150

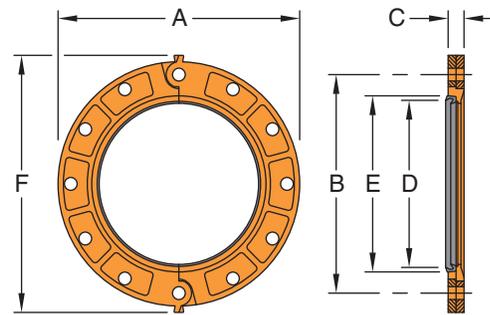


The Figure 71 Flange Adapter is capable of pressures up to 300 psi (20,7 bar) depending on pipe size and wall thickness. It provides a direct transition from flanged components to a grooved piping system. I.P.S. size flange bolt patterns conform to AS2129 Table E.

The gasket seal is designed with an optimal amount of rubber to provide a dependable seal and to avoid the gasket pocket from overfilling, which may cause assembly difficulties.



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com



Sizes 3" - 8" (80mm - 200mm)

Pipe Size		Max † End Load Lbs. N	Dimensions - Inches mm						Recommended Flange Mating Bolts ‡			Approx. Wt. Lbs kg
Nominal Inches mm	O.D. Inches mm		A	B	C	*D	*E	F	Size Dia. x Lg Inches mm	Qty.	Bolt Torque Range Nm	
3	3.500	2,886	7.88	6.30	0.94	3.50	4.53	8.75	-	8	-	6.4
80	88,9	12,838	200,2	160,0	23,9	88,9	115,1	222,3	M16 x 76	8	149-190	2,9
4	4.500	4,771	9.00	7.09	0.94	4.50	5.53	9.90	-	8	-	7.7
100	114,3	21,222	228,6	180,1	23,9	114,3	140,5	251,5	M16 x 76	8	149-190	3,5
6	6.625	10,341	11.25	9.45	1.00	6.50	7.53	12.12	-	8	-	10.6
150	168,3	45,999	285,8	240,0	25,4	165,1	191,3	307,8	M20 x 89	8	298-339	4,8
8	8.625	27,229	13.38	11.61	1.13	8.62	9.94	14.31	-	12	-	15.0
200	219,1	121,121	339,9	294,9	28,7	218,9	252,5	363,5	M20 x 89	12	298-339	6,8

* Dimensions D and E represent minimum and maximum sealing surfaces.

† Maximum End Load is total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ on other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

‡ Mating Bolts and Nuts are not supplied. Flange Mating Bolts must be at least SAE J429, Grade 5 or stronger. Bolt lengths are standard; responsibility lies with the purchaser to verify the correct length for the intended application.

Maximum Pressure rating is 300 psi (20,7 bar).

For information on larger sizes, contact GRINNELL Mechanical Products.

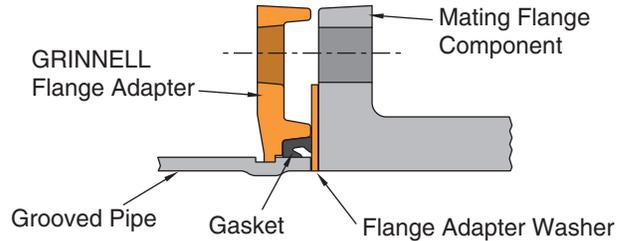
See page 17 for coupling specifications and pages 191 - 198 for gasket information.

See page 33 for Flange Adapter Washers and page 226 Flange Drilling Specifications.

Carbon steel Flange Adapter Washers are required when the Figure 61 and Figure 71 Flange Adapter is used against surfaces such as:

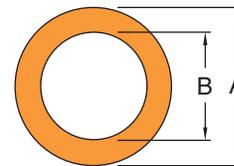
- Rubber surfaces
- Adapting to AWWA cast flanges
- Rubber faced wafer valves
- Serrated flange surfaces

Contact GRINNELL Mechanical Products for additional information.



MATERIAL SPECIFICATIONS

- Cold rolled steel sheet per ASTM A 1008-00 CS Types A, B, or C
- Zinc Electrodeposited coating per ASTM B 633-07 SC2 Type III



Pipe Size		Dimensions - Inches <i>mm</i>	
Nominal Inches <i>mm</i>	O.D. Inches <i>mm</i>	A	B
2	2.375	3.94	2.25
50	60,3	100,1	57,2
2½	2.875	4.69	2.75
65	73,0	119,1	69,9
76,1mm	3.000	4.89	2.88
65	76,1	124,2	73,2
3	3.500	5.19	3.38
80	88,9	131,8	85,9
4	4.500	6.69	4.38
100	114,3	169,9	111,3
139,7mm	5.500	7.45	5.32
125	139,7	189,2	135,1
5	5.563	7.56	5.38
125	141,3	192,0	136,7
165,1mm	6.500	8.47	6.32
150	165,1	215,1	160,5
6	6.625	8.56	6.44
150	168,3	217,4	163,6
8	8.625	10.81	8.44
200	219,1	274,6	214,4

Pipe Size		Dimensions - Inches <i>mm</i>	
Nominal Inches <i>mm</i>	O.D. Inches <i>mm</i>	A	B
10	10.750	13.19	10.50
250	273,0	335,0	266,7
12	12.750	15.94	12.50
300	323,9	404,9	317,5
14	14.000	17.50	13.50
350	355,6	444,5	342,9
16	16.000	20.00	15.50
400	406,4	508,0	393,7
18	18.000	21.38	17.50
450	457,2	542,9	444,5
20	20.000	23.63	19.50
500	508,0	600,1	495,3
24	24.000	28.00	23.50
600	609,6	711,2	596,9

For information on additional sizes, PN10, PN16, and AS2129 Table E sizes, contact GRINNELL Mechanical Products.

Available in stainless steel ASTM A 666 Type 304-2B. Contact GRINNELL Mechanical Products.

See Flange Drilling Specifications on page 226.

Coupling Installation Information

Tech Data Sheet: G900

Installation Handbook: IH-1000M

These installation instructions do not take the place of nor do they eliminate the need for the installer to fully read and understand the complete GRINNELL Mechanical Products Installation Handbook (refer to IH-1000M). Always review the GRINNELL Mechanical Products Installation Handbook and individual product tech data sheets for the latest instructions, techniques, and care and maintenance information. This document does not supersede or replace the GRINNELL Mechanical Products Installation Handbook or individual product tech data sheets. Current documentation can be obtained by contacting GRINNELL Mechanical Products or visiting www.grinnell.com.

Bolt Torque

Bolt Size ANSI Inches	Bolt Torque Range Ft.- Lbs.	Bolt Size Metric	Bolt Torque Range Nm
3/8	30-40	M10	40-60
1/2	90-110	M12	120-150
5/8	100-130	M16	135-175
3/4	150-200	M20	200-270
7/8	180-220	M22	245-300
1	200-250	M24	270-340
1 1/8	225-275		

⚠ WARNING

Failure to follow these instructions may result in improper product installation, joint failure or leakage, serious personal injury, and/or property damage.

The following instructions should be used as a guideline for the proper installation of GRINNELL Grooved Products.

1. Always read and understand the instructions.
2. To avoid serious personal injury always wear appropriate personal protective equipment (ppe), such as safety glasses, hard hat and foot protection.
3. Never remove any piping component without verifying that the system is de-pressurized and drained. Failure to do so may result in serious personal injury.
4. Ensure that the supplied gasket is suitable for the intended application. To prevent deterioration of the gasket material, a petroleum lubricant should never be used. Use a recommended lubricant to install the gasket.
5. The pipe groove dimensions must be in accordance with Standard Roll Groove or Cut Groove Specifications. Refer to Pages 201 to 203 or Tech Data Sheet G710 for additional information.
6. Ensure that the coupling keys are engaged in the grooves.
7. Always tighten nuts evenly by alternating sides. Uneven tightening can cause the gasket to pinch or bind. If a gasket becomes pinched, replace it immediately.
8. Torque values are supplied as a guideline and may be used when setting the torque on power impact wrenches. Always refer to the power impact wrench manufacturer's instructions for settings.
9. Exceeding the suggested torque values may cause damage to the coupling and/or result in pipe-joint failure. Minimum bolt torque is required for coupling to meet the published performance parameters.
10. Always inspect each joint to ensure that the coupling is properly installed.

EDPM, Tri-Seal gaskets are recommended for freezer applications. Reducing Couplings are not recommended for freezer applications. For dry pipe and freezer applications, use the Tri-Seal freezer gasket with a petroleum-free silicone lubricant. Standard lube is not recommended for this application as it freezes and can cause leakage.

ASME Standard Note

*Note: The samples that were tested contained the GRINNELL Figure 707 high pressure flexible couplings, and the GRINNELL Figure 260 end caps of the appropriate size. These were used on the assembly to test system components as related in a field environment. The rated or working pressure of these items is 1,000 psi (68.9 bar)

*Note: The material of both the fittings and couplings used in this testing is found on page nine of the GRINNELL Mechanical Handbook. This material is Ductile Iron Casting Grade 65-45-12, which has an elongation in 2" (51mm) of 12%.

The **Component Proof Test** in ASME A17.1 – 2004, section 3.19.1.3 requires testing to section 8.2.8.5, or five times the rated pressure.

The calculation of the factor of safety located in section 8.2.8.5 would then be calculated as $F = (5.04 / 12 - 2.8) + 2.7$. This then, according to section 8.2.8.5, would be a requirement safety factor of 3.25. The minimum pressure requirement of these components then would be 3,250 psig (224.1 bar)



Grooved Fittings Table of Contents

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GRINNELL Grooved Fittings in ductile iron and fabricated steel provide an economical and efficient method of changing direction, adding an outlet, and reducing or capping piping systems.

GRINNELL Grooved Fittings are rated at the pressure rating of the coupling in use.

Fittings Specifications

Tech Data Sheet: G180



MATERIAL SPECIFICATIONS

Ductile Iron Fitting Specifications

- ASTM A 536 - Standard specification for ductile iron castings, Grade 65-45-12
- Tensile Strength, minimum 65,000 psi (4481,6 bar)
- Yield Strength, minimum 45,000 psi (3102,6 bar)
- Elongation in 2" (50mm), minimum 12%
- ASTM A 153 – Standard specification for hot-dip galvanizing

Fabricated Steel Fitting Specifications

- Carbon Steel: According to ASTM A 53, Grade B
- Tensile Strength, minimum 60,000 psi (4136,9 bar)
- Yield Strength, minimum 35,000 psi (2413,2 bar)
- Sizes 1¼" – 10" (32mm – 250mm) Schedule 40
- Sizes 12" – 24" (300mm – 600mm) STD (.375)

Coatings

- Orange – Non-lead paint (standard)
- Red – Non-lead paint (optional, regional)
- Hot-Dipped, Zinc Galvanized (optional)

Threads

- NPT (standard)
- BSPT (optional, regional)

Fitting Friction Resistance Chart

Pipe Size		Elbows 90° Feet m	Elbows 45° Feet m	Tee Branch Feet m	Tee Run Feet m
Nominal Inches mm	O.D. Inches mm				
1	1.315	1.6	0.7	4.3	1.6
25	33,4	0,5	0,2	1,3	0,5
1¼	1.660	1.9	1.0	4.8	1.9
32	42,4	0,6	0,3	1,5	0,6
1½	1.900	2.3	1.2	5.8	2.3
40	48,3	0,7	0,4	1,8	0,7
2	2.375	3.2	1.6	8.0	3.2
50	60,3	1,0	0,5	2,5	1,0
2½	2.875	3.9	2.0	9.8	3.9
65	73,0	1,2	0,6	3,0	1,2
76,1mm	3.000	4.1	2.1	10.3	4.1
65	76,1	1,2	0,6	3,1	1,2
3	3.500	4.9	2.4	12.2	4.9
80	88,9	1,5	0,7	3,7	1,5
4	4.500	6.5	3.3	16.3	6.5
100	114,3	2,0	1,0	5,0	2,0
139,7mm	5.500	8.0	4.1	20.0	8.0
125	139,7	2,4	1,3	6,1	2,4
5	5.563	8.2	4.1	20.5	8.2
125	141,3	2,5	1,3	6,3	2,5
165,1mm	6.500	9.5	4.8	23.8	9.5
150	165,1	2,9	1,4	7,2	2,9
6	6.625	9.9	5.0	24.8	9.9
150	168,3	3,0	1,5	7,6	3,0
8	8.625	13.1	6.6	32.8	13.1
200	219,1	4,0	2,0	10,0	4,0
10	10.750	16.5	8.3	41.3	16.5
250	273,0	5,0	2,5	12,6	5,0
12	12.750	19.9	9.9	49.7	19.9
300	323,9	6,1	3,0	15,1	6,1
14	14.000	23.0	18.0	67.9	23.0
350	355,6	7,0	5,5	20,7	7,0
16	16.000	25.9	20.0	78.1	25.9
400	406,4	7,9	6,1	23,8	7,9
18	18.000	28.9	23.0	85.0	28.9
450	457,2	8,8	7,0	25,9	8,8
20	20.000	33.1	25.9	100.1	33.1
500	508,0	10,1	7,9	30,5	10,1
24	24.000	40.0	29.9	115.2	40.0
600	609,6	12,2	9,1	35,1	12,2

For reducing tee branches, use value corresponding to the branch size.

For example, for a 8" x 8" x 2" (200mm x 200mm x 50mm) tee, use a branch value of 2" (50mm) is 8.0' (2,5m).

For sizes not listed, interpolate from the values shown.

Expressed as Equivalent Straight Pipe.

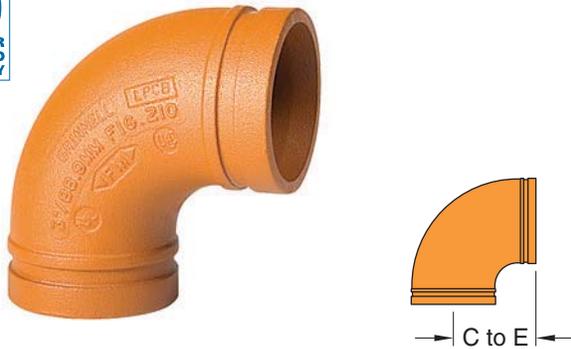


For additional listings or approvals, see page 11 or visit our website at www.grinnell.com

Figure 210 90° Cast Elbows

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Figures 210LR & 310LR 90° Long Radius Elbows

Tech Data Sheet: G180

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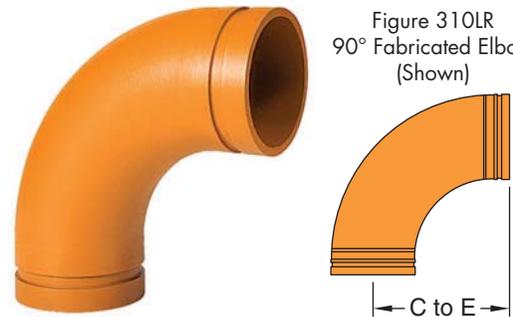


Figure 310LR
90° Fabricated Elbow
(Shown)

Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1¼	1.660	2.75	1.0
32	42,4	69,9	0,5
1½	1.900	2.75	1.3
40	48,3	69,9	0,6
2	2.375	3.25	1.8
50	60,3	82,6	0,8
2½	2.875	3.75	3.1
65	73,0	95,3	1,4
76,1mm	3.000	3.75	3.2
65	76,1	95,3	1,5
3	3.500	4.25	4.8
80	88,9	108,0	2,2
4	4.500	5.00	7.5
100	114,3	127,0	3,4
139,7mm	5.500	5.50	11.3
125	139,7	139,7	5,1
5	5.563	5.50	11.6
125	141,3	139,7	5,3
165,1mm	6.500	6.50	16.9
150	165,1	165,1	7,7
6	6.625	6.50	16.6
150	168,3	165,1	7,5
8	8.625	7.75	29.6
200	219,1	196,9	13,4
10	10.750	9.00	48.5
250	273,0	228,6	22,0
12	12.750	10.00	66.4
300	323,9	254,0	30,1

► Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Pipe Size		Figure 210LR - Cast		Figure 310LR - Fabricated	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx. Weight Lbs. kg	C to E Inches mm	Approx. Weight Lbs. kg
2	2.375	4.38	2.4	-	-
50	60,3	111,3	1,1	-	-
2½	2.875	5.00	5.1	-	-
65	73,0	127,0	2,3	-	-
76,1mm	3.000	5.00	4.4	-	-
65	76,1	127,0	2,0	-	-
3	3.500	5.88	6.6	-	-
80	88,9	149,4	3,0	-	-
4	4.500	7.50	11.6	-	-
100	114,3	190,5	5,3	-	-
139,7mm	5.500	9.50	19.0	-	-
125	139,7	241,3	8,6	-	-
5	5.563	9.50	20.0	-	-
125	141,3	241,3	9,1	-	-
165,1mm	6.500	10.75	26.4	-	-
150	165,1	273,1	12,0	-	-
6	6.625	10.75	29.5	-	-
150	168,3	273,1	13,4	-	-
8	8.625	14.25	62.1	-	-
200	219,1	362,0	28,2	-	-
10	10.750	-	-	18.00	103.7
250	273,0	-	-	457,2	47,0
12	12.750	-	-	21.00	147.8
300	323,9	-	-	533,4	67,0
14	14.000	21.00	131.0	21.00	155.0
350	355,6	533,4	59,4	533,4	70,3
16	16.000	24.00	180.0	24.00	206.0
400	406,4	609,6	81,6	609,6	93,4
18	18.000	-	-	27.00	262.0
450	457,2	-	-	685,8	118,8
20	20.000	-	-	33.00	324.0
500	508,0	-	-	838,2	147,0
24	24.000	-	-	36.00	466.0
600	609,6	-	-	914,4	211,4

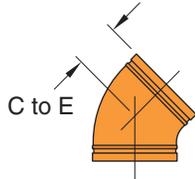
For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Figure 201 45° Cast Elbows

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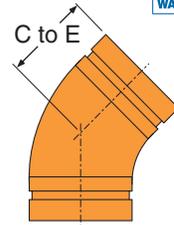
Figures 201LR & 301LR 45° Long Radius Elbows

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Figure 301LR
45° Fabricated Elbow
(Shown)



Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1¼	1.660	1.75	0.8
32	42,4	44,5	0,4
1½	1.900	1.75	0.9
40	48,3	44,5	0,4
2	2.375	2.00	1.3
50	60,3	50,8	0,6
2½	2.875	2.25	2.1
65	73,0	57,2	1,0
76,1mm	3.000	2.25	2.2
65	76,1	57,2	1,0
3	3.500	2.50	3.5
80	88,9	63,5	1,6
4	4.500	3.00	5.5
100	114,3	76,2	2,5
139,7mm	5.500	3.25	7.7
125	139,7	82,6	3,5
5	5.563	3.25	8.1
125	141,3	82,6	3,7
165,1mm	6.500	3.50	11.0
150	165,1	88,9	5,0
6	6.625	3.50	11.2
150	168,3	88,9	5,1
8	8.625	4.25	19.0
200	219,1	108,0	8,6
10	10.750	4.75	28.0
250	273,0	120,7	12,7
12	12.750	5.25	48.0
300	323,9	133,4	22,0

▶ Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.
 For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.
 See page 37 for fitting specifications.

Pipe Size		Figure 201LR - Cast		Figure 301LR - Fabricated	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx. Weight Lbs. kg	C to E Inches mm	Approx. Weight Lbs. kg
1¼	1.660	-	-	2.50	1.1
32	42,4	-	-	63,5	0,5
1½	1.900	-	-	2.50	1.3
40	48,3	-	-	63,5	0,6
2	2.375	-	-	2.75	1.8
50	60,3	-	-	69,9	0,8
2½	2.875	-	-	3.00	2.9
65	73,0	-	-	76,2	1,3
76,1mm	3.000	-	-	3.00	3.1
65	76,1	-	-	76,2	1,4
3	3.500	-	-	3.38	4.6
80	88,9	-	-	85,9	2,1
4	4.500	-	-	4.00	7.5
100	114,3	-	-	101,6	3,4
139,7mm	5.500	-	-	5.00	12.5
125	139,7	-	-	127,0	5,7
5	5.563	-	-	5.00	12.5
125	141,3	-	-	127,0	5,7
165,1mm	6.500	-	-	5.50	12.0
150	165,1	-	-	139,7	5,4
6	6.625	-	-	5.50	12.0
150	168,3	-	-	139,7	5,4
8	8.625	-	-	7.25	34.0
200	219,1	-	-	184,2	15,4
10	10.750	-	-	8.50	56.0
250	273,0	-	-	215,9	25,4
12	12.750	-	-	10.00	98.0
300	323,9	-	-	254,0	44,5
14	14.000	8.75	60.0	-	-
350	355,6	228,3	27,2	-	-
16	16.000	10.00	97.0	-	-
400	406,4	254,0	44,0	-	-
18	18.000	-	-	11.25	145.0
450	457,2	-	-	285,8	65,8
20	20.000	-	-	12.50	180.0
500	508,0	-	-	317,5	81,6
24	24.000	-	-	15.00	250.0
600	609,6	-	-	381,0	133,4

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.
 See page 37 for fitting specifications.

GROOVED FITTINGS

Figures 212 & 312 22½° Elbows

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GROOVED FITTINGS

Figure 212
22½° Cast Elbow

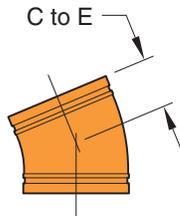
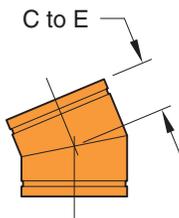


Figure 312
22½° Fabricated Elbow



Pipe Size		Figure 212 - Cast		Figure 312 - Fabricated	
Nominal Inches	O.D. Inches	C to E Inches	Approx. Weight Lbs.	C to E Inches	Approx. Weight Lbs.
mm	mm	mm	kg	mm	kg
1¼	1.660	1.75	0.8	-	-
32	42,4	44,5	0,4	-	-
1½	1.900	1.75	1.0	-	-
40	48,3	44,5	0,5	-	-
2	2.375	1.88	1.3	-	-
50	60,3	47,8	0,6	-	-
2½	2.875	2.00	1.9	-	-
65	73,0	50,8	0,9	-	-
76,1mm	3.000	2.00	2.0	-	-
65	76,1	50,8	0,9	-	-
3	3.500	2.25	2.9	-	-
80	88,9	57,2	1,3	-	-
4	4.500	2.63	4.7	-	-
100	114,3	66,8	2,1	-	-
139,7mm	5.500	2.88	6.9	-	-
125	139,7	73,2	3,1	-	-
5	5.563	2.88	6.9	-	-
125	141,3	73,2	3,1	-	-
165,1mm	6.500	-	-	3.13	9.4
150	165,1	-	-	79,5	4,3
6	6.625	3.13	9.4	-	-
150	168,3	79,5	4,3	-	-
8	8.625	3.88	16.9	-	-
200	219,1	98,6	7,7	-	-
10	10.750	-	-	4.38	14.0
250	273,0	-	-	111,3	6,4
12	12.750	-	-	4.88	22.0
300	323,9	-	-	124,0	10,0
14	14.000	-	-	5.00	46.0
350	355,6	-	-	127,0	20,9
16	16.000	-	-	5.00	52.2
400	406,4	-	-	127,0	23,7
18	18.000	-	-	5.50	65.0
450	457,2	-	-	139,7	29,5
20	20.000	-	-	6.00	80.0
500	508,0	-	-	152,4	36,3
24	24.000	-	-	7.00	112.0
600	609,6	-	-	177,8	50,8

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Figures 211 & 311 11 1/4° Elbows

Tech Data Sheet: G180



Pipe Size		Figure 211 - Cast		Figure 311 - Fabricated	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx. Weight Lbs. kg	C to E Inches mm	Approx. Weight Lbs. kg
1 1/4	1.660	1.38	0.7	-	-
32	42,4	35,1	0,3	-	-
1 1/2	1.900	1.38	0.8	-	-
40	48,3	35,1	0,4	-	-
2	2.375	1.38	1.1	-	-
50	60,3	35,1	0,5	-	-
2 1/2	2.875	1.50	1.6	-	-
65	73,0	38,1	0,7	-	-
76,1mm	3.000	1.50	1.7	-	-
65	76,1	38,1	0,7	-	-
3	3.500	1.50	2.2	-	-
80	88,9	38,1	1,0	-	-
4	4.500	1.75	3.4	-	-
100	114,3	44,5	1,5	-	-
139,7mm	5.500	2.00	5.1	-	-
125	139,7	50,8	2,3	-	-
5	5.563	2.00	5.2	-	-
125	141,3	50,8	2,4	-	-
165,1mm	6.500	2.00	6.4	-	-
150	165,1	50,8	2,9	-	-
6	6.625	2.00	6.5	-	-
150	168,3	50,8	2,9	-	-
8	8.625	2.00	9.2	-	-
200	219,1	50,8	4,2	-	-
10	10.750	-	-	2.13	9.1
250	273,0	-	-	54,1	4,1
12	12.750	-	-	2.25	16.7
300	323,9	-	-	57,2	7,6
14	14.000	-	-	3.50	32.1
350	355,6	-	-	88,9	14,6
16	16.000	-	-	4.00	42.0
400	406,4	-	-	101,6	19,1
18	18.000	-	-	4.50	53.2
450	457,2	-	-	114,3	24,2
20	20.000	-	-	5.00	65.7
500	508,0	-	-	127,0	29,8
24	24.000	-	-	6.00	96.0
600	609,6	-	-	152,4	43,5

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Figure 211
11 1/4° Cast Elbow

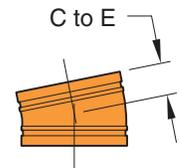


Figure 311
11 1/4° Fabricated Elbow

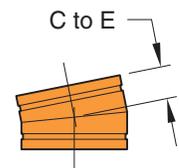
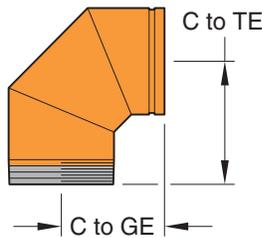


Figure 315 90° Elbows (Groove x Male Thread)

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Pipe Size		C to GE Inches mm	C to TE Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			
1¼	1.660	2.75	2.75	0.9
32	42,4	69,9	69,9	0,4
1½	1.900	2.75	2.75	1.2
40	48,3	69,9	69,9	0,5
2	2.375	3.25	4.25	2.0
50	60,3	82,6	108,0	0,9
2½	2.875	3.75	3.75	3.1
60	73,0	95,3	95,3	1,4
3	3.500	4.25	6.00	5.7
80	88,9	108,0	152,4	2,6
4	4.500	5.00	7.25	9.8
100	114,3	127,0	184,2	4,4
6	6.625	6.50	6.50	17.6
150	168,3	165,1	165,1	8,0

Note: Available with BSP and NPT type threads.

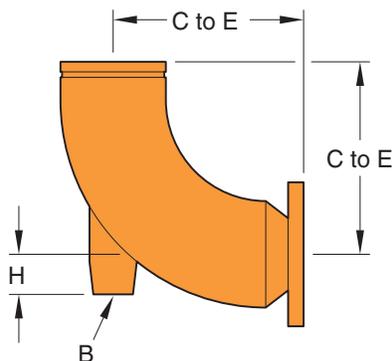
For information on larger sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Figure 316 Reducing Base Support Elbow (Groove x Flange)

Tech Data Sheet: G180

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Pipe Size			C to E Inches mm	H Inches mm	B Dia. NPSC Threaded Inches mm	Approx. Wt. Ea. Lbs Kg
Nominal Inches mm	Grooved End O.D. Inches mm	Flanged End O.D. Inches mm				
6 x 4	6.625	4.500	12.0	2.5	1.5	38.5
150 x 100	168,3	114,3	304,8	63,5	38,1	17,5
6 x 5	6.625	5.563	12.5	2.5	1.5	45.4
150 x 125	168,3	141,3	317,5	63,5	38,1	20,6
8 x 5	8.625	5.563	15.5	3.0	1.5	65.5
200 x 125	219,1	141,3	393,7	76,2	38,1	29,7
8 x 6	8.625	6.625	15.5	3.0	1.5	73.0
200 x 150	219,1	168,3	393,7	76,2	38,1	33,1
10 x 6	10.750	6.625	18.5	3.5	1.5	100.0
250 x 150	273,1	168,3	469,9	88,9	38,1	45,4
10 x 8	10.750	8.625	19.0	3.5	1.5	126.5
250 x 200	273,1	219,1	482,6	88,9	38,1	57,4
12 x 8	12.750	8.625	22.0	4.0	1.5	155.0
300 x 200	323,9	219,1	558,8	101,6	38,1	70,3
12 x 10	12.750	10.750	22.0	4.0	1.5	186.0
300 x 250	323,9	273,1	558,8	101,6	38,1	84,4

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Long Radius 3D Elbows

Tech Data Sheet: G180

10
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WARRANTY

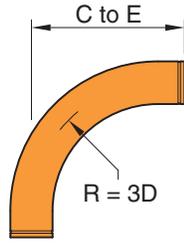


Figure 310-3D
(90°)

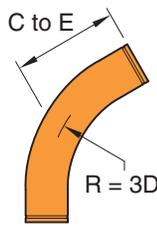


Figure 306-3D
(60°)

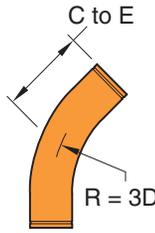


Figure 301-3D
(45°)

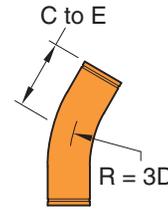


Figure 303-3D
(30°)

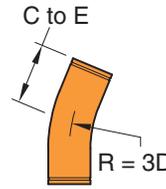


Figure 312-3D
(22.5°)

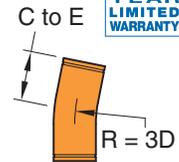


Figure 311-3D
(11.25°)

Pipe Size		310-3D 90° Elbow		306-3D 60° Elbow		301-3D 45° Elbow		303-3D 30° Elbow		312-3D 22½° Elbow		311-3D 11¼° Elbow	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx Weight Lbs Kg										
2	2.375	10	5.3	7½	4.7	6½	4.2	5¾	3.8	5¼	3.5	4½	2.9
50	60,3	254	2,4	191	2,1	165	1,9	146	1,7	133	1,6	114	1,3
2½	2.875	11½	9.5	8¼	8.2	7¼	7.6	6	6.4	5½	5.8	4¾	4.9
65	73,0	292	4,3	210	3,7	184	3,4	152	2,9	140	2,6	121	2,2
3	3.500	13	14.7	9¼	12.6	7¾	11.2	6½	9.7	5¾	8.5	5	7.3
80	88,9	330	6,7	235	5,7	197	5,1	165	4,4	146	3,9	127	3,3
3½	4.000	14½	18.6	10	14.4	8½	12.3	6¾	10.2	6	9.2	5	7.6
90	101,6	368	8,4	254	6,5	216	5,6	171	4,6	152	4,2	127	3,4
4	4.500	16	24.1	11	20.4	9	17.8	7¼	14.8	6½	13.4	5¼	10.5
100	114,3	406	10,9	279	9,3	229	8,1	184	6,7	165	6,1	133	4,8
5	5.563	20	40.9	13¾	34.5	11¼	30.1	9	24.9	8	22.2	6½	17.6
125	141,3	508	18,6	349	15,7	286	13,7	229	11,3	203	10,1	165	8
6	6.625	24	63.7	16½	53.7	13½	46.9	10¾	38.6	9½	34.2	7¾	27.1
150	168,3	610	28,9	419	24,4	343	21,3	273	17,5	241	15,5	197	12,3
8	8.625	32	128.0	22	108.0	18	94.3	14½	78.7	12¾	69.3	10½	55.7
200	219,1	813	58,1	559	49,0	457	42,8	368	35,7	324	31,4	267	25,3
10	10.750	40	226.5	27¼	189.4	22½	166.9	18	138.2	16	123.2	13	97.3
250	273,1	1016	102,8	692	85,9	572	75,7	457	62,7	406	55,9	330	44,1
12	12.750	48	332.9	32¾	278.8	27	245.3	21¾	204.7	19¼	181.6	15½	141.8
300	323,9	1219	151	832	126,5	686	111,3	552	92,9	489	82,4	394	64,3
14	14.000	56	427.6	38¼	358.5	31½	315.0	25¼	261.4	22½	233.7	18¼	184.4
350	355,6	1422	194	972	162,6	800	142,9	641	118,6	572	106	464	83,6
16	16.000	64	560.3	43¾	470.1	36	412.8	29	334.5	25½	303.2	20¾	239.9
400	406,4	1626	254,1	1111	213,2	914	187,2	737	151,7	648	137,5	527	108,8
18	18.000	72	710.7	49¼	596.9	40½	523.7	32½	435.1	28¾	385.7	23.35	304.5
450	457,2	1829	322,4	1251	270,7	1029	237,5	826	197,4	730	175	593	138,1
20	20.000	80	879.3	54¾	738.7	45	647.8	36	536.4	32	478.1	26	377.7
500	508,0	2032	398,8	1391	335,1	1143	293,8	914	243,3	813	216,9	660	171,3
24	24.000	96	1270.3	65½	1,063.6	53¾	931.0	43¼	775.7	38¼	687.2	31	540.9
600	609,6	2438	576,2	1664	482,4	1365	422,3	1099	351,9	972	311,8	787	245,3

Long radius Elbows 3D, 5D, and 6D, in sizes up to and including 4" (100mm), are provided with 4" (100mm) long integral tangent.

Remaining sizes provided with integral tangents with lengths equal to nominal pipe size.

Grooved or plain-end available; specify choice on order.

Material is standard wall steel pipe to ASTM A 53, Grade B. (Other materials available on request).

Elbow bends to conform to above radii.

C to E tolerances: 2" - 6" (50mm - 150mm) ± 1/8" (3,2 mm); 8" - 16" (200mm - 400mm) ± 1/4" (6,4 mm);

18" - 24" (450mm - 600mm) ± 3/8" (9,5mm).

All weights are approximate, based on calculated weight of pipe.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

GROOVED FITTINGS

Long Radius 5D Elbows

Tech Data Sheet: G180

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WARRANTY

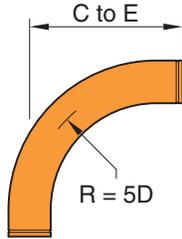


Figure 310-5D
(90°)

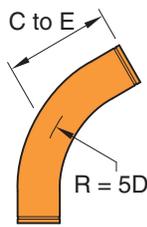


Figure 306-5D
(60°)

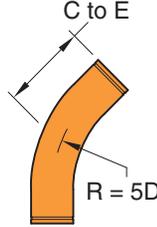


Figure 301-5D
(45°)

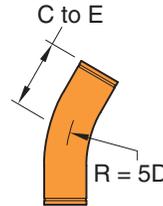


Figure 303-5D
(30°)

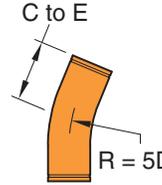


Figure 312-5D
(22.5°)

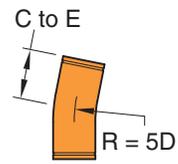


Figure 311-5D
(11.25°)

Pipe Size		310-5D 90° Elbow		306-5D 60° Elbow		301-5D 45° Elbow		303-5D 30° Elbow		312-5D 22½° Elbow		311-5D 11¼° Elbow	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx Weight Lbs Kg										
2	2.375	14	7.2	9¾	6.1	8¼	5.5	6¾	4.6	6	4.1	5	3.3
50	60,3	356	3,3	248	2,8	210	2,5	171	2,1	152	1,9	127	1,5
2½	2.875	16½	13.3	11¼	11.2	9¼	9.8	7½	8.3	6½	7.2	5¼	5.6
65	73,0	419	6	286	5,1	235	4,4	191	3,8	165	3,3	133	2,5
3	3.500	19	21.0	12¾	17.5	10¼	15.1	8	12.3	7	10.8	5½	8.3
80	88,9	483	9,5	324	7,9	260	6,8	203	5,6	178	4,9	140	3,8
3½	4.000	21½	26.9	12¼	20.0	11¼	16.5	8¾	13.0	7½	11.3	5¾	8.7
90	101,6	546	12,2	311	9,1	286	7,5	222	5,9	191	5,1	146	3,9
4	4.500	24	35.4	15½	28.9	12½	25.4	9½	20.1	8	17.1	6	12.5
100	114,3	610	16,1	394	13,1	318	11,5	241	9,1	203	7,8	152	5,7
5	5.563	30	60	19½	49.2	15½	42.3	11¾	33.7	10	28.9	7½	21.2
125	141,3	762	27,2	495	22,3	394	19,2	298	15,3	254	13,1	191	9,6
6	6.625	36	93.5	23¼	76.1	18½	65.5	14	52.7	12	45.0	9	32.9
150	168,3	914	42,4	591	34,5	470	29,7	356	23,9	305	20,4	229	14,9
8	8.625	48	187.9	31	152.9	24½	130.8	18¾	105.2	16	90.5	12	66.2
200	219,1	1219	85,2	787	69,4	622	59,3	476	47,7	406	41,1	305	30
10	10.750	60	332.6	39	272.5	30¾	232.5	23½	186.8	20	160.3	15	117.2
250	273,1	1524	150,9	991	123,6	781	105,5	597	84,7	508	72,7	381	53,2
12	12.750	72	488.8	46¾	400.0	37	342.7	28	272.3	24	235.5	18	172.2
300	323,9	1829	221,7	1187	181,4	940	155,4	711	123,5	610	106,8	457	78,1
14	14.000	84	627.7	54½	513.3	43	438.3	32¾	350.7	28	302.5	21	221.2
350	355,6	2134	284,7	1384	232,8	1092	198,8	832	159,1	711	137,2	533	100,3
16	16.000	96	822.5	62¼	672.2	49¼	575.6	37½	460.6	32	396.4	24	289.8
400	406,4	2438	373,1	1581	304,9	1251	261,1	953	208,9	813	179,8	610	131,5
18	18.000	108	1,043.5	70	852.5	55¼	728.2	42¼	585.3	36	506.9	27	367.8
450	457,2	2743	473,3	1778	386,7	1403	330,3	1073	265,5	914	229,9	686	166,8
20	20.000	120	1,290.9	77¾	1,054.2	61½	902.5	46¾	720.7	40	622.1	30	454.9
500	508,0	3048	585,5	1975	478,2	1562	409,4	1187	326,9	1016	282,2	762	206,3
24	24.000	144	1,864.4	93¼	1,521.8	73¾	1,302.5	56¼	1,044.0	48	898.5	35¾	651.2
600	609,6	3658	845,7	2369	690,3	1873	590,8	1429	473,6	1219	407,6	908	295,4

Long radius Elbows 3D, 5D, and 6D, in sizes up to and including 4" (100mm), are provided with 4" (100mm) long integral tangent.

Remaining sizes provided with integral tangents with lengths equal to nominal pipe size.

Grooved or plain-end available; specify choice on order.

Material is standard wall steel pipe to ASTM A 53, Grade B. (Other materials available on request).

Elbow bends to conform to above radii.

C to E tolerances: 2" - 6" (50mm - 150mm) ± 1/8" (3,2 mm); 8" - 16" (200mm - 400mm) ± 1/4" (6,4 mm);

18" - 24" (450mm - 600mm) ± 3/8" (9,5mm).

All weights are approximate, based on calculated weight of pipe.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Long Radius 6D Elbows

Tech Data Sheet: G180

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YEAR
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WARRANTY

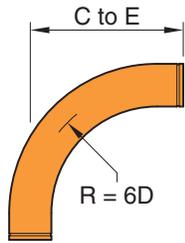


Figure 310-6D
(90°)

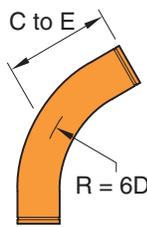


Figure 306-6D
(60°)

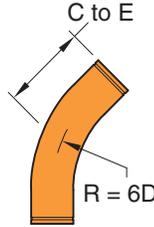


Figure 301-6D
(45°)

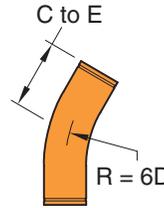


Figure 303-6D
(30°)

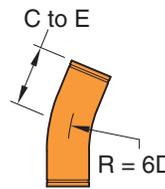


Figure 312-6D
(22.5°)

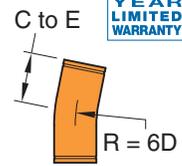


Figure 311-6D
(11.25°)

Pipe Size		310-6D 90° Elbow		306-6D 60° Elbow		301-6D 45° Elbow		303-6D 30° Elbow		312-6D 22½° Elbow		311-6D 11¼° Elbow	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx Weight Lbs Kg										
2	2.375	16	8.2	11	6.9	9	6.0	7¼	5.0	6½	4.5	5¼	3.6
50	60,3	406	3,7	279	3,1	229	2,7	184	2,3	165	2	133	1,6
2½	2.875	19	13.0	12¾	12.7	10¼	11.0	8	8.9	7	7.8	5½	6.0
65	73,0	483	5,9	324	5,8	260	5	203	4	178	3,5	140	2,7
3	3.500	22	24.1	14½	19.9	11½	17.1	8¾	13.6	7½	11.7	5¾	8.7
80	88,9	559	10,9	368	9,0	292	7,8	222	6,2	191	5,3	146	3,9
3½	4.000	25	31.1	16¼	22.8	12¾	18.6	9¼	14.4	8¼	12.3	6	9.2
90	101,6	635	14,1	413	10,3	324	8,4	248	6,5	210	5,6	152	4,2
4	4.500	28	41.1	18	33.6	14	28.4	10½	22.5	8¾	18.9	6½	13.8
100	114,3	711	18,6	457	15,2	356	12,9	267	10,2	222	8,6	165	6,3
5	5.563	35	69.6	22¼	56.2	17½	48.1	13	37.7	11	32.3	8	22.9
125	141,3	889	31,6	565	25,5	445	21,8	330	17,1	279	14,7	203	10,4
6	6.625	42	108.4	26¾	87.7	21	74.8	15¾	59.3	13¼	50.5	9½	35.3
150	168,3	1067	49,2	679	39,8	533	33,9	400	26,9	337	22,9	241	16
8	8.625	56	217.8	35¾	176.7	28	150.4	21	119.2	17½	100.4	12¾	71.5
200	219,1	1422	98,8	908	80,1	711	68,2	533	54,1	445	45,5	324	32,4
10	10.750	70	385.6	44¾	313.1	35	266.3	26	208.9	22	178.8	16	127.1
250	273,1	1778	174,9	1137	142	889	120,8	660	94,8	559	81,1	406	57,7
12	12.750	84	566.7	53½	458.5	41¾	388.9	31¼	307.5	26¼	261.1	19	184.4
300	323,9	2134	257,1	1359	208	1060	176,4	794	139,5	667	118,4	483	83,6
14	14.000	98	727.8	62½	589.6	48¾	499.9	36½	395.4	30¾	336.9	22¼	238.0
350	355,6	2489	330,1	1588	267,4	1238	226,8	927	179,4	781	152,8	565	108
16	16.000	112	953.6	71½	773.3	55¾	655.5	41¾	518.6	35¼	443.0	25½	312.9
400	406,4	2845	432,5	1816	350,8	1416	297,3	1060	235,2	895	200,9	648	141,9
18	18.000	126	1,209.9	80½	981.9	62¾	832.7	47	658.5	39½	559.5	28¾	398.7
450	457,2	3200	548,8	2045	445,4	1594	377,7	1194	298,7	1003	253,8	730	180,8
20	20.000	140	1,496.6	89¼	1,212.0	69¾	1,029.8	52¼	815.0	44	694.1	31¾	488.7
500	508,0	3556	678,8	2267	549,8	1772	467,1	1327	369,7	1118	314,8	806	221,7
24	24.000	168	2,161.6	107¼	1,752.9	83¾	1,488.2	62½	1,173.0	52.34	992.5	38¼	709.3
600	609,6	4267	980,5	2724	795,1	2127	675	1588	532,1	1329	450,2	972	321,7

Long radius Elbows 3D, 5D, and 6D, in sizes up to and including 4" (100mm), are provided with 4" (100mm) long integral tangent.

Remaining sizes provided with integral tangents with lengths equal to nominal pipe size.

Grooved or plain-end available; specify choice on order.

Material is standard wall steel pipe to ASTM A 53, Grade B. (Other materials available on request).

Elbow bends to conform to above radii.

C to E tolerances: 2" - 6" (50mm - 150mm) ± 1/8" (3,2 mm); 8" - 16" (200mm - 400mm) ± 1/4" (6,4 mm);

18" - 24" (450mm - 600mm) ± 3/8" (9,5mm).

All weights are approximate, based on calculated weight of pipe.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Figures 219 & 319 Tees

Tech Data Sheet: G180

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YEAR
LIMITED
WARRANTY

Figure 219
Cast Tee

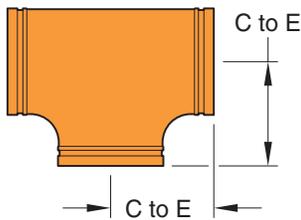
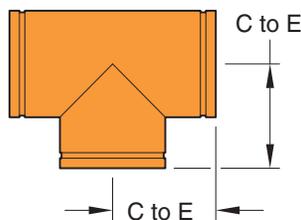


Figure 319
Fabricated Tee



Pipe Size		Figure 219 - Cast		Figure 319 - Fabricated	
Nominal Inches mm	O. D. Inches mm	C to E Inches mm	Approx Weight Lbs Kg	C to E Inches mm	Approx Weight Lbs Kg
1¼	1.660	2.75	1.7	-	-
32	42,4	69,9	0,8	-	-
1½	1.900	2.75	2.1	-	-
40	48,3	69,9	1,0	-	-
2	2.375	3.25	2.8	-	-
50	60,3	82,6	1,3	-	-
2½	2.875	3.75	4.4	-	-
65	73,0	95,3	2,0	-	-
76,1mm	3.000	3.75	6.5	-	-
65	76,1	95,3	2,9	-	-
3	3.500	4.25	6.5	-	-
80	88,9	108,0	2,9	-	-
4	4.500	5.00	10.7	-	-
100	114,3	127,0	4,8	-	-
139,7mm	5.500	5.50	15.2	-	-
125	139,7	139,7	6,9	-	-
5	5.563	5.50	15.5	-	-
125	141,3	139,7	7,0	-	-
165,1mm	6.500	6.50	24.2	-	-
150	165,1	165,1	11,0	-	-
6	6.625	6.50	23.0	-	-
150	168,3	165,1	10,4	-	-
216,3mm	8.500	7.75	43.0	-	-
200	216,3	196,9	19,5	-	-
8	8.625	7.75	43.7	-	-
200	219,1	196,9	19,8	-	-
10	10.750	9.00	57.0	-	-
250	273,0	228,6	25,9	-	-
12	12.750	10.00	110.0	-	-
300	323,9	254,0	49,9	-	-
14	14.000	11.00	135.0	-	-
350	355,6	279,0	61,2	-	-
16	16.000	12.00	136.0	-	-
400	406,4	305,0	61,7	-	-
18	18.000	-	-	15.50	218.0
450	457,2	-	-	394,0	98,9
20	20.000	-	-	17.25	275.0
500	508,0	-	-	438,0	125,0
24	24.000	-	-	20.00	379.0
600	609,6	-	-	508,0	172,0

► Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

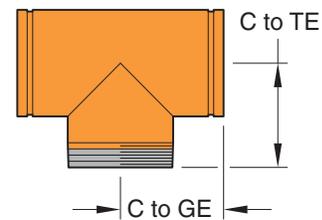
Figure 320 Tees (Groove x Groove x Male Thread)

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GROOVED FITTINGS

Pipe Size		C to GE Inches mm	C to TE Inches mm	Approx. Weight Lbs Kg
Nominal Inches mm	O.D. Inches mm			
1¼	1.660	2.75	2.75	1.5
32	42,4	69,9	69,9	0,7
1½	1.900	2.75	2.75	1.9
40	48,3	69,9	69,9	0,9
2	2.375	3.25	4.25	3.2
50	60,3	82,6	108,0	1,5
2½	2.875	3.75	3.75	4.0
60	73,0	95,3	95,3	1,8
3	3.500	4.25	6.00	6.0
80	88,9	108,0	152,4	2,7
4	4.500	5.00	7.25	11.0
100	114,3	127,0	184,2	5,0
5	5.563	5.50	5.50	23.0
125	141,3	139,7	139,7	10,5
6	6.625	6.50	6.50	23.0
150	168,3	165,1	165,1	10,5
8	8.625	7.75	7.75	38.7
200	219,1	196,9	196,9	17,6
10	10.750	9.00	9.00	72.1
250	273,0	228,6	228,6	32,8
12	12.750	10.00	10.00	92.5
300	323,9	254,0	254,0	42,0



For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.
Available with BSP threads. Contact GRINNELL Mechanical Products for details.
See page 37 for fitting specifications.

Figures 221 & 321 Reducing Tees

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YEAR
LIMITED
WARRANTY

GROOVED FITTINGS



Figure 221 Reducing Tee Cast



Figure 321 Reducing Tee Fabricated

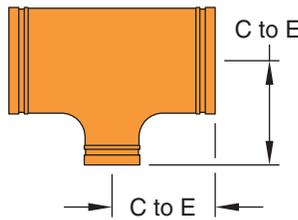


Figure 221 Reducing Tee Cast

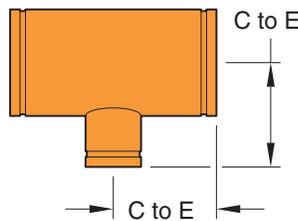


Figure 321 Reducing Tee Fabricated

Pipe Size		Figure 221 - Cast		Figure 321 - Fabricated	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx. Weight Lbs Kg	C to E Inches mm	Approx. Weight Lbs Kg
1½ x 1½ x 1¼ 40 x 40 x 32	1.900 x 1.900 x 1.660 48,3 x 48,3 x 42,4	-	-	2.75	1.5
2 x 2 x 1 50 x 50 x 25	2.375 x 2.375 x 1.315 60,3 x 60,3 x 33,4	-	-	3.25	1.6
2 x 2 x 1½ 50 x 50 x 40	2.375 x 2.375 x 1.900 60,3 x 60,3 x 48,3	3.25	2.7	-	-
2½ x 2½ x 1 65 x 65 x 25	2.875 x 2.875 x 1.315 73,0 x 73,0 x 33,4	-	-	3.75	2.3
2½ x 2½ x 1¼ 65 x 65 x 32	2.875 x 2.875 x 1.660 73,0 x 73,0 x 42,4	-	-	3.75	4.2
2½ x 2½ x 1½ 65 x 65 x 40	2.875 x 2.875 x 1.900 73,0 x 73,0 x 48,3	3.75	4.2	-	-
2½ x 2½ x 2 65 x 65 x 50	2.875 x 2.875 x 2.375 73,0 x 73,0 x 60,3	3.75	4.2	-	-
76,1mm x 76,1mm x 1½ 65 x 65 x 40	3.000 x 3.000 x 1.900 76,1 x 76,1 x 48,3	3.75	4.5	-	-
76,1mm x 76,1mm x 2 65 x 65 x 50	3.000 x 3.000 x 2.375 76,1 x 76,1 x 60,3	3.75	4.3	-	-
3 x 3 x 1 80 x 80 x 25	3.500 x 3.500 x 1.315 88,9 x 88,9 x 33,4	4.25	5.6	-	-
3 x 3 x 1½ 80 x 80 x 40	3.500 x 3.500 x 1.900 88,9 x 88,9 x 48,3	4.25	5.9	-	-
3 x 3 x 2 80 x 80 x 50	3.500 x 3.500 x 2.375 88,9 x 88,9 x 60,3	4.25	6.0	-	-
3 x 3 x 2½ 80 x 80 x 65	3.500 x 3.500 x 2.875 88,9 x 88,9 x 73,0	4.25	6.2	-	-
3 x 3 x 76,1mm 80 x 80 x 65	3.500 x 3.500 x 3.000 88,9 x 88,9 x 76,1	4.25	6.0	-	-
4 x 4 x 1 100 x 100 x 25	4.500 x 4.500 x 1.315 114,3 x 114,3 x 33,4	-	-	5.00	8.0
4 x 4 x 1¼ 100 x 100 x 32	4.500 x 4.500 x 1.660 114,3 x 114,3 x 42,4	-	-	127,0	3,7
4 x 4 x 1½ 100 x 100 x 40	4.500 x 4.500 x 1.900 114,3 x 114,3 x 48,3	-	-	5.00	9.8
4 x 4 x 2 100 x 100 x 50	4.500 x 4.500 x 2.375 114,3 x 114,3 x 60,3	-	-	127,0	4,4
4 x 4 x 2½ 100 x 100 x 65	4.500 x 4.500 x 2.875 114,3 x 114,3 x 73,0	-	-	5.00	9.9
4 x 4 x 76,1mm 100 x 100 x 65	4.500 x 4.500 x 3.000 114,3 x 114,3 x 76,1	-	-	127,0	4,5
4 x 4 x 3 100 x 100 x 80	4.500 x 4.500 x 3.500 114,3 x 114,3 x 88,9	5.00	9.1	-	-
139,7mm x 139,7mm x 3 125 x 125 x 80	5.500 x 5.500 x 3.500 139,7 x 139,7 x 88,9	5.00	9.1	-	-
139,7mm x 139,7mm x 4 125 x 125 x 100	5.500 x 5.500 x 4.500 139,7 x 139,7 x 114,3	5.00	9.5	-	-
		127,0	4,3	-	-
		5.00	9.5	-	-
		127,0	4,3	-	-
		5.00	9.7	-	-
		127,0	4,4	-	-
		5.50	12.7	-	-
		139,7	5,8	-	-
		5.50	13.4	-	-
		139,7	6,1	-	-

Figures 221 & 321 Reducing Tees

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Pipe Size		Figure 221 - Cast		Figure 321 - Fabricated	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx. Weight Lbs Kg	C to E Inches mm	Approx. Weight Lbs Kg
5 x 5 x 2	5.563 x 5.563 x 2.375	-	-	5.50	14.5
125 x 125 x 50	141,3 x 141,3 x 60,3	-	-	139,7	6,6
5 x 5 x 2½	5.563 x 5.563 x 2.875	5.50	18.0	-	-
125 x 125 x 65	141,3 x 141,3 x 73,0	139,7	8,2	-	-
5 x 5 x 3	5.563 x 5.563 x 3.500	5.50	14.0	-	-
125 x 125 x 80	141,3 x 141,3 x 88,9	139,7	6,4	-	-
5 x 5 x 4	5.563 x 5.563 x 4.500	5.50	13.9	-	-
125 x 125 x 100	141,3 x 141,3 x 114,3	139,7	6,3	-	-
165,1mm x 165,mm x 3	6.500 x 6.500 x 3.500	6.50	18.0	-	-
150 x 150 x 80	165,1 x 165,1 x 88,9	165,1	8,2	-	-
165,1mm x 165,mm x 4	6.500 x 6.500 x 4.500	6.50	19.5	-	-
150 x 150 x 100	165,1 x 165,1 x 114,3	165,1	8,9	-	-
6 x 6 x 2	6.625 x 6.625 x 2.375	6.50	19.4	-	-
150 x 150 x 50	168,3 x 168,3 x 60,3	165,1	8,8	-	-
6 x 6 x 2½	6.625 x 6.625 x 2.875	6.50	21.2	-	-
150 x 150 x 65	168,3 x 168,3 x 73,0	165,1	9,8	-	-
6 x 6 x 76,1mm	6.625 x 6.625 x 3.000	6.50	21.2	-	-
150 x 150 x 65	168,3 x 168,3 x 76,1	165,1	9,8	-	-
6 x 6 x 3	6.625 x 6.625 x 3.500	6.50	21.0	-	-
150 x 150 x 80	168,3 x 168,3 x 88,9	165,1	9,5	-	-
6 x 6 x 4	6.625 x 6.625 x 4.500	6.50	21.8	-	-
150 x 150 x 100	168,3 x 168,3 x 114,3	165,1	9,9	-	-
6 x 6 x 139,7mm	6.625 x 6.625 x 5.500	6.50	23.0	-	-
150 x 150 x 125	168,3 x 168,3 x 139,7	165,1	10,4	-	-
6 x 6 x 5	6.625 x 6.625 x 5.563	-	-	6.50	27.0
150 x 150 x 125	168,3 x 168,3 x 141,3	-	-	165,1	12,2
8 x 8 x 2	8.625 x 8.625 x 2.375	-	-	7.75	36.2
200 x 200 x 50	219,1 x 219,1 x 60,3	-	-	196,9	16,4
8 x 8 x 2½	8.625 x 8.625 x 2.875	-	-	7.75	36.4
200 x 200 x 65	219,1 x 219,1 x 73,0	-	-	196,9	16,5
8 x 8 x 3	8.625 x 8.625 x 3.500	-	-	7.75	36.5
200 x 200 x 80	219,1 x 219,1 x 88,9	-	-	196,9	16,6
8 x 8 x 4	8.625 x 8.625 x 4.500	7.75	37.2	-	-
200 x 200 x 100	219,1 x 219,1 x 114,1	196,9	16,9	-	-
8 x 8 x 139,7mm	8.625 x 8.625 x 5.500	7.75	37.7	-	-
200 x 200 x 125	219,1 x 219,1 x 139,7	196,9	17,1	-	-
8 x 8 x 5	8.625 x 8.625 x 5.563	-	-	7.75	36.8
200 x 200 x 125	219,1 x 219,1 x 141,3	-	-	196,9	16,7
8 x 8 x 165,1mm	8.625 x 8.625 x 6.500	7.75	37.7	-	-
200 x 200 x 150	219,1 x 219,1 x 165,1	196,9	17,1	-	-
8 x 8 x 6	8.625 x 8.625 x 6.625	7.75	37.4	-	-
200 x 200 x 150	219,1 x 219,1 x 168,3	196,9	17,0	-	-
10 x 10 x 2	10.750 x 10.750 x 2.375	-	-	9.00	57.1
250 x 250 x 50	273,0 x 273,0 x 60,3	-	-	228,6	25,9
10 x 10 x 3	10.750 x 10.750 x 3.500	-	-	9.00	57.4
250 x 250 x 80	273,0 x 273,0 x 88,9	-	-	228,6	26,0
10 x 10 x 4	10.750 x 10.750 x 4.500	-	-	9.00	58.0
250 x 250 x 100	273,0 x 273,0 x 114,3	-	-	228,6	26,3
10 x 10 x 5	10.750 x 10.750 x 5.563	-	-	9.00	57.8
250 x 250 x 125	273,0 x 273,0 x 141,3	-	-	228,6	26,2
10 x 10 x 6	10.750 x 10.750 x 6.625	-	-	9.00	66.0
250 x 250 x 150	273,0 x 273,0 x 168,3	-	-	228,6	27,2
10 x 10 x 8	10.750 x 10.750 x 8.625	-	-	9.00	62.0
250 x 250 x 200	273,0 x 273,0 x 219,1	-	-	228,6	28,1
12 x 12 x 3	12.750 x 12.750 x 3.500	-	-	10.00	80.2
300 x 300 x 80	323,9 x 323,9 x 88,9	-	-	254,0	36,4
12 x 12 x 4	12.750 x 12.750 x 4.500	-	-	10.00	80.5
300 x 300 x 100	323,9 x 323,9 x 114,3	-	-	254,0	36,5

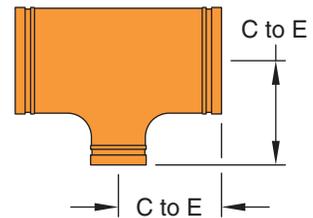


Figure 221 Reducing Tee Cast

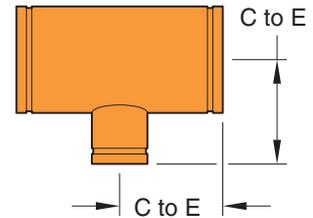


Figure 321 Reducing Tee Fabricated

Figures 221 & 321 Reducing Tees

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GROOVED FITTINGS

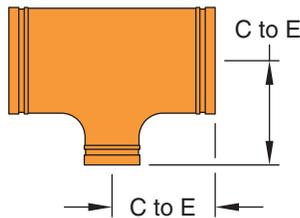


Figure 221 Reducing Tee
Cast

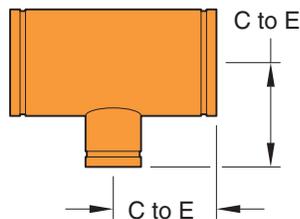


Figure 321 Reducing Tee
Fabricated

Pipe Size		Figure 221 - Cast		Figure 321 - Fabricated	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx. Weight Lbs Kg	C to E Inches mm	Approx. Weight Lbs Kg
12 x 12 x 5	12.750 x 12.750 x 5.563	-	-	10.00	80.7
300 x 300 x 125	323,9 x 323,9 x 141,3	-	-	254,0	36,6
12 x 12 x 6	12.750 x 12.750 x 6.625	-	-	10.00	80.9
300 x 300 x 150	323,9 x 323,9 x 168,3	-	-	254,0	36,7
12 x 12 x 8	12.750 x 12.750 x 8.625	-	-	10.00	76.3
300 x 300 x 200	323,9 x 323,9 x 219,1	-	-	254,0	34,6
12 x 12 x 10	12.750 x 12.750 x 10.750	-	-	10.00	77.6
300 x 300 x 250	323,9 x 323,9 x 273,0	-	-	254,0	35,2
14 x 14 x 6	14.000 x 14.000 x 6.625	-	-	11.00	103.3
350 x 350 x 150	355,6 x 355,6 x 168,3	-	-	279,4	46,9
14 x 14 x 8	14.000 x 14.000 x 8.625	-	-	11.00	103.4
350 x 350 x 200	355,6 x 355,6 x 219,1	-	-	279,4	46,9
14 x 14 x 10	14.000 x 14.000 x 10.750	-	-	11.00	104.3
350 x 350 x 250	355,6 x 355,6 x 273,0	-	-	279,4	47,3
14 x 14 x 12	14.000 x 14.000 x 12.750	-	-	11.00	105.3
350 x 350 x 300	355,6 x 355,6 x 323,9	-	-	279,4	47,8
16 x 16 x 4	16.000 x 16.000 x 4.500	-	-	12.00	110.7
400 x 400 x 100	406,4 x 406,4 x 114,3	-	-	304,8	50,2
16 x 16 x 8	16.000 x 16.000 x 8.625	-	-	12.00	128.5
400 x 400 x 200	406,4 x 406,4 x 219,1	-	-	304,8	58,3
16 x 16 x 10	16.000 x 16.000 x 10.750	-	-	12.00	129.3
400 x 400 x 250	406,4 x 406,4 x 273,0	-	-	304,8	58,6
16 x 16 x 12	16.000 x 16.000 x 12.750	-	-	12.00	130.2
400 x 400 x 300	406,4 x 406,4 x 323,9	-	-	304,8	59,1
16 x 16 x 14	16.000 x 16.000 x 14.000	-	-	12.00	140.4
400 x 400 x 350	406,4 x 406,4 x 355,6	-	-	304,8	63,7
18 x 18 x 8	18.000 x 18.000 x 8.625	-	-	15.50	192.7
450 x 450 x 200	457,2 x 457,2 x 219,1	-	-	393,7	87,4
18 x 18 x 10	18.000 x 18.000 x 10.750	-	-	15.50	193.6
450 x 450 x 250	457,2 x 457,2 x 273,0	-	-	393,7	87,8
18 x 18 x 12	18.000 x 18.000 x 12.750	-	-	15.50	196.3
450 x 450 x 300	457,2 x 457,2 x 323,9	-	-	393,7	89,0
18 x 18 x 14	18.000 x 18.000 x 14.000	-	-	15.50	201.3
450 x 450 x 350	457,2 x 457,2 x 355,6	-	-	393,7	91,3
18 x 18 x 16	18.000 x 18.000 x 16.000	-	-	15.50	203.2
450 x 450 x 400	457,2 x 457,2 x 406,4	-	-	393,7	92,2
20 x 20 x 14	20.000 x 20.000 x 14.000	-	-	17.25	247.9
500 x 500 x 350	508,0 x 508,0 x 355,6	-	-	450,9	112,4
20 x 20 x 16	20.000 x 20.000 x 16.000	-	-	17.25	250.1
500 x 500 x 400	508,0 x 508,0 x 406,4	-	-	450,9	113,4
20 x 20 x 18	20.000 x 20.000 x 18.000	-	-	17.25	252.2
500 x 500 x 450	508,0 x 508,0 x 457,2	-	-	450,9	114,4
24 x 24 x 10	24.000 x 24.000 x 10.750	-	-	20.00	330.9
600 x 600 x 250	609,6 x 609,6 x 273,0	-	-	508,0	150,1
24 x 24 x 12	24.000 x 24.000 x 12.750	-	-	20.00	334.5
600 x 600 x 300	609,6 x 609,6 x 323,9	-	-	508,0	151,7
24 x 24 x 14	24.000 x 24.000 x 14.000	-	-	20.00	340.3
600 x 600 x 350	609,6 x 609,6 x 355,6	-	-	508,0	154,4
24 x 24 x 16	24.000 x 24.000 x 16.000	-	-	20.00	342.6
600 x 600 x 400	609,6 x 609,6 x 406,4	-	-	508,0	155,4
24 x 24 x 18	24.000 x 24.000 x 18.000	-	-	20.00	344.7
600 x 600 x 450	609,6 x 609,6 x 457,2	-	-	508,0	156,4
24 x 24 x 20	24.000 x 24.000 x 20.000	-	-	20.00	346.8
600 x 600 x 500	609,6 x 609,6 x 508,0	-	-	508,0	157,3

► Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.
For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figure 323 Reducing Tees (Groove x Groove x Male Thread)

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Tech Data Sheet: G180

10
YEAR
LIMITED
WARRANTY

GROOVED FITTINGS

Pipe Size		C to GE & C to TE Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1½ x 1½ x 1¼	1.900 x 1.900 x 1.660	3.25	1.8
40 x 40 x 32	48,3 x 48,3 x 42,4	82,6	0,8
2 x 2 x 1	2.375 x 2.375 x 1.315	3.25	2.2
50 x 50 x 25	60,3 x 60,3 x 33,4	82,6	1,0
2 x 2 x 1¼	2.375 x 2.375 x 1.660	3.25	2.3
50 x 50 x 32	60,3 x 60,3 x 42,4	82,6	1,0
2 x 2 x 1½	2.375 x 2.375 x 1.900	3.25	1.4
50 x 50 x 40	60,3 x 60,3 x 48,3	82,6	1,1
2½ x 2½ x 1	2.875 x 2.875 x 1.315	3.75	3.6
65 x 65 x 25	73,0 x 73,0 x 33,4	95,3	1,6
2½ x 2½ x 1¼	2.875 x 2.875 x 1.660	3.75	3.8
65 x 65 x 32	73,0 x 73,0 x 42,4	95,3	1,7
2½ x 2½ x 1½	2.875 x 2.875 x 1.900	3.75	4.0
65 x 65 x 40	73,0 x 73,0 x 48,3	95,3	1,8
2½ x 2½ x 2	2.875 x 2.875 x 2.375	3.75	4.2
65 x 65 x 50	73,0 x 73,0 x 60,3	95,3	1,9
3 x 3 x 1	3.500 x 3.500 x 1.315	4.25	5.7
80 x 80 x 25	88,9 x 88,9 x 33,4	108,0	2,6
3 x 3 x 1½	3.500 x 3.500 x 1.900	4.25	5.8
80 x 80 x 40	88,9 x 88,9 x 48,3	108,0	2,6
3 x 3 x 2	3.500 x 3.500 x 2.375	4.25	5.9
80 x 80 x 50	88,9 x 88,9 x 60,3	108,0	2,7
3 x 3 x 2½	3.500 x 3.500 x 2.875	4.25	6.3
80 x 80 x 65	88,9 x 88,9 x 73,0	108,0	2,9
4 x 4 x 1	4.500 x 4.500 x 1.315	5.00	6.9
100 x 100 x 25	114,3 x 114,3 x 33,4	127,0	3,1
4 x 4 x 1¼	4.500 x 4.500 x 1.660	5.00	7.6
100 x 100 x 32	114,3 x 114,3 x 42,4	127,0	3,4
4 x 4 x 1½	4.500 x 4.500 x 1.900	5.00	8.3
100 x 100 x 40	114,3 x 114,3 x 48,3	127,0	3,8
4 x 4 x 2	4.500 x 4.500 x 2.375	5.00	9.6
100 x 100 x 50	114,3 x 114,3 x 60,3	127,0	4,4
4 x 4 x 2½	4.500 x 4.500 x 2.875	5.00	10.0
100 x 100 x 65	114,3 x 114,3 x 73,0	127,0	4,5
4 x 4 x 3	4.500 x 4.500 x 3.500	5.00	10.3
100 x 100 x 80	114,3 x 114,3 x 88,9	127,0	4,7
5 x 5 x 2	5.563 x 5.563 x 2.375	5.50	14.0
125 x 125 x 50	141,3 x 141,3 x 60,3	139,7	6,4
5 x 5 x 2½	5.563 x 5.563 x 2.875	5.50	14.3
125 x 125 x 65	141,3 x 141,3 x 73,0	139,7	6,5
5 x 5 x 3	5.563 x 5.563 x 3.500	5.50	14.6
125 x 125 x 80	141,3 x 141,3 x 88,9	139,7	6,6
5 x 5 x 4	5.563 x 5.563 x 4.500	5.50	15.1
125 x 125 x 100	141,3 x 141,3 x 114,3	139,7	6,8
6 x 6 x 2	6.625 x 6.625 x 2.375	6.50	21.3
150 x 150 x 50	168,3 x 168,3 x 60,3	165,1	9,7
6 x 6 x 2½	6.625 x 6.625 x 2.875	6.50	21.7
150 x 150 x 65	168,3 x 168,3 x 73,0	165,1	9,8
6 x 6 x 3	6.625 x 6.625 x 3.500	6.50	22.0
150 x 150 x 80	168,3 x 168,3 x 88,9	165,1	10,0
6 x 6 x 4	6.625 x 6.625 x 4.500	6.50	22.5
150 x 150 x 100	168,3 x 168,3 x 114,3	165,1	10,2
6 x 6 x 5	6.625 x 6.625 x 5.563	6.50	23.1
150 x 150 x 125	168,3 x 168,3 x 141,3	165,1	10,5

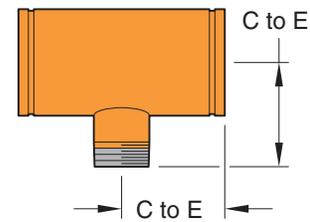


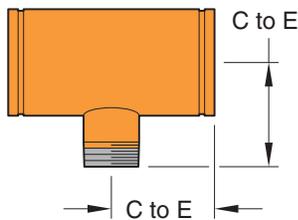
Figure 323 Reducing Tees (Groove x Groove x Male Thread)

(Page 2 of 2)

Tech Data Sheet: G180



GROOVED FITTINGS



Nominal Inches mm	Pipe Size		C to GE & C to TE Inches mm	Approx. Weight Lbs. kg
	O.D. Inches mm			
8 x 8 x 2	8.625 x 8.625 x 2.375		7.75	32.7
200 x 200 x 50	219,1 x 219,1 x 60,3		196,9	14,8
8 x 8 x 3	8.625 x 8.625 x 3.500		7.75	33.5
200 x 200 x 80	219,1 x 219,1 x 88,9		196,9	15,2
8 x 8 x 4	8.625 x 8.625 x 4.500		7.75	34.5
200 x 200 x 100	219,1 x 219,1 x 114,1		196,9	15,6
8 x 8 x 5	8.625 x 8.625 x 5.563		7.75	34.7
200 x 200 x 125	219,1 x 219,1 x 141,3		196,9	15,7
8 x 8 x 6	8.625 x 8.625 x 6.625		7.75	35.6
200 x 200 x 150	219,1 x 219,1 x 168,3		196,9	16,1
10 x 10 x 2	10.750 x 10.750 x 2.375		9.00	52.2
250 x 250 x 50	273,0 x 273,0 x 60,3		228,6	23,7
10 x 10 x 3	10.750 x 10.750 x 3.500		9.00	53.0
250 x 250 x 80	273,0 x 273,0 x 88,9		228,6	24,0
10 x 10 x 4	10.750 x 10.750 x 4.500		9.00	53.6
250 x 250 x 100	273,0 x 273,0 x 114,3		228,6	24,3
10 x 10 x 5	10.750 x 10.750 x 5.563		9.00	54.2
250 x 250 x 125	273,0 x 273,0 x 141,3		228,6	24,6
10 x 10 x 6	10.750 x 10.750 x 6.625		9.00	54.9
250 x 250 x 150	273,0 x 273,0 x 168,3		228,6	24,9
10 x 10 x 8	10.750 x 10.750 x 8.625		9.00	55.3
250 x 250 x 200	273,0 x 273,0 x 219,1		228,6	25,1
12 x 12 x 3	12.750 x 12.750 x 3.500		10.00	74.6
300 x 300 x 80	323,9 x 323,9 x 88,9		254,0	33,8
12 x 12 x 4	12.750 x 12.750 x 4.500		10.00	75.1
300 x 300 x 100	323,9 x 323,9 x 114,3		254,0	34,1
12 x 12 x 5	12.750 x 12.750 x 5.563		10.00	75.6
300 x 300 x 125	323,9 x 323,9 x 141,3		254,0	34,3
12 x 12 x 6	12.750 x 12.750 x 6.625		10.00	76.2
300 x 300 x 150	323,9 x 323,9 x 168,3		254,0	34,6
12 x 12 x 8	12.750 x 12.750 x 8.625		10.00	76.3
300 x 300 x 200	323,9 x 323,9 x 219,1		254,0	34,6
12 x 12 x 10	12.750 x 12.750 x 10.750		10.00	77.6
300 x 300 x 250	323,9 x 323,9 x 273,0		254,0	35,2

Available with BSP threads. Contact GRINNELL Mechanical Products for details.
For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figures 250 & 350 Concentric Reducers

(Page 1 of 3)

Tech Data Sheet: G180



Pipe Size		Figure 250 - Cast		Figure 350 - Fabricated	
Nominal Inches mm	O.D. Inches mm	E to E Inches mm	Approx. Weight Lbs. kg	E to E Inches mm	Approx. Weight Lbs. kg
1¼ x 1	1.660 x 1.315	2.50	0.7	—	—
32 x 25	42,4 x 33,4	63,5	0,3	—	—
1½ x 1	1.900 x 1.315	—	—	2.50	0.7
40 x 25	48,3 x 33,4	—	—	63,5	0,3
1½ x 1¼	1.900 x 1.660	2.50	0.8	—	—
40 x 32	48,3 x 42,4	63,5	0,3	—	—
2 x 1	2.375 x 1.315	2.50	0.9	—	—
50 x 25	60,3 x 33,4	63,5	0,4	—	—
2 x 1¼	2.375 x 1.660	2.50	0.9	—	—
50 x 32	60,3 x 42,4	63,5	0,4	—	—
2 x 1½	2.375 x 1.900	2.50	1.0	—	—
50 x 40	60,3 x 48,3	63,5	0,5	—	—
2½ x 1	2.875 x 1.315	—	—	2.50	1.2
65 x 25	73,0 x 33,4	—	—	63,5	0,5
2½ x 1¼	2.875 x 1.660	2.50	1.4	—	—
65 x 32	73,0 x 42,4	63,5	0,6	—	—
2½ x 1½	2.875 x 1.900	2.50	1.4	—	—
65 x 40	73,0 x 48,3	63,5	0,6	—	—
2½ x 2	2.875 x 2.375	2.50	1.3	—	—
65 x 50	73,0 x 60,3	63,5	0,6	—	—
76,1mm x 1¼	3.000 x 1.660	2.50	1.4	—	—
65 x 32	76,1 x 42,4	63,5	0,6	—	—
76,1mm x 1½	3.000 x 1.900	2.50	1.4	—	—
65 x 40	76,1 x 48,3	63,5	0,6	—	—
76,1mm x 2	3.000 x 2.375	2.50	1.5	—	—
65 x 50	76,1 x 60,3	63,5	0,7	—	—
3 x 1	3.500 x 1.315	—	—	2.50	1.3
80 x 25	88,9 x 33,4	—	—	63,5	0,6
3 x 1¼	3.500 x 1.660	—	—	2.50	1.3
80 x 32	88,9 x 42,4	—	—	63,5	0,6
3 x 1½	3.500 x 1.900	2.50	1.8	—	—
80 x 40	88,9 x 48,3	63,5	0,8	—	—
3 x 2	3.500 x 2.375	2.50	1.7	—	—
80 x 50	88,9 x 60,3	63,5	0,8	—	—
3 x 2½	3.500 x 2.875	2.50	1.8	—	—
80 x 65	88,9 x 73,0	63,5	0,8	—	—
3 x 76,1mm	3.500 x 3.000	2.50	2.0	—	—
80 x 65	88,9 x 76,1	63,5	0,9	—	—
4 x 1	4.500 x 1.315	—	—	3.00	2.9
100 x 25	114,3 x 33,4	—	—	76,2	1,1
4 x 1¼	4.500 x 1.660	—	—	3.00	2.2
100 x 32	114,3 x 42,4	—	—	76,2	1,0
4 x 1½	4.500 x 1.900	—	—	3.00	2.3
100 x 40	114,3 x 48,3	—	—	76,2	1,0
4 x 2	4.500 x 2.375	3.00	2.4	—	—
100 x 50	114,3 x 60,3	76,2	1,1	—	—
4 x 2½	4.500 x 2.875	3.00	2.7	—	—
100 x 65	114,3 x 73,0	76,2	1,2	—	—
4 x 76,1mm	4.500 x 3.000	3.00	3.2	—	—
100 x 65	114,3 x 76,1	76,2	1,5	—	—
4 x 3	4.500 x 3.500	3.00	2.8	—	—
100 x 80	114,3 x 88,9	76,2	1,3	—	—
139,7mm x 3	5.500 x 3.500	3.50	4.2	—	—
125 x 80	139,7 x 88,9	88,9	1,9	—	—

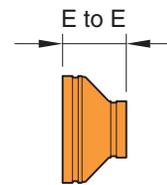


Figure 250
Concentric Reducer Cast

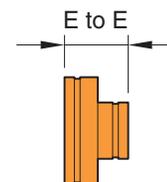


Figure 350
Concentric Reducer Fabricated

Figures 250 & 350 Concentric Reducers

(Page 2 of 3)

Tech Data Sheet: G180

10
YEAR
LIMITED
WARRANTY

GROOVED FITTINGS

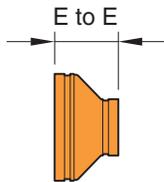


Figure 250
Cast Concentric
Reducer

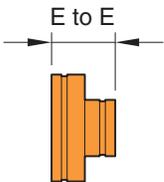


Figure 350
Fabricated Concentric
Reducer

Pipe Size		Figure 250 - Cast		Figure 350 - Fabricated	
Nominal Inches mm	O.D. Inches mm	E to E Inches mm	Approx. Weight Lbs. kg	E to E Inches mm	Approx. Weight Lbs. kg
139,7mm x 4 125 x 100	5.500 x 4.500 139,7 x 114,3	3.50 88,9	4.4 2,0	— —	— —
5 x 2 125 x 50	5.563 x 2.375 141,3 x 60,3	— —	— —	3.50 88,9	4.6 2,1
5 x 2½ 125 x 65	5.563 x 2.875 141,3 x 73,0	— —	— —	3.50 88,9	4.5 2,0
5 x 3 125 x 80	5.563 x 3.500 141,3 x 88,9	3.50 88,9	4.2 1,9	— —	— —
5 x 4 125 x 100	5.563 x 4.500 141,3 x 114,3	3.50 88,9	4.4 2,0	— —	— —
165,1mm x 3 150 x 80	6.500 x 3.500 165,1 x 88,9	4.00 101,6	5.5 2,5	— —	— —
165,1mm x 4 150 x 100	6.500 x 4.500 165,1 x 114,3	4.00 101,6	6.0 2,7	— —	— —
165,1 x 139,7mm 150 x 125	6.500 x 5.500 165,1 x 139,7	4.00 101,6	5.6 2,5	— —	— —
6 x 2 150 x 50	6.625 x 2.375 168,3 x 60,3	4.00 101,6	5.3 2,4	— —	— —
6 x 2½ 150 x 65	6.625 x 2.875 168,3 x 73,0	4.00 101,6	5.6 2,5	— —	— —
6 x 76,1mm 150 x 65	6.625 x 3.000 168,3 x 76,1	4.00 101,6	6.1 2,7	— —	— —
6 x 3 150 x 80	6.625 x 3.500 168,3 x 88,9	4.00 101,6	5.8 2,6	— —	— —
6 x 4 150 x 100	6.625 x 4.500 168,3 x 114,3	4.00 101,6	6.0 2,7	— —	— —
6 x 139,7mm 150 x 125	6.625 x 5.500 168,3 x 139,7	4.00 101,6	6.3 2,3	— —	— —
6 x 5 150 x 125	6.625 x 5.563 168,3 x 141,3	4.00 101,6	6.2 2,8	— —	— —
8 x 2½ 200 x 65	8.625 x 2.875 219,1 x 73,0	— —	— —	5.00 127,0	12.1 5,5
8 x 3 200 x 80	8.625 x 3.500 219,1 x 88,9	5.00 127,0	11.5 5,2	— —	— —
8 x 4 200 x 100	8.625 x 4.500 219,1 x 114,3	5.00 127,0	10.7 4,9	— —	— —
8 x 139,7mm 200 x 125	8.625 x 5.500 219,1 x 139,7	5.00 127,0	10.0 4,5	— —	— —
8 x 5 200 x 125	8.625 x 5.563 219,1 x 141,3	5.00 127,0	10.8 4,9	— —	— —
8 x 165,1mm 200 x 150	8.625 x 6.500 219,1 x 165,1	5.00 127,0	11.0 5,0	— —	— —
8 x 6 200 x 150	8.625 x 6.625 219,1 x 168,3	5.00 127,0	11.3 5,1	— —	— —
10 x 4 250 x 100	10.750 x 4.500 273,0 x 114,3	— —	— —	6.00 152,4	20.5 9,3
10 x 5 250 x 125	10.750 x 5.563 273,0 x 141,3	— —	— —	6.00 152,4	20.1 9,1
10 x 165,1mm 250 x 150	10.750 x 6.500 273,0 x 165,1	6.00 152,4	17.8 8,0	— —	— —
10 x 6 250 x 150	10.750 x 6.625 273,0 x 168,3	6.00 152,4	16.3 7,4	— —	— —
10 x 8 250 x 200	10.750 x 8.625 273,0 x 219,1	6.00 152,4	18.3 8,3	— —	— —

Figures 250 & 350 Concentric Reducers

(Page 3 of 3)

Tech Data Sheet: G180



Pipe Size		Figure 250 - Cast		Figure 350 - Fabricated	
Nominal Inches mm	O.D. mm	E to E Inches mm	Approx. Weight Lbs. kg	E to E Inches mm	Approx. Weight Lbs. kg
12 x 4 300 x 100	12.750 x 4.500 323,9 x 114,3	7.00 177,8	23.0 10,4	—	—
12 x 6 300 x 150	12.750 x 6.625 323,9 x 168,3	7.00 177,8	23.6 10,7	—	—
12 x 8 300 x 200	12.750 x 8.625 323,9 x 219,1	7.00 177,8	25.2 11,4	—	—
12 x 10 300 x 250	12.750 x 10.750 323,9 x 273,0	7.00 177,8	28.2 12,8	—	—
14 x 6 350 x 150	14.000 x 6.625 355,6 x 168,3	—	—	13.0 330,2	54.3 24,6
14 x 8 350 x 200	14.000 x 8.625 355,6 x 219,1	—	—	13.0 330,2	54.5 24,7
14 x 10 350 x 250	14.000 x 10.750 355,6 x 273,0	—	—	13.0 330,2	55.8 25,3
14 x 12 350 x 300	14.000 x 12.750 355,6 x 323,9	—	—	13.0 330,2	57.3 26,0
16 x 8 400 x 200	16.000 x 8.625 406,4 x 219,1	—	—	14.0 355,6	65.4 29,7
16 x 10 400 x 250	16.000 x 10.750 406,4 x 273,0	—	—	14.0 355,6	66.7 30,2
16 x 12 400 x 300	16.000 x 12.750 406,4 x 323,9	—	—	14.0 355,6	68.1 30,9
16 x 14 400 x 350	16.000 x 14.000 406,4 x 355,6	—	—	14.0 355,6	71.0 32,2
18 x 12 450 x 300	18.000 x 12.750 457,2 x 323,9	—	—	15.0 381,0	83.6 37,9
18 x 14 450 x 350	18.000 x 14.000 457,2 x 355,6	—	—	15.0 381,0	86.2 39,1
18 x 16 450 x 400	18.000 x 16.000 457,2 x 406,4	—	—	15.0 381,0	87.2 39,6
20 x 10 500 x 250	20.000 x 10.750 508,0 x 273,0	—	—	20.0 508,0	124.7 56,6
20 x 12 500 x 300	20.000 x 12.750 508,0 x 323,9	—	—	20.0 508,0	124.7 56,6
20 x 14 500 x 350	20.000 x 14.000 508,0 x 355,6	—	—	20.0 508,0	129.0 58,5
20 x 16 500 x 400	20.000 x 16.000 508,0 x 406,4	—	—	20.0 508,0	131.1 59,5
20 x 18 500 x 450	20.000 x 18.000 508,0 x 457,2	—	—	20.0 508,0	133.4 60,5
24 x 10 600 x 250	24.000 x 10.750 609,6 x 273,0	—	—	20.0 508,0	149.1 67,6
24 x 12 600 x 300	24.000 x 12.750 609,6 x 323,9	—	—	20.0 508,0	150.4 68,2
24 x 14 600 x 350	24.000 x 14.000 609,6 x 355,6	—	—	20.0 508,0	151.6 68,8
24 x 16 600 x 400	24.000 x 16.000 609,6 x 406,4	—	—	20.0 508,0	152.8 69,3
24 x 18 600 x 450	24.000 x 18.000 609,6 x 457,2	—	—	20.0 508,0	154.1 69,9
24 x 20 600 x 500	24.000 x 20.000 609,6 x 508,0	—	—	20.0 508,0	155.5 70,5

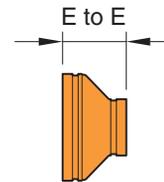


Figure 250
Cast Concentric
Reducer

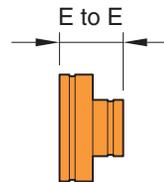


Figure 350
Fabricated Concentric
Reducer

▶ Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.
For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figures 251 & 351 Eccentric Reducers

(Page 1 of 3)

Tech Data Sheet: G180

10
YEAR
LIMITED
WARRANTY

GROOVED FITTINGS



Figure 251
Cast Eccentric Reducer



Figure 351
Fabricated Eccentric Reducer
(Segment Welded)

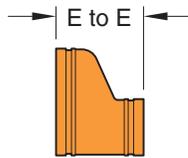


Figure 251
Cast Eccentric Reducer

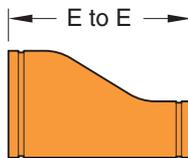


Figure 351
Fabricated Eccentric Reducer
(Segment Welded)

Pipe Size		Figure 251 - Cast		Figure 351 - Fabricated	
Nominal Inches mm	O.D. Inches mm	E to E Inches mm	Approx. Weight Lbs. kg	E to E Inches mm	Approx. Weight Lbs. kg
1½ x 1	1.900 x 1.315	—	—	8.5	1.9
40 x 25	48,3 x 33,4	—	—	215,9	0,9
1½ x 1¼	1.900 x 1.660	—	—	8.5	2.2
40 x 32	48,3 x 42,4	—	—	215,9	1,0
2 x 1	2.375 x 1.315	—	—	9.0	2.2
50 x 25	60,3 x 33,4	—	—	223,6	1,0
2 x 1¼	2.375 x 1.660	—	—	9.0	2.4
50 x 32	60,3 x 42,4	—	—	228,6	1,1
2 x 1½	2.375 x 1.900	—	—	9.0	2.5
50 x 40	60,3 x 48,3	—	—	228,6	1,1
2½ x 1	2.875 x 1.315	—	—	9.5	3.2
65 x 25	73,0 x 33,4	—	—	241,3	1,5
2½ x 1¼	2.875 x 1.660	—	—	9.5	3.4
65 x 32	73,0 x 42,4	—	—	241,3	1,5
2½ x 1½	2.875 x 1.900	—	—	9.5	3.6
65 x 40	73,0 x 48,3	—	—	241,3	1,6
2½ x 2	2.875 x 2.375	—	—	9.5	4.0
65 x 50	73,0 x 60,3	—	—	241,3	1,8
3 x 1	3.500 x 1.315	—	—	9.5	4.0
80 x 25	88,9 x 33,4	—	—	241,3	1,8
3 x 1¼	3.500 x 1.660	—	—	9.5	4.3
80 x 32	88,9 x 42,4	—	—	241,3	2,0
3 x 1½	3.500 x 1.900	—	—	9.5	4.5
80 x 40	88,9 x 48,3	—	—	241,3	2,0
3 x 2	3.500 x 2.375	3.5	2.0	—	—
80 x 50	88,9 x 60,3	88,9	0,9	—	—
3 x 2½	3.500 x 2.875	3.5	2.2	—	—
80 x 65	88,9 x 73,0	88,9	1,0	—	—
4 x 1	4.500 x 1.315	—	—	10.0	5.9
100 x 25	114,3 x 33,4	—	—	254,0	2,7
4 x 1¼	4.500 x 1.660	—	—	10.0	6.3
100 x 32	114,3 x 42,4	—	—	254,0	2,9
4 x 1½	4.500 x 1.900	—	—	10.0	6.4
100 x 40	114,3 x 48,3	—	—	254,0	2,9
4 x 2	4.500 x 2.375	4.0	3.0	—	—
100 x 50	114,3 x 60,3	101,6	1,4	—	—
4 x 2½	4.500 x 2.875	4.0	3.1	—	—
100 x 65	114,3 x 73,0	101,6	1,4	—	—
4 x 3	4.500 x 3.500	4.0	3.3	—	—
100 x 80	114,3 x 88,9	101,6	1,5	—	—
5 x 2	5.563 x 2.375	—	—	11.0	9.3
125 x 50	141,3 x 60,3	—	—	279,4	4,2

Figures 251 & 351 Eccentric Reducers

(Page 2 of 3)

Tech Data Sheet: G180



Pipe Size		Figure 251 - Cast		Figure 351 - Fabricated	
Nominal Inches mm	O.D. Inches mm	E to E Inches mm	Approx. Weight Lbs. kg	E to E Inches mm	Approx. Weight Lbs. kg
5 x 2½	5.563 x 2.875	—	—	11.0	9.9
125 x 65	141,3 x 73,0	—	—	279,4	4,5
5 x 3	5.563 x 3.500	—	—	11.0	10.7
125 x 80	141,3 x 88,9	—	—	279,4	4,9
5 x 4	5.563 x 4.500	5.0	5.7	—	—
125 x 100	141,3 x 114,3	127,5	2,6	—	—
165,1mm x 3	6.500 x 3.500	—	—	11.5	13.6
150 x 80	165,1 x 88,9	—	—	292,1	6,2
165,1mm x 4	6.500 x 4.500	—	—	11.5	14.9
150 x 100	165,1 x 114,3	—	—	292,1	6,8
6 x 2	6.625 x 2.375	—	—	11.5	12.2
150 x 50	168,3 x 60,3	—	—	292,1	5,5
6 x 2½	6.625 x 2.875	—	—	11.5	12.8
150 x 65	168,3 x 73,0	—	—	292,1	5,8
6 x 3	6.625 x 3.500	5.5	7.4	—	—
150 x 80	168,3 x 88,9	139,7	3,4	—	—
6 x 4	6.625 x 4.500	5.5	7.5	—	—
150 x 100	168,3 x 114,3	139,7	3,4	—	—
6 x 5	6.625 x 5.563	5.5	8.1	—	—
150 x 125	168,3 x 141,3	139,7	3,7	—	—
8 x 3	8.625 x 3.500	—	—	12.0	17.9
200 x 80	219,1 x 88,9	—	—	304,8	8,1
8 x 4	8.625 x 4.500	—	—	12.0	19.7
200 x 100	219,1 x 114,3	—	—	304,8	9,8
8 x 5	8.625 x 5.563	—	—	12.0	21.4
200 x 125	219,1 x 141,3	—	—	304,8	9,7
8 x 6	8.625 x 6.625	—	—	12.0	23.2
200 x 150	219,1 x 168,3	—	—	304,8	10,5
10 x 4	10.750 x 4.500	—	—	13.0	29.7
250 x 100	273,0 x 114,3	—	—	330,2	13,5
10 x 5	10.750 x 5.563	—	—	13.0	31.7
250 x 125	273,0 x 141,3	—	—	330,2	14,4
10 x 6	10.750 x 6.625	—	—	13.0	34.0
250 x 150	273,0 x 168,3	—	—	330,2	15,4
10 x 8	10.750 x 8.625	—	—	13.0	34.4
250 x 200	273,0 x 219,1	—	—	330,2	15,6
12 x 4	12.750 x 4.500	—	—	14.0	44.8
300 x 100	323,9 x 114,3	—	—	355,6	20,3
12 x 6	12.750 x 6.625	—	—	14.0	45.2
300 x 150	323,9 x 168,3	—	—	355,6	20,5
12 x 8	12.750 x 8.625	—	—	14.0	47.7
300 x 200	323,9 x 219,1	—	—	355,6	21,6
12 x 10	12.750 x 10.750	—	—	14.0	52.0
300 x 250	323,9 x 273,0	—	—	355,6	23,6
14 x 6	14.000 x 6.625	—	—	19.0	78.0
350 x 150	355,6 x 168,3	—	—	482,6	35,4
14 x 8	14.000 x 8.625	—	—	19.0	80.0
350 x 200	355,6 x 219,1	—	—	482,6	36,3
14 x 10	14.000 x 10.750	—	—	19.0	84.0
350 x 250	355,6 x 273,0	—	—	482,6	38,1
14 x 12	14.000 x 12.750	—	—	19.0	88.0
350 x 300	355,6 x 323,9	—	—	482,6	39,9

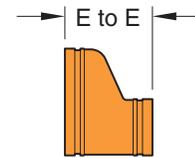


Figure 251
Cast Eccentric Reducer

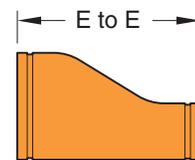


Figure 351
Fabricated Eccentric Reducer
(Segment Welded)

Figures 251 & 351 Eccentric Reducers

(Page 3 of 3)

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GROOVED FITTINGS

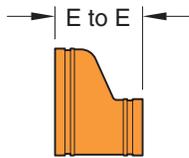


Figure 251
Cast Eccentric Reducer

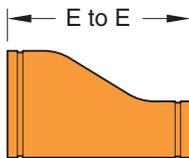


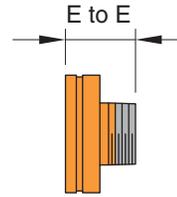
Figure 351
Fabricated Eccentric Reducer
(Segment Welded)

Pipe Size		Figure 251 - Cast		Figure 351 - Fabricated	
Nominal Inches mm	O.D. Inches mm	E to E Inches mm	Approx. Weight Lbs. kg	E to E Inches mm	Approx. Weight Lbs. kg
16 x 8	16.000 x 8.625	—	—	20.0	91.0
400 x 200	406,4 x 219,1	—	—	508,0	41,3
16 x 10	16.000 x 10.750	—	—	20.0	96.0
400 x 250	406,4 x 273,0	—	—	508,0	43,5
16 x 12	16.000 x 12.750	—	—	20.0	99.0
400 x 300	406,4 x 323,9	—	—	508,0	44,9
16 x 14	16.000 x 14.000	—	—	20.0	104.0
400 x 350	406,4 x 355,6	—	—	508,0	47,2
18 x 10	18.000 x 10.750	—	—	21.0	110.0
450 x 250	457,2 x 273,1	—	—	533,0	49,9
18 x 12	18.000 x 12.750	—	—	21.0	113.0
450 x 300	457,2 x 323,9	—	—	533,0	51,3
18 x 14	18.000 x 14.000	—	—	21.0	117.0
450 x 350	457,2 x 355,6	—	—	533,0	53,1
18 x 16	18.000 x 16.000	—	—	21.0	121.0
450 x 400	457,2 x 406,4	—	—	533,0	54,9
20 x 10	20.000 x 10.750	—	—	26.0	145.0
500 x 250	508,0 x 273,0	—	—	660,4	65,8
20 x 12	20.000 x 12.750	—	—	26.0	149.0
500 x 300	508,0 x 323,9	—	—	660,4	67,6
20 x 14	20.000 x 14.000	—	—	26.0	152.0
500 x 350	508,0 x 355,6	—	—	660,4	68,9
20 x 16	20.000 x 16.000	—	—	26.0	156.0
500 x 400	508,0 x 406,4	—	—	660,4	70,8
20 x 18	20.000 x 18.000	—	—	26.0	160.0
500 x 450	508,0 x 457,2	—	—	660,4	72,6
24 x 10	24.000 x 10.750	—	—	26.0	147.0
600 x 250	609,6 x 273,0	—	—	660,4	78,9
24 x 12	24.000 x 12.750	—	—	26.0	179.0
600 x 300	609,6 x 323,9	—	—	660,4	81,2
24 x 14	24.000 x 14.000	—	—	26.0	184.0
600 x 350	609,6 x 355,6	—	—	660,4	83,5
24 x 16	24.000 x 16.000	—	—	26.0	189.0
600 x 400	609,6 x 406,4	—	—	660,4	85,7
24 x 18	24.000 x 18.000	—	—	26.0	194.0
600 x 450	609,6 x 457,2	—	—	660,4	88,0
24 x 20	24.000 x 20.000	—	—	26.0	199.0
600 x 500	609,6 x 508,0	—	—	660,4	90,3

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figure 372 Concentric Reducers (Small End Male Thread)

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Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1½ x 1	1.900 x 1.315	2.50	0.6
40 x 25	48,3 x 33,7	63,5	0,3
2 x ¾	2.375 x 1.050	2.50	1.0
50 x 20	60,3 x 26,7	63,5	0,5
2 x 1	2.375 x 1.315	2.50	0.8
50 x 25	60,3 x 33,7	63,5	0,4
2 x 1¼	2.375 x 1.660	2.50	0.8
50 x 32	60,3 x 42,4	63,5	0,4
2 x 1½	2.375 x 1.900	2.50	0.8
50 x 40	60,3 x 48,3	63,5	0,4
2½ x 1¼	2.875 x 1.660	2.50	1.0
65 x 32	73,0 x 42,4	63,5	0,5
2½ x 1½	2.875 x 1.900	2.50	1.3
65 x 40	73,0 x 48,3	63,5	0,6
2½ x 2	2.875 x 2.375	2.50	1.2
65 x 50	73,0 x 60,3	63,5	0,5
3 x 1	3.500 x 1.315	2.50	1.3
80 x 25	88,9 x 33,7	63,5	0,6
3 x 1½	3.500 x 1.900	2.50	1.3
80 x 40	88,9 x 48,3	63,5	0,6
3 x 2	3.500 x 2.375	2.50	1.3
80 x 50	88,9 x 60,3	63,5	0,6
3 x 2½	3.500 x 2.875	2.50	1.5
80 x 65	88,9 x 73,0	63,5	0,7
3½ x 3	4.000 x 3.500	2.50	1.5
90 x 80	101,6 x 88,9	63,5	0,7

Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
4 x 1	4.500 x 1.315	3.00	1.8
100 x 25	114,3 x 33,4	76,2	0,8
4 x 1½	4.500 x 1.900	3.00	2.3
100 x 40	114,3 x 48,3	76,2	1,0
4 x 2	4.500 x 2.375	3.00	2.3
100 x 50	114,3 x 60,3	76,2	1,0
4 x 2½	4.500 x 2.875	3.00	2.3
100 x 65	114,3 x 73,0	76,2	1,0
4 x 3	4.500 x 3.500	3.00	2.6
100 x 80	114,3 x 88,9	76,2	1,2
5 x 4	5.563 x 4.500	3.50	4.5
125 x 100	141,3 x 114,3	88,9	2,0
6 x 1	6.625 x 1.315	4.00	5.2
150 x 25	168,3 x 33,4	101,6	2,4
6 x 2	6.625 x 2.375	4.00	6.0
150 x 50	168,3 x 60,3	101,6	2,7
6 x 3	6.625 x 3.500	4.00	6.0
150 x 80	168,3 x 88,9	101,6	2,7
6 x 4	6.625 x 4.500	4.00	5.9
150 x 100	168,3 x 114,3	101,6	2,7
6 x 5	6.625 x 5.563	4.00	5.8
150 x 125	168,3 x 141,3	101,6	2,6

Available with BSP threads. Contact GRINNELL Mechanical Products for details.

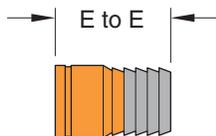
For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Figure 395 Hose Adapter Nipples (Groove x Hose)

Tech Data Sheet: G180

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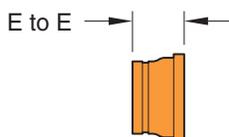
Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1	1.315	3.25	0.4
25	33,4	82,6	0,2
1¼	1.600	3.63	0.7
32	42,4	92,1	0,3
1½	1.900	4.00	0.8
40	48,3	101,6	0,4
2	2.375	4.63	1.3
50	60,3	117,5	0,6
2½	2.875	5.50	2.1
65	73,0	139,7	1,0
3	3.500	6.00	3.3
80	88,9	152,4	1,5
4	4.500	7.25	5.5
100	114,3	184,2	2,5
5	5.563	9.75	8.1
125	141,3	247,7	3,7
6	6.625	11.00	13.2
150	168,3	279,4	6,0
8	8.625	12.50	24.0
200	219,1	317,5	10,9
10	10.750	14.00	29.0
250	273,0	355,6	13,2
12	12.750	16.00	46.0
300	323,9	406,4	20,9

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figure 380 Female Thread Adapters (Groove x Female Thread)

Tech Data Sheet: G180

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Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1	1.315	2.063	0.7
25	33,4	52,4	0,3
1¼	1.600	2.312	1.4
32	42,4	58,7	0,6
1½	1.900	2.312	1.5
40	48,3	58,7	0,7
2	2.375	2.500	1.6
50	60,3	63,5	0,7
2½	2.875	2.500	1.9
65	73,0	63,5	0,9
76,1mm	3.000	2.500	1.9
65	76,1	63,5	0,9
3	3.500	2.750	2.5
80	88,9	69,9	1,1
4	4.500	3.250	4.5
100	114,3	82,5	2,0

Available with BSP threads. Contact GRINNELL Mechanical Products for details.
For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figures 391, 392 & 393 Adapter Nipples

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GROOVED FITTINGS

Figure 391
Fabricated Adapter Nipple
Groove x Male Thread

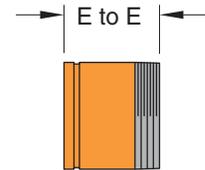


Figure 392
Fabricated Adapter Nipple
Groove x Groove

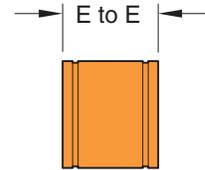
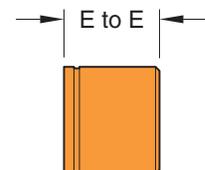


Figure 393
Fabricated Adapter Nipple
Groove x Plain



Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1¼	1.600	4.00	0.8
32	42,4	101,6	0,4
1½	1.900	4.00	0.9
40	48,3	101,6	0,4
2	2.375	4.00	1.2
50	60,3	101,6	0,5
2½	2.875	4.00	1.9
65	73,0	101,6	0,9
3	3.500	4.00	2.5
80	88,9	101,6	1,1
4	4.500	6.00	5.4
100	114,3	154,4	2,4
5	5.563	6.00	7.3
125	141,3	154,4	3,3
6	6.625	6.00	9.4
150	168,3	154,4	4,3
8	8.625	6.00	14.2
200	219,1	154,4	6,4
10	10.750	8.00	27.0
250	273,0	203,2	12,2
12	12.750	8.00	33.0
300	323,9	203,2	15,0

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figures 397, 398 & 399 Concentric Swaged Nipples

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Figure 397
Fabricated Swaged Nipple
Groove x Groove



Figure 398
Fabricated Swaged Nipple
Groove x Male Thread



Figure 399
Fabricated Swaged Nipple
Groove x Plain End



Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2 x 1	2.375 x 1.315	6.50	2.0
50 x 25	60,3 x 33,4	165,1	0,9
2 x 1¼	2.375 x 1.660	6.50	2.0
50 x 32	60,3 x 42,4	165,1	0,9
2 x 1½	2.375 x 1.900	6.50	2.0
50 x 40	60,3 x 48,3	165,1	0,9
2½ x 1	2.875 x 1.315	7.00	3.5
65 x 25	73,0 x 33,4	177,8	1,6
2½ x 1¼	2.875 x 1.660	7.00	3.5
65 x 32	73,0 x 42,4	177,8	1,6
2½ x 1½	2.875 x 1.900	7.00	3.5
65 x 40	73,0 x 48,3	177,8	1,6
2½ x 2	2.875 x 2.375	7.00	3.5
65 x 50	73,0 x 60,3	177,8	1,6
3 x 1	3.500 x 1.315	8.00	5.0
80 x 25	88,9 x 33,4	203,2	2,3
3 x 1¼	3.500 x 1.660	8.00	5.0
80 x 32	88,9 x 42,4	203,2	2,3
3 x 1½	3.500 x 1.900	8.00	5.0
80 x 40	88,9 x 48,3	203,2	2,3
3 x 2	3.500 x 2.375	8.00	5.0
80 x 50	88,9 x 60,3	203,2	2,3
3 x 2½	3.500 x 2.875	8.00	5.0
80 x 65	88,9 x 73,0	203,2	2,3
4 x 1	4.500 x 1.315	9.00	8.0
100 x 25	114,3 x 33,4	228,6	3,6
4 x 1¼	4.500 x 1.660	9.00	8.0
100 x 32	114,3 x 42,4	228,6	3,6
4 x 1½	4.500 x 1.900	9.00	8.0
100 x 40	114,3 x 48,3	228,6	3,6
4 x 2	4.500 x 2.375	9.00	8.0
100 x 50	114,3 x 60,3	228,6	3,6
4 x 2½	4.500 x 2.875	9.00	8.0
100 x 65	114,3 x 73,0	228,6	3,6

Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
4 x 3	4.500 x 3.500	9.00	8.0
100 x 80	114,3 x 88,9	228,6	3,6
5 x 1½	5.563 x 1.900	11.00	12.0
125 x 40	141,3 x 48,3	279,4	5,4
5 x 2	5.563 x 2.375	11.00	12.0
125 x 50	141,3 x 60,3	279,4	5,4
5 x 2½	5.563 x 2.875	11.00	12.0
125 x 65	141,3 x 73,0	279,4	5,4
5 x 3	5.563 x 3.500	11.00	12.0
125 x 80	141,3 x 88,9	279,4	5,4
5 x 4	5.563 x 4.500	11.00	12.0
125 x 100	141,3 x 114,3	279,4	5,4
6 x 1	6.625 x 1.315	12.00	19.0
150 x 25	168,3 x 33,4	304,8	8,6
6 x 1¼	6.625 x 1.660	12.00	19.0
150 x 32	168,3 x 42,4	304,8	8,6
6 x 1½	6.625 x 1.900	12.00	19.0
150 x 40	168,3 x 48,3	304,8	8,6
6 x 2	6.625 x 2.375	12.00	19.0
150 x 50	168,3 x 60,3	304,8	8,6
6 x 2½	6.625 x 2.875	12.00	19.0
150 x 65	168,3 x 73,0	304,8	8,6
6 x 3	6.625 x 3.500	12.00	19.0
150 x 80	168,3 x 88,9	304,8	8,6
6 x 4	6.625 x 4.500	12.00	19.0
150 x 100	168,3 x 114,3	304,8	8,6
6 x 5	6.625 x 5.563	12.00	19.0
150 x 125	168,3 x 141,3	304,8	8,6
8 x 6	8.625 x 6.625	◆	◆
200 x 150	219,1 x 168,3	-	-

◆ These sizes are available. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, contact GRINNELL Mechanical Products.

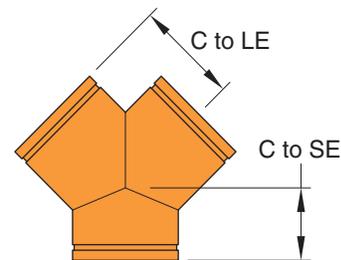
See page 37 for fitting specifications.

Figure 324 90° True Wyes

Tech Data Sheet: G180



Pipe Size		C to LE Inches mm	C to SE Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			
1¼	1.660	2.75	2.50	1.4
32	42,4	69,9	63,5	0,6
1½	1.900	2.75	2.75	1.7
40	48,3	69,9	69,9	0,8
2	2.375	3.25	2.75	2.5
50	60,3	82,6	69,9	1,1
2½	2.875	3.75	3.00	4.4
65	73,0	95,3	76,2	2,0
76,1mm	3.000	3.75	3.00	4.4
65	76,1	95,3	76,2	2,0
3	3.500	4.25	3.25	6.4
80	88,9	108,0	82,6	2,9
4	4.500	5.00	3.75	10.5
100	114,3	127,0	95,3	4,8
139,7mm	5.500	5.50	4.00	15.2
125	139,7	139,7	101,6	6,9
5	5.563	5.50	4.00	15.2
125	141,3	139,7	101,6	6,9
165,1mm	6.500	6.50	4.50	22.9
150	165,1	165,1	114,3	10,4
6	6.625	6.50	4.50	22.9
150	168,3	165,1	114,3	10,4
8	8.625	7.75	6.00	41.9
200	219,1	196,9	152,4	19,0
10	10.750	9.00	6.50	66.2
250	273,0	228,6	165,71	30,0
12	12.750	10.00	7.00	87.7
300	323,9	254,0	177,8	39,8
14	14.000	11.00	7.50	105.3
350	355,6	279,4	190,5	47,8
16	16.000	12.00	8.00	129.1
400	406,4	304,8	203,2	58,6
18	18.000	15.50	8.50	184.4
450	457,2	393,7	215,9	83,6
20	20.000	17.25	9.00	225.8
500	508,0	438,2	238,6	102,4
24	24.000	20.00	10.00	308.5
600	609,6	508,0	254,0	139,9



For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

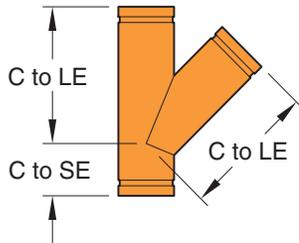
See page 37 for fitting specifications.

Figure 314 45° Laterals

Tech Data Sheet: G180

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GROOVED FITTINGS



Pipe Size		C to LE Inches mm	C to SE Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			
1¼	1.660	5.75	2.50	1.4
32	42,4	146,1	63,5	0,6
1½	1.900	6.25	2.75	1.7
40	48,3	158,8	69,9	0,8
2	2.375	7.00	2.75	2.5
50	60,3	177,8	69,9	1,1
2½	2.875	7.75	3.00	4.4
65	73,0	196,9	76,2	2,0
76,1mm	3.000	7.75	3.00	4.4
65	76,1	196,9	76,2	2,0
3	3.500	8.50	3.25	6.4
80	88,9	215,9	82,6	2,9
4	4.500	10.50	3.75	10.5
100	114,3	266,7	95,3	4,8
139,7mm	5.500	12.50	4.00	30.0
125	139,7	317,5	102,0	13,6
5	5.563	12.50	4.00	15.2
125	141,3	317,5	101,6	6,9
165,1mm	6.500	14.00	4.50	22.9
150	165,1	355,6	114,3	10,4
6	6.625	14.00	4.50	22.9
150	168,3	355,6	114,3	10,4
8	8.625	18.00	6.00	41.9
200	219,1	457,2	152,4	19,0
10	10.750	20.50	6.50	66.2
250	273,0	520,7	165,71	30,0
12	12.750	23.00	7.00	87.7
300	323,9	584,2	177,8	39,8
14	14.000	26.50	7.50	105.3
350	355,6	673,1	190,5	47,8
16	16.000	29.00	8.00	129.1
400	406,4	736,6	203,2	58,6
18	18.000	32.00	8.50	184.4
450	457,2	812,8	215,9	83,6
20	20.000	35.00	9.00	225.8
500	508,0	889,0	238,6	102,4
24	24.000	40.00	10.00	308.5
600	609,6	1016,0	254,0	139,9

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Figure 325 45° Reducing Laterals

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Tech Data Sheet: G180

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YEAR
LIMITED
WARRANTY

Pipe Size		C to LE Inches mm	C to SE Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			
3 x 3 x 2	3.500 x 3.500 x 2.375	8.50	3.25	9.0
80 x 80 x 50	88,9 x 88,9 x 60,3	215,9	82,6	4,1
3 x 3 x 2½	3.500 x 3.500 x 2.875	8.50	3.25	10.0
80 x 80 x 65	88,9 x 88,9 x 73,0	215,9	82,6	4,5
3 x 3 x 76,1mm	3.500 x 3.500 x 3.000	8.50	3.25	11.5
80 x 80 x 76,1	88,9 x 88,9 x 76,1	216,0	83,0	5,2
4 x 4 x 2	4.500 x 4.500 x 2.375	10.50	3.75	14.7
100 x 100 x 50	114,3 x 114,3 x 60,3	266,7	95,3	6,7
4 x 4 x 2½	4.500 x 4.500 x 2.875	10.50	3.75	16.0
100 x 100 x 65	114,3 x 114,3 x 73,0	266,7	95,3	7,3
4 x 4 x 76,1mm	4.500 x 4.500 x 3.000	10.50	3.75	16.9
100 x 100 x 65	114,3 x 114,3 x 76,1	267,0	95,0	7,7
4 x 4 x 3	4.500 x 4.500 x 3.500	10.50	3.75	16.9
100 x 100 x 80	114,3 x 114,3 x 88,9	266,7	95,3	7,7
139,7 x 139,7mm x 2	5.500 x 5.500 x 2.375	12.50	4.00	22.4
125 x 125 x 50	139,7 x 139,7 x 60,3	318,1	102,0	10,2
139,7 x 139,7mm x 3	5.500 x 5.500 x 3.500	12.50	4.00	26.5
125 x 125 x 80	139,7 x 139,7 x 88,9	318,0	102,0	12,0
139,7 x 139,7mm x 4	5.500 x 5.500 x 4.500	12.50	4.00	30.4
125 x 125 x 100	139,7 x 139,7 x 114,3	318,0	102,0	13,8
5 x 5 x 2	5.563 x 5.563 x 2.375	12.50	4.00	22.4
125 x 125 x 50	141,3 x 141,3 x 60,3	317,5	101,6	10,2
5 x 5 x 2½	5.563 x 5.563 x 2.875	12.50	4.00	23.5
125 x 125 x 65	141,3 x 141,3 x 73,0	317,5	101,6	10,7
5 x 5 x 3	5.563 x 5.563 x 3.500	12.50	4.00	24.9
125 x 125 x 80	141,3 x 141,3 x 88,9	317,5	101,6	11,3
5 x 5 x 4	5.563 x 5.563 x 4.500	12.50	4.00	26.9
125 x 125 x 100	141,3 x 141,3 x 114,3	317,5	101,6	12,2
165,1 x 165,1mm x 2	6.500 x 6.500 x 2.375	14.00	4.50	33.1
150 x 150 x 50	165,1 x 165,1 x 60,3	356,0	114,0	15,0
165,1 x 165,1mm x 3	6.500 x 6.500 x 3.500	14.00	4.50	37.0
150 x 150 x 80	165,1 x 165,1 x 88,9	356,0	114,0	16,8
165,1 x 165,1mm x 4	6.500 x 6.500 x 4.500	14.00	4.50	39.9
150 x 150 x 100	165,1 x 165,1 x 114,3	356,0	114,0	18,1
165,1 x 165,1 x 139,7mm	6.500 x 6.500 x 5.500	14.00	4.50	45.0
150 x 150 x 125	165,1 x 165,1 x 139,7	356,0	114,0	20,4
6 x 6 x 2	6.625 x 6.625 x 2.375	14.00	4.50	31.7
150 x 150 x 50	168,3 x 168,3 x 60,3	355,6	114,3	14,4
6 x 6 x 2½	6.625 x 6.625 x 2.875	14.00	4.50	34.0
150 x 150 x 65	168,3 x 168,3 x 73,0	355,6	114,3	15,0
6 x 6 x 3	6.625 x 6.625 x 3.500	14.00	4.50	34.4
150 x 150 x 80	168,3 x 168,3 x 88,9	355,6	114,3	15,6
6 x 6 x 4	6.625 x 6.625 x 4.500	14.00	4.50	36.5
150 x 150 x 100	168,3 x 168,3 x 114,3	355,6	114,3	16,6
6 x 6 x 139,7mm	6.625 x 6.625 x 5.500	14.00	4.50	45.0
150 x 150 x 125	168,3 x 168,3 x 139,7	356,0	114,0	20,4
6 x 6 x 5	6.625 x 6.625 x 5.563	14.00	4.50	39.1
150 x 150 x 125	168,3 x 168,3 x 141,3	355,6	114,3	17,7

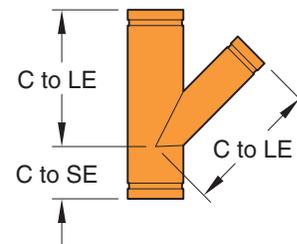


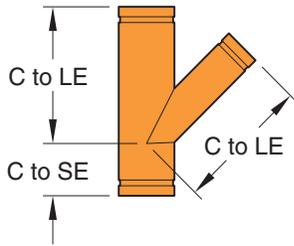
Figure 325 45° Reducing Laterals

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Tech Data Sheet: G180

10
YEAR
LIMITED
WARRANTY

GROOVED FITTINGS



Pipe Size		C to LE Inches mm	C to SE Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O. D. Inches mm			
8 x 8 x 4	8.625 x 8.625 x 4.500	18.00	6.00	58.9
200 x 200 x 100	219,1 x 219,1 x 114,1	457,2	152,4	26,7
8 x 8 x 139,7mm	8.625 x 8.625 x 5.500	18.00	6.00	67.9
200 x 200 x 125	219,1 x 219,1 x 139,7	457,0	152,0	30,8
8 x 8 x 5	8.625 x 8.625 x 5.563	18.00	6.00	62.2
200 x 200 x 125	219,1 x 219,1 x 141,3	457,2	152,4	28,2
8 x 8 x 6	8.625 x 8.625 x 6.625	18.00	6.00	66.1
200 x 200 x 150	219,1 x 219,1 x 168,3	457,2	152,4	30,0
10 x 10 x 4	10.750 x 10.750 x 4.500	20.50	6.50	87.3
250 x 250 x 100	273,0 x 273,0 x 114,3	520,7	165,1	39,6
10 x 10 x 139,7mm	10.750 x 10.750 x 5.500	20.50	6.50	100.1
250 x 250 x 125	273,0 x 273,0 x 139,7	521,0	165,0	45,4
10 x 10 x 5	10.750 x 10.750 x 5.563	20.50	6.50	90.7
250 x 250 x 125	273,0 x 273,0 x 141,3	520,7	165,1	41,1
10 x 10 x 6	10.750 x 10.750 x 6.625	20.50	6.50	94.7
250 x 250 x 150	273,0 x 273,0 x 168,3	520,7	165,1	43,0
10 x 10 x 8	10.750 x 10.750 x 8.625	20.50	6.50	99.2
250 x 250 x 200	273,0 x 273,0 x 219,1	520,7	165,1	45,0
12 x 12 x 4	12.750 x 12.750 x 4.500	23.00	7.00	120.6
300 x 300 x 100	323,9 x 323,9 x 114,3	584,2	177,8	54,7
12 x 12 x 6	12.750 x 12.750 x 6.625	23.00	7.00	128.5
300 x 300 x 150	323,9 x 323,9 x 168,3	584,2	177,8	58,3
12 x 12 x 8	12.750 x 12.750 x 8.625	23.00	7.00	133.1
300 x 300 x 200	323,9 x 323,9 x 219,1	584,2	177,8	60,4
12 x 12 x 10	12.750 x 12.750 x 10.750	23.00	7.00	142.3
300 x 300 x 250	323,9 x 323,9 x 273,0	584,2	177,8	64,5
14 x 14 x 4	14.000 x 14.000 x 4.500	26.50	7.50	167.9
350 x 350 x 100	355,6 x 355,6 x 114,3	673,1	190,5	76,2
14 x 14 x 6	14.000 x 14.000 x 6.625	26.50	7.50	177.2
350 x 350 x 150	355,6 x 355,6 x 168,3	673,1	190,5	80,4
14 x 14 x 8	14.000 x 14.000 x 8.625	26.50	7.50	182.5
350 x 350 x 200	355,6 x 355,6 x 219,1	673,1	190,5	82,8
14 x 14 x 10	14.000 x 14.000 x 10.750	26.50	7.50	193.0
350 x 350 x 250	355,6 x 355,6 x 273,0	673,1	190,5	87,5
14 x 14 x 12	14.000 x 14.000 x 12.750	26.50	7.50	203.8
350 x 350 x 300	355,6 x 355,6 x 323,9	673,1	190,5	92,4
16 x 16 x 6	16.000 x 16.000 x 6.625	29.00	8.00	217.2
400 x 400 x 150	406,4 x 406,4 x 168,3	736,6	203,0	98,5
16 x 16 x 8	16.000 x 16.000 x 8.625	29.00	8.00	223.0
400 x 400 x 200	406,4 x 406,4 x 219,1	736,6	203,0	101,2
16 x 16 x 10	16.000 x 16.000 x 10.750	29.00	8.00	234.1
400 x 400 x 250	406,4 x 406,4 x 273,0	736,6	203,0	106,2
16 x 16 x 12	16.000 x 16.000 x 12.750	29.00	8.00	245.4
400 x 400 x 300	406,4 x 406,4 x 323,9	736,6	203,0	111,3
16 x 16 x 14	16.000 x 16.000 x 14.000	29.00	8.00	261.0
400 x 400 x 350	406,4 x 406,4 x 355,6	736,6	203,0	118,4

Figure 325 45° Reducing Laterals

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Pipe Size		C to LE Inches mm	C to SE Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			
18 x 18 x 6	18.000 x 18.000 x 6.625	32.00	8.50	265.1
450 x 450 x 150	457,2 x 457,2 x 168,3	812,8	215,9	120,2
18 x 18 x 8	18.000 x 18.000 x 8.625	32.00	8.50	271.5
450 x 450 x 200	457,2 x 457,2 x 219,1	812,8	215,9	123,2
18 x 18 x 10	18.000 x 18.000 x 10.750	32.00	8.50	283.7
450 x 450 x 250	457,2 x 457,2 x 273,0	812,8	215,9	128,7
18 x 18 x 12	18.000 x 18.000 x 12.750	32.00	8.50	296.0
450 x 450 x 300	457,2 x 457,2 x 323,9	812,8	215,9	134,3
18 x 18 x 14	18.000 x 18.000 x 14.000	32.00	8.50	312.6
450 x 450 x 350	457,2 x 457,2 x 355,6	812,8	215,9	141,8
18 x 18 x 16	18.000 x 18.000 x 16.000	32.00	8.50	322.6
450 x 450 x 400	457,2 x 457,2 x 406,4	812,8	215,9	146,3
20 x 20 x 12	20.000 x 20.000 x 12.750	35.00	9.00	351.4
500 x 500 x 300	508,0 x 508,0 x 323,9	889,0	228,6	159,4
20 x 20 x 14	20.000 x 20.000 x 14.000	35.00	9.00	369.1
500 x 500 x 350	508,0 x 508,0 x 355,6	889,0	228,6	167,4
20 x 20 x 16	20.000 x 20.000 x 16.000	35.00	9.00	379.7
500 x 500 x 400	508,0 x 508,0 x 406,4	889,0	228,6	172,2
24 x 24 x 16	24.000 x 24.000 x 16.000	40.00	10.00	495.6
600 x 600 x 400	609,6 x 609,6 x 406,4	1016,0	254,0	224,8
24 x 24 x 20	24.000 x 24.000 x 20.000	40.00	10.00	518.4
600 x 600 x 500	609,6 x 609,6 x 508,0	1016,0	254,0	235,1

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

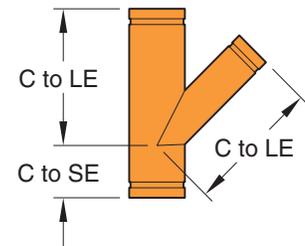
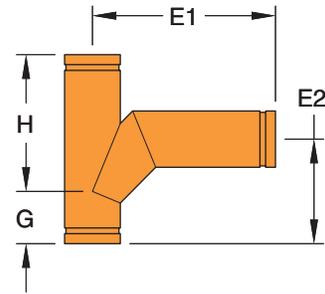


Figure 330 Tee Wyes

(Page 1 of 2)

Tech Data Sheet: G180

10
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WARRANTY

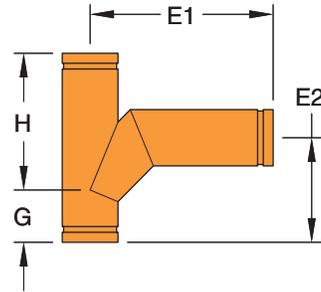


Pipe Size		G Inches mm	H Inches mm	E1 Inches mm	E2 Inches mm	Approx Wt. Lbs. kg
Nominal Inches mm	O.D. Inches mm					
2 x 2 x 2	2.375 x 2.375 x 2.375	2.75	7.00	9.00	7.37	5.7
50 x 50 x 50	60,3 x 60,3 x 60,3	69,9	177,8	228,6	187,2	2,6
2½ x 2½ x 2½	2.875 x 2.875 x 2.875	3.00	7.75	10.50	8.84	10.2
65 x 65 x 65	73,0 x 73,0 x 73,0	76,2	196,9	266,7	224,5	4,6
3 x 3 x 3	3.500 x 3.500 x 3.500	3.25	8.50	11.50	9.31	14.4
80 x 80 x 80	88,9 x 88,9 x 88,9	82,6	215,9	292,1	236,5	6,5
4 x 4 x 3	4.500 x 4.500 x 3.500	3.75	10.50	12.88	10.17	20.5
100 x 100 x 80	114,3 x 114,3 x 88,9	95,3	266,7	327,2	258,3	9,3
4 x 4 x 4	4.500 x 4.500 x 4.500	3.75	10.50	13.63	11.87	24.6
100 x 100 x 100	114,3 x 114,3 x 114,3	95,3	266,7	346,2	301,5	11,2
5 x 5 x 3	5.563 x 5.563 x 3.500	4.00	12.50	14.25	13.25	28.4
125 x 125 x 80	141,3 x 141,3 x 88,9	101,6	317,5	362,0	336,6	12,9
5 x 5 x 4	5.563 x 5.563 x 4.500	4.00	12.50	15.13	13.63	32.8
125 x 125 x 100	141,3 x 141,3 x 114,3	101,6	317,5	384,3	346,1	14,9
5 x 5 x 5	5.563 x 5.563 x 5.563	4.00	12.50	16.13	14.00	38.8
125 x 125 x 125	141,3 x 141,3 x 141,3	101,6	317,5	409,7	355,6	17,6
6 x 6 x 3	6.625 x 6.625 x 3.500	4.50	14.00	15.31	14.81	37.9
150 x 150 x 80	168,3 x 168,3 x 88,9	114,3	355,6	388,9	376,2	17,2
6 x 6 x 4	6.625 x 6.625 x 4.500	4.50	14.00	16.25	15.25	42.5
150 x 150 x 100	168,3 x 168,3 x 114,3	114,3	355,6	412,8	387,4	19,3
6 x 6 x 5	6.625 x 6.625 x 5.563	4.50	14.00	17.25	15.63	48.5
150 x 150 x 125	168,3 x 168,3 x 141,3	114,3	355,6	438,2	396,9	22,0
6 x 6 x 6	6.625 x 6.625 x 6.625	4.50	14.00	18.25	16.00	56.3
150 x 150 x 150	168,3 x 168,3 x 168,3	114,3	355,6	463,6	406,4	25,5
8 x 8 x 3	8.625 x 8.625 x 3.500	6.00	18.00	18.19	19.18	67.3
200 x 200 x 80	219,1 x 219,1 x 88,9	152,4	457,2	462,0	487,2	30,5
8 x 8 x 4	8.625 x 8.625 x 4.500	6.00	18.00	19.00	19.50	72.3
200 x 200 x 100	219,1 x 219,1 x 114,3	152,4	457,2	482,6	495,3	32,8
8 x 8 x 5	8.625 x 8.625 x 5.563	6.00	18.00	20.00	19.87	78.8
200 x 200 x 125	219,1 x 219,1 x 141,3	152,4	457,2	508,0	504,7	35,7

Figure 330 Tee Wyes

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Pipe Size		G Inches mm	H Inches mm	E1 Inches mm	E2 Inches mm	Approx Wt. Lbs. kg
Nominal Inches mm	O.D. Inches mm					
8 x 8 x 6	8.625 x 8.625 x 6.625	6.00	18.00	21.13	20.37	87.4
200 x 200 x 150	219,1 x 219,1 x 168,3	152,4	457,2	536,7	517,4	39,6
8 x 8 x 8	8.625 x 8.625 x 8.625	6.00	18.00	23.25	21.25	109.0
200 x 200 x 200	219,1 x 219,1 x 219,1	152,4	457,2	590,6	539,8	49,4
10 x 10 x 3	10.750 x 10.750 x 3.500	6.50	20.50	19.88	21.38	101.7
250 x 250 x 80	273,0 x 273,0 x 88,9	165,1	520,7	505,0	543,1	46,1
10 x 10 x 4	10.750 x 10.750 x 4.500	6.50	20.50	20.75	21.75	106.9
250 x 250 x 100	273,0 x 273,0 x 114,3	165,1	520,7	527,1	552,5	48,5
10 x 10 x 5	10.750 x 10.750 x 5.563	6.50	20.50	21.88	22.25	113.8
250 x 250 x 125	273,0 x 273,0 x 141,3	165,1	520,7	555,8	565,2	51,6
10 x 10 x 6	10.750 x 10.750 x 6.625	6.50	20.50	22.88	22.63	122.1
250 x 250 x 150	273,0 x 273,0 x 168,3	165,1	520,7	581,2	574,7	55,4
10 x 10 x 8	10.750 x 10.750 x 8.625	6.50	20.50	27.25	25.75	151.1
250 x 250 x 200	273,0 x 273,0 x 219,1	165,1	520,7	692,2	654,1	68,5
10 x 10 x 10	10.750 x 10.750 x 10.750	6.50	20.50	27.25	24.38	175.1
250 x 250 x 250	273,0 x 273,0 x 273,0	165,1	520,7	692,2	619,1	79,4
12 x 12 x 3	12.750 x 12.750 x 3.500	7.00	23.00	20.75	22.75	134.5
300 x 300 x 80	323,9 x 323,9 x 88,9	177,8	584,2	527,1	577,9	61,0
12 x 12 x 4	12.750 x 12.750 x 4.500	7.00	23.00	21.50	23.00	139.4
300 x 300 x 100	323,9 x 323,9 x 114,3	177,8	584,2	546,1	584,2	63,2
12 x 12 x 6	12.750 x 12.750 x 6.625	7.00	23.00	23.75	24.00	154.5
300 x 300 x 150	323,9 x 323,9 x 168,3	177,8	584,2	603,3	609,6	70,0
12 x 12 x 8	12.750 x 12.750 x 8.625	7.00	23.00	26.00	25.00	175.8
300 x 300 x 200	323,9 x 323,9 x 219,1	177,8	584,2	660,4	635,0	79,7
12 x 12 x 10	12.750 x 12.750 x 10.750	7.00	23.00	28.00	25.75	205.4
300 x 300 x 250	323,9 x 323,9 x 273,0	177,8	584,2	711,2	654,1	93,2
12 x 12 x 12	12.750 x 12.750 x 12.750	7.00	23.00	31.00	27.50	240.1
300 x 300 x 300	323,9 x 323,9 x 323,9	177,8	584,2	787,4	698,5	108,9

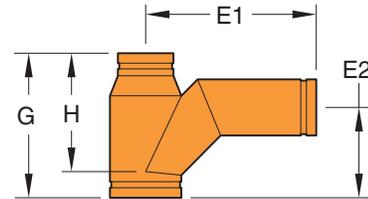
For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figure 331 Reducing Tee Wyes

Tech Data Sheet: G180

10
YEAR
LIMITED
WARRANTY

GROOVED FITTINGS



Pipe Size		G Inches mm	H Inches mm	E1 Inches mm	E2 Inches mm	Approx Wt. Lbs. kg
Nominal Inches mm	O.D. Inches mm					
4 x 3 x 3	4.500 x 3.500 x 3.500	9.01	7.38	10.75	7.25	13.7
100 x 80 x 80	114,3 x 88,9 x 88,9	228,9	187,5	273,1	184,2	6,2
4 x 3 x 4	4.500 x 3.500 x 4.500	14.25	10.50	13.63	11.87	24.5
100 x 80 x 100	114,3 x 88,9 x 114,3	362,0	266,7	346,2	301,5	11,1
5 x 3 x 3	5.563 x 3.500 x 3.500	11.00	9.75	11.50	7.71	19.0
125 x 80 x 80	141,3 x 88,9 x 88,9	279,5	247,7	292,1	195,8	8,6
5 x 3 x 5	5.563 x 3.500 x 5.563	16.50	12.50	16.13	13.95	38.5
125 x 80 x 125	141,3 x 88,9 x 141,3	419,1	317,5	409,7	354,3	17,5
5 x 4 x 3	5.563 x 4.500 x 3.500	11.01	9.13	11.88	8.71	19.5
125 x 100 x 80	141,3 x 114,3 x 88,9	279,7	231,9	301,88	221,2	8,8
5 x 4 x 4	5.563 x 4.500 x 4.500	11.01	9.13	12.75	9.00	23.1
125 x 100 x 100	141,3 x 114,3 x 114,3	279,7	231,9	323,9	228,6	10,5
6 x 4 x 6	6.625 x 4.500 x 6.625	18.50	14.00	18.25	13.75	56.2
150 x 100 x 150	168,3 x 114,3 x 168,3	469,9	355,6	463,6	349,3	25,5
6 x 5 x 3	6.625 x 5.563 x 3.500	12.00	10.75	13.00	9.25	25.6
150 x 125 x 80	168,3 x 141,3 x 88,9	304,9	273,1	330,2	235,0	11,6
6 x 5 x 4	6.625 x 5.563 x 4.500	12.00	10.75	13.88	9.62	29.3
150 x 125 x 100	168,3 x 141,3 x 114,3	304,9	273,1	352,6	244,3	13,3
8 x 6 x 4	8.625 x 6.625 x 4.500	13.00	12.00	14.75	10.25	40.2
200 x 150 x 100	219,1 x 168,3 x 114,3	330,2	304,8	374,7	260,3	18,2
8 x 6 x 8	8.625 x 6.625 x 8.625	24.00	18.00	23.25	21.25	108.6
200 x 150 x 200	219,1 x 168,3 x 219,1	609,6	457,2	590,6	539,8	49,3

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figures 227 & 327 Crosses

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Pipe Size		Figure 227 - Cast		Figure 327 - Fabricated	
Nominal Inches mm	O.D. Inches mm	C to E Inches mm	Approx Weight Lbs. kg	C to E Inches mm	Approx Weight Lbs. kg
1¼	1.660	2.75	2.2	2.75	2.2
32	42,4	69,9	1,0	69,9	1,0
1½	1.900	2.75	2.5	2.75	2.5
40	48,3	69,9	1,1	69,9	1,1
2	2.375	3.25	3.7	3.25	3.7
50	60,3	82,6	1,7	82,6	1,7
2½	2.875	3.75	5.8	3.75	5.8
65	73,0	95,3	2,6	95,3	2,6
76,1mm	3.000	3.75	6.0	3.75	6.0
65	76,1	95,3	2,7	95,3	2,7
3	3.500	4.25	8.6	4.25	8.6
80	88,9	108,0	3,9	108,0	3,9
4	4.500	5.00	20.7	5.00	20.7
100	114,3	127,0	9,4	127,0	9,4
139,7mm	5.500	5.50	17.6	5.50	17.6
125	139,7	139,7	8,0	139,7	8,0
5	5.563	-	-	5.50	18.5
125	141,3	-	-	139,7	8,4
165,1mm	6.500	6.50	27.3	6.50	27.3
150	165,1	165,1	12,4	165,1	12,4
6	6.625	6.50	28.6	6.50	28.6
150	168,3	165,1	13,0	165,1	13,0
8	8.625	7.75	48.0	7.75	48.0
200	219,1	196,9	21,7	196,9	21,7
10	10.750	9.00	75.0	9.00	75.0
250	273,0	228,6	34,0	228,6	34,0
12	12.750	10.00	95.8	10.00	95.8
300	323,9	254,0	43,4	254,0	43,4
14	14.000	-	-	11.00	136.8
350	355,6	-	-	279,4	62,0
16	16.000	-	-	12.00	167.3
400	406,4	-	-	304,8	75,9
18	18.000	-	-	15.50	259.5
450	457,2	-	-	393,7	117,7
20	20.000	-	-	17.25	321.7
500	508,0	-	-	438,2	145,9
24	24.000	-	-	20.00	442.7
600	609,6	-	-	508,0	200,8

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.
See fitting specifications on page 37.

Figure 227
Cast Cross

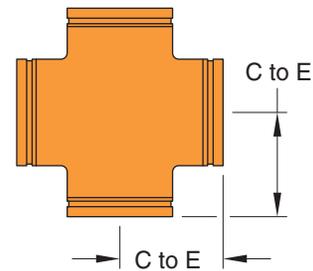
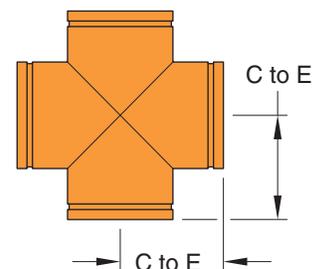


Figure 327
Fabricated Cross



Figures 260 & 360 End Caps

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Figure 260 Cap
Cast

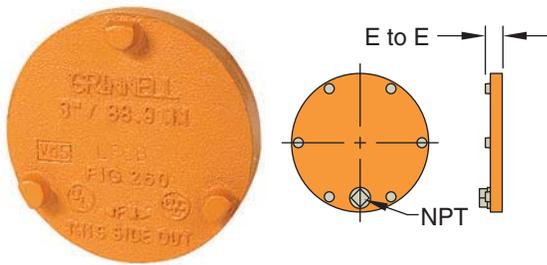


Figure 360 Cap
Fabricated



Pipe Size		Figure 260 - Cast		Figure 360 - Fabricated	
Nominal Inches mm	O.D. Inches mm	E to E Inches mm	Approx Weight Lbs. kg	E to E Inches mm	Approx Weight Lbs. kg
1	1.315 33,4	0.83 21,1	0.2 0,1	-	-
1 1/4	1.660 42,4	0.83 21,1	0.3 0,1	-	-
1 1/2	1.900 48,3	0.83 21,1	0.4 0,2	-	-
2	2.375 60,3	0.92 23,4	0.7 0,3	-	-
2 1/2	2.875 73,0	0.92 23,4	1.0 0,5	-	-
76,1mm	3.000 76,1	0.86 21,8	1.3 0,6	-	-
3	3.500 88,9	0.92 23,4	1.4 0,6	-	-
4	4.500 114,3	1.00 25,4	2.6 1,2	-	-
139,7mm	5.500 139,7	0.92 23,4	4.7 2,1	-	-
5	5.563 141,3	1.00 25,4	5.0 2,3	-	-
165,1mm	6.500 165,1	0.92 23,4	6.4 2,9	-	-
6	6.625 168,3	1.00 25,4	6.2 2,8	-	-
8	8.625 219,1	1.06 27,0	7.1 3,2	-	-
10	10.750 273,0	1.02 25,8	24.5 11,1	-	-
12	12.750 323,9	1.02 25,8	31.0 14,1	-	-
14	14.000 355,6	-	-	8.50 215,9	36.5 16,6
16	16.000 406,4	-	-	9.00 228,6	43.5 19,7
18	18.000 457,2	-	-	10.00 254,0	57.0 25,6
20	20.000 508,0	-	-	11.00 279,4	75.7 34,3
24	24.000 609,6	-	-	12.50 317,5	101.0 45,8

Figure 260/360 Cap with Tap				
Size (in) (mm)	1/2" Tap 13mm	3/4" Tap 19mm	1" Tap 25mm	2" Tap 50mm
1 (25)	•	-	-	-
1 1/4 (32)	•	-	-	-
1 1/2 (40)	•	-	-	-
2 (50)	•	•	-	-
2 1/2 (65)	•	•	-	-
3 (80)	•	•	•	•
4 (100)	•	•	•	•
5 (125)	•	•	•	•
6 (150)	•	•	•	•
8 (200)	•	•	•	•
10 (250)	•	•	•	•
12 (300)	•	•	•	-
14 (350)	-	-	-	-
16 (400)	-	-	-	-
18 (450)	-	-	-	-
20 (500)	-	-	-	-
24 (600)	-	-	-	-

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 37 for fitting specifications.

Figure 341 Flange Adapters (ANSI Class 150#) Figure 342 Flange Adapters (ANSI Class 300#)

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Figure 341
Fabricated Flange Adapter
ANSI Class 150#

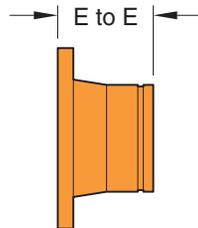
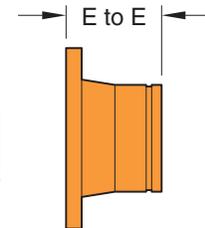


Figure 342
Fabricated Flange Adapter
ANSI Class 300#



Pipe Size		Figure 341 - ANSI Class 150#			Figure 342 - ANSI Class 300#		
Nominal Inches	O.D. Inches	E to E Inches	Mating Flange Bolt Qty.	Approx. Weight Lbs.	E to E Inches	Mating Flange Bolt Qty.	Approx. Weight Lbs.
mm	mm	mm		kg	mm		kg
1¼	1.660	4.00	4	3.7	4.00	4	4.6
32	42,4	101,6	4	1,7	101,6	4	2,1
1½	1.900	4.00	4	3.9	4.00	4	7.1
40	48,3	101,6	4	1,8	101,6	4	3,2
2	2.375	4.00	4	6.4	4.00	8	8.2
50	60,3	101,6	4	2,8	101,6	8	3,7
2½	2.875	4.00	4	8.8	4.00	8	11.9
65	73,0	101,6	4	4,0	101,6	8	5,4
3	3.500	4.00	4	10.4	4.00	8	15.5
80	88,9	101,6	4	4,7	101,6	8	7,0
4	4.500	6.00	8	18.2	6.00	8	28.0
100	114,3	152,4	8	8,3	152,4	8	12,7
5	5.563	6.00	8	22.0	6.00	8	37.0
125	141,3	152,4	8	10,0	152,4	8	16,8
6	6.625	6.00	8	28.1	6.00	12	48.0
150	168,3	152,4	8	12,7	152,4	12	21,8
8	8.625	6.00	8	43.7	6.00	12	79.0
200	219,1	152,4	8	19,8	152,4	12	35,8
10	10.750	8.00	12	68.2	8.00	16	122.0
250	273,0	203,2	12	30,9	203,2	16	55,3
12	12.750	8.00	12	96.1	8.00	16	183.0
300	323,9	203,2	12	43,6	203,2	16	83,0
14	14.000	8.00	12	123.0	8.00	20	199.0
350	355,6	203,2	12	55,8	203,2	20	90,3
16	16.000	8.00	16	151.0	8.00	20	255.0
400	406,4	203,2	16	68,5	203,2	20	155,7
18	18.000	8.00	16	165.0	8.00	24	303.0
450	457,2	203,2	16	74,8	203,2	24	137,4
20	20.000	8.00	20	205.0	8.00	24	365.0
500	508,0	203,2	20	93,0	203,2	24	165,6
24	24.000	8.00	20	265.0	8.00	24	550.0
600	609,6	203,2	20	120,2	203,2	24	249,5

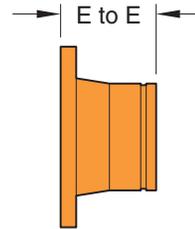
For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.

Figure 343 Flange Adapters (PN16) Figure 344 Flange Adapters (PN16 BS 4504)

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GROOVED FITTINGS



Pipe Size		Figure 343 - PN16#		Figure 344 - PN16 BS 4504	
Nominal Inches	O.D. Inches	E to E Inches	Approx. Weight Lbs.	E to E Inches	Approx. Weight Lbs.
mm	mm	mm	kg	mm	kg
2	2.375	3.74	5.07	—	—
50	60,3	95,0	2,3	—	—
76,1mm	3.000	3.74	7.27	—	—
65	76,1	95,0	3,3	—	—
3	3.500	3.94	8.82	—	—
80	88,9	100,0	4,0	—	—
4	4.500	4.02	10.14	—	—
100	114,3	102,0	4,6	—	—
139,7mm	5.500	4.13	13.23	—	—
125	139,7	105,0	6,0	—	—
165,1mm	6.500	4.13	15.87	—	—
150	165,1	105,0	7,2	—	—
6	6.625	4.13	15.87	—	—
150	168,3	105,0	7,2	—	—
8	8.625	4.41	22.49	4.41	22.49
200	219,1	112,0	10,2	112,0	10,2
10	10.750	5.43	39.68	5.43	39.68
250	273,0	138,0	18,0	138,0	18,0
12	12.750	5.43	49.38	5.43	49.38
300	323,9	138,0	22,4	138,0	22,4

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 37 for fitting specifications.



Mechanical Tees Table of Contents

Threaded Tees and Crosses



Figure 730
Female Threaded Tees
Pages 77 - 79



Figure 730
Female Threaded Crosses
Pages 77 - 79

Grooved Tees and Crosses



Figure 730
Grooved Tees
Pages 80 - 82



Figure 730
Grooved Crosses
Pages 80 - 82



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com

Coatings

- Orange – Non-lead paint (standard)
- Red – Non-lead paint (optional, regional)
- Hot-Dipped, Zinc Galvanized (optional)

The GRINNELL Figure 730 Mechanical Tee is rated at 500 psi (34,5 bar) on standard weight pipe. It can be used in place of a tee, a cross connection, or a welded outlet where a threaded or grooved outlet is needed. The Mechanical Tee is ideal for use in retrofit or equipment hookup installations as it can be positioned along the pipe at the proper location in the field, ensuring exact lineup of the branch outlet connection. The GRINNELL Figure 730 can be used on steel or HDPE pipe.

All GRINNELL Figure 730 Mechanical Tees are provided with a ductile iron lower housing section for increased strength and dependability. This design provides stability and rigidity while inhibiting damage to the pipe during tightening.

MATERIAL SPECIFICATIONS

Housing Specifications

- ASTM A 536 – Standard specification for ductile iron castings, Grade 65-45-12
- Tensile Strength, minimum 65,000 psi (4481,6 bar)
- Yield Strength, minimum 45,000 psi (3102,6 bar)
- Elongation in 2" (50mm), minimum 12%
- ASTM A 153 – Standard specification for hot-dip galvanizing

Bolt/Nut Specifications

- **ANSI:** Carbon steel oval neck bolts and nuts are heat-treated and conform to the physical properties of ASTM A 183 Grade 2 and SAE J429 Grade 5 with a minimum tensile strength of 110,000 psi (7584.2 bar). Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 183 Grade 2 and SAE J995 Grade 5. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.
- **Metric:** Carbon steel oval neck track head bolts (Gold color coded) are heat treated and conform to the physical properties of ASTM F 568 M with a minimum tensile strength of 760 MPa. Carbon steel heavy hex nuts conform to the physical properties of ASTM A 563 M Class 9. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.
- Stainless steel bolts and nuts are available upon request.

Gasket Specifications

- **Grade "E" EPDM** gaskets have a Green color code identification and conform to ASTM D 2000 for service temperatures from -30°F to 230°F (-34°C to 110°C). They are recommended for hot water not to exceed 230°F (110°C), plus a variety of dilute acids, oil free air, and many chemical services. They are not recommended for petroleum services.
- **Grade "T" Nitrile** gaskets have an Orange color code identification and conform to ASTM D 2000 for service temperatures from -20°F to 180°F (-29°C to 82°C). They are recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapors.

Figure 730 Mechanical Tees & Crosses – Threaded

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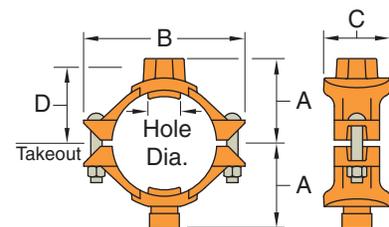
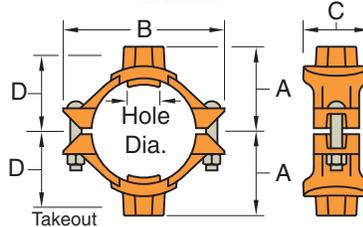
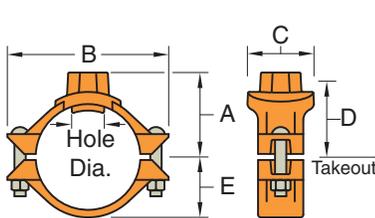


Figure 730 Branch Outlet with Female NPT/BSP Threaded Branch (Tee Configuration)

Figure 730 Branch Outlet with Female NPT/BSP Threaded Branch (Cross Configuration)

Figure 730 Branch Outlet with a Female NPT/BSP Threaded Branch and a Grooved Branch (Cross Configuration)

Nominal Size Run x Branch Inches mm	Hole Dia. †		Max. ‡ Branch End Load Lbs. kN	Dimensions - Inches mm					Bolt Size Inches mm	Tee Approx. Weight Lbs. kg	Cross Approx. Weight Lbs. kg
	Min. Inches mm	Max. Inches mm		A	B	C	D	E			
2 x 1/2	1.50	1.63	277.1	2.62	4.88	3.07	2.12	1.59	3/8 x 2 1/4	2.5	3.4
50 x 15	38,1	41,3	1,2	66,5	124,0	78,0	53,8	40,4	M10 x 57	1,1	1,5
2 x 3/4	1.50	1.63	433.0	2.62	4.88	3.07	2.12	1.59	3/8 x 2 1/4	2.3	3.0
50 x 20	38,1	41,3	1,9	66,5	124,0	78,0	53,8	40,4	M10 x 57	1,0	1,4
2 x 1	1.50	1.63	679.1	2.62	4.88	3.07	2.12	1.59	3/8 x 2 1/4	2.2	3.2
50 x 25	38,1	41,3	3,0	66,5	124,0	78,0	53,8	40,4	M10 x 57	1,0	1,5
2 x 1 1/4	1.75	1.88	1082.1	2.78	4.88	3.32	1.93	1.59	3/8 x 2 1/4	2.4	3.4
50 x 32	44,5	47,6	4,8	70,6	124,0	84,3	49,0	40,4	M10 x 57	1,1	1,5
2 x 1 1/2	1.75	1.88	1417.6	2.75	4.88	3.32	1.93	1.59	3/8 x 2 1/4	2.5	3.9
50 x 40	44,5	47,6	6,3	69,9	124,0	84,3	49,0	40,4	M10 x 57	1,1	1,8
2 1/2 x 1/2	1.50	1.63	277.1	2.88	5.25	3.07	2.38	1.81	3/8 x 2 1/4	2.4	3.4
65 x 15	38,1	41,3	1,2	73,2	133,4	78,0	60,5	46,0	M10 x 57	1,1	1,5
2 1/2 x 3/4	1.50	1.63	433.0	2.88	5.25	3.07	2.38	1.81	3/8 x 2 1/4	2.4	3.4
65 x 20	38,1	41,3	1,9	73,2	133,4	78,0	60,5	46,0	M10 x 57	1,1	1,5
2 1/2 x 1	1.50	1.63	679.1	2.88	5.25	3.07	2.38	1.81	3/8 x 2 1/4	2.4	3.4
65 x 25	38,1	41,3	3,0	73,2	133,4	78,0	60,5	46,0	M10 x 57	1,1	1,5
2 1/2 x 1 1/4	2.00	2.13	1082.1	3.00	5.25	3.56	2.19	1.81	3/8 x 2 1/4	2.5	3.8
65 x 32	50,8	54,0	4,8	76,2	133,4	90,4	55,6	46,0	M10 x 57	1,1	1,7
2 1/2 x 1 1/2	2.00	2.13	1417.6	3.07	5.25	3.59	2.17	1.81	3/8 x 2 1/4	2.6	4.1
65 x 40	50,8	54,0	6,3	78,0	133,4	91,2	55,1	46,0	M10 x 57	1,2	1,9
2 1/2 x 2	2.00	2.13	2215.1	3.19	5.25	4.00	2.44	1.81	3/8 x 2 1/4	2.7	4.1
65 x 50	50,8	54,0	9,9	81,0	133,4	101,6	62,0	46,0	M10 x 57	1,2	1,9
76,1mm x 1/2	1.50	1.63	277.1	2.94	5.62	3.07	2.44	1.87	-	2.5	3.5
65 x 15	38,1	41,3	1,2	74,5	142,7	78,0	62,0	47,5	M10 x 57	1,1	1,6
76,1mm x 3/4	1.50	1.63	433.0	2.94	5.62	3.07	2.44	1.87	-	2.5	3.5
65 x 20	38,1	41,3	1,9	74,5	142,7	78,0	62,0	47,5	M10 x 57	1,1	1,6
76,1mm x 1	1.50	1.63	679.1	2.94	5.62	3.07	2.44	1.87	-	2.5	3.5
65 x 25	38,1	41,3	3,0	74,5	142,7	78,0	62,0	47,5	M10 x 57	1,1	1,6
76,1mm x 1 1/4	2.00	2.13	1082.1	3.06	5.62	3.56	2.25	1.87	-	3.3	5.1
65 x 32	50,8	54,0	4,8	77,7	142,7	90,4	57,2	47,5	M10 x 57	1,5	2,3
76,1mm x 1 1/2	2.00	2.13	1417.6	3.13	5.62	3.56	2.25	1.87	-	3.6	5.7
65 x 40	50,8	54,0	6,3	79,5	142,7	90,4	57,2	47,5	M10 x 57	1,6	2,6
76,1mm x 2	2.00	2.13	2215.1	3.25	5.62	4.00	2.50	1.87	-	3.7	5.8
65 x 50	50,8	54,0	9,9	82,6	142,7	101,6	63,5	47,5	M10 x 57	1,7	2,6
3 x 1/2	1.50	1.63	277.1	3.19	6.13	3.07	2.56	2.21	1/2 x 3	3.7	5.2
80 x 15	38,1	41,3	1,2	81,0	155,7	78,0	65,0	56,1	M12 x 89	1,7	2,4

Figure 730 Mechanical Tees & Crosses – Threaded

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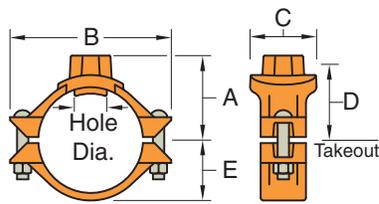


Figure 730 Branch Outlet with Female NPT/BSP Threaded Branch (Tee Configuration)

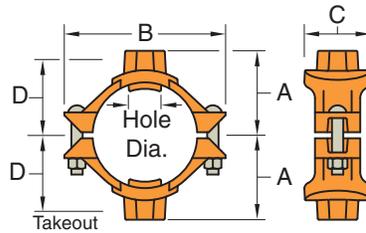


Figure 730 Branch Outlet with Female NPT/BSP Threaded Branch (Cross Configuration)

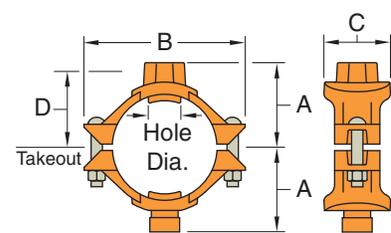


Figure 730 Branch Outlet with a Female NPT/BSP Threaded Branch and a Grooved Branch (Cross Configuration)

Nominal Size Run x Branch Inches mm	Hole Dia.†		Max. ‡ Branch End Load Lbs. kN	Dimensions - Inches mm					Bolt Size Inches mm	Tee Approx. Weight Lbs. kg	Cross Approx. Weight Lbs. kg
	Min. Inches mm	Max. Inches mm		A	B	C	D	E			
3 x 3/4	1.50	1.63	433.0	3.19	6.13	3.07	2.56	2.21	1/2 x 3	3.7	5.2
80 x 20	38,1	41,3	1,9	81,0	155,7	78,0	65,0	56,1	M12 x 89	1,7	2,4
3 x 1	1.50	1.63	679.1	3.19	6.13	3.07	2.56	2.21	1/2 x 3	3.7	5.2
80 x 25	38,1	41,3	3,0	81,0	155,7	78,0	65,0	56,1	M12 x 89	1,7	2,4
3 x 1 1/4	1.75	1.88	1082.1	3.34	6.13	3.32	2.50	2.21	1/2 x 3	3.5	4.6
80 x 32	44,5	47,6	4,8	84,8	155,7	84,3	63,5	56,1	M12 x 89	1,6	2,1
3 x 1 1/2	2.00	2.13	1417.6	3.38	6.13	3.56	2.48	2.21	1/2 x 3	3.7	5.2
80 x 40	50,8	54,0	6,3	85,9	155,7	90,4	63,0	56,1	M12 x 89	1,7	2,4
3 x 2	2.50	2.63	2215.1	3.50	6.13	4.09	2.75	2.21	1/2 x 3	4.7	6.8
80 x 50	63,5	66,7	9,9	88,9	155,7	103,9	69,9	56,1	M12 x 89	2,1	3,1
4 x 1/2	1.50	1.63	277.1	3.69	7.13	3.07	3.06	2.78	1/2 x 3	4.8	5.6
100 x 15	38,1	41,3	1,2	93,7	181,1	78,0	77,7	70,6	M12 x 89	2,2	2,5
4 x 3/4	1.50	1.63	433.0	3.69	7.13	3.07	3.06	2.78	1/2 x 3	4.8	5.6
100 x 20	38,1	41,3	1,9	93,7	181,1	78,0	77,7	70,6	M12 x 89	2,2	2,5
4 x 1	1.50	1.63	679.1	3.69	7.13	3.07	3.06	2.78	1/2 x 3	4.8	5.6
100 x 25	38,1	41,3	3,0	93,7	181,1	78,0	77,7	70,6	M12 x 89	2,2	2,5
4 x 1 1/4	1.75	1.88	1082.1	3.92	7.13	3.32	3.00	2.78	1/2 x 3	4.8	5.6
100 x 32	44,5	47,6	4,8	99,6	181,1	84,3	76,2	70,6	M12 x 89	2,2	2,5
4 x 1 1/2	2.00	2.13	1417.6	4.00	7.13	3.56	2.98	2.78	1/2 x 3	5.1	6.4
100 x 40	50,8	54,0	6,3	101,6	181,1	90,4	75,7	70,6	M12 x 89	2,3	2,5
4 x 2	2.50	2.63	2215.1	4.00	7.13	4.06	3.25	2.78	1/2 x 3	5.5	7.3
100 x 50	63,5	66,7	9,9	101,6	181,1	103,1	82,6	70,6	M12 x 89	2,5	3,3
4 x 2 1/2	2.75	2.88	3245.9	4.00	7.13	4.38	3.12	2.78	1/2 x 3	6.2	8.7
100 x 65	69,9	73,0	14,4	101,6	181,1	111,3	79,2	70,6	M12 x 89	2,8	3,9
4 x 76,1mm	2.75	2.88	3534.3	4.00	7.13	4.38	3.12	2.78	-	6.2	8.7
100 x 65	69,9	73,0	15,7	101,6	181,1	111,3	79,2	70,6	M12 x 89	2,8	3,9
4 x 3	3.50	3.63	4810.6	4.13	7.13	5.13	3.31	2.78	1/2 x 3	7.8	11.9
100 x 80	88,9	92,1	21,4	104,9	181,1	130,3	84,1	70,6	M12 x 89	3,5	5,4
5 x 1 1/2	2.00	2.13	1417.6	4.63	8.13	3.56	4.00	3.37	5/8 x 4 3/4	7.8	9.4
125 x 40	50,8	54,0	6,3	117,6	206,5	90,4	101,6	85,6	M16 x 121	3,5	4,3
5 x 2	2.50	2.63	2215.1	4.63	8.13	4.06	3.88	3.37	5/8 x 4 3/4	7.8	9.4
125 x 50	63,5	66,7	9,9	117,6	206,5	103,1	98,6	85,6	M16 x 121	3,5	4,3
5 x 2 1/2	2.75	2.88	3245.9	4.75	8.13	4.38	3.88	3.37	5/8 x 4 3/4	8.9	11.5
125 x 65	69,9	73,0	14,4	120,7	206,5	111,3	98,6	85,6	M16 x 121	4,0	5,2
5 x 76,1mm	2.75	2.88	3534.3	4.75	8.13	4.38	3.88	3.37	-	8.9	11.5
125 x 65	69,9	73,0	15,7	120,7	206,5	111,3	98,6	85,6	M16 x 121	4,0	5,2
5 x 3	3.50	3.63	4810.6	5.00	8.13	5.13	4.06	3.37	5/8 x 4 3/4	12.7	13.3
125 x 80	88,9	92,1	21,4	127,0	206,5	130,3	103,1	85,6	M16 x 121	5,8	6,0
165,1mm x 1 1/4	2.00	2.13	1082.1	5.13	9.25	3.56	4.25	3.90	-	7.7	9.5
150 x 32	50,8	54,0	4,8	130,3	235,0	90,4	108,0	99,1	M16 x 121	3,5	4,3
165,1mm x 1 1/2	2.00	2.13	1417.6	5.13	9.25	3.56	4.04	3.90	-	7.7	9.5
150 x 40	50,8	54,0	6,3	130,3	235,0	90,4	102,6	99,1	M16 x 121	3,5	4,3
165,1mm x 2	2.50	2.63	2215.1	5.13	9.25	4.06	4.31	3.90	-	8.2	9.5
150 x 50	63,5	66,7	9,9	130,3	235,0	103,1	109,5	99,1	M16 x 121	3,7	4,3

Figure 730 Mechanical Tees & Crosses – Threaded

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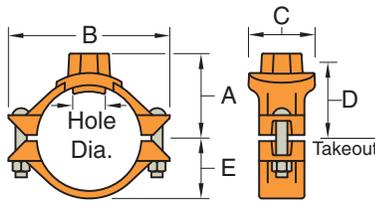


Figure 730 Branch Outlet with Female NPT/BSP Threaded Branch (Tee Configuration)

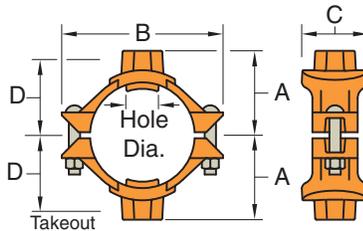


Figure 730 Branch Outlet with Female NPT/BSP Threaded Branch (Cross Configuration)

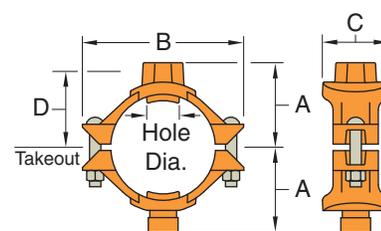


Figure 730 Branch Outlet with a Female NPT/BSP Threaded Branch and a Grooved Branch (Cross Configuration)

Nominal Size Run x Branch Inches mm	Hole Dia. †		Max. ‡ Branch End Load Lbs. kN	Dimensions - Inches mm					Bolt Size Inches mm	Tee Approx. Weight Lbs. kg	Cross Approx. Weight Lbs. kg
	Min. Inches mm	Max. Inches mm		A	B	C	D	E			
165,1mm x 2½ 150 x 65	2.75 69,9	2.88 73,0	3245.9 14,4	5.13 130,3	9.25 235,0	4.38 111,3	4.18 106,2	3.90 99,1	– M16 x 121	9.0 4,1	11.3 5,1
165,1mm x 76,1mm 150 x 65	2.75 69,9	2.88 73,0	3584.3 15,7	5.13 130,3	9.25 235,0	4.38 111,3	4.18 106,2	3.90 99,1	– M16 x 121	9.0 4,1	11.3 5,1
165,1mm x 3 150 x 80	3.50 88,9	3.63 92,1	4810.6 21,4	5.50 139,7	9.25 235,0	5.13 130,3	4.37 111,0	3.90 99,1	– M16 x 121	10.5 4,8	14.1 6,4
165,1mm x 4 150 x 100	4.50 114,3	4.63 117,5	7952.2 35,4	5.38 136,7	9.25 235,0	6.13 155,7	4.56 115,8	3.90 99,1	– M16 x 121	12.1 5,5	17.3 7,8
6 x 1¼ 150 x 32	2.00 50,8	2.13 54,0	1082.1 4,8	5.13 130,3	9.25 235,0	3.56 90,4	4.25 108,0	3.90 99,1	5/8 x 4¾ M16 x 121	7.5 3,4	8.7 3,9
6 x 1½ 150 x 40	2.00 50,8	2.13 54,0	1417.6 6,3	5.13 130,3	9.25 235,0	3.56 90,4	4.04 102,6	3.90 99,1	5/8 x 4¾ M16 x 121	7.5 3,4	8.7 3,9
6 x 2 150 x 50	2.50 63,5	2.63 66,7	2215.1 9,9	5.13 130,3	9.25 235,0	4.06 103,1	4.31 109,5	3.90 99,1	5/8 x 4¾ M16 x 121	7.7 3,5	9.5 4,3
6 x 2½ 150 x 65	2.75 69,9	2.88 73,0	3245.9 14,4	5.13 130,3	9.25 235,0	4.38 111,3	4.18 106,2	3.90 99,1	5/8 x 4¾ M16 x 121	8.9 4,0	11.3 5,1
6 x 76,1mm 150 x 65	2.75 69,9	2.88 73,0	3245.9 14,4	5.13 130,3	9.25 235,0	4.38 111,3	4.18 106,2	3.90 99,1	5/8 x 4¾ M16 x 121	8.9 4,0	11.3 5,1
6 x 3 150 x 80	3.50 88,9	3.63 92,1	4810.6 21,4	5.50 139,7	9.25 235,0	5.13 130,3	4.37 111,0	3.90 99,1	5/8 x 4¾ M16 x 121	10.3 4,7	14.1 6,4
6 x 4 150 x 100	4.50 114,3	4.63 117,5	7952.2 35,4	5.38 136,7	9.25 235,0	6.13 155,7	4.56 115,8	3.90 99,1	5/8 x 4¾ M16 x 121	11.9 5,4	17.3 7,8
8 x 2 200 x 50	2.75 69,9	2.88 73,0	3245.9 14,4	6.25 158,8	12.50 317,5	4.06 103,1	5.12 130,0	4.90 124,5	¾ x 4¾ M20 x 121	12.1 5,5	14.1 6,4
8 x 2½ 200 x 65	2.75 69,9	2.88 73,0	3245.9 14,4	6.25 158,8	12.50 317,5	4.38 111,3	5.12 130,0	4.90 124,5	¾ x 4¾ M20 x 121	12.6 5,7	15.0 6,8
8 x 76,1mm 200 x 65	2.75 69,9	2.88 73,0	3534.3 15,7	6.25 158,8	12.50 317,5	4.38 111,3	5.12 130,0	4.90 124,5	– M20 x 121	12.6 5,7	15.0 6,8
8 x 3 200 x 80	3.50 88,9	3.63 92,1	4810.6 21,4	6.50 165,1	12.50 317,5	5.13 130,3	5.37 136,4	4.90 124,5	¾ x 4¾ M20 x 121	13.6 6,1	16.9 7,7
8 x 4 200 x 100	4.50 114,3	4.63 117,5	7952.2 35,4	6.38 162,1	12.50 317,5	6.13 155,7	5.56 141,2	4.90 124,5	¾ x 4¾ M20 x 121	15.2 6,9	20.0 9,1

† Proper hole preparation is required for effective sealing and performance. Check the pipe seal surface within 5/8" (15,9mm) of the hole to ensure it is free from conditions affecting proper gasket sealing. Remove any sharp or rough edges from the hole or upper housing contact area that might affect assembly, proper seating of the locating collar, or flow from the outlet. For crosses, ensure double outlet holes are aligned on opposite sides of the pipe. The use of threaded products other than steel pipe, such as dry pendent sprinklers, may not be compatible with the female threaded outlet on the Mechanical Tee. Always confirm compatibility by contacting GRINNELL Mechanical Products.

‡ Maximum pressures and end loads are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ on other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

Threads are NPT. Some size outlets are available with BSP threads. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 76 for mechanical tee specifications and pages 191 - 198 for gasket information.

Figure 730 Mechanical Tees & Crosses – Grooved

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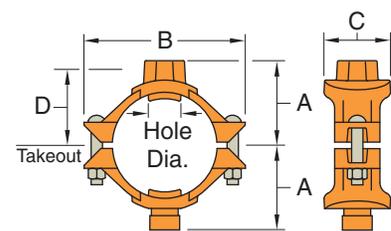
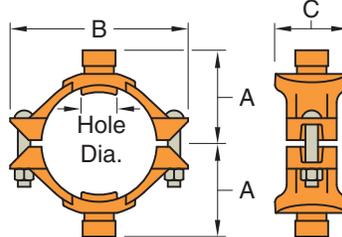
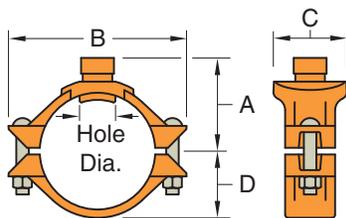


Figure 730 Branch Outlet with Grooved Branch (Tee Configuration)

Figure 730 Branch Outlet with Grooved Branch (Cross Configuration)

Figure 730 Branch Outlet with a Female NPT/BSP Threaded Branch and a Grooved Branch (Cross Configuration)

Nominal Size Run x Branch Inches mm	Hole Dia.†		Max. ‡ End Load Branch Lbs. kN	Dimensions - Inches mm				Bolt Size Inches mm	Tee Approx. Weight Lbs. kg	Cross Approx. Weight Lbs. kg
	Min. Inches mm	Max. Inches mm		A	B	C	D			
2 x 1¼	1.75	1.88	1082.1	2.78	4.88	3.32	1.59	¾ x 2¼	2.5	3.3
50 x 32	44,5	47,6	4,8	70,6	124,0	84,3	40,4	M10 x 57	1,1	1,5
2 x 1½	1.75	1.88	1417.6	2.62	4.88	3.32	1.59	¾ x 2¼	2.4	3.7
50 x 40	44,5	47,6	6,3	66,5	124,0	84,3	40,4	M10 x 57	1,1	1,7
2½ x 1¼	2.00	2.13	1082.1	3.00	5.25	3.56	1.81	¾ x 2¼	2.5	3.8
65 x 32	50,8	54,0	4,8	76,2	133,4	90,4	46,0	M10 x 57	1,1	1,7
2½ x 1½	2.00	2.13	1417.6	3.07	5.25	3.59	1.81	¾ x 2¼	2.5	3.9
65 x 40	50,8	54,0	6,3	78,0	133,4	91,2	46,0	M10 x 57	1,1	1,8
2½ x 2	2.00	2.13	2215.1	3.19	5.25	4.00	1.81	¾ x 2¼	2.5	3.8
65 x 50	50,8	54,0	9,9	81,0	133,4	101,6	46,0	M10 x 57	1,1	1,7
76,1mm x 1¼	2.00	2.13	1082.1	3.06	5.62	3.56	1.87	–	2.5	3.8
65 x 32	50,8	54,0	4,8	77,7	142,7	90,4	47,5	M10 x 57	1,1	1,7
76,1mm x 1½	2.00	2.13	1417.6	3.13	5.62	3.56	1.87	–	2.5	3.9
65 x 40	50,8	54,0	6,3	79,5	142,7	90,4	47,5	M10 x 57	1,1	1,8
76,1mm x 2	2.00	2.13	2215.1	3.25	5.62	4.00	1.87	–	2.5	3.8
65 x 50	50,8	54,0	9,9	82,6	142,7	101,6	47,5	M10 x 57	1,1	1,7
3 x 1¼	1.75	1.88	1082.1	3.34	6.13	3.32	2.21	½ x 3	3.5	4.6
80 x 32	44,5	47,6	4,8	84,8	155,7	84,3	56,1	M12 x 89	1,6	2,1
3 x 1½	2.00	2.13	1417.6	3.38	6.13	3.56	2.21	½ x 3	3.6	5.0
80 x 40	50,8	54,0	6,3	85,9	155,7	90,4	56,1	M12 x 89	1,6	2,3
3 x 2	2.50	2.63	2215.1	3.50	6.13	4.09	2.21	½ x 3	4.5	6.4
80 x 50	63,5	66,7	9,9	88,9	155,7	103,9	56,1	M12 x 89	2,0	2,9
4 x 1¼	1.75	1.88	1082.1	3.92	7.13	3.32	2.78	½ x 3	4.8	5.6
100 x 32	44,5	47,6	4,8	99,6	181,1	84,3	70,6	M12 x 89	2,2	2,5

Figure 730 Mechanical Tees & Crosses – Grooved

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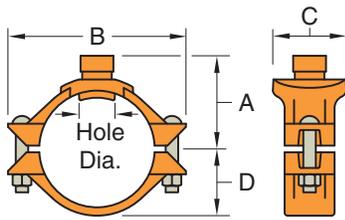


Figure 730 Branch Outlet with Grooved Branch (Tee Configuration)

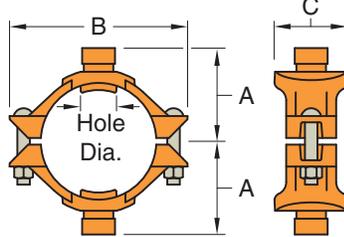


Figure 730 Branch Outlet with Grooved Branch (Cross Configuration)

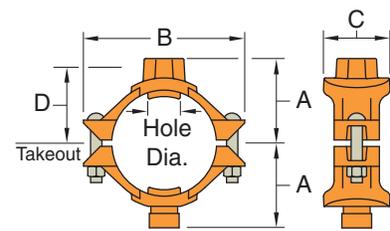


Figure 730 Branch Outlet with a Female NPT/BSP Threaded Branch and a Grooved Branch (Cross Configuration)

Nominal Size Run x Branch Inches mm	Hole Dia.†		Max.‡ End Load Branch Lbs. kN	Dimensions - Inches mm				Bolt Size Inches mm	Tee Approx. Weight Lbs. kg	Cross Approx. Weight Lbs. kg
	Min. Inches mm	Max. Inches mm		A	B	C	D			
4 x 1½ 100 x 40	2.00 50,8	2.13 54,0	1417.6 6,3	4.00 101,6	7.13 181,1	3.56 90,4	2.78 70,6	½ x 3 M12 x 89	5.0 2,3	6.2 2,8
4 x 2 100 x 50	2.50 63,5	2.63 66,7	2215.1 9,9	4.00 101,6	7.13 181,1	4.06 103,1	2.78 70,6	½ x 3 M12 x 89	5.3 2,4	6.9 3,1
4 x 2½ 100 x 65	2.75 69,9	2.88 73,0	3245.9 14,4	4.00 101,6	7.13 181,1	4.38 111,3	2.78 70,6	½ x 3 M12 x 89	5.9 2,7	8.2 3,7
4 x 76,1mm 100 x 65	2.75 69,9	2.88 73,0	3534.3 15,7	4.00 101,6	7.13 181,1	4.38 111,3	2.78 70,6	– M12 x 89	5.9 2,7	8.2 3,7
4 x 3 100 x 80	3.50 88,9	3.63 92,1	4810.6 21,4	4.13 104,9	7.13 181,1	5.13 130,3	2.78 70,6	½ x 3 M12 x 89	7.4 3,4	11.1 5,0
5 x 1½ 125 x 40	2.00 50,8	2.13 54,0	1417.6 6,3	4.63 117,6	8.13 206,5	3.56 90,4	3.37 85,6	⅝ x 4¾ M16 x 121	7.7 3,5	9.2 4,2
5 x 2 125 x 50	2.50 63,5	2.63 66,7	2215.1 9,9	4.63 117,6	8.13 206,5	4.06 103,1	3.37 85,6	⅝ x 4¾ M16 x 121	7.6 3,4	9.0 4,1
5 x 2½ 125 x 65	2.75 69,9	2.88 73,0	3245.9 14,4	4.75 120,7	8.13 206,5	4.38 111,3	3.37 85,6	⅝ x 4¾ M16 x 121	8.6 3,9	11.0 5,0
5 x 76,1mm 125 x 65	2.75 69,9	2.88 73,0	3534.3 15,7	4.75 120,7	8.13 206,5	4.38 111,3	3.37 85,6	– M16 x 121	8.6 3,9	11.0 5,0
5 x 3 125 x 80	3.50 88,9	3.63 92,1	4810.6 21,4	5.00 127,0	8.13 206,5	5.13 130,3	3.37 85,6	⅝ x 4¾ M16 x 121	12.3 5,6	12.5 5,7
165,1mm x 1¼ 150 x 32	2.00 50,8	2.13 54,0	1082.1 4,8	5.13 130,3	9.25 235,0	3.56 90,4	3.90 99,1	– M16 x 121	7.7 3,5	9.5 4,3
165,1mm x 1½ 150 x 40	2.00 50,8	2.13 54,0	1417.6 6,3	5.13 130,3	9.25 235,0	3.56 90,4	3.90 99,1	– M16 x 121	7.6 3,4	9.3 4,2
165,1mm x 2 150 x 50	2.50 63,5	2.63 66,7	2215.1 9,9	5.13 130,3	9.25 235,0	4.06 103,1	3.90 99,1	– M16 x 121	8.0 3,6	9.1 4,1
165,1mm x 2½ 150 x 65	2.75 69,9	2.88 73,0	3245.9 14,4	5.13 130,3	9.25 235,0	4.38 111,3	3.90 99,1	– M16 x 121	8.8 4,0	10.8 4,9
165,1mm x 76,1mm 150 x 65	2.75 69,9	2.88 73,0	3534.3 15,7	5.13 130,3	9.25 235,0	4.38 111,3	3.90 99,1	– M16 x 121	8.8 4,0	10.8 4,9
165,1mm x 3 150 x 80	3.50 88,9	3.63 92,1	4810.6 21,4	5.50 139,7	9.25 235,0	5.13 130,3	3.90 99,1	– M16 x 121	10.1 4,6	13.3 6,0
165,1mm x 4 150 x 100	4.50 114,3	4.63 117,5	7952.2 35,4	5.38 136,7	9.25 235,0	6.13 155,7	3.90 99,1	– M16 x 121	11.6 5,3	16.3 7,4

Figure 730 Mechanical Tees & Crosses – Grooved

(Page 3 of 3)

Tech Data Sheet: G210

10
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LIMITED
WARRANTY

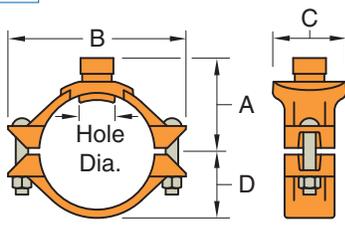


Figure 730 Branch Outlet with Grooved Branch (Tee Configuration)

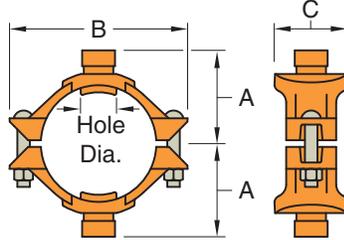


Figure 730 Branch Outlet with Grooved Branch (Cross Configuration)

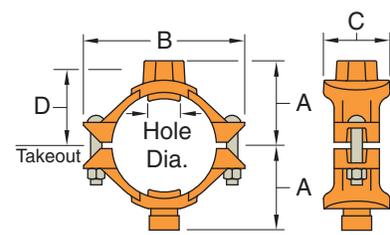


Figure 730 Branch Outlet with a Female NPT/BSP Threaded Branch and a Grooved Branch (Cross Configuration)

Nominal Size Run x Branch Inches mm	Hole Dia.†		Max.‡ End Load Branch Lbs. kN	Dimensions - Inches mm				Bolt Size Inches mm	Tee Approx. Weight Lbs. kg	Cross Approx. Weight Lbs. kg
	Min. Inches mm	Max. Inches mm		A	B	C	D			
6 x 1¼ 150 x 32	2.00 50,8	2.13 54,0	1082.1 4,8	5.13 130,3	9.25 235,0	3.56 90,4	3.90 99,1	5⁄8 x 4¾ M16 x 121	7.7 3,5	9.5 4,3
6 x 1½ 150 x 40	2.00 50,8	2.13 54,0	1417.6 6,3	5.13 130,3	9.25 235,0	3.56 90,4	3.90 99,1	5⁄8 x 4¾ M16 x 121	7.6 3,4	9.3 4,2
6 x 2 150 x 50	2.50 63,5	2.63 66,7	2215.1 9,9	5.13 130,3	9.25 235,0	4.06 103,1	3.90 99,1	5⁄8 x 4¾ M16 x 121	8.0 3,6	9.1 4,1
6 x 2½ 150 x 65	2.75 69,9	2.88 73,0	3245.9 14,4	5.13 130,3	9.25 235,0	4.38 111,3	3.90 99,1	5⁄8 x 4¾ M16 x 121	8.8 4,0	10.8 4,9
6 x 3 150 x 80	3.50 88,9	3.63 92,1	4810.6 21,4	5.50 139,7	9.25 235,0	5.13 130,3	3.90 99,1	5⁄8 x 4¾ M16 x 121	10.1 4,6	13.3 6,0
6 x 4 150 x 100	4.50 114,3	4.63 117,5	7952.2 35,4	5.38 136,7	9.25 235,0	6.13 155,7	3.90 99,1	5⁄8 x 4¾ M16 x 121	11.6 5,3	16.3 7,4
8 x 2½ 200 x 65	2.75 69,9	2.88 73,0	3245.9 14,4	6.25 158,8	12.50 317,5	4.38 111,3	4.90 124,5	¾ x 4¾ M20 x 121	12.3 5,6	14.5 6,6
8 x 76,1mm 200 x 65	2.75 69,9	2.88 73,0	3534.3 15,7	6.25 158,8	12.50 317,5	4.38 111,3	4.90 124,5	– M20 x 121	12.3 5,6	14.5 6,6
8 x 3 200 x 80	3.50 88,9	3.63 92,1	4810.6 21,4	6.50 165,1	12.50 317,5	5.13 130,3	4.90 124,5	¾ x 4¾ M20 x 121	13.2 6,0	16.1 7,3
8 x 4 200 x 100	4.50 114,3	4.63 117,5	7952.2 35,4	6.38 162,1	12.50 317,5	6.13 155,7	4.90 124,5	¾ x 4¾ M20 x 121	14.7 6,7	19.0 8,6

† Proper hole preparation is required for effective sealing and performance. Check the pipe seal surface within 5⁄8" (15,9mm) of the hole to ensure it is free from conditions affecting proper gasket sealing. Remove any sharp or rough edges from the hole or upper housing contact area that might affect assembly, proper seating of the locating collar, or flow from the outlet. For crosses, ensure double outlet holes are aligned on opposite sides of the pipe.

‡ Maximum pressures and end loads are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ on other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, European sizes or other alternative sizes, contact GRINNELL Mechanical Products.

See page 76 for mechanical tee specifications and pages 191 - 198 for gasket information.



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Model B8101 Low Profile Butterfly Valves

Tech Data Sheet: G330



The GRINNELL Model B8101 Low Profile Butterfly Valve has a rated working pressure of 200 psi (13,8 bar) and provides efficient control of fluid in piping systems. Flow can be from either direction and the valve may be positioned in any orientation. The ductile iron body is epoxy-coated to resist atmospheric corrosion. The disc is EPDM encapsulated ductile iron compatible with a variety of chemicals and temperature ranges.

MATERIAL SPECIFICATIONS

Body

- Ductile iron

Body Coating

- Black epoxy-coated

Disc

- Ductile iron

Disc Seal

- Grade “E” EPDM encapsulated rubber
-20°F to 250°F (-29°C to 121°C) with intermittent service at 250°F (121°C) and continuous service at 225°F (107°C)
- Optional: Grade “T” Nitrile encapsulated rubber
-20°F to 180°F (-29°C to 82°C)

Stem

- Two-piece stainless steel, splined

Stem Seal

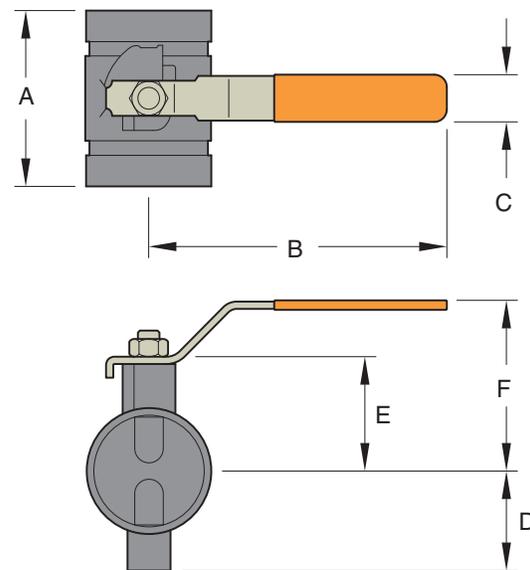
- O-rings, upper and lower stem

Handle

- Carbon steel zinc-plated

Performance

- Pressure drop, contact GRINNELL Mechanical Products.



Pipe Size		Dimensions - Inches mm					
Nominal Inches mm	O.D. Inches mm	A	B	C	D	E	F
2	2.375	3.39	5.98	0.98	1.81	1.97	3.15
50	60,3	86,0	152,0	25,0	46,0	50,0	80,0
2½	2.875	3.78	5.98	0.98	2.05	2.40	3.58
65	73,0	96,0	152,0	25,0	52,0	61,0	91,0
3	3.500	3.78	8.27	0.98	2.56	2.64	4.21
80	88,9	96,0	210,0	25,0	65,0	67,0	107,0
4	4.500	4.53	8.27	0.98	3.27	3.27	4.84
100	114,3	115,0	210,0	25,0	83,0	83,0	123,0
5	5.563	5.50	12.25	1.26	4.00	4.00	6.75
125	141,3	139,7	311,2	32,0	101,6	101,6	171,5
6	6.625	5.20	12.01	1.26	4.29	4.29	6.85
150	168,3	132,0	305,0	32,0	109,0	109,0	174,0

For information on larger sizes, contact GRINNELL Mechanical Products.



Model B302 Grooved End Butterfly Valves

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Tech Data Sheet: G310



GRINNELL Model B302 Butterfly Valves are capable of pressures of 300 psi (20,7 bar) for sizes 2" – 8" (50mm – 200mm) and 200 psi (13,8 bar) for sizes 10" and 12" (250mm – 300mm). The valves are designed for efficient control of: on/off or throttling/balancing service; fluid flow; and "bubble tight" shut-off in piping systems. Flow may be from either direction, and the valve may be positioned in any orientation. The valves are available with either a gear operator, for sizes 2" – 12" (50mm – 300mm), or lever-lock operator, for sizes 2" – 8" (50mm – 200mm). The valves are furnished with grooved ends for use with grooved couplings and can be easily adapted to flanged components utilizing GRINNELL Figure 71 Class 150 Flange Adapters.

The body and disc construction provides for increased strength and durability. The disc seal and body coatings are compatible with a variety of chemicals and temperature range. (Contact GRINNELL Mechanical Products for specific recommendations on seal and coating selection).

The GRINNELL Model B302 Butterfly Valve with Gear Operator is a self-locking worm gear type. It is equipped with adjustable stops at the open and shut positions.

The GRINNELL Model B302 Butterfly Valve with Lever-Lock Operator has a throttling plate that provides throttling notches every 10° for manual control in balancing up to 90° or shut off service. The lever may be padlocked in any one of the positions, including opened or closed, by virtue of a locking hole located in the handle and lever.

Conforms To MSS SP-67



Model B302
with Gear Operator



Model B302
with Lever-Lock Operator



Note: replacement lever handles and gear wheels are available, contact GRINNELL Mechanical Products.

MATERIAL SPECIFICATIONS

Ductile Iron Body

- ASTM A 395 – Standard specification for ductile iron castings, Grade 60-40-18
- Tensile strength, minimum 60,000 psi (4136,9 bar)
- Yield strength, minimum 40,000 psi (2757,9 bar)
- Elongation in 2" (50mm), minimum 18%

Disc

- Ductile iron ASTM A 395 w/EPDM or Buna-N encapsulation

Body Coating

- Black Polyamide-Coated

O-Ring

- EPDM, Fluoroelastomer, or Buna-N

Upper and Lower Stem

- Type 416 Stainless Steel ASTM A 582

Gear Operator

- Cast iron housing

Lever-Lock Operator

- Handle – Iron Polymer-Coated
- Lever-Lock – Steel Zinc-Plated
- Throttling Plate – Steel Zinc-Plated

Disc Seal Specifications Encapsulated Rubber

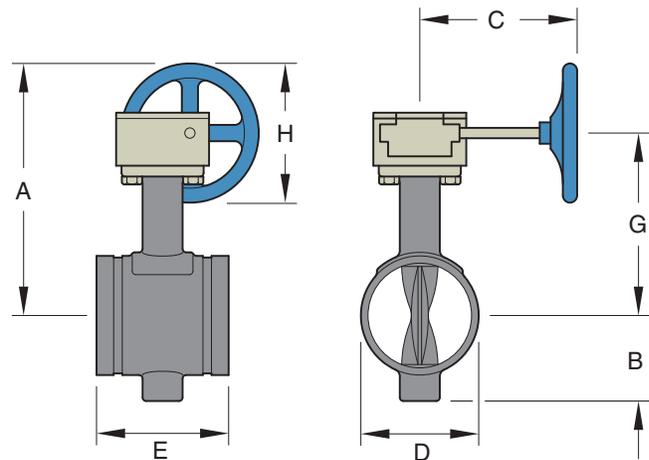
- **EPDM** – For service temperatures from -20°F to 250°F (-29°C to 121°C), intermittent service at 250°F (121°C) and continuous service at 225°F (107°C). Recommended for hot water not to exceed the temperature ratings above, plus a variety of dilute acids, alkalines, and many chemical services. They are not recommended for petroleum oil, strong acid, strong alkaline, or compressed air services.
- **Nitrile** – For service temperatures from -20°F to 180°F (-29°C to 82°C). Recommended for solvents, oils, water, and hydraulic fluid resistance. They are not recommended for highly polar solvents such as acetone and methyl ethyl ketone, chlorinated hydrocarbons, ozone, or nitro hydrocarbons and some aviation fuels.
- **Fluoroelastomer** – For service temperatures +20°F to 300°F (-7°C to 149°C). Recommended for oxidizing acids, petroleum products, hydraulic fluids, lubricants, and halogenated hydrocarbons.

Model B302 Grooved End Butterfly Valves

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Tech Data Sheet: G310

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Model B302 - Gear Operator									
Pipe Size		Dimensions - Inches mm							Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	E	G	H	
2	2.375	8.46	3.14	7.64	2.89	3.33	5.50	5.91	14.5
50	60,3	214,9	79,8	194,1	73,4	84,6	139,7	150,1	6,6
2½	2.875	8.65	3.25	7.64	3.46	3.85	5.69	5.91	15.5
65	73,0	219,7	82,6	194,1	87,9	97,8	144,5	150,1	7,0
3	3.500	8.99	3.54	7.64	3.97	3.85	5.94	5.91	17.0
80	88,9	226,1	89,9	194,1	100,8	97,8	150,9	150,1	7,7
4	4.500	9.79	4.35	7.64	5.03	4.56	8.00	5.91	20.5
100	114,3	248,7	110,5	194,1	127,8	115,8	203,2	150,1	9,3
5	5.563	9.30	4.84	7.64	6.27	5.86	7.33	5.91	25.0
125	141,3	236,2	122,9	194,1	159,3	148,8	186,2	150,1	11,3
6	6.625	13.53	5.93	9.53	7.25	5.86	8.61	9.84	33.0
150	168,3	343,7	150,6	242,1	184,2	148,8	218,7	249,9	15,0
8	8.625	14.47	6.87	9.53	9.25	5.26	9.55	9.84	45.0
200	219,1	367,5	174,5	242,1	235,0	133,6	242,6	249,9	20,4
10	10.750	16.53	9.17	11.54	11.25	6.29	11.61	18.0	83.0
250	273,1	418,9	232,9	293,1	285,6	159,8	294,9	457,2	37,6
12	12.750	17.52	10.17	11.54	13.14	6.52	12.60	18.0	100.0
300	323,9	445,0	258,3	293,1	333,8	165,6	320,0	457,2	45,4

*End of disc does not extend beyond valve body.

For information on larger sizes, contact GRINNELL Mechanical Products.

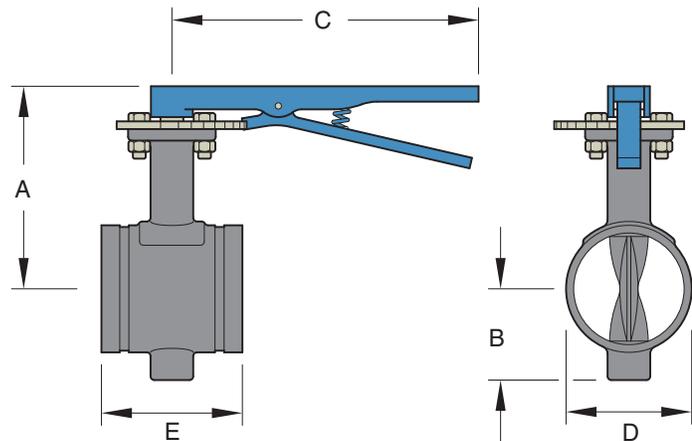


Model B302 Grooved End Butterfly Valves

(Page 3 of 4)

Tech Data Sheet: G310

10
YEAR
LIMITED
WARRANTY



Pipe Size		Dimensions - Inches mm					Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	E	
2	2.375	5.31	3.14	10.50	2.89	3.33	6.7
50	60,3	134,9	79,8	266,7	73,4	84,6	3,0
2½	2.875	5.41	3.25	10.50	3.46	3.85	7.5
65	73,0	137,4	82,6	266,7	87,9	97,8	3,4
3	3.500	5.62	3.54	10.50	3.97	3.85	8.7
80	88,9	142,7	89,9	266,7	100,8	97,8	3,9
4	4.500	6.57	4.35	10.50	5.03	4.56	12.2
100	114,3	166,9	110,5	266,7	127,8	115,8	5,5
5	5.563	7.07	4.84	10.50	6.27	5.86	17.3
125	141,3	179,6	122,9	266,7	159,3	148,8	7,8
6	6.625	8.40	5.93	13.75	7.25	5.86	27.4
150	168,3	213,4	150,6	349,3	184,2	148,8	23,4
8	8.625	9.37	6.87	13.75	9.25	5.26	32.5
200	219,1	238,0	174,5	349,3	235,0	133,6	14,7

*End of disc does not extend beyond valve body.
For information on larger sizes or availability in select regions, contact GRINNELL Mechanical Products.

Model B302 Grooved End Butterfly Valves - Options

(Page 4 of 4)

Tech Data Sheet: G310



Stem Extensions

Stem extensions can be provided to permit remote operation of the valve in any required length. Stem extensions are available in lengths up to 10 ft. (3 meters). The top flange of the extension stem, plug shaft diameter, and distance across the flats on the plug shaft are the same size as the valve selected. This design allows interchangeability of gear operators, actuators, and adapter bushings from the valve mounting flange to the extension stem top flange.

Adjustable Sprocket Rim

The Babbitt Adjustable Sprocket Rim provides for remote operation of the butterfly valves in high, out-of-reach locations. Specify the sprocket number size, and chain length. ($Chain\ length = Height \times 0,6m + 0,6m$).

Torque

Torque is the rotary effort required to operate a valve. This turning force in a butterfly valve is determined by three factors:

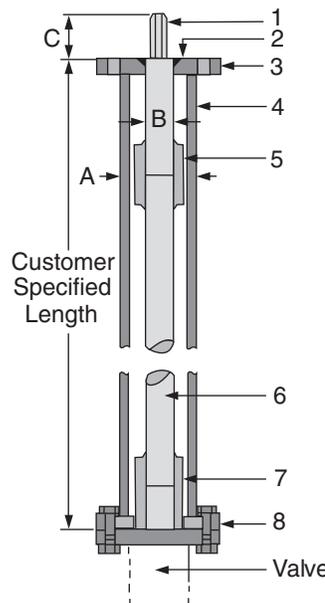
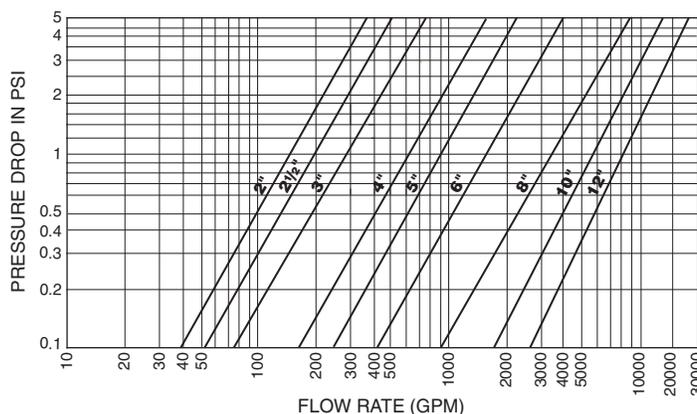
- Friction of the disc to seat for sealing
- Bearing friction
- Dynamic torque

Breakaway Torque is the total of the torques resulting from bearing friction and seat/disc interference friction at a given pressure differential. This value is normally the highest required torque to operate a valve, and is used in sizing actuators. The torques listed are valid for water and lubricating fluids at ambient temperature. For dry and non-lubricating fluids, contact a GRINNELL Mechanical Products representative.

Butterfly valves, sizes 8" (200mm) and larger, when used on liquids, show a marked increase in dynamic torque, which tends to close the valve. For this reason, gear operated or actuated valves are recommended.

The torque listed is for EPDM. When calculating torques for Buna-N or Fluoroelastomer, multiply listed torque by 1.25.

Performance



MATERIAL LIST	
Part	Material
1. Plug	Steel
2. Top Flange Bushing	Bronze
3. Top Flange	Steel
4. Housing (Steel Pipe)	Steel
5. Plug and Rod Coupling	Steel
6. Rod	Steel
7. Rod and Stem Coupling	Steel
8. Bottom Flange	Steel

Pipe Size Nominal Inches mm	Dimensions - Inches mm		
	A	B	C
2 - 12	2.88	1.125	1.12
50 - 300	73,2	28,6	28,4

Pipe Size		Torque Lbs - In., N - m		
Nominal Inches mm	O.D. Inches mm	100 psi 6,9 bar	200 psi 13,8 bar	300 psi 20,7 bar
2	2.375	48	67	83
50	60,3	5,42	7,56	9,38
2½	2.875	48	67	83
65	73,0	5,42	7,56	9,38
3	3.500	100	134	168
80	88,9	11,25	15,13	18,98
4	4.500	185	251	317
100	114,3	20,88	16,20	35,81
5	5.563	294	410	499
125	141,3	33,21	46,31	56,37
6	6.625	520	705	890
150	168,3	58,71	79,65	100,55
8	8.625	1,070	1,495	1,798
200	219,1	120,88	168,90	203,14
10	10.750	1,550	2,214	2,654
250	273,0	175,12	250,15	299,85
12	12.750	2,150	3,024	3,662
300	323,9	242,91	341,66	413,74

For information on larger sizes, contact GRINNELL Mechanical Products.



Model 308 Butterfly Valves

(Page 1 of 2)

Tech Data Sheet: G320

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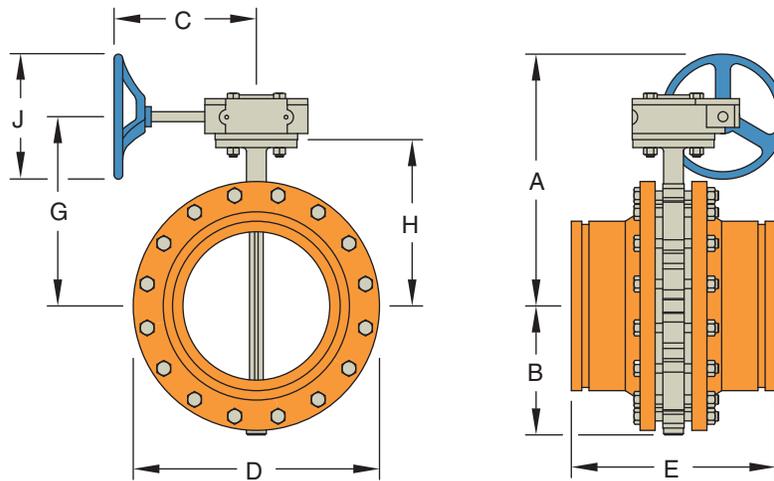


The GRINNELL Model 308 Butterfly Valve provides dependable, long-term service and superior control of fluid flow in piping systems. Flow may be from either direction, and the valve may be positioned in any orientation.

The valve is furnished with grooved ends for use with grooved couplings. The body and disc design provides exceptional flow characteristics and low operating torque. The disc has a streamlined profile that optimizes flow. The body is lined with an elastomer seat that is reinforced with a phenolic backing ring, reducing seat distortion, and wear.

The GRINNELL Model 308 Butterfly Valve includes a gear operator with adjustable stops at the open and shut positions.

The maximum Working Pressure is 150 psi (10,3 bar) with 316 S.S. Stem and 200 psi (13,8 bar) with 416 S.S. Stem. Special order is available upon request: Vacuum Service to 29.5" (750mm) Hg.



Pipe Size		Dimensions - Inches mm						Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	E	F	
14	14.000	23.25	10.75	10.00	21.00	13.06	15.25	378.0
350	355,6	590,6	273,1	254,0	533,4	331,7	387,4	171,8
16	16.000	24.75	12.50	10.00	23.50	14.33	16.75	452.0
400	406,4	628,7	317,5	254,0	596,9	364,0	425,5	205,5
18	18.000	25.75	14.00	10.00	25.00	15.40	17.75	548.0
450	457,2	654,1	355,6	254,0	635,0	391,2	450,9	249,1
20	20.000	27.25	15.00	10.00	27.50	16.38	18.25	728.0
500	508,0	692,2	381,0	254,0	698,5	416,1	463,6	330,9
24	24.000	30.12	16.75	10.25	32.00	18.26	21.12	1097.0
600	609,6	765,0	425,5	260,4	812,8	463,8	536,4	498,6

For information on larger sizes, contact GRINNELL Mechanical Products.

MATERIAL SPECIFICATIONS

Body

- Cast iron conforming to ASTM A 126, Class B

Body Seat (Liner)

- Grade E EPDM, grade T nitrile or fluoroelastomer
Contact GRINNELL Mechanical Products for specific recommendations on seat material.

Body Coating

- Epoxy coated

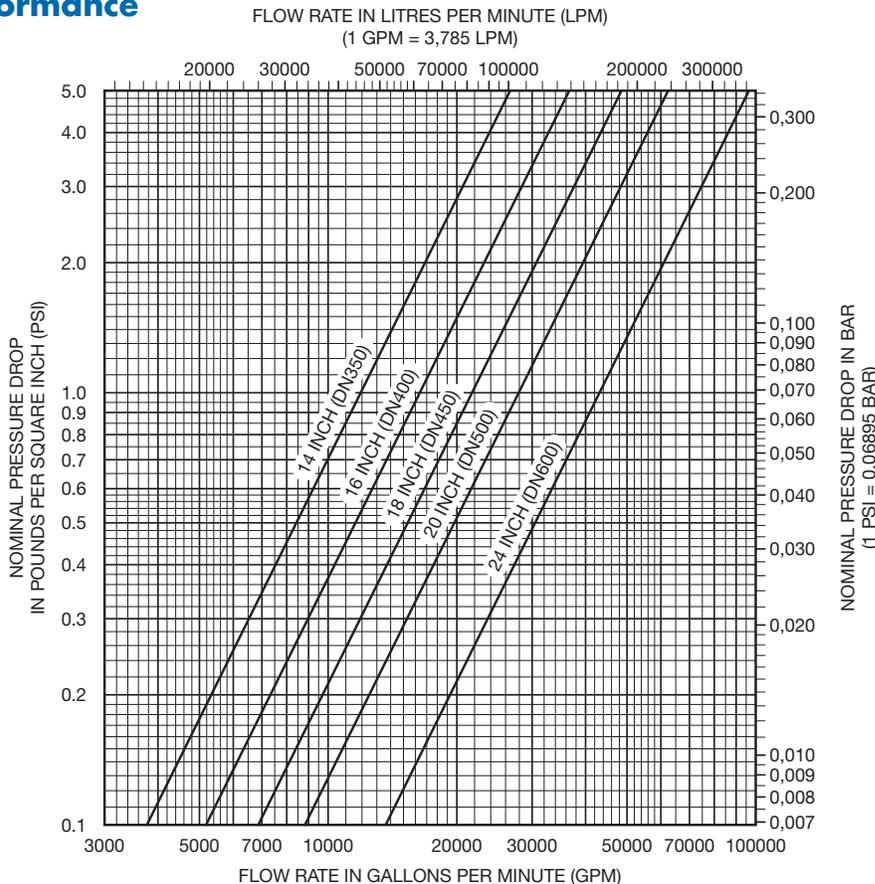
Disc

- Stainless steel conforming to ASTM A 351, Grade CF8M
- Aluminum bronze conforming to ASTM B 148, C95400
- Ductile iron conforming to ASTM A 536, Grade 65-45-12

Drive and Bottom Shaft

- Stainless steel conforming to ASTM A 582, Type 416 or Stainless steel conforming to ASTM A 276, Type 316

Performance



Note:

For design purposes, a safety factor of 15% to 20% should be applied to the values in the above table.

* Teflon is a trademark of Dupont

Model 308 Butterfly Valves

(Page 2 of 2)

Tech Data Sheet: G320

Gear Operator

- Cast iron housing



Upper and Lower Bearings

- Reinforced Teflon*

Plug

- Cast iron ASTM A 126

Seat Material

- **Grade E EPDM** – For service temperatures from -40°F to 230°F (-40°C to 110°C). Recommended for water service, dilute acids, alkalis, oil-free air, and many chemical services. They are not recommended for use in petroleum services.
- **Grade T Nitrile** – For service temperatures from -20°F to 180°F (-29°C to 82°C). Recommended for petroleum products, air with oil vapors, vegetable oils, and mineral oils. They are not recommended for use in hot water services.

Contact GRINNELL Mechanical Products for specific recommendations on seat material.



Model BV835 Ball Valves

(Page 1 of 2)

Tech Data Sheet: G380

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GRINNELL Model BV835 Ball Valves provide for efficient control of fluid in piping systems. Flow may be from either direction, and the valves may be positioned in any orientation. The valves are furnished with grooved ends for use with GRINNELL Grooved Couplings. The handle is provided with a device for padlocking in either the open or closed position.

The GRINNELL Model BV835 is furnished with grooved ends and features a handle that accepts a padlock device for locking in either the open or closed position. Flow may be from either direction and the valves may be positioned in any orientation.

Maximum Working Pressure

1,000 psi (68,9 bar) 2" – 3" (50mm – 80mm)
800 psi (55,2 bar) 4" (100mm)
600 psi (41,4 bar) 6" (150mm)

Shell Test

1.5 times WOG x 60 seconds, hydrostatic, at ambient temperature

Seat Test

80 psi (5,5 bar) x 60 seconds, pneumatic

MATERIAL SPECIFICATIONS

Body

- Ductile iron conforming to ASTM A 536, Grade 65-45-12

Body Coating

- Black enamel

Ball

- Type 304 Stainless Steel

Body Seal

- R-PTFE

Seats

- Virgin TFE

O-Ring

- Fluoroelastomer (Viton)

Stem

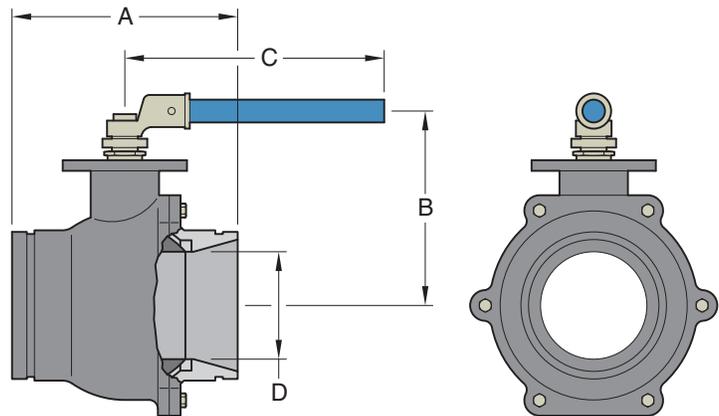
- Carbon steel, nickel-plated,
- Type 304 Stainless Steel available

Lever Handle

- Carbon steel, zinc plated with plastic grip,
- Type 304 Stainless Steel available

Gear Operator

- Manual with hand wheel, cast iron body



Pipe Size		Operating Torque * Lbs - in N-m	Dimensions - Inches mm				Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		A	B	C	D	
1½	1.900	62	5.12	3.39	7.00	1.25	4.8
40	48,3	7	130	86	178	32	2,2
2	2.375	150	5.50	3.75	7.00	1.50	6.4
50	60,3	17	140	95	178	38	2,9
2½	2.875	186	6.25	5.20	10.43	2.00	10.6
65	73,0	21	159	132	265	50	4,8
3	3.500	248	6.56	5.63	10.43	2.50	13.4
80	88,9	28	167	143	265	63	6,1
4	4.500	398	9.45	3.70	10.43	3.50	55.0
100	114,3	45	240	94	265	90	25,0
6	6.625	531	10.15	8.70	23.60	4.92	79.2
150	168,3	60	258	221	600	125	36,0

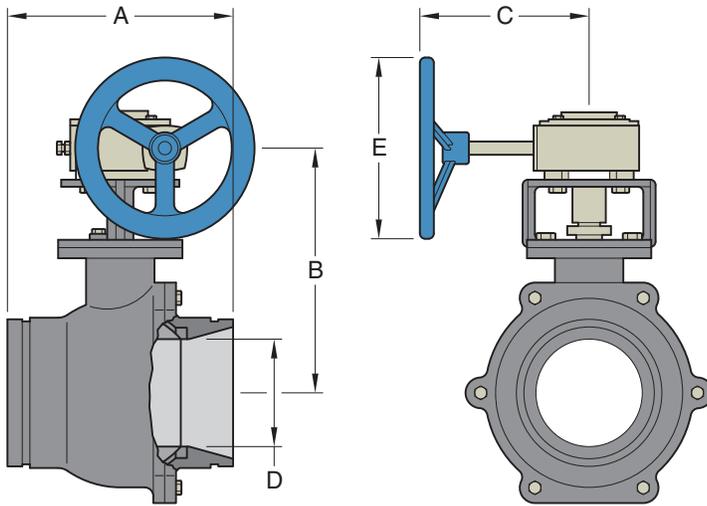
* For the first opening or closing of the valve when the valve is not continuously operated, an additional torque of 2.0 – 2.5 times the listed operating torque is normally required.

For information on larger sizes, contact GRINNELL Mechanical Products.

Model BV835 Ball Valves

(Page 2 of 2)

Tech Data Sheet: G380



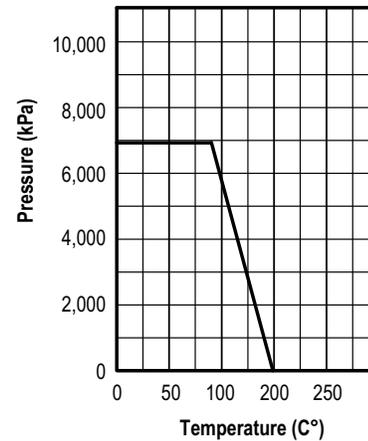
Pipe Size		Dimensions - Inches mm					Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	E	
1½	1.900	5.12	4.88	8	1.25	6	15.0
40	48,3	130	124	203	32	152	7,0
2	2.375	5.50	5.38	8	1.50	6	18.0
50	60,3	140	137	203	38	152	8,0
2½	2.875	6.25	5.68	8	2.00	6	22.0
65	73,0	159	145	203	50	152	10,0
3	3.500	6.56	7.16	8	2.50	6	31.0
80	88,9	167	182	203	63	152	14,0
4	4.500	9.45	8.00	8	3.50	6	73.0
100	114,3	240	203	203	90	152	33,0
6	6.625	10.15	10.89	14	4.92	12	123.4
150	168,3	258	277	356	125	305	56,0

For information on larger sizes, contact GRINNELL Mechanical Products.

General Notes

- Pressure ratings listed are CWP (cold water pressure) or maximum working pressure within the service temperature range of the gasket used in the coupling. For additional information, contact GRINNELL Mechanical Products.
- Maximum working pressures and end loads listed are total of internal and external pressures and loads based on Schedule 40 steel pipe with roll grooves to ANSI/AWWA C606-04 specifications. For information on other pipe schedules, contact GRINNELL Mechanical Products.
- Warning: Piping systems must always be depressurized and drained before attempting disassembly and/or removal of any components.

Pressure Performance



Flow Data - C_v Values

Values for flow of water at 60°F (16°C)

$$C_v = \frac{Q}{\sqrt{\Delta P}}$$

Where: C_v = Flow coefficient
 Q = Flow (GPM)
 ΔP = Pressure drop (psi)

Pipe Size		C _v Value
Nominal Inches mm	O.D. Inches mm	
1½	1.900	130
40	48,3	130
2	2.375	180
50	60,3	180
2½	2.875	320
65	73,0	320
3	3.500	600
80	88,9	600
4	4.500	1020
100	114,3	1020
6	6.625	3300
150	168,3	3300



Model 590 Grooved End Check Valves

(Page 1 of 2)

Tech Data Sheet: G350

10
YEAR
LIMITED
WARRANTY



GRINNELL Model 590 Check Valves are capable of pressures up to 300 psi (20,7 bar). These valves are designed as compact and rugged swing-type units that allow water flow in one direction and prevent flow in the opposite direction. They are manufactured with a ductile iron body, nickel seat, and a stainless steel clapper assembly for sizes 2" – 8" (50mm – 200mm), and a ductile iron clapper assembly for sizes 10" – 12" (250mm – 300mm). A resilient elastomer seal facing on the spring loaded clapper ensures a leak tight seal and a non-sticking operation. The GRINNELL Model 590 Check Valve is designed to minimize water hammer caused by flow reversal.

The valves are furnished with grooved ends and can be installed using GRINNELL Couplings. The GRINNELL Model 590 can be installed with GRINNELL Figure 71 Flange Adapters or ANSI class 300 Flange Adapters. All GRINNELL Model 590 Check Valves are designed with a removable cover for ease during field maintenance.

MATERIAL SPECIFICATIONS

Ductile Iron Body and Cap Specifications

- ASTM A 536 – Standard specification for ductile iron castings, Grade 65-45-12
- Tensile strength, minimum 65,000 psi (4481,6 bar)
- Yield strength, minimum 45,000 psi (3102,6 bar)
- Elongation in 2" (50mm), minimum 12%

Seat

- Nickel

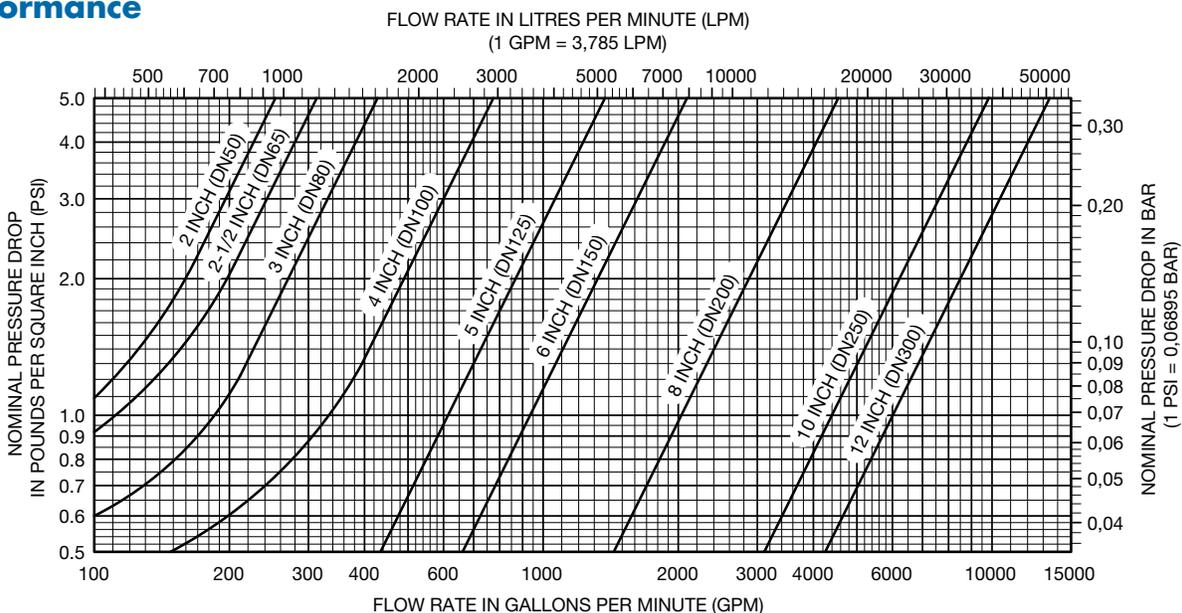
Coating

- Non-Lead paint

Performance

Seal Specifications

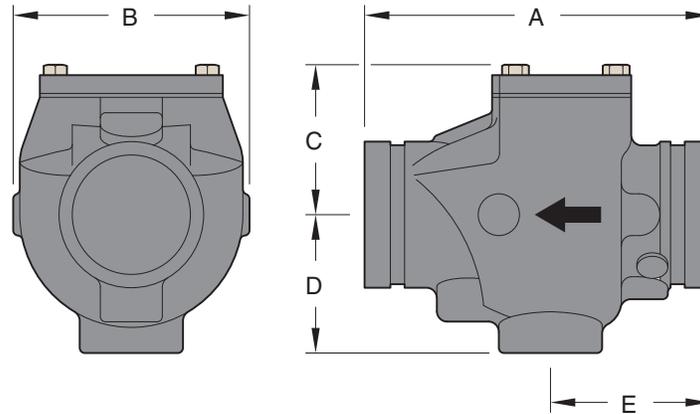
- **Grade "E" EPDM** seals have a Green color code identification and conform to ASTM D 2000 for service temperatures from -30°F to 230°F (-34°C to 110°C). They are recommended for hot water not to exceed 230°F (110°C), plus a variety of dilute acids, oil free air, and many chemical services. They are not recommended for petroleum services.
- **Grade "T" Nitrile** seals have an Orange color code identification and conform to ASTM D 2000 for service temperatures from -20°F to 180°F (-29°C to 82°C). They are recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapors.



Model 590 Grooved End Check Valves

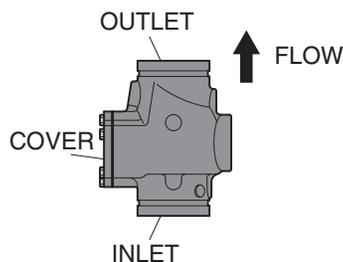
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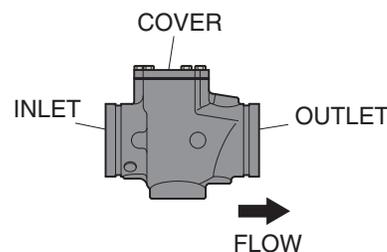


Pipe Size		Dimensions - Inches mm					Cover Bolt Torq. Lb.-ft. Nm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	E		
2	2.375	6.75	4.38	2.55	2.57	3.25	15	9.0
50	60,3	171,5	111,3	64,8	65,3	82,3	21	4,5
2½	2.875	8.00	5.42	3.41	3.09	3.88	39	10.0
65	73,0	203,2	136,7	86,6	78,5	98,6	54	4,5
76,1mm	3.000	8.00	5.42	3.41	3.09	3.88	39	10.0
65	76,1	203,2	136,7	86,6	78,5	98,6	54	4,5
3	3.500	8.38	5.76	3.60	3.31	3.88	39	11.0
80	88,9	212,9	146,3	91,4	84,1	98,6	54	5,0
4	4.500	9.63	6.74	4.61	3.63	4.53	39	25.0
100	114,3	245,6	171,2	117,1	92,2	115,4	54	11,3
139,7mm	5.500	10.50	7.50	5.29	4.13	4.90	39	29.0
125	139,7	266,7	190,5	134,4	104,9	124,5	54	13,2
5	5.563	10.50	7.50	5.29	4.13	4.90	39	29.0
125	141,3	266,7	190,5	134,4	104,9	124,5	54	13,2
165,1mm	6.500	11.50	8.05	5.75	4.50	5.00	60	47.0
150	165,1	292,1	204,4	146,1	114,3	127,0	82	21,3
6	6.625	11.50	8.05	5.75	4.50	5.00	60	47.0
150	168,3	292,1	204,4	146,1	114,3	127,0	82	21,3
8	8.625	14.00	10.25	7.75	5.62	5.45	120	66.0
200	219,1	355,6	260,4	196,9	142,7	138,4	164	30,0
10	10.750	18.00	13.00	10.21	6.38	7.50	120	109.7
250	273,1	457,2	330,2	259,3	162,1	190,5	164	49,4
12	12.750	21.0	14.28	11.31	7.26	7.62	120	151.0
300	323,9	533,4	362,7	287,2	184,4	193,5	164	68,0

For information on larger sizes, contact GRINNELL Mechanical Products.



VERTICAL ORIENTATION



HORIZONTAL ORIENTATION



Model TD830 Triple Duty Valves

Tech Data Sheet: G390

10
YEAR
LIMITED
WARRANTY



The GRINNELL Model TD830 Triple Duty Valve is designed for installation in pump discharge piping where it functions as a spring-loaded silent check valve, a balancing valve, and a shut-off valve.

The GRINNELL Model TD830 Triple Duty Valve operates automatically and quietly. Line pressure of approximately 0.25 psi (0,02 bar) opens the disc. To prevent flow reversal and water hammer, the spring closes the disc as the line flow approaches zero in order. The flow through the valve can be adjusted from bubble tight shut-off to full-flow by the threaded rising stem.

MATERIAL SPECIFICATIONS

Body and Yoke

- Ductile iron conforming to ASTM A 395, Grade 60-40-18 or A 536

Disc

- Aluminum bronze ASTM B 142, C 950

Disc Guide and Flanged Gland

- Cast iron conforming to ASTM A 126-B

Spring

- 302 stainless steel

Stem

- Type 316 stainless steel

Stem Guide

- Ductile iron conforming to ASTM A 536 or A 395

O-Rings

- EPDM

Seat

- Bronze

Seat Guide

- Bronze conforming to ASTM B 584 (81-3-7-9)

Finish

- Black paint

Performance

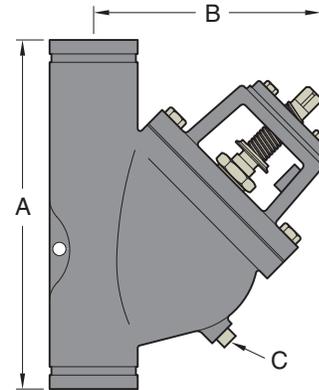
- Pressure drop, contact GRINNELL Mechanical Products.

The GRINNELL Model TD830 Triple Duty Valve can be installed quickly into grooved end piping systems using two GRINNELL Couplings. The externally guided disc has a soft seat to ensure a leak-tight seal. It lifts $\frac{1}{3}$ " (8mm) for each 1" (25,4mm) of pipe diameter. The rising stem design incorporates a graduated position indicator to ensure accurate disc positioning for throttling service.

The yoke and valve stem are unwetted external parts so they cannot be corroded or eroded by the line fluid. All mating threaded parts are made of dissimilar, non-galling metals. An NPT drain plug is provided, as well as bosses for gauge taps at the inlet and outlet.

Maximum working pressure is 640 psi (44,1 bar) at 100°F (38°C) and 565 psi (39 bar) at 300°F (149°C).

Note: Pressure and temperature can be limited by gasket material. Contact GRINNELL Mechanical Products.



Pipe Size		Dimensions - Inches mm			Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B OPEN	C NPT	
2	2.375	9.38	9.63	1/2	23.0
50	60,3	238,1	244,5	15	10,0
2 1/2	2.875	10.25	9.63	1/2	24.0
65	73,0	260,4	244,5	15	10,9
3	3.500	11.25	10.13	1/2	33.0
80	88,9	285,8	257,2	15	15,0
4	4.500	15.63	12.63	1/2	84.0
100	114,3	397,9	320,8	15	38,0
5	5.563	15.625	11.125	1/2	84.0
125	141,3	397,9	282,6	15	38,0
6	6.625	19.63	17.50	3/4	156.0
150	168,3	498,5	444,5	20	70,0
8	8.625	23.63	18.00	3/4	300.0
200	219,1	600,0	457,2	20	136,0
10	10.750	28.00	21.75	1	392.0
250	273,1	711,2	552,5	25	178,0
12	12.750	31.63	25.00	1	496.0
300	323,9	803,3	635,0	25	225,0
14	14.000	33.50	25.000	1	790.0
340	355,6	851,0	635,0	25	358,3

For information on larger sizes, contact GRINNELL Mechanical Products.



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GRINNELL Model CB800 Circuit Balancing Valves are designed to achieve accurate and efficient balancing of hydronic heating or cooling systems. Circuit Balancing Valves provide superior accuracy in measuring flows rather than ball type circuit setters.

The CB800 valve serves 5 functions:

- Throttling
- Measuring differential pressure
- Draining
- Filling
- Positive shutoff

These valves are rated at 300 psi (20,7 bar) at 300°F (150°C).

The valve is made of dezincification-resistant brass and bronze components. Threaded and solder connections are available for sizes 1/2" - 2" (15mm - 50mm) sizes with bronze bodies. Flanged (125#) and grooved connections are available for sizes 2 1/2" - 12" (65mm - 300mm) with cast iron bodies.

The Y-Pattern style provides low pressure drop. The globe style valve allows for precise throttling. The easy-to-adjust digital/vernier handwheel provides a minimum of 70 unique handwheel positions. The handwheel and test ports are located on one side for easy access. A built-in memory stop ensures the setting can be returned to a balanced position after shutoff. The self-sealing pressure/temperature test ports use standard insertion probes to eliminate additional components.

The GRINNELL Circuit Balancing Valve is installed with flow in the direction of the arrow, and may be in the horizontal or vertical position. The handwheel can be positioned up or down, or on either side.

CB800 Circuit Balancing Valves

Tech Data Sheet: G450

10
YEAR
LIMITED
WARRANTY

MATERIAL SPECIFICATIONS

Body

- Sizes 1/2" – 2" (15mm – 50mm) solder or NPT threaded connection: brass-resistant to dezincification (DZR)
- Sizes 2 1/2" – 12" (65mm – 300mm), grooved or flanged connection: Cast Iron conforming to ASME ANSI B16.5

Valve Stem and Disc

- Brass resistant to dezincification (DZR)

O Ring

- EPDM E

Handwheel

- Thermoplastic



For accessories and replacement parts contact GRINNELL Mechanical Products for details.

Valve Sizing

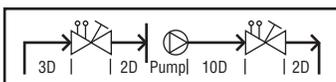
All balancing valves are sized to perform in a normal operation range between 25% and 100% of the full open position, at a minimum differential pressure between 1 – 3 ft. (0,3m – 0,9m) of water. It is recommended that for improved accuracy, the valve is set to open 70%+.

When maximum flow is known but a pressure drop through the balancing valve is unknown, select a balancing valve for a maximum pressure drop of 2 ft. (0,6m) water 0.8 psi (0,06 bar) in the full open position as shown in the table to the right.

Accurate flow measurement requires that the velocity distribution near the balancing valve remains constant, regardless of the total flow through the pipe. Fittings, such as elbows and tees, disturb the normal flow profile which is established through straight pipe. Pumps create even greater disturbances. Failure to allow water flows around fittings and pumps to normalize can affect measuring accuracy by as much as 20% when the valve is in the fully open position. Minimum lengths (diameters, D) of straight pipe before and after the balancing valve prevent these errors.

Valves are designed for vertical, horizontal, or inclined installation.

Minimum Pipe Diameters from Fittings

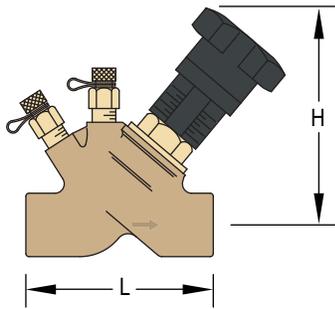


Size Inches mm	Flow Rate GPM LPM	Connection Type
1/2	2.6 - 4.2	Thread
15	0,687 - 1,110	
3/4	3.4 - 6.2	
20	0,898 - 1,638	
1	6.2 - 9.6	
25	1,638 - 2,536	
1 1/4	9.4 - 21.0	
32	2,483 - 5,548	
1 1/2	15 - 30	
40	3,96 - 7,93	
2	22 - 42	
50	5,812 - 11,096	
2 1/2	39 - 106	Flanged or Grooved
65	10,30 - 28,01	
76,1mm	39 - 106	
65	10,30 - 28,01	
3	60 - 132	
80	15,85 - 34,87	
4	100 - 217	
100	26,42 - 57,33	
139,7mm	112 - 317	
125	29,59 - 83,75	
5	112 - 317	
125	29,59 - 83,75	
165,1mm	220 - 437	
150	58,12 - 115,46	
6	220 - 437	
150	58,12 - 115,46	
8	223 - 881	
200	58,92 - 232,76	
10	292 - 1298	
250	77,15 - 342,93	
12	616 - 1731	
300	162,75 - 457,33	

Model CB800 Circuit Balancing Valves Solder Ends

Tech Data Sheet: G450

10
YEAR
LIMITED
WARRANTY



The GRINNELL Model CB800 Balancing Valve provides features for achieving accurate and efficient balancing of hydronic heating or cooling systems. One valve serves five functions: throttling, measuring (pressure and temperature), positive shutoff, draining and filling. The GRINNELL Solder-by-Solder Model CB800 Valve, available in sizes 1/2" to 2" (15mm to 50mm), is composed of dezincification resistant brass.

Pipe Size		Dimensions - Inches mm		Approx. Weight Lbs. kg	Limits PSI/°F PN/°C	Handwheel Turns
Nominal Inches mm	O.D. Inches mm	L	H			
1/2	0.840	3.50	4.50	1.4	235/300	7
15	21,3	88,9	114,3	0,6	16/150	7
3/4	1.050	3.81	4.56	1.4	235/300	7
20	26,7	96,8	115,8	0,6	16/150	7
1	1.315	4.31	4.69	2.2	235/300	7
25	33,7	109,5	119,1	1,0	16/150	7
1 1/4	1.660	5.06	5.38	3.0	235/300	10
32	42,4	128,5	136,7	1,4	16/150	10
1 1/2	1.900	5.56	5.44	3.9	235/300	10
40	48,3	141,2	138,2	1,7	16/150	10
2	2.375	6.56	5.81	5.6	235/300	10
50	60,3	166,6	147,6	2,6	16/150	10

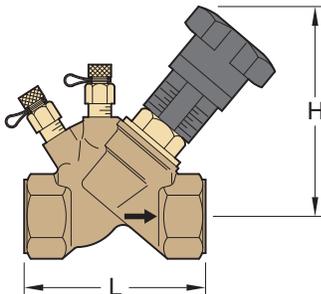
For information on larger sizes, contact GRINNELL Mechanical Products.
See circuit balancing valve specifications on pages 99.

CIRCUIT BALANCING VALVES

Model CB800 Circuit Balancing Valves Threaded Ends

Tech Data Sheet: G450

10
YEAR
LIMITED
WARRANTY



The GRINNELL Model CB800 Balancing Valve provides features for achieving accurate and efficient balancing of hydronic heating or cooling systems. One valve serves five functions: throttling, measuring (pressure and temperature), positive shutoff, draining and filling. The GRINNELL Thread-by-Thread Model CB800 Valve, available in sizes 1/2" to 2" (15mm to 50mm), is composed of dezincification resistant brass.

Pipe Size		Dimensions - Inches mm		Approx. Weight Lbs. kg	Limits PSI/°F PN/°C	Handwheel Turns
Nominal Inches mm	O.D. Inches mm	L	H			
1/2	0.840	3.13	4.13	1.4	235/300	7
15	21,3	79,5	104,9	0,6	16/150	7
3/4	1.050	3.31	4.56	1.4	235/300	7
20	26,7	84,1	115,8	0,6	16/150	7
1	1.315	3.38	4.69	2.2	235/300	7
25	33,7	85,6	119,1	1,0	16/150	7
1 1/4	1.660	4.38	5.38	3.0	235/300	10
32	42,4	111,3	136,7	1,4	16/150	10
1 1/2	1.900	4.75	5.44	3.9	235/300	10
40	48,3	120,7	138,2	1,7	16/150	10
2	2.375	5.94	5.81	5.6	235/300	10
50	60,3	150,9	147,6	2,6	16/150	10

For information on larger sizes, contact GRINNELL Mechanical Products.
See circuit balancing valve specifications on pages 99.

Model CB800 Circuit Balancing Valves Grooved Ends

The GRINNELL Model CB800 Balancing Valve provides features for achieving accurate and efficient balancing of hydronic heating or cooling systems. The GRINNELL Groove-by-Groove Model CB800 Valve, available sizes 2½" to 12" (65mm to 300mm), is composed of cast iron.

Tech Data Sheet: G450



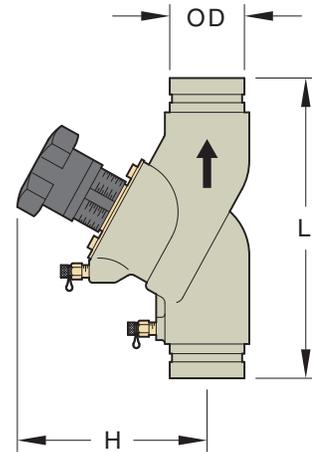
The CB800 valve serves 5 functions:

- Throttling
- Measuring differential pressure
- Draining
- Filling
- Positive shutoff



Pipe Size		Dimensions - Inches mm		Approx. Weight Lbs. kg	Limits PSI/°F PN/°C	Handwheel Turns
Nominal Inches mm	O.D. Inches mm	L	H			
2½	2.875	11.44	7.38	18.7	300/300	8
65	73,0	290,6	187,5	8,5	20,7/150	
76,1mm	3.000	11.44	7.38	18.7	300/300	8
65	76,1	290,6	187,5	8,5	20,7/150	
3	3.500	12.25	8.00	27.5	300/300	8
80	88,9	311,2	203,2	12,5	20,7/150	
4	4.500	13.75	9.44	45.1	300/300	8
100	114,3	349,3	239,8	20,5	20,7/150	
139,7mm	5.500	15.75	11.13	70.4	300/300	8
125	139,7	400,0	282,7	32,0	20,7/150	
5	5.563	15.75	11.13	70.4	300/300	8
125	141,3	400,0	282,7	32,0	20,7/150	
165,1mm	6.500	18.88	11.25	95.7	300/300	8
150	165,1	479,6	285,8	43,5	20,7/150	
6	6.625	18.88	11.25	95.7	300/300	8
150	168,3	479,6	285,8	43,5	20,7/150	
8	8.625	23.63	18.44	255.2	300/300	12
200	219,1	600,2	468,4	116,0	20,7/150	
10	10.750	28.75	18.88	376.2	300/300	12
250	273,1	730,3	479,6	171,0	20,7/150	
12	12.750	33.44	20.25	519.2	300/300	12
300	323,9	849,4	514,4	136,0	20,7/150	

For information on larger sizes, contact GRINNELL Mechanical Products.
See circuit balancing valve specifications on pages 99.



CIRCUIT BALANCING VALVES

Model CB800 Circuit Balancing Valves Flanged Ends, ANSI Class 125#

Tech Data Sheet: G450

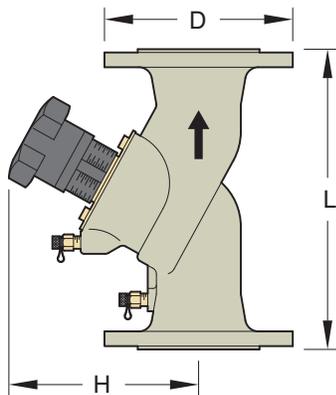


The GRINNELL Model CB800 Balancing Valve provides features for achieving accurate and efficient balancing of hydronic heating or cooling systems. One valve serves five functions: throttling, measuring (pressure and temperature), positive shutoff, draining, and filling. The GRINNELL Flange-by-Flange Model CB800 Valve, available in sizes 2½" to 12" (65mm to 300mm), is composed of cast iron.

The CB800 valve serves 5 functions:

- Throttling
- Measuring differential pressure
- Draining
- Filling
- Positive shutoff

CIRCUIT BALANCING VALVES



Pipe Size		Dimensions - Inches mm			Approx. Weight Lbs. kg	Limits PSI/°F PN/°C	Handwheel Turns
Nominal Inches mm	O.D. Inches mm	L	H	D			
2½	2.875	11.4	7.4	7.3	18.7	235/300	8
65	73,0	290	188	185	13,5	16/150	
76,1mm	3.000	11.4	7.4	7.3	18.7	235/300	8
65	76,1	290	188	185	13,5	16/150	
3	3.500	12.2	8.0	7.9	39.6	235/300	8
80	88,9	310	203	200	18,0	16/150	
4	4.500	13.8	9.4	8.7	61.6	235/300	8
100	114,3	350	240	220	28,0	16/150	
139,7mm	5.500	15.7	11.1	9.8	89.1	235/300	8
125	139,7	400	283	250	40,5	16/150	
5	5.563	15.7	11.1	9.8	89.1	235/300	8
125	141,3	400	283	250	40,5	16/150	
165,1mm	6.500	18.9	11.2	11.2	113.3	235/300	8
150	165,1	480	285	285	51,5	16/150	
6	6.625	18.9	11.2	11.2	113.3	235/300	8
150	168,3	480	285	285	51,5	16/150	
8	8.625	23.6	18.4	13.4	284.9	235/300	12
200	219,1	600	467	340	129,5	16/150	
10	10.750	28.7	18.9	15.9	431.2	235/300	12
250	273,1	730	480	405	196,0	16/150	
12	12.750	33.5	20.3	19.1	580.8	235/300	12
300	323,9	850	515	485	264,0	16/150	

For information on larger sizes, contact GRINNELL Mechanical Products.
See circuit balancing valve specifications on pages 99.

Model CB800 Circuit Balancing Valves Flanged Ends, PN16/PN10

Tech Data Sheet: G450



The GRINNELL Model CB800 Balancing Valve provides features for achieving accurate and efficient balancing of hydronic heating or cooling systems. One valve serves five functions: throttling, measuring (pressure and temperature), positive shutoff, draining, and filling. The GRINNELL Flange-by-Flange Model CB800 Valve, available in sizes 2½" to 12" (65mm to 300mm), is composed of cast iron.

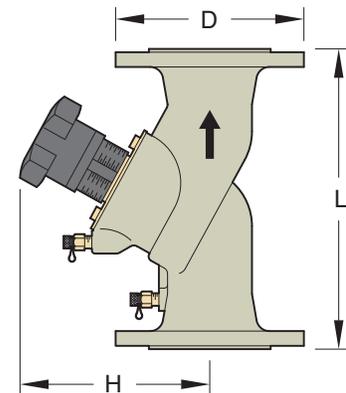
The CB800 valve serves 5 functions:

- Throttling
- Measuring differential pressure
- Draining
- Filling
- Positive shutoff



Pipe Size		Dimensions - Inches <i>mm</i>			Approx. Weight Lbs. <i>kg</i>	Limits PSI/°F PN/°C	Handwheel Turns
Nominal Inches <i>mm</i>	O.D. Inches <i>mm</i>	L	H	D			
2½	2.875	11.4	7.4	7.3	18.7	235/300	8
65	73,0	290	188	185	13,5	16/150	
76,1mm	3.000	11.4	7.4	7.3	18.7	235/300	8
65	76,1	290	188	185	13,5	16/150	
3	3.500	12.2	8.0	7.9	39.6	235/300	8
80	88,9	310	203	200	18,0	16/150	
4	4.500	13.8	9.4	8.7	61.6	235/300	8
100	114,3	350	240	220	28,0	16/150	
139,7mm	5.500	15.7	11.1	9.8	89.1	235/300	8
125	139,7	400	283	250	40,5	16/150	
5	5.563	15.7	11.1	9.8	89.1	235/300	8
125	141,3	400	283	250	40,5	16/150	
165,1mm	6.500	18.9	11.2	11.2	113.3	235/300	8
150	165,1	480	285	285	51,5	16/150	
6	6.625	18.9	11.2	11.2	113.3	235/300	8
150	168,3	480	285	285	51,5	16/150	
8	8.625	23.6	18.4	13.4	284.9	235/300	12
200	219,1	600	467	340	129,5	16/150	
10	10.750	28.7	18.9	15.9	431.2	235/300	12
250	273,1	730	480	405	196,0	16/150	
12	12.750	33.5	20.3	18.1	580.8	235/300	12
300	323,9	850	515	460	264,0	16/150	

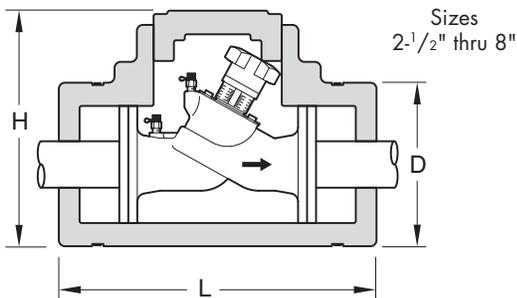
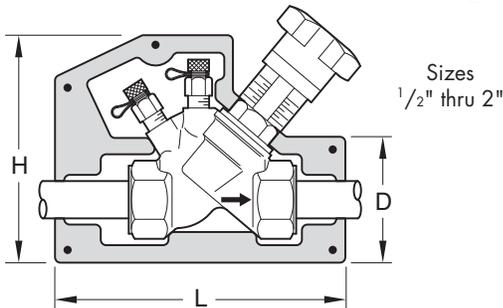
For information on larger sizes, contact GRINNELL Mechanical Products.
See circuit balancing valve specifications on pages 99.



Model CB800 Circuit Balancing Valves Insulation Kits

Tech Data Sheet: G450

10
YEAR
LIMITED
WARRANTY



The insulation shells have a CFC-free inner core made of polyurethane foam with a 0.06" (1,5mm) plastic coat. It consists of two double shells which are tightened by two metal straps.

Available for sizes 1/2" – 8" (15mm – 200mm). Specify size and end-connection type.

Pipe Size		Dimensions - Inches mm			Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	D	H	L	
1/2	0.840	2.72	5.35	7.20	0.3
15	21,3	69	136	183	0.15
3/4	1.050	3.31	5.63	7.68	0.4
20	26,7	77	143	195	0.18
1	1.315	3.35	5.94	9.57	0.5
25	33,7	85	151	243	0.22
1 1/4	1.660	3.82	6.77	10.00	0.4
32	42,4	97	172	254	0.20
1 1/2	1.900	4.13	7.28	9.84	0.7
40	48,3	105	185	250	0.33
2	2.375	4.72	8.23	10.87	0.9
50	60,3	120	209	276	0.43
2 1/2	2.875	10.2	16.1	19.9	6.7
65	73,0	260	410	505	3.06
3	3.500	11.0	16.3	20.9	7.2
80	88,9	280	415	530	3.25
4	4.500	12.6	20.5	22.8	11.4
100	114,3	320	520	580	5.16
5	5.563	14.2	22.1	24.4	11.6
125	141,3	360	560	620	5.24
6	6.625	15.7	23.6	28.7	13.2
150	168,3	400	600	730	5.97
8	8.625	17.6	30.0	31.5	◆
200	219,1	450	760	800	-

For information on larger sizes, contact GRINNELL Mechanical Products.
◆ Contact GRINNELL Mechanical Products for details.

CIRCUIT BALANCING VALVES

Model CB800 Circuit Balancing Valves MC2 Measuring Computer

Tech Data Sheet: G450

10
YEAR
LIMITED
WARRANTY



The GRINNELL Model MC2 computer is a hand-held computer-balancing instrument designed to measure the flow in GRINNELL Balancing Valves from 1/2" – 12" (15mm – 300mm). The GRINNELL Model MC2 computer:

- Automatically calculates the flow rate for a valve.
- Measures differential pressure and temperature.
- Compares the actual and nominal flow values.
- Displays the required presetting value.

All results may be saved in the hand-held computer and can be downloaded to a PC at a later time.

The easy-to-operate touch button keypad protects against water and dirt particles. The hand-held computer is supplied with a rechargeable power pack. All parts of the hand-held computer are stored in a convenient carrying case.

Note: Only available in select regions, contact GRINNELL Mechanical Products.



Accessories Table of Contents



Figure S853
"Y" Strainers
Page 107



Figure S810
Suction Diffusers
Pages 108 - 109



Figure S855
Tee Strainers
Page 110

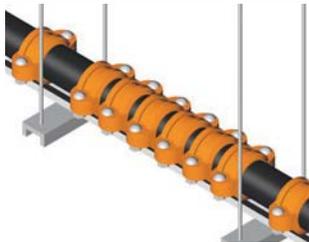


Figure 7550
Expansion Joints
Pages 111 - 116

GRINNELL accessories are designed to provide protection for Mechanical piping system equipment. GRINNELL Suction Diffusers and Strainers reduce maintenance time and labor and allow easy access to the piping system.

Figure S853 "Y" Strainers

Tech Data Sheet: G420

10
YEAR
LIMITED
WARRANTY

The GRINNELL Figure S853 "Y" Strainer is rated for 640 psi (44,1 bar) at 100°F (38°C) and 150 psi (10,3 bar) at 565°F (296°C). The "Y" Strainer provides economical strainer protection for piping equipment such as pumps, meters, valves, compressors, and traps. The inlet and outlet ends are suitable for installation with Figure 705, 707, and 772 Couplings.

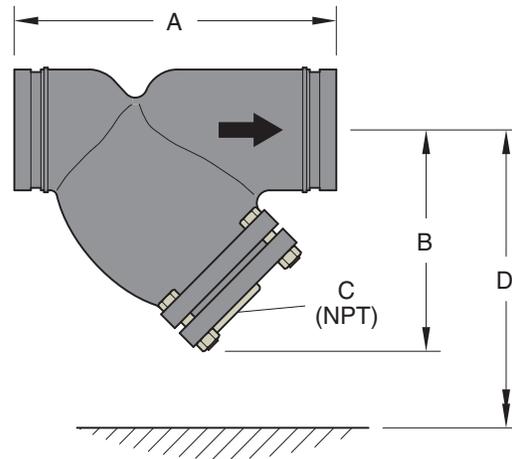
The Figure S853 "Y" Strainer screen has the following standard perforations:

- Sizes 2" – 4" (50mm – 100mm) = 1/16" (1,6mm)
- Sizes 5" – 12" (125mm – 300mm) = 1/8" (3,2mm)

All covers have an NPT blow-off outlet (pipe plugs not included) and recessed seat in the cover to ensure screen alignment.

Self-cleaning occurs by opening the valve (not supplied) connected to the blow-off outlet. Indicate when ordering strainers that are mounted in vertical piping so that the cover will be rotated to position the blow-off at the lowest point.

Note: Pressure and temperature can be limited by gasket material. Contact GRINNELL Mechanical Products.



MATERIAL SPECIFICATIONS

Ductile Iron Body and Cover Specifications

- ASTM A 536, Grade 65-45-12 – Standard specification for ductile iron castings
- Tensile strength, minimum 65,000 psi (4481,6 bar)
- Yield strength, minimum 45,000 psi (3102,6 bar)
- Elongation in 2" (50mm), minimum 12%

Screen

- Type 304 Stainless Steel ASTM A 240. (Other alloys are available, contact GRINNELL Mechanical Products)

Gasket

- Non-asbestos

Coating

- Black enamel paint

Performance

- Pressure drop, contact GRINNELL Mechanical Products.

Pipe Size		Dimensions - Inches mm				Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C*	D Screen Removal	
2	2.375	7.88	5.25	0.50	7.00	12.0
50	60,3	200,2	133,4	12,7	177,8	5,4
2½	2.875	10.00	6.50	1.00	9.75	18.0
65	73,0	254,0	165,1	25,4	247,7	8,2
3	3.500	10.13	7.00	1.00	10.00	23.0
80	88,9	257,3	177,8	25,4	254,0	10,4
4	4.500	12.13	8.25	1.50	12.00	42.0
100	114,3	308,1	209,6	38,1	304,8	19,1
5	5.563	15.63	11.25	2.00	17.00	80.0
125	141,3	397,0	285,8	50,8	431,8	36,3
6	6.625	18.50	13.50	2.00	20.00	112.0
150	168,3	469,9	342,9	50,8	508,0	50,8
8	8.625	21.63	15.50	2.00	22.75	205.0
200	219,1	549,4	393,7	50,8	577,9	93,0
10	10.750	29.13	19.25	2.00	29.25	277.0
250	273,1	739,8	489,0	50,8	743,0	125,6
12	12.750	33.75	22.88	2.00	35.24	470.0
300	323,9	857,3	581,0	50,8	895,4	213,2

* Blow-off outlet threads conforming to BSP are available upon request. Contact GRINNELL Mechanical Products.

For information on larger sizes, contact GRINNELL Mechanical Products.

Figure S810 Suction Diffusers

(Page 1 of 2)

Tech Data Sheet: G410

10
YEAR
LIMITED
WARRANTY



The GRINNELL Figure S810 Suction Diffuser is compact and rugged for direct mounting to the suction side of a pump in either a horizontal or vertical position. In addition to removing foreign particles, this diffuser also provides proper flow conditions to the pump. Where space is limited, this diffuser can be used to replace the straight pipe normally required to reduce turbulence.

The GRINNELL Figure S810 Suction Diffuser's permanent perforated stainless steel screen helps remove foreign particles. The inlet end is suitable for installation with GRINNELL Couplings. The outlet end is provided with a 150# ANSI flat face flange. Integral straightening vanes in the diffuser outlet reduce turbulence so that stress and erosion on the pump is minimized.

Maximum working pressure is 300 psi (20,7 bar) at 100°F (38°C) and 165 psi (11,4 bar) at 300°F (149°C).

Note: Pressure and temperature can be limited by O-ring material. Contact GRINNELL Mechanical Products.

MATERIAL SPECIFICATIONS

Body and Cover

- Ductile iron conforming to ASTM A 126B

Knobs

- Ductile iron conforming to ASTM A 536, Grade 65-45-12 for sizes 3" x 2" thru 10" x 8" (80mm x 50mm thru 250mm x 200mm)
Stud/nuts carbon steel conforming to ASTM A 193-4, for sizes 10" x 10" (250mm x 250mm) and larger

Screen

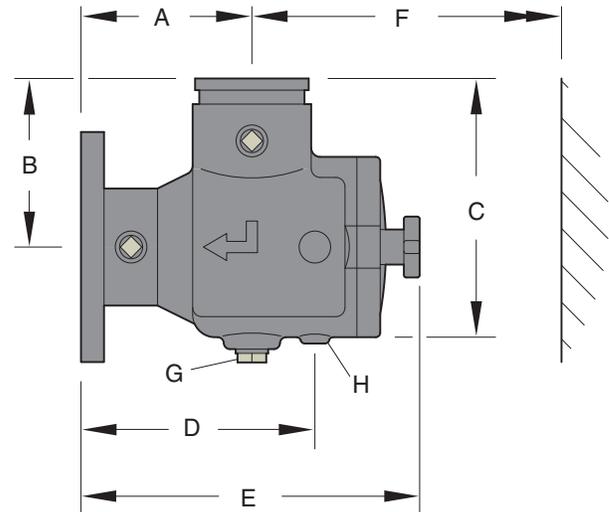
- $\frac{5}{32}$ " (4,0mm) perforated type 304 stainless steel for sizes 3" x 2" thru 6" x 6" (80mm x 50mm thru 150mm x 150mm);
- $\frac{1}{8}$ " (3,2mm) perforated type 304 stainless steel for sizes 8" x 5" (200 x 125mm) and larger
- Sleeve is 20 mesh type 304 stainless steel

Coating

- Black enamel paint

Performance

- Pressure drop, contact GRINNELL Mechanical Products.



Pipe Size		Dimensions - Inches mm								Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	E	F Screen Removal	G Plug NPT	H Pipe Support ID	
2 x 2	2.375 x 2.375	4.50	4.50	6.69	6.13	10.19	8.81	0.75	0.824	19
50 x 50	60,3 x 60,3	114,3	114,3	169,9	155,7	258,8	223,8	20	20,9	8,6
2½ x 2	2.875 x 2.375	5.00	5.00	7.50	6.56	10.88	9.13	0.75	1.38	20
65 x 50	73,0 x 60,3	127,0	127,0	190,5	166,6	276,4	231,9	20	35,1	9,1
2½ x 2½	2.875 x 2.875	5.00	5.00	7.50	6.56	10.88	9.13	0.75	1.38	22
65 x 65	73,0 x 73,0	127,0	127,0	190,5	166,6	276,4	231,9	20	35,1	10,0
3 x 2	3.500 x 2.375	5.50	5.50	8.44	7.38	11.56	9.63	0.75	1.38	38.0
80 x 50	88,9 x 60,3	139,7	139,7	214,4	187,5	293,6	244,6	20	35,1	17,2
3 x 2½	3.500 x 2.875	5.50	5.50	8.44	7.38	11.56	9.63	0.75	1.38	39.0
80 x 65	88,9 x 73,0	139,7	139,7	214,4	187,5	293,6	244,6	20	35,1	17,7

Figure S810 Suction Diffusers

(Page 2 of 2)

Tech Data Sheet: G410



Pipe Size		Dimensions - Inches mm								Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	E	F Screen Removal	G Plug NPT	H Pipe Support ID	
3 x 3	3.500 x 3.500	5.50	5.50	8.44	7.38	11.56	9.63	0.75	1.38	40.0
80 x 80	88,9 x 88,9	139,7	139,7	214,4	187,5	293,6	244,6	20	35,1	18,1
4 x 2	4.500 x 2.375	5.75	5.75	9.13	7.63	11.81	11.18	0.75	1.38	48.0
100 x 50	114,3 x 60,3	146,1	146,1	231,9	193,8	300,0	284,0	20	35,1	21,8
4 x 2½	4.500 x 2.875	6.50	6.50	10.48	8.75	13.13	9.63	1.00	1.38	49.0
100 x 65	114,3 x 73,0	165,1	165,1	266,2	222,3	333,5	244,6	25	35,1	22,2
4 x 3	4.500 x 3.500	6.50	6.81	10.44	8.75	13.13	11.50	1.00	1.38	50.0
100 x 80	114,3 x 88,9	165,1	173,0	265,2	222,3	333,5	292,1	25	35,1	22,7
4 x 4	4.500 x 4.500	6.50	6.81	10.44	8.75	13.13	11.50	1.00	1.38	52.0
100 x 100	114,3 x 114,3	165,1	173,0	265,2	222,3	333,5	292,1	25	35,1	23,6
5 x 3	5.563 x 3.500	6.50	6.50	10.48	8.75	13.13	11.50	1.00	1.38	94.0
125 x 80	141,3 x 88,9	165,1	165,1	266,2	222,3	333,5	292,1	25	35,1	42,6
5 x 4	5.563 x 4.500	6.50	6.50	11.94	10.00	15.75	14.00	1.00	1.38	96.0
125 x 100	141,3 x 114,3	165,1	165,1	303,3	254,0	400,1	355,6	25	35,1	43,5
5 x 5	5.563 x 5.563	7.50	7.50	11.94	10.00	15.75	14.88	1.00	1.38	101.0
125 x 125	141,3 x 141,3	190,5	190,5	303,3	254,0	400,1	378,0	25	35,1	45,8
6 x 3	6.625 x 3.500	8.00	8.00	13.31	10.50	16.88	16.56	1.00	1.38	103.0
150 x 80	168,3 x 88,9	203,2	203,2	338,1	266,7	428,8	420,6	25	35,1	46,7
6 x 4	6.625 x 4.500	8.00	8.00	13.31	10.50	16.88	16.56	1.00	1.38	106.0
150 x 100	168,3 x 114,3	203,2	203,2	338,1	266,7	428,8	420,6	25	35,1	48,1
6 x 5	6.625 x 5.563	8.00	8.00	13.31	10.50	16.88	16.56	1.00	1.38	110.0
150 x 125	168,3 x 141,3	203,2	203,2	338,1	266,7	428,8	420,6	25	35,1	49,9
6 x 6	6.625 x 6.625	8.00	8.00	13.31	10.50	16.88	16.56	1.00	1.38	113.0
150 x 150	168,3 x 168,3	203,2	203,2	338,1	266,7	428,8	420,6	25	35,1	51,2
8 x 5	8.625 x 5.563	9.00	9.00	14.38	11.50	17.88	16.88	1.00	1.38	135.0
200 x 125	219,1 x 141,3	228,6	228,6	365,3	292,1	454,2	428,8	25	35,1	61,2
8 x 6	8.625 x 6.625	9.00	10.00	15.31	11.50	17.88	16.88	1.00	1.38	137.0
200 x 150	219,1 x 168,3	228,6	254,0	388,9	292,1	454,2	428,8	25	35,1	62,1
8 x 8	8.625 x 8.625	9.00	10.00	16.31	11.75	20.75	22.88	1.25	1.38	222.0
200 x 200	219,1 x 219,1	228,6	254,0	414,3	298,5	527,1	581,2	32	35,1	100,7
10 x 6	10.750 x 6.625	9.48	9.48	15.50	11.94	18.31	16.88	1.25	1.38	230.0
250 x 150	273,1 x 168,3	240,8	240,8	393,7	303,3	465,1	428,8	32	35,1	104,3
10 x 8	10.750 x 8.625	9.00	11.75	18.44	11.75	20.75	22.88	1.25	1.38	236.0
250 x 200	237,1 x 219,1	228,6	298,5	468,4	298,5	527,1	581,2	32	35,1	107,0
10 x 10	10.750 x 10.750	11.00	11.75	20.00	14.00	26.38	30.75	1.25	1.38	343.0
250 x 250	273,1 x 273,1	279,4	298,5	508,0	355,6	670,1	781,1	32	35,1	155,6
12 x 8	12.000 x 8.625	9.00	9.00	19.63	11.75	20.75	22.88	1.25	1.38	357.0
300 x 200	323,9 x 219,1	228,6	228,6	498,6	298,5	527,1	581,2	32	35,1	161,9
12 x 10	12.000 x 10.750	11.00	12.88	21.00	14.00	26.38	30.75	1.25	1.38	357.0
300 x 250	323,9 x 273,1	279,4	327,2	533,4	355,6	670,1	781,1	32	35,1	161,9
12 x 12	12.000 x 12.000	12.00	12.00	22.06	15.25	26.18	30.75	1.25	1.38	357.0
300 x 300	323,9 x 323,9	304,8	304,8	560,3	387,4	665,0	781,1	32	35,1	161,9
14 x 10	14.000 x 10.750	11.00	11.00	22.50	14.00	26.38	30.75	1.25	1.38	507.0
350 x 250	355,6 x 273,1	279,4	279,4	571,5	355,6	670,1	781,1	32	35,1	229,9
14 x 12	14.000 x 12.000	12.00	12.00	22.38	15.25	26.18	31.00	1.25	1.38	601.0
350 x 300	355,6 x 323,9	304,8	304,8	568,5	387,4	665,0	787,4	32	35,1	272,6
14 x 14	14.000 x 14.000	14.00	14.00	25.00	17.50	27.75	33.13	2.00	1.38	706.0
350 x 350	355,6 x 355,6	355,6	355,6	635,0	444,5	704,9	841,5	50	35,1	320,2
16 x 14	16.000 x 14.000	14.00	14.00	26.00	17.50	27.88	31.00	2.00	1.38	750.0
400 x 350	406,4 x 355,6	355,6	355,6	660,4	444,5	708,2	787,4	50	35,1	340,1

For information on larger sizes, contact GRINNELL Mechanical Products.



Figure S855 Tee Strainers

Tech Data Sheet: G430



The Tee Strainer is designed to remove particles from pipelines where a compact, accessible strainer is needed for the protection of pumps, meters, valves, and similar mechanical equipment. The inlet and outlet ends are suitable for installation with GRINNELL Couplings that provide quick and easy installation.

The cover is secured by a GRINNELL Figure 772 Coupling for easy access to the screen. The cover is tapped and plugged to allow for draining.

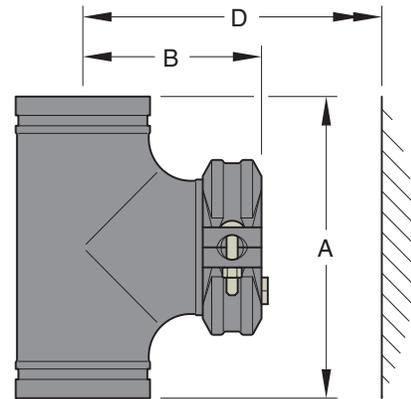
The GRINNELL Figure S855 Tee Strainer is rated for the following pressures:

- Sizes 2" – 5" (50mm – 125mm): 750 psi (51,7 bar) at 100°F (38°C)
- Size 6" (150mm): 700 psi (48,3 bar) at 100°F (38°C)
- Size 8" (200mm): 600 psi (41,7 bar) at 100°F (38°C)
- Size 10" (250mm): 500 psi (34,5 bar) at 100°F (38°C)
- Size 12" (300mm): 400 psi (27,6 bar) at 100°F (38°C)

The Figure S855 Tee Strainer perforated screen has the following perforations:

- Sizes 2" – 6" (50mm – 150mm) = 1/8" (3,2mm)
- Sizes 8" – 12" (200mm – 300mm) = 5/32" (4,0mm)

Note: Other perforation screen sizes are available upon request. Specify particle retention size when ordering nonstandard screens.



MATERIAL SPECIFICATIONS

Ductile Iron Body and Cover

- ASTM A 395, Grade 60-40-18 or A 536 – Standard specification for ductile iron castings
- Tensile strength, minimum 65,000 psi (4481,6 bar)
- Yield strength, minimum 45,000 psi (3102,6 bar)
- Elongation in 2" (50mm), minimum 12%

Screen

- 20 gauge type 304 stainless steel ASTM A 240 for Sizes 2" – 6" (50mm – 150mm)
- 18 gauge type 304 stainless steel ASTM A 240 for Sizes 8" – 12" (200mm – 300mm)

Coating

- Black enamel paint
- Orange – Non-lead paint
- Red – Non-lead paint (optional, regional)

Performance

- Pressure drop, contact GRINNELL Mechanical Products.

Pipe Size		Dimensions - Inches mm			Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	D Screen Removal	
2	2.375	6.50	4.25	7.50	6.0
50	60,3	165,0	108,0	191,0	2,7
2½	2.875	7.50	4.75	8.75	11.0
65	73,0	191,0	110,0	222,0	5,0
3	3.500	8.50	5.25	10.00	12.0
80	88,9	216,0	133,0	254,0	5,4
4	4.500	10.00	6.13	12.00	20.0
100	114,3	254,0	156,0	305,0	9,0
5	5.563	11.00	6.63	13.50	30.0
125	141,3	279,0	168,0	342,0	13,0
6	6.625	13.00	7.63	16.00	40.0
150	168,3	330,0	194,0	406,0	18,0
8	8.625	15.50	9.13	19.44	81.0
200	219,1	394,0	232,0	494,0	36,0
10	10.750	18.00	10.38	22.94	126.0
250	273,0	457,0	264,0	583,0	57,0
12	12.750	20.00	11.38	25.94	174.0
300	323,9	508,0	289,0	659,0	79,0

For information on larger sizes, contact GRINNELL Mechanical Products.

GRINNELL Grooved Expansion Joints are custom-designed, thermal movement solutions that utilize the proven design characteristics of GRINNELL Flexible Couplings.

Expansion joints are designed to be used in both hot and cold applications. When pipe heats up, the expansion joint contracts to absorb the thermal expansion of the pipe. When pipe cools down, the expansion joint expands to absorb the thermal contraction of the pipe.

The expansion joints are factory fabricated and calibrated to the specific thermal movement conditions of the piping runs. The joints are manufactured from machined grooved nipples and GRINNELL Flexible Couplings, providing dependable, high pressure performance.

Expansion Joints should be anchored and guided in accordance with standard industry practices. Refer to the appropriate coupling data sheet for pressure/temperature ratings and materials of construction.

Nipples are manufactured from standard wall, A 53B black steel pipe.

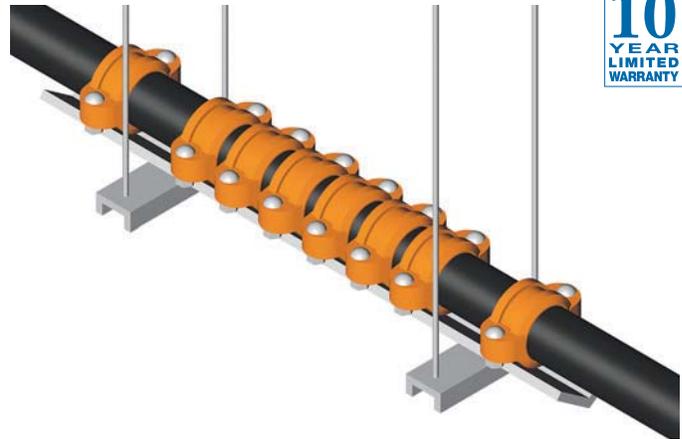
Figure 7550 Expansion joints are custom designed to your specifications. Contact GRINNELL Mechanical Services for additional information.

Figure 7550 Expansion Joint

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Tech Data Sheet: G460

10
YEAR
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WARRANTY



Ordering Procedure

GRINNELL Mechanical Products are available globally through a network of distribution centers. Visit www.grinnell.com for the nearest distributor. When placing an order, indicate the full product name.

Use the worksheet shown below to specify information required for ordering expansion joints.

Specify quantity, nominal pipe size, (ANSI or O.D.), figure number (Figure 7550 Flexible Coupling), and type of gasket:

- Grade "E" EPDM
- Grade "L" Silicone
- Grade "O" Fluoroelastomer
- Grade "T" Nitrile



Nominal Pipe Size 1 1/4" to 16" (32mm to 400mm): Inches mm				
Pipe Finish	<input type="checkbox"/> Black	<input type="checkbox"/> Galvanized	<input type="checkbox"/> Stainless Steel	
Coupling Finish	<input type="checkbox"/> Orange Paint	<input type="checkbox"/> RAL Red	<input type="checkbox"/> Galvanized	<input type="checkbox"/> Stainless Steel
Gasket Material*	<input type="checkbox"/> Grade "E" EPDM	<input type="checkbox"/> Grade "T" Nitrile	<input type="checkbox"/> Grade "O" Fluoroelastomer	<input type="checkbox"/> Grade "L" Silicone
Factory Preset	<input type="checkbox"/> Fully Expanded	<input type="checkbox"/> Fully Compressed	Intermediate** %	
Total Required Movement:	1.00"	1.25"	1.50"	1.75"

* These products are assembled with a silicone-based lubricant.
** For intermediate factory preset indicate percentage of movement from compressed position.

Figure 7550 Expansion Joint

(Page 2 of 6)

Tech Data Sheet: G460

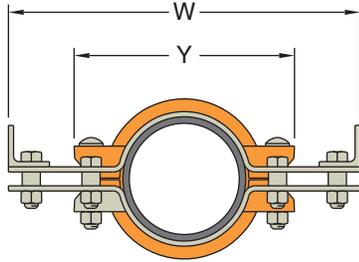


Figure 7550 Expansion Joints
Nominal Dimensions for End Elevation View

Pipe Size		Dimensions - Inches mm		Coupling Movement Capability Inches mm
Nominal Inches mm	O.D. Inches mm	Y Coupling Length	W Overall Width	
1¼	1.660	4.190	9.750	0.125
32	42,4	106,4	247,7	3,18
1½	1.900	4.440	9.625	0.125
40	48,3	112,8	244,5	3,18
2	2.375	4.880	10.875	0.125
50	60,3	124,0	276,2	3,18
2½	2.875	5.500	10.750	0.125
65	73,0	139,7	273,1	3,18
3	3.500	6.500	11.750	0.125
80	88,9	165,1	298,5	3,18
4	4.500	7.750	12.937	0.250
100	114,3	196,9	328,6	6,35
5	5.563	9.750	14.250	0.250
125	141,3	247,7	362,0	6,35
6	6.625	10.690	15.500	0.250
150	168,3	271,5	393,7	6,35
8	8.625	13.560	18.250	0.250
200	219,1	344,4	463,6	6,35
10	10.750	16.380	20.125	0.250
250	273,0	416,1	511,2	6,35
12	12.750	18.880	22.375	0.250
300	323,9	479,6	568,3	6,35
14	14.000	20.380	24.125	0.250
350	355,6	517,7	612,8	6,35
16	16.000	22.640	27.870	0.250
400	406,4	575,1	707,9	6,35

Refer to Technical Data Sheet G460 for additional dimensions and information.

ACCESSORIES

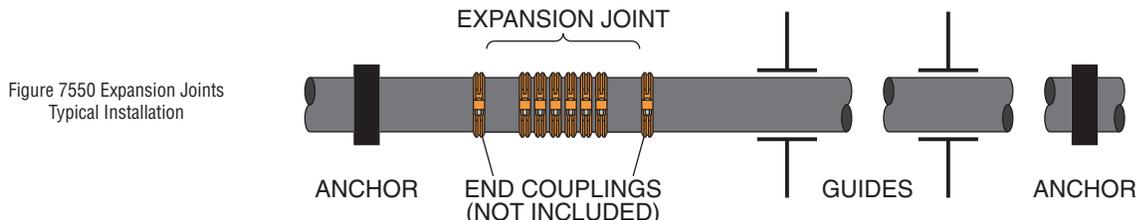
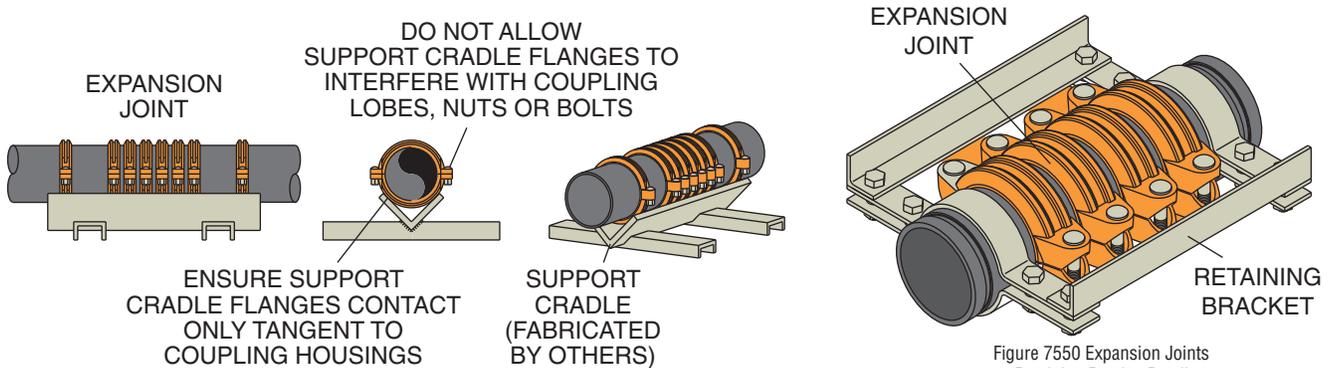


Figure 7550 Expansion Joint

(Page 3 of 6)

Tech Data Sheet: G460

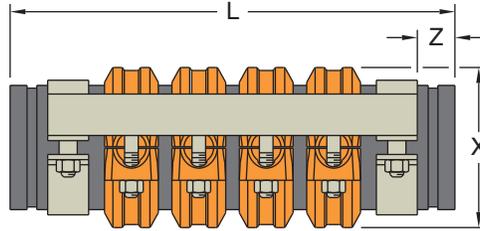


Figure 7550-1 Expansion Joints - 1" Total Movement Length
Nominal Dimensions for Side Elevation View

Nominal Pipe Size		Flexible* Coupling Figure / Quantity	X Coupling Height Inches mm	Z Tie Location Inches mm	L Compressed Length Inches mm	L Expanded Length Inches mm	Total Movement Capability Inches mm	Approx. Weight Lbs. kg
ANSI Inches mm	O.D. Inches mm							
1¼	1.660	705 / 8	2.560	1.25	26.625	27.625	1.000	26
32	42,4		65,02	31,75	676,27	701,67	25,40	11,8
1½	1.900	705 / 8	2.750	1.25	26.625	27.625	1.000	28
40	48,3		69,85	31,75	676,27	701,67	25,40	12,7
2	2.375	705 / 8	3.250	1.25	26.625	27.625	1.000	31
50	60,3		82,55	31,75	676,27	701,67	25,40	14,1
2½	2.875	705 / 8	3.690	1.25	26.625	27.625	1.000	37
65	73,0		93,73	31,75	676,27	701,67	25,40	16,8
3	3.500	705 / 8	4.380	1.25	26.625	27.625	1.000	49
80	88,9		111,25	31,75	676,27	701,67	25,40	22,2
4	4.500	705 / 4	5.690	1.25	17.500	18.500	1.000	36
100	114,3		144,53	31,75	444,50	469,90	25,40	16,3
5	5.563	705 / 4	6.880	1.25	17.500	18.500	1.000	53
125	141,3		174,75	31,75	444,50	469,90	25,40	24,0
6	6.625	705 / 4	7.940	1.25	17.500	18.500	1.000	59
150	168,3		201,68	31,75	444,50	469,90	25,40	26,8
8	8.625	705 / 4	10.190	1.375	19.125	20.125	1.000	104
200	219,1		258,83	34,93	488,95	511,17	25,40	47,2
10	10.750	705 / 4	12.690	1.375	21.500	22.500	1.000	179
250	273,0		322,33	34,93	546,10	571,50	25,40	81,2
12	12.750	705 / 4	14.940	1.375	21.500	22.500	1.000	235
300	323,9		379,48	34,93	546,10	571,50	25,40	106,6
14	14.000	707 / 4	16.670	1.500	23.125	24.125	1.000	305
350	355,6		423,42	38,10	587,40	612,77	25,40	138,4
16	16.000	707 / 4	18.830	1.500	24.125	25.125	1.000	371
400	406,4		478,28	38,10	612,77	638,17	25,40	168,2

* 1¼" - 8" Figure 405 Stainless Steel Couplings available upon request.

Figure 7550 Expansion Joint

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Tech Data Sheet: G460

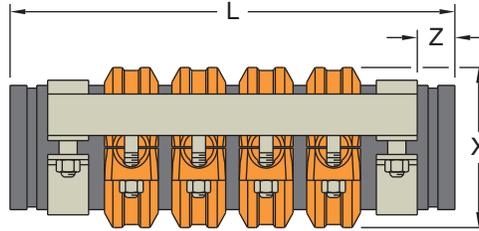


Figure 7550-13 Expansion Joints - 1 1/4" Total Movement Length

Nominal Dimensions for Side Elevation View

Nominal Pipe Size		Flexible* Coupling Figure / Quantity	X Coupling Height Inches mm	Z Tie Location Inches mm	L Compressed Length Inches mm	L Expanded Length Inches mm	Total Movement Capability Inches mm	Approx. Weight Lbs. kg
ANSI Inches mm	O.D. Inches mm							
1 1/4	1.660	705 / 10	2.560	1.25	31.375	32.625	1.250	31
32	42,4		65,02	31,75	796,92	828,67	31,75	14,1
1 1/2	1.900	705 / 10	2.750	1.25	31.375	32.625	1.250	33
40	48,3		69,85	31,75	796,92	828,67	31,75	15,0
2	2.375	705 / 10	3.250	1.25	31.375	32.625	1.250	37
50	60,3		82,55	31,75	796,92	828,67	31,75	16,8
2 1/2	2.875	705 / 10	3.690	1.25	31.375	32.625	1.250	45
65	73,0		93,73	31,75	796,92	828,67	31,75	20,4
3	3.500	705 / 10	4.380	1.25	31.375	32.625	1.250	59
80	88,9		111,25	31,75	796,92	828,67	31,75	26,8
4	4.500	705 / 5	5.690	1.25	20.000	21.250	1.250	43
100	114,3		144,53	31,75	508,00	539,75	31,75	19,5
5	5.563	705 / 5	6.880	1.25	20.000	21.250	1.250	64
125	141,3		174,75	31,75	508,00	539,75	31,75	29,0
6	6.625	705 / 5	7.940	1.25	20.000	21.250	1.250	70
150	168,3		201,68	31,75	508,00	539,75	31,75	31,8
8	8.625	705 / 5	10.190	1.375	22.000	23.250	1.250	125
200	219,1		258,83	34,93	558,80	590,55	31,75	56,7
10	10.750	705 / 5	12.690	1.375	24.500	25.750	1.250	215
250	273,0		322,33	34,93	622,30	654,05	31,75	97,5
12	12.750	705 / 5	14.940	1.375	24.500	25.750	1.250	281
300	323,9		379,48	34,93	622,30	654,05	31,75	127,5
14	14.000	707 / 5	16.670	1.500	26.500	27.750	1.250	365
350	355,6		423,42	38,10	673,10	704,85	31,75	138,4
16	16.000	707 / 5	18.830	1.500	27.500	28.750	1.250	441
400	406,4		478,28	38,10	698,50	730,25	31,75	168,2

* 1 1/4" - 8" Figure 405 Stainless Steel Couplings available upon request.

Figure 7550 Expansion Joint

(Page 5 of 6)

Tech Data Sheet: G460

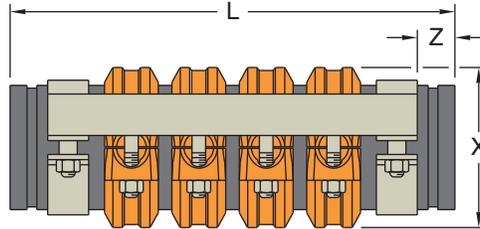


Figure 7550-15 Expansion Joints - 1½" Total Movement Length

Nominal Dimensions for Side Elevation View

Nominal Pipe Size		Flexible* Coupling Figure / Quantity	X Coupling Height Inches mm	Z Tie Location Inches mm	L Compressed Length Inches mm	L Expanded Length Inches mm	Total Movement Capability Inches mm	Approx. Weight Lbs. kg
ANSI Inches mm	O.D. Inches mm							
1¼	1.660	705 / 12	2.560	1.25	36.125	37.625	1.500	37
32	42,4		65,02	31,75	917,57	955,68	38,10	16,8
1½	1.900	705 / 12	2.750	1.25	36.125	37.625	1.500	39
40	48,3		69,85	31,75	917,57	955,68	38,10	17,7
2	2.375	705 / 12	3.250	1.25	36.125	37.625	1.500	43
50	60,3		82,55	31,75	917,57	955,68	38,10	19,5
2½	2.875	705 / 12	3.690	1.25	36.125	37.625	1.500	52
65	73,0		93,73	31,75	917,57	955,68	38,10	23,6
3	3.500	705 / 12	4.380	1.25	36.125	37.625	1.500	69
80	88,9		111,25	31,75	917,57	955,68	38,10	31,3
4	4.500	705 / 6	5.690	1.25	22.500	24.000	1.500	50
100	114,3		144,53	31,75	571,50)	609,60)	38,10	22,7)
5	5.563	705 / 6	6.880	1.25	22.500	24.000	1.500	74
125	141,3		174,75	31,75	571,50	609,60	38,10	33,6
6	6.625	705 / 6	7.940	1.25	22.500	24.000	1.500	81
150	168,3		201,68	31,75	571,50	609,60	38,10	36,7
8	8.625	705 / 6	10.190	1.375	24.875	26.375	1.500	145
200	219,1		258,83	34,93	631,82	669,93	38,10	65,8
10	10.750	705 / 6	12.690	1.375	27.500	29.000	1.500	251
250	273,0		322,33	34,93	698,50	736,60	38,10	113,8
12	12.750	705 / 6	14.940	1.375	27.500	29.000	1.500	328
300	323,9		379,48	34,93	698,50	736,60	38,10	148,8
14	14.000	707 / 6	16.670	1.500	29.875	31.375	1.500	425
350	355,6		423,42	38,10	758,82	796,93	38,10	192,8
16	16.000	707 / 6	18.830	1.500	30.875	32.375	1.500	512
400	406,4		478,28	38,10	784,22	822,32	38,10	232,2

* 1¼" - 8" Figure 405 Stainless Steel Couplings available upon request.

Figure 7550 Expansion Joint

(Page 6 of 6)

Tech Data Sheet: G460

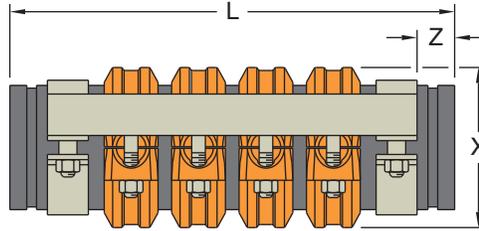
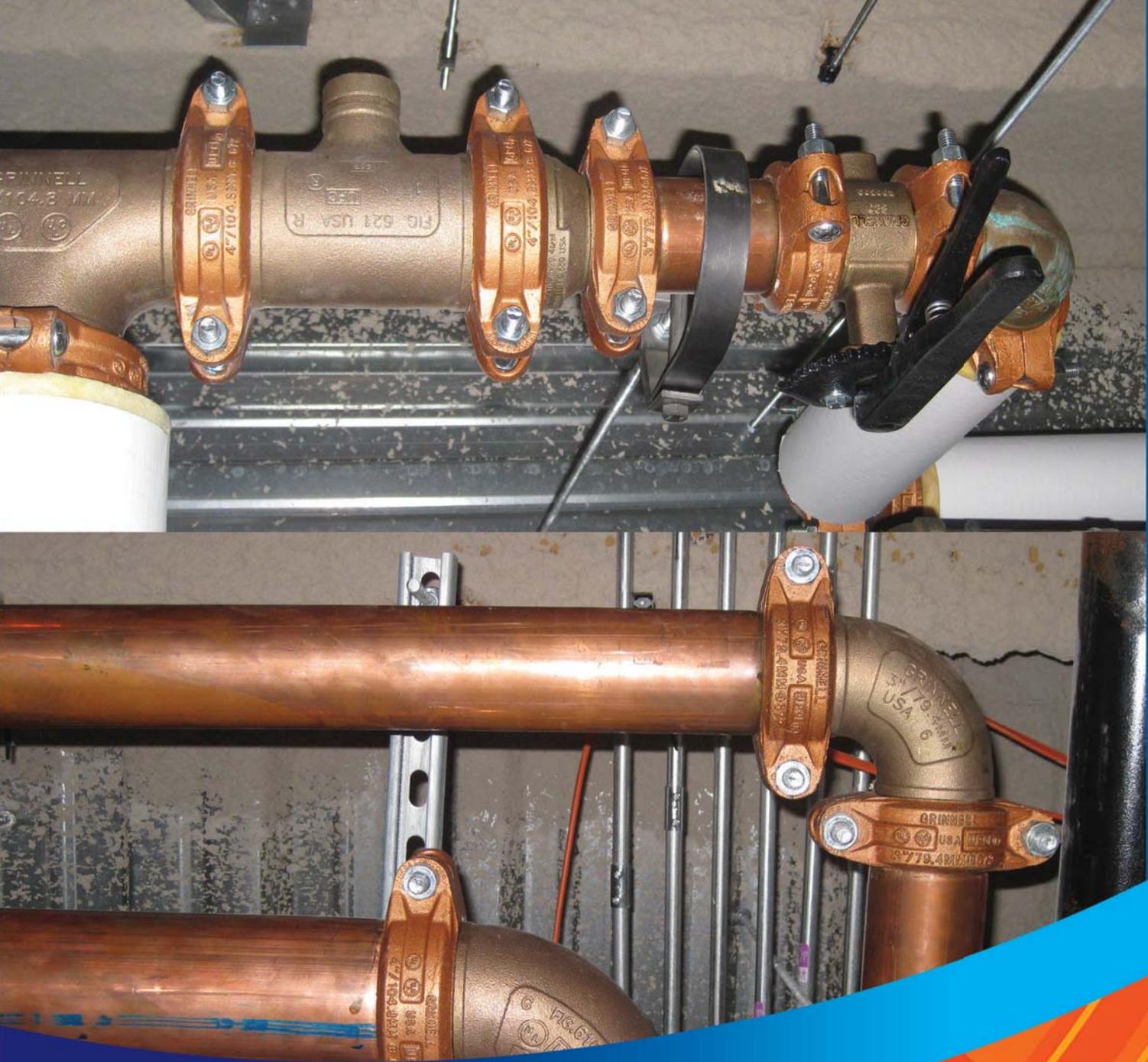


Figure 7550-75 Expansion Joints - 1³/₄" Total Movement Length
Nominal Dimensions for Side Elevation View

Nominal Pipe Size		Flexible* Coupling Figure / Quantity	X Coupling Height Inches mm	Z Tie Location Inches mm	L Compressed Length Inches mm	L Expanded Length Inches mm	Total Movement Capability Inches mm	Approx. Weight Lbs. kg
ANSI Inches mm	O.D. Inches mm							
1 ¹ / ₄ 32	1.660 42,4	705 / 14	2.560 65,02	1.25 31,75	40.875 1038,22	42.625 1082,67	1.750 44,45	42 19,0
1 ¹ / ₂ 40	1.900 48,3		2.750 69,85					
2 50	2.375 60,3	705 / 14	3.250 82,55	1.25 31,75	40.875 1038,22	42.625 1082,67	1.750 44,45	49 22,2
2 ¹ / ₂ 65	2.875 73,0		3.690 93,73					
3 80	3.500 88,9	705 / 14	4.380 111,25	1.25 31,75	40.875 1038,22	42.625 1082,67	1.750 44,45	79 35,8
4 100	4.500 114,3		5.690 144,53					
5 125	5.563 141,3	705 / 7	6.880 174,75	1.25 31,75	25.000 635,00	26.750 679,45	1.750 44,45	84 38,1
6 150	6.625 168,3		7.940 201,68					
8 200	8.625 219,1	705 / 7	10.190 258,83	1.375 34,93	27.750 704,85	29.500 749,30	1.750 44,45	166 75,3
10 250	10.750 273,0		12.690 322,33					
12 300	12.750 323,9	705 / 7	14.940 379,48	1.375 34,93	30.500 774,70	32.250 819,15	1.750 44,45	375 170,1
14 350	14.000 355,6		16.670 423,42					
16 400	16.000 406,4	707 / 7	18.830 478,28	1.500 38,10	33.250 844,55	35.000 889,00	1.750 44,45	486 220,5
			18.830 478,28					

* 1¹/₄" - 8" Figure 405 Stainless Steel Couplings available upon request.

ACCESSORIES



Copper Systems Table of Contents

GRINNELL Copper Grooved Systems are designed for joining copper tube size components 2" to 8" (DN 50 to DN 200) type K, L, M, and DWV. All couplings and fittings are rated for working pressures up to 300 psi (20,7 bar) depending on copper tubing size and type (see pressure rating chart).

	Figure 640 Pivot-Bolt Rigid Couplings Page 120		Figure 618 Reducing Tees Page 126
	Figure 672 Rigid Couplings Page 121		Figures 650 Concentric Reducers Page 127
	Figure 61 Flange Adapters Page 122		Figures 652 Concentric Reducers Page 127
	Figure 610 90° Elbows Page 123		Model B680 Butterfly Valves Page 128
	Figure 601 45° Elbows Page 123		Figure 407GT Dielectric Waterway Page 129
	Figure 619 Tees Page 124		Figure 407T Dielectric Waterway Page 129
	Figure 660 Caps Page 124		Figure 407GG Dielectric Waterway Transition Fitting Page 130
	Figure 621 Reducing Tees Page 125		Model 1039-66 Copper Roll Groover Page 130

Coupling Specifications

MATERIAL SPECIFICATIONS

The applicable material specifications for ductile iron and rubber gaskets apply:

Ductile Iron Housing Specifications

- ASTM A 536 – Standard Specification for Ductile Iron Castings Grade 65-45-12

Coatings

- Copper – Acrylic Enamel

Gasket Specifications

- **Tri-Seal Grade "EN" EPDM, NSF 61 Approved** compound, has a Copper color code, for potable water systems up to 180°F (82°C). Not recommended for petroleum service.
- **Grade "EHT" EPDM NSF-61 Certified** Center-Stop, Push-On Style gaskets for copper tubing systems, have a Red and Copper stripped color code. For closed-loop heating systems from -30°F to 250°F (-34°C to 120°C) and potable water systems up to 180°F (82°C). Recommended for use in low temperature and vacuum systems. They are not recommended for petroleum service.

Bolt/Nut Specifications

- **ANSI:** Carbon steel oval neck bolts and nuts are heat-treated and conform to the physical properties of ASTM A 183 Grade 2 and SAE J429 Grade 5 with a minimum tensile strength of 110,000 psi (7584 bar). Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 183 Grade 2 and SAE J995 Grade 5. Bolts and nuts are zinc-electroplated conforming to ASTM B 633. Carbon Steel pivot bolts are heat treated with a minimum tensile strength of 130,000 psi (8963 bar).
- **Metric:** Carbon steel oval neck track head bolts (Gold color coded) are heat treated and conform to the physical properties of ASTM F 568 M with a minimum tensile strength of 760 MPa. Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 563 M Class 9. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.
- Stainless steel bolts and nuts are available upon request.



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com

MATERIAL SPECIFICATIONS

Cast Copper Alloy Fittings

- Copper Alloy Conforming to CDA C89833
- UL Classified in Accordance with ANSI/NSF61 and Bears the UL Water Quality Mark

Wrot Copper Fittings

- ASTM B 75 C12200; Wall Thickness Per ASTM B 88 Type L (For Figure 652 Groove by Copper Fittings Only)

Fitting Specifications

Tech Data Sheet: G520



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com



Cast fittings in 90° and 45° elbows, tees, caps, concentric reducers, and reducing tees are cast with a copper alloy conforming to CDA C89833. Cast fittings are stronger and more durable than wrot copper fittings and are less susceptible to damage in transit or during installation. Reducing fittings are available with Groove x Groove or Groove x Cup End configurations.

Fittings are standard radius, full flow, designed for installation with GRINNELL Copper System Figure 640 Couplings, Figure 672 Couplings, or Figure 61 Flange Adapters.

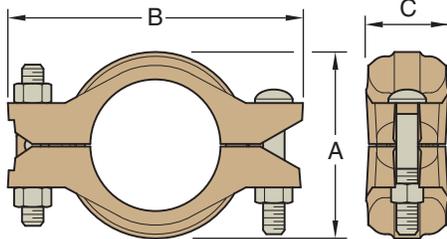
Fittings are rated at the pressure rating of the Figure 640 Couplings, Figure 672 Couplings, or Figure 61 Flange Adapters being used.

Refer to back cover for country-specific customer care numbers.

Figure 640 Pivot-Bolt Rigid Installation-Ready Coupling

Tech Data Sheet: G512

10
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The GRINNELL Figure 640 Pivot-Bolt Rigid Coupling joins rolled grooved, hard-drawn copper tubing systems (CTS). It provides a rigid joint by firmly gripping the entire circumference of the copper tube groove.

GRINNELL Pivot-Bolt Couplings have been tested and proven to install in less than half the time of other standard grooved couplings. Simply push the gasket onto the pipe, swing the coupling body over the gasket, and tighten only one bolt. In comparison with other installation-ready couplings, the GRINNELL Pivot-Bolt Coupling allows clear visual confirmation that the gasket is properly seated on the gasket sealing surfaces.

The Figure 640 Pivot-Bolt Rigid Coupling is capable of pressures up to 300 psi (20,7 bar).

Pipe Size		Dimensions			Pivot Bolt Size Dia. x Lg.	Coupling Bolt Size Dia. x Lg.	Approx. Weight lbs kg
Nominal Inches mm	Copper Tubing O.D. Inches mm	A Inches mm	B Inches mm	C Inches mm			
2	2.125	3.34	5.86	1.90	1/2 x 3 3/4	1/2 x 3 5/8	3.1
50	54,0	84,9	148,8	48,3	—	—	1,4
2 1/2	2.625	3.85	6.36	1.90	1/2 x 3 3/4	1/2 x 3 5/8	3.2
65	66,7	97,8	161,5	48,3	—	—	1,5
3	3.125	4.35	6.86	1.91	1/2 x 3 3/4	1/2 x 3 5/8	3.6
80	79,4	110,5	174,2	48,5	—	—	1,6
4	4.125	5.48	7.99	1.93	1/2 x 3 3/4	1/2 x 3 5/8	4.2
100	104,8	139,2	202,9	49,0	—	—	1,9
5	5.125	6.57	9.73	2.00	5/8 x 4 1/2	5/8 x 4 1/2	6.9
125	130,7	166,9	247,1	50,8	—	—	3,1
6	6.125	7.57	10.73	2.02	5/8 x 4 1/2	5/8 x 4 1/2	7.5
150	155,6	192,3	272,5	51,3	—	—	3,4
8	8.125	9.57	12.73	2.04	5/8 x 4 1/2	5/8 x 4 1/2	8.8
200	206,4	243,1	323,3	51,8	—	—	4,0

See page 119 for specifications and pages 191 - 198 for gasket information.

Performance Pressure

Pipe Size		Type "K" ASTM B-88			Type "L" ASTM B-88			Type "M" ASTM B-88			DWV ASTM B-306		
Nominal Size Inches mm	Copper Tubing O.D. Inches mm	Wall Thick Inches mm	Max. Working Pressure psi/bar	Max. End Load lbs/kN	Wall Thick Inches mm	Max. Working Pressure psi/bar	Max. End Load lbs/kN	Wall Thick Inches mm	Max. Working Pressure psi/bar	Max. End Load lbs/kN	Wall Thick Inches mm	Max. Working Pressure psi/bar	Max. End Load lbs/kN
2	2.125	0.083	300	1.065	0.070	300	1.065	0.058	250	890	—	—	—
50	54,0	2,1	20,7	4,74	1,8	20,7	4,74	1,5	17,2	3,96	—	—	—
2 1/2	2.625	0.095	300	1.625	0.080	300	1.625	0.065	250	1.350	—	—	—
65	66,7	2,4	20,7	7,23	2,0	20,7	7,23	1,7	17,2	6,01	—	—	—
3	3.125	0.109	300	2.300	0.090	300	2.300	0.072	250	1.415	0.045	100	765
80	79,4	2,8	20,7	10,23	2,3	20,7	10,23	1,8	17,2	6,30	1,1	6,9	3,40
4	4.125	0.134	300	4.005	0.110	300	4.005	0.095	250	3.340	0.058	100	1.335
100	104,8	3,4	20,7	17,82	2,8	20,7	17,82	2,4	17,2	14,86	1,5	6,9	5,94
5	5.125	0.160	300	6.190	0.125	300	6.190	0.109	200	4.125	0.072	100	2.060
125	130,7	4,1	20,7	27,55	3,2	20,7	27,55	2,8	13,8	18,36	1,8	6,9	9,17
6	6.125	0.192	300	8.840	0.140	300	8.840	0.122	200	5.890	0.083	100	2.945
150	155,6	4,9	20,7	39,34	3,6	20,7	39,34	3,1	13,8	26,21	2,1	6,9	13,10
8	8.125	0.271	300	15.550	0.200	300	15.550	0.170	200	10.370	0.109	100	5.180
200	206,4	6,9	20,7	69,2	5,1	20,7	69,20	4,3	13,8	46,10	2,8	6,9	23,0

Figure 672 Rigid Coupling

Tech Data Sheet: G510



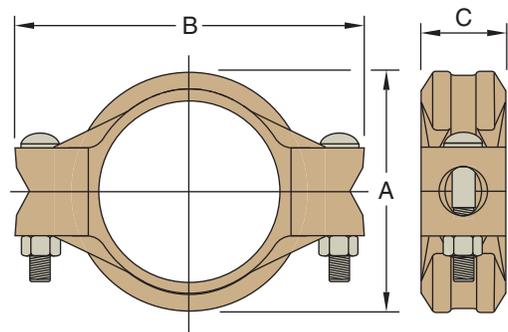
The GRINNELL Figure 672 Rigid Coupling, size range 2" to 8" (50mm - 200mm) is capable of pressures up to 300 PSI (20,7 bar) depending on copper tubing size and type. It provides a rigid joint by firmly gripping along the circumference of the copper tube grooves. The GRINNELL Figure 672 Coupling is supplied with a NSF61 approved grade EPDM EN tri-seal gasket.

GRINNELL Figure 672 Rigid Couplings are a proven dependable method of joining copper tubing and are an economical alternative to soldering (sweating) joints and can be used on type K, L, M, DWV copper tube.



Pipe Size		Max.* Gap Inches mm	Dimensions			Coupling Bolts		Approx. Weight lbs kg
Nominal Inches mm	Copper Tubing O.D. Inches mm		A Inches mm	B Inches mm	C Inches mm	Qty.	Size Inches	
2	2.125	0.06	3.09	4.65	1.76	2	3/8 x 2 1/4	1.7
50	54,0	1,5	78,6	118,1	44,7	2	—	0,8
2 1/2	2.625	0.06	3.59	5.56	1.76	2	3/8 x 2 1/4	1.9
65	66,7	1,5	91,3	141,2	44,7	2	—	0,9
3	3.125	0.06	4.12	6.25	1.76	2	1/2 x 3	3.1
80	79,4	1,5	104,7	158,8	44,7	2	—	1,4
4	4.125	0.09	5.33	7.75	1.86	2	1/2 x 3	4.3
100	104,8	2,3	135,3	196,9	47,2	2	—	2,0
5	5.125	0.09	6.48	9.25	1.86	2	5/8 x 3 1/4	6.0
125	130,7	2,3	164,6	235,0	47,2	2	—	2,7
6	6.125	0.09	7.48	10.25	1.86	2	5/8 x 3 1/4	6.6
150	155,6	2,3	190,0	260,4	47,2	2	—	3,0
8	8.125	0.09	9.64	12.75	1.86	2	3/4 x 4 3/4	10.2
200	206,4	2,3	244,8	323,9	47,2	2	—	4,6

* Maximum available gap between pipe ends, minimum gap = 0.
See page 119 for specifications and pages 191 - 198 for gasket information.



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Performance Pressure

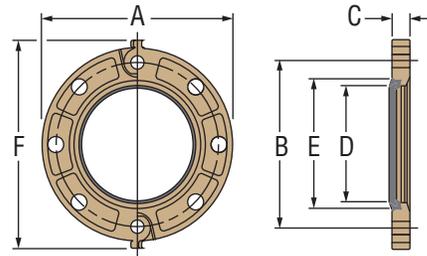
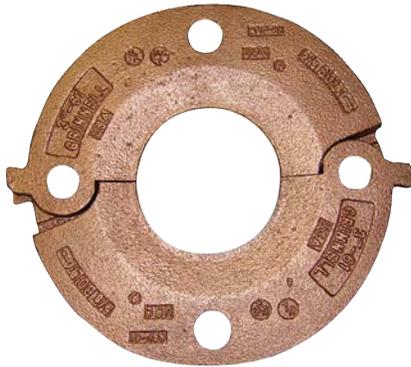
Pipe Size		Type "K" ASTM B-88			Type "L" ASTM B-88			Type "M" ASTM B-88			DWV ASTM B-306		
Nominal Size Inches mm	Copper Tubing O.D. Inches mm	Wall Thick Inches mm	Max. Working Pressure psi/bar	Max. End Load lbs/kN									
2	2.125	0.083	300	1.065	0.070	300	1.065	0.058	250	890	0.042	—	—
50	54,0	2,1	20,7	4,74	1,8	20,7	4,74	1,5	17,2	3,96	1,1	—	—
2 1/2	2.625	0.095	300	1.625	0.080	300	1.625	0.065	250	1.350	—	—	—
65	66,7	2,4	20,7	7,23	2,0	20,7	7,23	1,7	17,2	6,01	—	—	—
3	3.125	0.109	300	2.300	0.090	300	2.300	0.072	250	1.415	0.045	100	765
80	79,4	2,8	20,7	10,23	2,3	20,7	10,23	1,8	17,2	6,30	1,1	6,9	3,40
4	4.125	0.134	300	4.005	0.110	300	4.005	0.095	250	3.340	0.058	100	1.335
100	104,8	3,4	20,7	17,82	2,8	20,7	17,82	2,4	17,2	14,86	1,5	6,9	5,94
5	5.125	0.160	300	6.190	0.125	300	6.19	0.109	200	4.125	0.072	100	2.060
125	130,7	4,1	20,7	27,55	3,2	20,7	27,55	2,8	13,8	18,36	1,8	6,9	9,17
6	6.125	0.192	300	8.840	0.140	300	8.840	0.122	200	5.890	0.083	100	2.945
150	155,6	4,9	20,7	39,34	3,6	20,7	39,34	3,1	13,8	26,21	2,1	6,9	13,10
8	8.125	0.271	300	15.550	0.200	300	15.550	0.170	200	10.370	0.109	100	5.180
200	206,4	6,9	20,7	69,2	5,1	20,7	69,20	4,3	13,8	46,10	2,8	6,9	23,0

Figure 61 Flange Adapter (ANSI Class 125/150)

Tech Data Sheet: G515



The GRINNELL Figure 61 Flange Adapter is capable of pressures up to 300 PSI (20,7 bar) depending on copper tubing size and type. It provides a direct transition from flanged components to a grooved copper tube system. I.P.S. size flange bolt patterns conform to ANSI Class 125 and 150. The GRINNELL Figure 61 Flange Adapter is supplied with NSF 61 approved grade EPDM EN Gasket.



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Pipe Size		Dimensions						Bolts**		Approx. Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm	A Inches mm	B Inches mm	C Inches mm	D* Inches mm	E* Inches mm	F Inches mm	Qty.	Size Inches mm	
2	2.125	6.38	4.75	0.75	2.3	2.83	7.25	4	5/8 x 3	3.7
50	54,0	162,1	120,7	19,1	58,4	71,9	184,2	4	—	1,7
2½	2.625	7.00	5.50	0.88	2.79	3.33	7.88	4	5/8 x 3	5.4
65	66,7	178,0	140,0	22,0	70,9	84,6	200,0	4	—	2,4
3	3.125	7.50	6.00	0.94	3.28	3.85	8.38	4	5/8 x 3	6.1
80	79,4	190,5	152,4	23,9	83,3	97,8	212,9	4	—	2,8
4	4.125	9.00	7.50	0.94	4.24	4.85	9.90	8	5/8 x 3	7.6
100	104,8	228,6	190,5	23,9	107,7	123,2	251,5	8	—	3,4
5	5.125	10.00	8.50	1.00	5.24	5.84	10.88	8	¾ x 3½	9.5
125	130,2	254,0	215,9	25,4	133,1	148,3	276,4	8	—	4,3
6	6.125	11.00	9.50	1.00	6.24	6.96	11.88	8	¾ x 3½	10.9
150	155,6	279,4	241,3	25,4	158,5	176,8	301,8	8	—	4,9

* Dimensions D and E represent minimum and maximum sealing surfaces.

** Bolts are not supplied. Bolt lengths shown are standard; it is the responsibility of the purchaser to verify correct length for the intended application.

Note: Phenolic Type "F" Flange Adapter Washer (page 33) are required when the Figure 61 Flange Adapter is used against surfaces such as:

- Rubber surfaces
- Adapting to AWWA cast flanges
- Rubber faced wafer valves
- Serrated flange surfaces

Figure 61 Flange Adapters are not recommended for applications that incorporate tie rods for anchoring or on a standard fitting within 90° of each other.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 119 for specifications and pages 191 - 198 for gasket information.

Figure 610 90° Elbow

Tech Data Sheet: G520

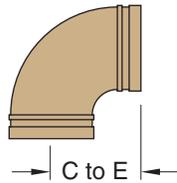
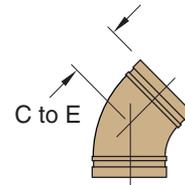


Figure 601 45° Elbow

Tech Data Sheet: G520



Pipe Size		C to E Inches mm	Approx. Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm		
2	2.125	2.91	1.9
50	54,0	73,9	0,9
2½	2.625	3.31	2.7
65	66,7	84,1	1,2
3	3.125	3.81	3.6
80	79,4	96,8	1,6
4	4.125	4.75	7.1
100	104,8	120,7	3,2
5	5.125	5.94	11.9
125	130,2	150,9	5,4
6	6.125	6.94	16.7
150	155,6	176,7	7,6
8	8.125	7.75	25.3
200	206,4	196,9	11,5

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 119 for specifications.

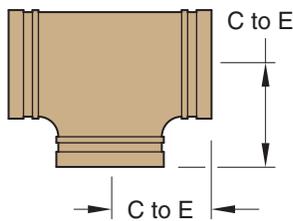
Pipe Size		C to E Inches mm	Approx. Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm		
2	2.125	2.19	1.6
50	54,0	55,6	0,7
2½	2.625	2.31	2.1
65	66,7	58,7	1,0
3	3.125	2.59	2.7
80	79,4	65,8	1,2
4	4.125	3.19	5.5
100	104,8	81,0	2,5
5	5.125	3.25	7.7
125	130,2	82,6	3,5
6	6.125	3.5	10.1
150	155,6	88,9	4,6
8	8.125	4.25	16.6
200	206,4	108,0	7,5

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 119 for specifications.

Figure 619 Tee

Tech Data Sheet: G520

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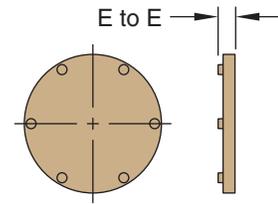
Pipe Size		C to E Inches mm	Approx. Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm		
2	2.125	2.69	2.5
50	54,0	68,3	1,1
2½	2.625	3.20	3.8
65	66,7	81,3	1,7
3	3.125	3.52	4.7
80	79,4	89,4	2,1
4	4.125	4.25	9.0
100	104,8	108,0	4,1
5	5.125	5.94	17.7
125	130,2	150,9	8,0
6	6.125	6.94	24.8
150	155,6	176,3	11,3
8	8.125	7.75	46.2
200	206,4	196,9	21,0

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 119 for specifications.

Figure 660 Cap

Tech Data Sheet: G520

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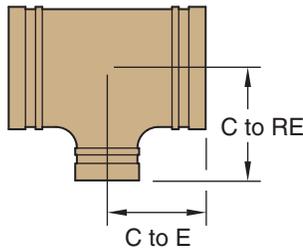


Pipe Size		E to E Inches mm	Approx. Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm		
2	2.125	0.92	0.6
50	54,0	23,4	0,3
2½	2.625	0.92	1.0
65	66,7	23,4	0,4
3	3.125	0.92	1.3
80	79,4	23,4	0,6
4	4.125	0.92	2.2
100	104,8	23,4	1,0
5	5.125	0.92	5.8
125	130,2	23,4	2,6
6	6.125	0.92	8.1
150	155,6	23,4	3,7
8	8.125	1.03	14.1
200	206,4	26,2	6,4

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 119 for specifications.

Figure 621 Reducing Tee

Tech Data Sheet: G520



Nominal Size Inches mm	Pipe Size	C to E Inches mm	C to RE Inches mm	Approx. Weight lbs kg
	Copper Tubing O.D. Inches mm			
2½ x 2½ x 2 65 x 65 x 50	2.625 x 2.625 x 2.125 66,7 x 66,7 x 54,0	3.28 83,3	3.38 85,9	3.5 1,6
3 x 3 x 2 80 x 80 x 50	3.125 x 3.125 x 2.125 79,4 x 79,4 x 54,0	3.00 76,2	3.38 85,9	3.8 1,7
3 x 3 x 2½ 80 x 80 x 65	3.125 x 3.125 x 2.625 79,4 x 79,4 x 66,7	3.25 82,6	3.5 88,9	4.3 2,0
4 x 4 x 2 100 x 100 x 50	4.125 x 4.125 x 2.125 104,8 x 104,8 x 54,0	3.66 93,0	4.13 104,9	6.9 3,2
4 x 4 x 2½ 100 x 100 x 65	4.125 x 4.125 x 2.625 104,8 x 104,8 x 66,7	3.94 100,1	4.06 103,1	7.5 3,4
4 x 4 x 3 100 x 100 x 80	4.125 x 4.125 x 3.125 104,8 x 104,8 x 79,4	4.19 106,4	4.16 105,7	8.7 4,0
5 x 5 x 3 125 x 125 x 80	5.125 x 5.125 x 3.125 130,2 x 130,2 x 79,4	3.75 95,3	4.63 117,6	10.0 4,5
5 x 5 x 4 125 x 125 x 100	5.125 x 5.125 x 4.125 130,2 x 130,2 x 104,8	4.25 108,0	4.56 115,8	11.4 5,2
6 x 6 x 2½ 150 x 150 x 65	6.125 x 6.125 x 2.625 155,6 x 155,6 x 66,7	3.63 92,2	5.13 130,3	11.5 5,2
6 x 6 x 3 150 x 150 x 80	6.125 x 6.125 x 3.125 155,6 x 155,6 x 79,4	3.69 93,7	5.19 131,8	11.9 5,4
6 x 6 x 4 150 x 150 x 100	6.125 x 6.125 x 4.125 155,6 x 155,6 x 104,8	4.19 106,4	5.13 130,3	13.7 6,2
6 x 6 x 5 150 x 150 x 125	6.125 x 6.125 x 5.125 155,6 x 155,6 x 130,2	4.69 119,1	5.19 131,8	15.9 7,2

For information on larger sizes, contact GRINNELL Mechanical Products.
Dimensional information in this chart is for cast fittings.
See page 119 for specifications.

Figure 618 Reducing Tee

Tech Data Sheet: G520

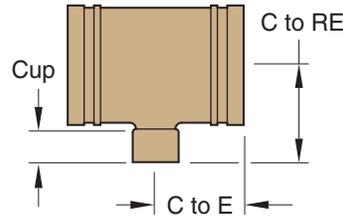


Figure 618
Reducing Tee
Groove x Groove x Cup

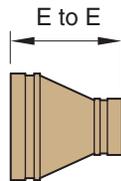
Pipe Size		C to E Inches mm	C to RE Inches mm	Cup Inches mm	Approx. Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm				
2 x 2 x 3/4	2.125 x 2.125 x 0.825	2.20	2.04	0.75	1.6
50 x 50 x 20	54,0 x 54,0 x 21,0	55,9	51,8	19,0	0,7
2 x 2 x 1	2.125 x 2.125 x 1.125	2.33	2.26	0.91	1.8
50 x 50 x 25	54,0 x 54,0 x 25,4	59,1	57,4	23,1	0,8
2 x 2 x 1 1/4	2.125 x 2.125 x 1.375	2.48	2.41	0.97	2.0
50 x 50 x 32	54,0 x 54,0 x 34,9	63,0	61,2	24,6	0,9
2 x 2 x 1 1/2	2.125 x 2.125 x 1.625	2.55	2.34	1.09	2.0
50 x 50 x 40	54,0 x 54,0 x 38,1	64,7	59,4	27,7	0,9
2 1/2 x 2 1/2 x 3/4	2.625 x 2.625 x 0.875	2.27	2.24	0.75	2.2
65 x 65 x 20	66,7 x 66,7 x 21,0	57,7	57,0	19,0	1,0
2 1/2 x 2 1/2 x 1	2.625 x 2.625 x 1.125	2.40	2.46	0.91	2.3
65 x 65 x 25	66,7 x 66,7 x 25,4	61,0	62,5	23,1	1,0
2 1/2 x 2 1/2 x 1 1/4	2.625 x 2.625 x 1.375	2.52	2.63	0.97	2.5
65 x 65 x 32	66,7 x 66,7 x 34,9	64,0	66,8	24,6	1,1
2 1/2 x 2 1/2 x 1 1/2	2.625 x 2.625 x 1.625	2.70	2.74	1.09	2.7
65 x 65 x 40	66,7 x 66,7 x 38,1	68,6	69,6	27,7	1,2
3 x 3 x 3/4	3.125 x 3.125 x 0.875	2.45	2.64	0.75	2.9
80 x 80 x 20	79,4 x 79,4 x 21,0	62,2	67,1	19,0	1,3
3 x 3 x 1	3.125 x 3.125 x 1.125	2.54	2.85	0.91	3.0
80 x 80 x 25	79,4 x 79,4 x 25,4	64,5	72,4	23,1	1,4
3 x 3 x 1 1/4	3.125 x 3.125 x 1.375	2.63	2.95	0.97	3.1
80 x 80 x 32	79,4 x 79,4 x 34,9	66,8	74,9	24,6	1,4
3 x 3 x 1 1/2	3.125 x 3.125 x 1.625	2.85	3.06	1.09	3.4
80 x 80 x 40	79,4 x 79,4 x 38,1	72,4	77,7	27,7	1,5
4 x 4 x 3/4	4.125 x 4.125 x 0.875	2.95	3.06	0.75	5.2
100 x 100 x 20	104,8 x 104,8 x 21,0	94,7	77,7	19,0	2,4
4 x 4 x 1	4.125 x 4.125 x 1.125	3.10	3.28	0.91	5.5
100 x 100 x 25	104,8 x 104,8 x 25,4	78,7	83,3	23,1	2,5
4 x 4 x 1 1/4	4.125 x 4.125 x 1.375	3.25	3.53	0.97	5.7
100 x 100 x 32	104,8 x 104,8 x 34,9	82,5	89,7	24,6	2,6
4 x 4 x 1 1/2	4.125 x 4.125 x 1.625	3.35	3.71	1.09	6.1
100 x 100 x 40	104,8 x 104,8 x 38,1	85,1	94,2	27,7	2,8

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 119 for specifications.

Figures 650 Concentric Reducer

Tech Data Sheet: G520

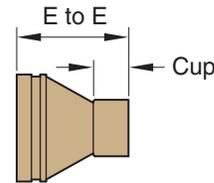
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Figures 652 Concentric Reducer

Tech Data Sheet: G520

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Pipe Size		E to E Inches mm	Approx. Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm		
2½ x 2 65 x 50	2.625 x 2.125 66,7 x 54,0	3.29 83,6	1.4 0,6
3 x 2 80 x 50	3.125 x 2.125 79,4 x 54,0	2.50 63,5	1.4 0,6
3 x 2½ 80 x 65	3.125 x 2.625 79,4 x 66,7	2.50 63,5	1.4 0,6
4 x 2 100 x 50	4.125 x 2.125 104,8 x 54,0	4.75 120,7	3.0 1,4
4 x 2½ 100 x 65	4.125 x 2.625 104,8 x 66,7	3.00 76,2	2.3 1,0
4 x 3 100 x 80	4.125 x 3.125 104,8 x 79,4	3.00 76,2	2.3 1,0
5 x 3 125 x 80	5.125 x 3.125 130,2 x 79,4	3.88 98,6	3.7 1,7
5 x 4 125 x 100	5.125 x 4.125 130,2 x 104,8	3.38 85,9	3.7 1,7
6 x 3 150 x 80	6.125 x 3.125 155,6 x 79,4	4.38 111,3	5.1 2,3
6 x 4 150 x 100	6.125 x 4.125 155,6 x 104,8	3.88 98,6	5.2 2,4
6 x 5 150 x 125	6.125 x 5.125 155,6 x 130,2	3.38 85,9	4.8 2,2
8 x 6 200 x 150	8.125 x 6.125 206,4 x 155,6	5.00 127,0	9.7 4,4

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 119 for specifications.

Pipe Size		E to E Inches mm	Cup Inches mm	Approx. Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm			
2 x 1 50 x 25	2.125 x 1.125 54,0 x 25,4	2.70 68,6	0.91 23,1	0.5 0,2
2 x 1¼ 50 x 32	2.125 x 1.375 54,0 x 34,9	3.00 76,2	0.97 24,6	0.4 0,2
2 x 1½ 50 x 40	2.125 x 1.625 54,0 x 38,1	2.94 74,7	1.09 27,7	0.4 0,2
2½ x 1 65 x 25	2.625 x 1.125 66,7 x 25,4	3.25 82,6	0.91 23,1	0.5 0,2
2½ x 1¼ 65 x 32	2.625 x 1.375 66,7 x 34,9	3.52 89,4	0.97 24,6	0.6 0,3
2½ x 1½ 65 x 40	2.625 x 1.625 66,7 x 38,1	3.45 87,6	1.09 27,7	0.6 0,3
2½ x 2 65 x 50	2.625 x 2.125 66,7 x 54,0	3.38 85,9	1.34 34,0	0.6 0,3
3 x 1½ 80 x 40	3.125 x 1.625 79,4 x 38,1	3.68 93,5	1.09 27,7	0.7 0,3
3 x 2 80 x 50	3.125 x 2.125 79,4 x 54,0	4.10 104,1	1.34 34,0	1.0 0,5
4 x 2 100 x 50	4.125 x 2.125 104,8 x 54,0	4.75 120,7	1.34 34,0	1.4 0,6

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 119 for specifications.

Model B680 Butterfly Valve with Lever Handle

Tech Data Sheet: G530



The GRINNELL Model B680 is a lever handle bronze body butterfly valve designed for use with grooved copper tubing (CTS), fittings and couplings. The valve is rated to 300 psi (20,7 bar) and features a 10 position locking lever handle and EPDM encapsulated ductile iron disc.



MATERIAL SPECIFICATIONS

Body

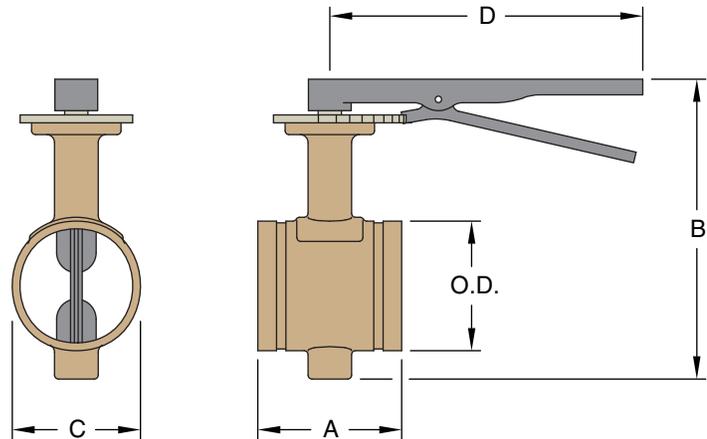
- Cast Bronze to ASTM B 584-87 Copper Alloy UNS C90500

Disc

- Ductile Iron to ASTM A 536 Grade 65-45-12 Encapsulated with EPDM

Upper and Lower Shafts

- Stainless Steel Type 416 of ASTM A 582
- UL Classified in Accordance with ANSI/NSF 61



Pipe Size		Dimensions				Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm	A Inches mm	B Inches mm	C Inches mm	D Inches mm	
2	2.125	3.19	5.31	2.45	10.0	4.9
50	54,0	81,0	135,0	57,0	254,0	2,2
2½	2.625	3.75	5.91	2.63	10.0	5.9
65	66,7	96,0	150,0	67,0	254,0	2,7
3	3.125	3.75	7.68	3.13	10.0	6.6
80	79,4	96,0	195,0	79,0	254,0	3,0
4	4.125	4.63	8.78	4.13	10.0	11.0
100	104,8	118,0	223,0	105,0	254,0	5,0
5	5.125	5.88	9.80	5.13	10.0	17.6
125	130,2	149,0	249,0	130,0	254,0	8,0
6	6.125	5.88	10.86	6.13	10.0	21.6
150	155,6	149,0	276,0	156,0	254,0	9,8

For information on larger sizes, contact GRINNELL Mechanical Products.
 Notes: Pressure ratings listed are CWP (cold water pressure) or maximum working pressure within the service temperature range of the gasket used in the coupling.
 Maximum working pressures and end loads listed are total of internal and external pressures and loads based on roll-grooved Type K – ASTM B 88 copper tubing.
 See page 119 for specifications.

Figures 407GT & 407T Dielectric Waterways

Tech Data Sheet: G465



Clearflow* Fittings protect plumbing systems through an innovative steel-to-plastic design that establishes a dielectric waterway. The dielectric fittings separate dissimilar metals in the electrolyte (waterway), eliminating the local galvanic cell.

The Clearflow Fittings metal-to-metal joint design maintains external electrical continuity, thereby preventing stray current corrosion. This feature is critical when stray current is present due to intentional or non-intentional grounding of direct current (DC) sources, such as phone systems and appliances.

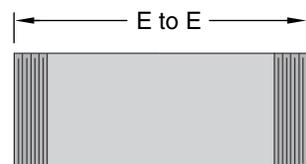
Fittings meet the requirements of ASTM F 492 for continuous use at temperatures up to 230°F (110°C).

Test data/results and listings by Pittsburgh Testing Laboratory can be provided upon request. Contact GRINNELL Mechanical Products

Figure 407GT
Dielectric Waterway



Figure 407T
Dielectric Waterway



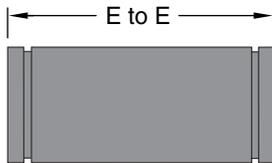
Pipe Size		Figure 407GT Grooved x Male Thread		Figure 407T Male Thread x Male Thread	
Nominal Inches mm	Copper Tubing O.D. Inches mm	End to End Inches mm	Approx. Weight Lbs. kg	End to End Inches mm	Approx. Weight Lbs. kg
1/2	0.625	-	-	3.0	0.2
15	15,9	-	-	76,2	0,1
3/4	0.875	-	-	3.0	0.2
20	22,2	-	-	76,2	0,1
1	1.125	4.0	0.3	4.0	0.3
25	28,6	101,6	0,1	101,6	0,1
1 1/4	1.375	4.0	0.6	4.0	0.6
32	34,9	101,6	0,3	101,6	0,3
1 1/2	1.625	4.0	0.8	4.0	0.8
40	41,3	101,6	0,4	101,6	0,4
2	2.125	4.0	1.0	4.0	1.0
50	54,0	101,6	0,5	101,6	0,5
2 1/2	2.625	6.0	1.6	6.0	1.6
65	66,7	152,4	0,7	152,4	0,7
3	3.125	6.0	2.0	6.0	2.0
80	79,4	152,4	0,9	152,4	0,9
4	4.125	6.0	4.5	6.0	4.5
100	104,8	152,4	2,0	152,4	2,0

For information on larger sizes, contact GRINNELL Mechanical Products.
See fitting specifications on page 37.

* Clearflow is a Registered Trademark of Perfection Corp.

Figure 407GG Dielectric Waterway Transition Fitting

Tech Data Sheet: G465



The GRINNELL Figure 407GG Transition Fitting protects systems through an innovative steel-to-plastic design that establishes a dielectric waterway. The transition fitting separates dissimilar metals in the electrolyte (waterway) eliminating the local galvanic cell.

The GRINNELL Figure 407GG Transition Fitting allows the connection between steel (IPS) size pipe and copper tube (CTS) size.

Pipe Size		Outside Diameter Inches mm		End to End Inches mm	Approx. Weight lbs kg
Nominal Size Inches mm	Copper Tubing O.D. Inches mm	Steel (IPS)	Copper (CTS)		
2	2.125	2.375	2.125	4.00	1.3
50	54,0	60,3	54,0	101,6	0,6
2½	2.625	2.875	2.625	4.00	3.3
65	66,7	73,0	66,7	101,6	1,5
3	3.125	3.500	3.125	4.00	4.5
80	79,4	88,9	79,4	101,6	2,1
4	4.125	4.500	4.125	4.00	5.8
100	104,8	114,3	104,8	101,6	2,6
5	5.125	5.563	5.125	4.00	7.8
125	130,2	141,3	130,2	101,6	3,5
6	6.125	6.625	6.125	4.00	10.1
150	155,6	168,3	155,6	101,6	4,6

For information on larger sizes, contact GRINNELL Mechanical Products.
See fitting specifications on page 37.

COPPER SYSTEMS

Model 1039-66 Copper Roll Groover



Capacity:

- 2" – 8" (50 - 200mm) Copper Tube K, L, M and DWV
- 1¼" – 6" (32 - 150mm) SCH 40 (7mm)

Model 1039 – 66 Mini-Mite Roll Groover service tool goes from in-place grooving and can be chucked in a Ridgid Model 300 in seconds with no gearbox removal.

Model 1039 – 66 Mini-Mite is self contained and can be entirely operated with its own multi-function crank. No additional tools are required. With ratchet hand crank, roll grooves 1¼" – 6" (32 - 150mm), Schedule 40 or thin wall steel pipe on the scaffold or anywhere power is unavailable. All hex drives on Model 1039 – 66 Mini-Mite are 15/16" (23,8mm).

Mini-Mites require no modifications or parts changes to groove any pipe or tubing in their size range.

Standard equipment includes a multi-step depth gauge, copper rolls for 2" – 8" (50 - 200mm). Steel rolls for 1¼" – 6" (32 - 150mm) may be ordered separately.

See Preparation Equipment section on pages 199 - 212 for more information and options.



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Stainless Steel Flange
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Coupling Specifications

MATERIAL SPECIFICATIONS

Stainless Steel Housing Specifications

- Type 316L, ASTM A 743/A 743M – Standard specification for castings, iron-chromium, iron-chromium-nickel, corrosion resistant; for general application Grade CR-8M.
- Tensile strength, minimum 70,000 psi (4826,3 bar)
- Yield strength, minimum 30,000 psi (2068,4 bar)
- Elongation in 2" (50mm) minimum 30%

Bolt/Nut Specifications

- Stainless steel bolts are metric track head bolts conforming to ASTM A 193M Class 2, Type 316 Grade B8M
- Class 2 stainless steel nuts are heavy hex nuts conforming to ASTM A 194M, Type 316, Grade 8M
- Bolts are coated with an anti-galling agent

Gasket Specifications

- **Grade "E" EPDM** gaskets have a Green color code identification and conform to ASTM D 2000 for service temperatures from -30°F to 230°F (-34°C to 110°C). They are recommended for hot water not to exceed 230°F (110°C) plus a variety of dilute acids, oil free air, and many chemical services. They are not recommended for petroleum services.
- **Grade "EN" EPDM** gaskets have a Copper color code identification and are NSF-61 approved for cold and hot portable water up to 180°F (82°C).
- **Grade "T" Nitrile** gaskets have an Orange color code identification and conform to ASTM D 2000 for service temperatures from -20°F to 180°F (-29°C to 82°C). They are recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapors.
- **Grade "O" Fluoroelastomer** gaskets have a Blue color code and conform to ASTM D 2000. They are recommended for oxidizing acids, petroleum products, hydraulic fluids, lubricants, and halogenated hydrocarbons.

Fitting Specifications

Tech Data Sheet: G570

MATERIAL SPECIFICATIONS

- Fabricated: 304/316L stainless steel conforming to ASTM A 312, Schedule 10 and Schedule 40
- Full-flow: 304/316L stainless steel conforming to ASTM A 403 WPW or A 403 CR

Fittings are available in full-flow and fabricated versions in 304 and 316L S.S. Fabricated fittings are available with Schedule 10 or Schedule 40 wall thickness.

For pressure ratings of fittings, refer to data sheet G570.



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com



For local country potable water approvals, contact GRINNELL Mechanical Products.

Refer to back cover for country-specific customer care numbers.

Figure 472 Stainless Steel Rigid Couplings

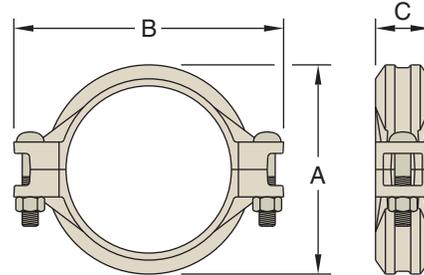
Tech Data Sheet: G560

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The GRINNELL Figure 472 Rigid Coupling is made of cast 316L stainless steel and is capable of pressure up to 600 psi (41,4 bar).

The GRINNELL Figure 472 Patented Coupling universal tongue-and-groove design allows the housing to grip along the full 360° of circumference of the pipe. Sizes 1¼" - 4" (32mm - 100mm) have gripping teeth to prevent rotation during installation.



Pipe Size		Max.† Pressures psi bar	Max.† End Load Lbs. kN	Max.*‡ End Gap Inches mm	Dimensions - Inches mm			Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm				A	B	C	Qty.	Size** Inches mm	
1¼	1.660	600	1,298.5	0.06	2.75	4.38	1.81	2	¾ x 2¼	2.0
32	42,4	41,4	5,78	1,5	69,9	111,3	46,0	2	M10 x 57	0,9
1½	1.900	600	1,701.1	0.08	3.00	4.62	1.81	2	¾ x 2¼	2.1
40	48,3	41,4	7,57	2,0	76,2	117,3	46,0	2	M10 x 57	1,0
2	2.375	600	2,658.0	0.13	3.41	5.12	1.88	2	¾ x 2¼	1.9
50	60,3	41,4	11,82	3,3	86,6	130,0	47,8	2	M10 x 57	0,9
2½	2.875	600	3,895.0	0.13	3.91	5.63	1.88	2	¾ x 2¼	3.2
65	73,0	41,4	17,32	3,3	99,3	143,0	47,8	2	M10 x 57	1,5
76,1mm	3.000	600	4,241.0	0.13	4.19	5.72	2.00	2	-	3.5
65	76,1	41,4	18,86	3,3	106,4	145,3	50,8	2	M10 x 57	1,6
3	3.500	600	5,772.5	0.13	4.63	6.25	1.88	2	½ x 3	3.5
80	88,9	41,4	25,68	3,3	117,6	158,8	47,8	2	M12 x 89	1,6
4	4.500	600	9,542.3	0.19	5.81	7.50	1.97	2	½ x 3	5.6
100	114,3	41,4	42,44	4,8	147,6	190,5	50,0	2	M12 x 89	2,5
139,7mm	5.500	600	14,254.6	0.19	7.02	9.72	2.06	2	-	8.5
125	139,7	41,4	63,40	4,8	178,3	246,9	52,3	2	M16 x 83	3,9
5	5.563	600	14,583.0	0.19	7.09	9.71	2.04	2	⅝ x 3¼	8.5
125	141,3	41,4	64,87	4,8	180,1	246,6	51,8	2	M16 x 83	3,9
6	6.625	600	20,682.4	0.19	8.09	10.53	2.13	2	⅝ x 3¼	9.4
150	168,3	41,4	92,00	4,8	205,5	267,5	54,1	2	M16 x 83	4,3
8	8.625	600	35,054.7	0.19	10.56	13.56	2.62	2	¾ x 4¾	19.4
200	219,1	41,4	155,92	4,8	268,2	344,4	66,5	2	M20 x 121	8,8
10	10.750	600	54,455.9	0.13	12.84	16.41	2.62	2	1 x 6½	32.0
250	273,0	41,4	242,22	3,3	326,1	416,8	66,5	2	M24 x 165	14,5
12	12.750	600	76,603.5	0.13	15.41	18.84	2.62	2	1 x 6½	43.0
300	323,9	41,4	340,73	3,3	391,4	478,5	66,5	2	M24 x 165	19,5

Figure 472 Rigid Couplings have an Anti-Rotation Feature of "gripping teeth" along the coupling keys in sizes 1¼" - 4" (32mm - 100mm), making the Figure 472 perfectly suited for installations where the likelihood of rotation is greatest.

* Maximum available gap between pipe ends. Minimum gap = 0.

† Maximum Pressure and End Load are total from all loads based on standard weight stainless steel pipe. Pressure ratings and end loads may differ for other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

‡ Max end gap is for cut grooved standard weight stainless steel pipe. Values for roll grooved pipe will be half that of cut grooved.

** Contact GRINNELL Mechanical Products for availability of inch bolt sizes vs. metric bolt sizes.

‣ Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, contact GRINNELL Mechanical Products.

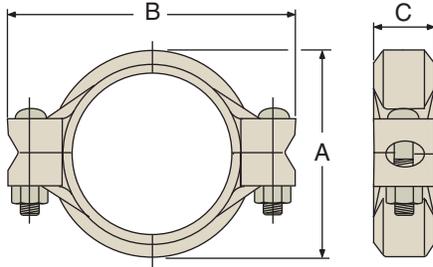
See page 133 for stainless steel coupling specifications and pages 191 - 198 for gasket information.

Refer to pressure ratings for Schedule 5, 10, and 40 pipe on pages 222 - 223, or contact GRINNELL Mechanical Products.

Figure 405 Stainless Steel Flexible Couplings

Tech Data Sheet: G565

The GRINNELL Figure 405 Flexible Coupling is made of 316L stainless steel and is capable of pressures up to 750 psi (51,7 bar), depending on pipe size and wall thickness.



Pipe Size		Max. † Pressures psi bar	Max. † End Load Lbs. kN	Max. * ‡ End Gap Inches mm	Deflection ‡		Dimensions - Inches mm			Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm				Degrees per coupling	In/Ft mm/m	A	B	C	Qty.	Size** Inches mm	
1	1.315	750	1,018.6	0.13	5° 26'	0.90	2.20	3.82	1.81	2	3/8 x 2 1/4 M10 x 57	1.5
25	33,4	51,7	4,53	3,3		95,1	56,0	97,0	46,0			0,6
1 1/4	1.660	750	1,623.1	0.13	4° 19'	0.90	2.56	4.19	1.81	2	3/8 x 2 1/4 M10 x 57	1.5
32	42,4	51,7	7,22	3,3		75,0	65,0	106,4	46,0			0,7
1 1/2	1.900	750	2,126.4	0.13	3° 46'	0.79	2.75	4.44	1.81	2	3/8 x 2 1/4 M10 x 57	1.6
40	48,3	51,7	9,46	3,3		65,8	69,9	112,8	46,0			0,7
2	2.375	500	2,215.0	0.13	3° 1'	0.63	3.25	4.88	1.88	2	3/8 x 2 1/4 M10 x 57	1.7
50	60,3	34,5	9,85	3,3		52,5	82,6	124,0	47,8			0,8
2 1/2	2.875	500	3,245.8	0.13	2° 29'	0.52	3.69	5.50	1.88	2	3/8 x 2 1/4 M10 x 57	2.0
65	73,0	34,5	14,44	3,3		43,3	93,7	139,7	47,8			0,9
76,1mm	3.000	500	3,534.2	0.13	2° 23'	0.50	4.00	5.75	1.88	2	-	3.1
65	76,1	34,5	15,72	3,3		41,7	101,6	146,10	47,8			1,4
3	3.500	500	4,810.4	0.13	2° 3'	0.43	4.38	6.50	1.88	2	1/2 x 3 M12 x 89	3.1
80	88,9	34,5	21,40	3,3		35,8	111,3	165,1	47,8			1,4
4	4.500	325	5,168.7	0.25	3° 11'	0.67	5.69	7.75	2.06	2	1/2 x 3 M12 x 89	4.0
100	114,3	22,4	22,99	6,4		55,8	144,5	196,9	52,3			1,8
139,7mm	5.500	200	4,751.5	0.25	2° 36'	0.55	6.81	9.75	2.06	2	-	7.2
125	139,7	13,8	21,13	6,4		45,5	173,0	247,7	52,3			3,3
5	5.563	200	4,861.0	0.25	2° 35'	0.54	6.88	9.75	2.06	2	5/8 x 3 1/4 M16 x 83	7.1
125	141,3	13,8	21,62	6,4		45,0	174,8	247,7	52,3			3,2
6	6.625	200	6,894.1	0.25	2° 10'	0.45	7.94	10.69	2.06	2	5/8 x 3 1/4 M16 x 83	7.1
150	168,3	13,8	30,67	6,4		37,5	201,7	271,5	52,3			3,2
8	8.625	200	11,684.9	0.25	1° 40'	0.35	10.19	13.56	2.50	2	3/4 x 4 3/4 M20 x 121	14.5
200	219,1	13,8	51,97	6,4		29,2	258,8	344,4	63,5			6,6

Values for roll grooved pipe will be half that of cut grooved.

* Maximum available gap between pipe ends. Minimum gap = 0.

† Maximum Pressure and end load are total from all loads based on standard weight stainless steel pipe. Pressure ratings and end loads may differ for other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details.

‡ Max End Gap and Deflection is for cut grooved standard weight stainless steel pipe.

** Contact GRINNELL Mechanical Products for availability of inch bolt sizes vs. metric bolt sizes.

‣ Sizes are available to JIS standards. Contact GRINNELL Mechanical Products for details.

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 133 for stainless steel coupling specifications and pages 191 - 198 for gasket information.

Refer to pressure ratings for Schedule 5, 10, and 40 pipe on pages 222 - 223, or contact GRINNELL Mechanical Products.

Figure 410 90° Stainless Steel Elbows

Tech Data Sheet: G570

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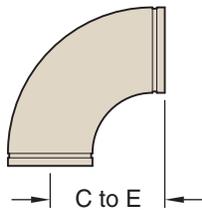


Figure 410A
Full-Flow 90° Elbow

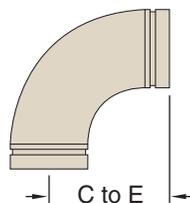


Figure 410
Fabricated 90° Elbow

Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1	1.315	2.88	1.0
25	33,4	73,2	0,45
1¼	1.660	3.13	1.0
32	42,4	79,5	0,45
1½	1.900	3.50	1.0
40	48,3	88,9	0,45
2	2.375	4.50	1.1
50	60,3	114,3	0,50
2½	2.875	5.00	1.7
65	73,0	127,0	0,77
76,1mm	3.000	5.12	3.1
65	76,1	130,0	1,41
3	3.500	4.50	2.6
80	88,9	114,3	1,18
4	4.500	6.00	4.7
100	114,3	152,4	2,13
5	5.563	7.50	8.4
125	141,3	190,5	3,81
6	6.625	9.00	10.3
150	168,3	228,6	4,67
8	8.625	12.00	17.6
200	219,1	304,8	7,98
10	10.750	15.00	49.2
250	273,0	381,0	22,32
12	12.750	18.00	78.4
300	323,9	457,2	35,56

For information on larger sizes, contact GRINNELL Mechanical Products.
Schedule 40 fittings available upon request, contact GRINNELL Mechanical Products.
See page 133 for stainless steel fitting specifications.

Figure 401 45° Stainless Steel Elbows

Tech Data Sheet: G570

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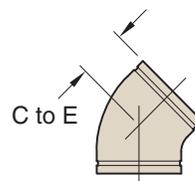


Figure 401A
Full-Flow 45° Elbow

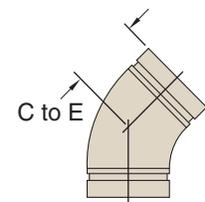


Figure 401
Fabricated 45° Elbow

Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1	1.315	2.00	0.6
25	33,4	50,8	0,27
1¼	1.660	2.00	0.8
32	42,4	50,8	0,36
1½	1.900	3.50	1.0
40	48,3	88,9	0,45
2	2.375	2.75	1.2
50	60,3	69,9	0,54
2½	2.875	2.81	1.7
65	73,0	71,4	0,77
76,1mm	3.000	2.87	3.1
65	76,1	73,0	1,41
3	3.500	2.00	1.3
80	88,9	50,8	0,59
4	4.500	2.50	2.3
100	114,3	63,5	1,04
5	5.563	3.13	4.2
125	141,3	79,4	1,90
6	6.625	3.75	5.1
150	168,3	95,3	2,31
8	8.625	5.00	13.8
200	219,1	127,0	6,26
10	10.750	6.25	24.6
250	273,0	158,8	11,16
12	12.750	7.50	39.2
300	323,9	190,5	17,78

For information on larger sizes, contact GRINNELL Mechanical Products.
Schedule 40 fittings available upon request, contact GRINNELL Mechanical Products.
See page 133 for stainless steel fitting specifications.

Figure 419 Tees

Tech Data Sheet: G570



Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O. D. Inches mm		
1	1.315	2.88	1.0
25	33,4	73,2	0,45
1¼	1.660	3.38	1.5
32	42,4	85,9	0,68
1½	1.900	3.38	1.6
40	48,3	85,9	0,73
2	2.375	2.75	2.3
50	60,3	69,9	1,04
2½	2.875	3.07	2.2
65	73,0	78,0	1,00
76,1mm	3.000	2.99	3.1
65	76,1	76,0	1,41
3	3.500	3.77	3.1
80	88,9	95,8	1,41
4	4.500	4.47	4.9
100	114,3	113,5	2,22
5	5.563	5.91	7.1
125	141,3	150,1	3,49
6	6.625	5.91	11.7
150	168,3	150,1	5,31
8	8.625	7.79	20.0
200	219,1	197,9	9,07
10	10.750	8.89	34.4
250	273,0	225,8	15,60
12	12.750	10.39	52.5
300	323,9	263,9	23,81

For information on larger sizes, contact GRINNELL Mechanical Products.
 Schedule 40 fittings available upon request, contact GRINNELL Mechanical Products.

See page 133 for stainless steel fitting specifications.

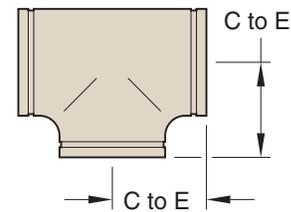


Figure 419A
Full-Flow Tee

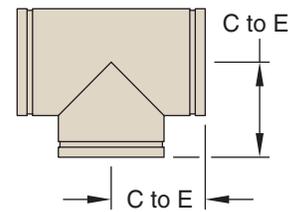


Figure 419
Fabricated Tee

Figure 460 End Caps

Tech Data Sheet: G570

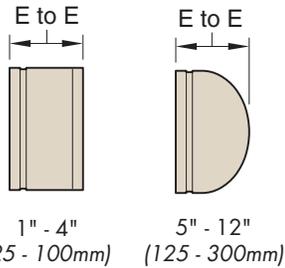


Figure 460A
Full-Flow End Cap

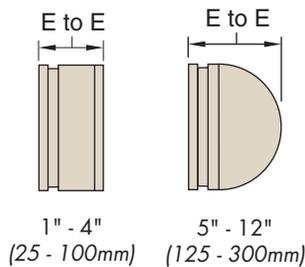


Figure 460
Fabricated End Cap

Pipe Size		Nominal E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1	1.315	1.08	0.2
25	33,4	27,5	0,09
1¼	1.660	1.08	0.4
32	42,4	27,5	0,09
1½	1.900	1.08	0.5
40	48,3	27,5	0,09
2	2.375	1.08	0.7
50	60,3	27,5	0,09
2½	2.875	1.08	1.0
65	73,0	27,5	0,45
76,1mm	3.000	2.36	3.1
65	76,1	60,0	1,41
3	3.500	1.08	2.0
80	88,9	27,5	0,91
4	4.500	1.13	3.1
100	114,3	28,7	1,41
5	5.563	3.00	1.5
125 *	141,3	76,2	0,68
6	6.625	3.50	1.5
150 *	168,3	88,9	0,68
8	8.625	4.00	3.1
200 *	219,1	101,6	1,41
10	10.750	5.00	6.0
250 *	273,0	127,0	2,72
12	12.750	6.00	7.8
300 *	323,9	152,4	3,54

* Dished Cap

For information on larger sizes, contact GRINNELL Mechanical Products.

Schedule 40 fittings available upon request, contact GRINNELL Mechanical Products.

See page 133 for stainless steel fitting specifications.

Figure 421 Reducing Tees

Tech Data Sheet: G570



Pipe Size		C to E Inches mm	C to B Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			
1½ x 1½ x 1	1.900 x 1.900 x 1.315	3.38	3.38	1.6
40 x 40 x 25	48,3 x 48,3 x 33,4	85,9	85,9	0,73
1½ x 1½ x 1¼	1.900 x 1.900 x 1.660	3.38	3.38	1.6
40 x 40 x 32	48,3 x 48,3 x 42,4	85,9	85,9	0,73
2 x 2 x 1	2.375 x 2.375 x 1.315	3.25	3.38	2.2
50 x 50 x 25	60,3 x 60,3 x 33,4	82,6	69,9	1,00
2 x 2 x 1¼	2.375 x 2.375 x 1.660	3.25	3.25	2.4
50 x 50 x 32	60,3 x 60,3 x 42,4	82,6	82,6	1,09
2 x 2 x 1½	2.375 x 2.375 x 1.900	2.75	2.75	2.4
50 x 50 x 40	60,3 x 60,3 x 48,3	69,9	69,9	1,09
2½ x 2½ x 1	2.375 x 2.375 x 1.315	3.75	3.75	3.1
50 x 50 x 40	60,3 x 60,3 x 33,4	95,3	95,3	1,41
2½ x 2½ x 1½	2.375 x 2.375 x 1.900	3.75	3.75	3.4
50 x 50 x 40	60,3 x 60,3 x 48,3	95,3	95,3	1,54
2½ x 2½ x 2	2.375 x 2.375 x 2.375	3.07	3.07	3.6
50 x 50 x 40	60,3 x 60,3 x 60,3	78,0	78,0	1,63
3 x 3 x 1	3.500 x 3.500 x 1.315	4.25	4.25	4.3
80 x 80 x 25	88,9 x 88,9 x 33,4	108,0	108,0	1,95
3 x 3 x 1¼	3.500 x 3.500 x 1.660	4.25	4.25	4.3
80 x 80 x 32	88,9 x 88,9 x 42,2	108,0	108,0	1,95
3 x 3 x 1½	3.500 x 3.500 x 1.900	4.25	4.25	4.4
80 x 80 x 40	88,9 x 88,9 x 48,3	108,0	108,0	2,00
3 x 3 x 2	3.500 x 3.500 x 2.375	3.77	3.23	4.4
80 x 80 x 50	88,9 x 88,9 x 60,3	95,8	82,0	2,00
3 x 3 x 2½	3.500 x 3.500 x 2.875	3.77	3.23	4.4
80 x 80 x 65	88,9 x 88,9 x 73,0	95,8	82,0	2,00
4 x 4 x 2	4.500 x 4.500 x 2.375	4.47	3.82	4.4
100 x 100 x 50	114,3 x 114,3 x 60,3	113,5	97,0	2,00
4 x 4 x 2½	4.500 x 4.500 x 2.875	5.00	5.00	4.4
100 x 100 x 65	114,3 x 114,3 x 73,0	113,5	113,5	2,00
4 x 4 x 3	4.500 x 4.500 x 3.500	4.47	3.38	4.9
100 x 100 x 80	114,3 x 114,3 x 88,9	113,5	69,9	2,22
6 x 6 x 1½	6.625 x 6.625 x 1.900	5.91	5.91	9.3
150 x 150 x 40	168,3 x 168,3 x 48,3	150,1	150,1	4,22
6 x 6 x 2	6.625 x 6.625 x 2.375	5.91	5.91	9.3
150 x 150 x 50	168,3 x 168,3 x 88,9	150,1	150,1	4,22
6 x 6 x 3	6.625 x 6.625 x 3.500	5.91	4.88	9.3
150 x 150 x 80	168,3 x 168,3 x 60,3	150,1	124,0	4,22
6 x 6 x 4	6.625 x 6.625 x 4.500	5.91	5.12	9.3
150 x 150 x 100	168,3 x 168,3 x 114,3	150,1	130,0	4,22
8 x 8 x 4	8.625 x 8.625 x 4.500	7.79	6.31	18.1
200 x 200 x 100	219,1 x 219,1 x 114,1	197,9	160,3	8,21
8 x 8 x 6	8.625 x 8.625 x 6.625	7.79	6.62	18.1
200 x 200 x 150	219,1 x 219,1 x 168,3	197,9	168,1	8,21
10 x 10 x 6	10.750 x 10.750 x 6.625	8.89	7.70	29.3
250 x 250 x 150	273,0 x 273,0 x 168,3	225,8	195,6	13,29
10 x 10 x 8	10.750 x 10.750 x 8.625	8.89	8.59	31.7
250 x 250 x 200	273,0 x 273,0 x 219,1	225,8	218,2	14,38
12 x 12 x 8	12.750 x 12.750 x 8.625	10.39	9.51	44.0
300 x 300 x 200	323,9 x 323,9 x 219,1	263,9	242,0	19,96
12 x 12 x 10	12.750 x 12.750 x 10.750	10.39	9.89	44.0
300 x 300 x 250	323,9 x 323,9 x 273,0	263,9	251,2	19,96

For information on larger sizes, contact GRINNELL Mechanical Products.
 Schedule 40 fittings available upon request, contact GRINNELL Mechanical Products.
 See page 133 for stainless steel fitting specifications.

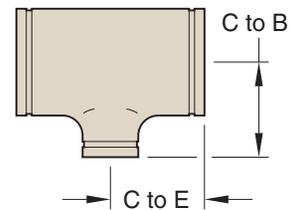


Figure 421A
Full-Flow Reducing Tee

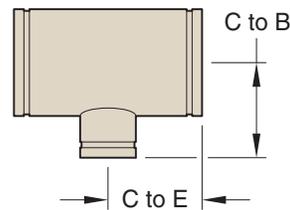


Figure 450
Fabricated Reducing Tee

Figure 450 Concentric Reducers

Tech Data Sheet: G570

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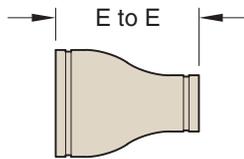


Figure 450A
Full-Flow Concentric Reducer

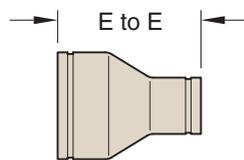


Figure 450
Fabricated Concentric Reducer

Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1½ x 1	1.900 x 1.315	3.75	1.4
40 x 25	48,3 x 33,7	95,3	0,64
1½ x 1¼	1.900 x 1.660	3.75	1.4
40 x 32	48,3 x 42,4	95,3	0,64
2 x 1	2.375 x 1.315	3.75	1.5
50 x 25	60,3 x 33,7	95,3	0,68
2 x 1¼	2.375 x 1.660	3.75	2.5
50 x 32	60,3 x 42,4	95,3	1,13
2 x 1½	2.375 x 1.900	5.00	2.5
50 x 40	60,3 x 48,3	127,0	1,13
2½ x 1½	2.875 x 1.900	5.00	3.5
65 x 40	73,0 x 48,3	127,0	1,59
2½ x 2	2.875 x 2.375	5.00	3.5
65 x 50	73,0 x 60,3	127,0	1,59
3 x 1	3.500 x 1.315	5.00	4.0
80 x 25	88,9 x 33,7	127,0	1,81
3 x 1¼	3.500 x 1.660	5.00	4.3
80 x 32	88,9 x 42,4	127,0	1,95
3 x 1½	3.500 x 1.900	5.00	4.4
80 x 40	88,9 x 48,3	127,0	2,00
3 x 2	3.500 x 2.375	5.00	4.8
80 x 50	88,9 x 60,3	127,0	2,17
3 x 2½	3.500 x 2.875	5.00	4.8
80 x 65	88,9 x 73,0	127,0	2,17
4 x 2	4.500 x 2.375	5.00	4.8
100 x 50	114,3 x 60,3	127,0	2,17
4 x 2½	4.500 x 2.875	5.00	4.8
100 x 65	114,3 x 73,0	127,0	2,17
4 x 3	4.500 x 3.500	5.00	5.0
100 x 80	114,3 x 88,9	127,0	2,27
5 x 3	5.563 x 3.500	9.00	7.0
125 x 80	141,3 x 88,9	228,6	3,18
5 x 4	5.563 x 4.500	9.00	7.0
125 x 100	141,3 x 114,3	228,6	3,18
6 x 2	6.625 x 2.375	9.00	7.0
150 x 50	168,3 x 60,3	228,6	3,18
6 x 2½	6.625 x 2.875	15.00	7.0
150 x 65	168,3 x 73,0	381,0	3,18
6 x 3	6.625 x 3.500	5.50	6.9
150 x 80	168,3 x 88,9	139,7	3,13
6 x 4	6.625 x 4.500	5.50	7.0
150 x 100	168,3 x 114,3	139,7	3,18
8 x 4	8.625 x 4.500	6.00	9.6
200 x 100	219,1 x 114,3	152,4	4,35
8 x 6	8.625 x 6.625	6.00	9.6
200 x 150	219,1 x 168,3	152,4	4,35
10 x 4	10.750 x 4.500	10.00	12.4
250 x 100	273,0 x 114,3	254,0	5,62
10 x 6	10.750 x 6.625	7.00	12.4
250 x 150	273,0 x 168,3	177,8	5,62
10 x 8	10.750 x 8.625	7.00	14.9
250 x 200	273,0 x 219,1	177,8	6,76
12 x 6	12.750 x 6.625	14.00	22.0
300 x 150	323,9 x 168,3	355,6	9,98
12 x 8	12.750 x 8.625	14.00	22.0
300 x 200	323,9 x 219,1	355,6	9,98
12 x 10	12.750 x 10.750	14.00	26.0
300 x 250	323,9 x 273,0	355,6	11,79

For information on larger sizes, contact GRINNELL Mechanical Products.
Schedule 40 fittings available upon request, contact GRINNELL Mechanical Products.
See page 133 for stainless steel fitting specifications.

Figure 451 Eccentric Reducers

Tech Data Sheet: G570

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Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
1½ x 1	1.900 x 1.315	3.75	1.4
40 x 25	48,3 x 33,7	95,3	0,64
1½ x 1¼	1.900 x 1.660	3.75	1.4
40 x 32	48,3 x 42,4	95,3	0,64
2 x 1	2.375 x 1.315	3.75	1.5
50 x 25	60,3 x 33,7	95,3	0,68
2 x 1¼	2.375 x 1.660	3.75	2.5
50 x 32	60,3 x 42,4	95,3	1,13
2 x 1½	2.375 x 1.900	5.00	2.5
50 x 40	60,3 x 48,3	127,0	1,13
2½ x 2	2.875 x 2.375	5.00	3.5
65 x 50	73,0 x 60,3	127,0	1,59
3 x 1	3.500 x 1.315	5.00	4.3
80 x 25	88,9 x 33,4	127,0	1,95
3 x 2	3.500 x 2.375	5.00	4.3
80 x 50	88,9 x 60,3	127,0	1,95
3 x 2½	3.500 x 2.875	5.00	4.5
80 x 65	88,9 x 73,0	127,0	1,95
4 x 2	4.500 x 2.375	5.00	4.8
100 x 50	114,3 x 60,3	127,0	2,18
4 x 2½	4.500 x 2.875	5.00	5.8
100 x 65	114,3 x 73,0	127,0	2,63
4 x 3	4.500 x 3.500	5.00	5.9
100 x 80	114,3 x 88,9	127,0	2,68
5 x 3	5.563 x 3.500	9.00	5.9
125 x 80	141,3 x 88,9	228,6	2,68
5 x 4	5.563 x 4.500	9.00	7.0
125 x 100	141,3 x 114,3	228,6	3,18
6 x 2	6.625 x 2.375	9.00	7.0
150 x 50	168,3 x 60,3	228,6	3,17
6 x 2½	6.625 x 2.875	9.00	7.0
150 x 65	168,3 x 73,0	228,6	3,17
6 x 3	6.625 x 3.500s	9.00	7.0
150 x 80	168,3 x 88,9	228,6	3,18
6 x 4	6.625 x 4.500	5.00	7.0
150 x 100	168,3 x 114,3	127,0	3,18
8 x 3	8.625 x 3.500	10.00	9.3
200 x 80	219,1 x 88,9	254,0	4,22
8 x 4	8.625 x 4.500	12.00	9.3
200 x 100	219,1 x 114,3	304,8	4,22
8 x 6	8.625 x 6.625	8.00	7.0
200 x 150	219,1 x 168,3	203,2	3,18
10 x 6	10.750 x 6.625	13.00	12.4
250 x 150	273,0 x 168,3	330,2	5,62
10 x 8	10.750 x 8.625	13.00	11.5
250 x 200	273,0 x 219,1	330,2	5,22
12 x 6	12.750 x 6.625	14.00	21.1
300 x 150	323,9 x 168,3	355,6	9,57
12 x 8	12.750 x 8.625	14.00	21.1
300 x 200	323,9 x 219,1	355,6	9,57
12 x 10	12.750 x 10.750	14.00	21.1
300 x 250	323,9 x 273,0	355,6	9,57

For information on larger sizes, contact GRINNELL Mechanical Products.
 Schedule 40 fittings available upon request, contact GRINNELL Mechanical Products.
 See page 133 for stainless steel fitting specifications.

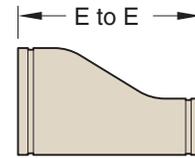


Figure 451A
Full-Flow Eccentric Reducer

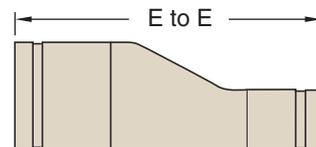


Figure 451
Fabricated Eccentric Reducer

Figure 441 Flange Adapters (ANSI Class 150#)

Tech Data Sheet: G568

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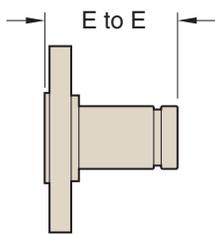


Figure 441
Fabricated Flange Adapter

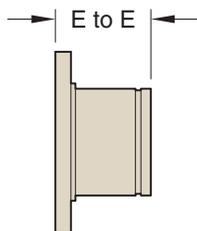
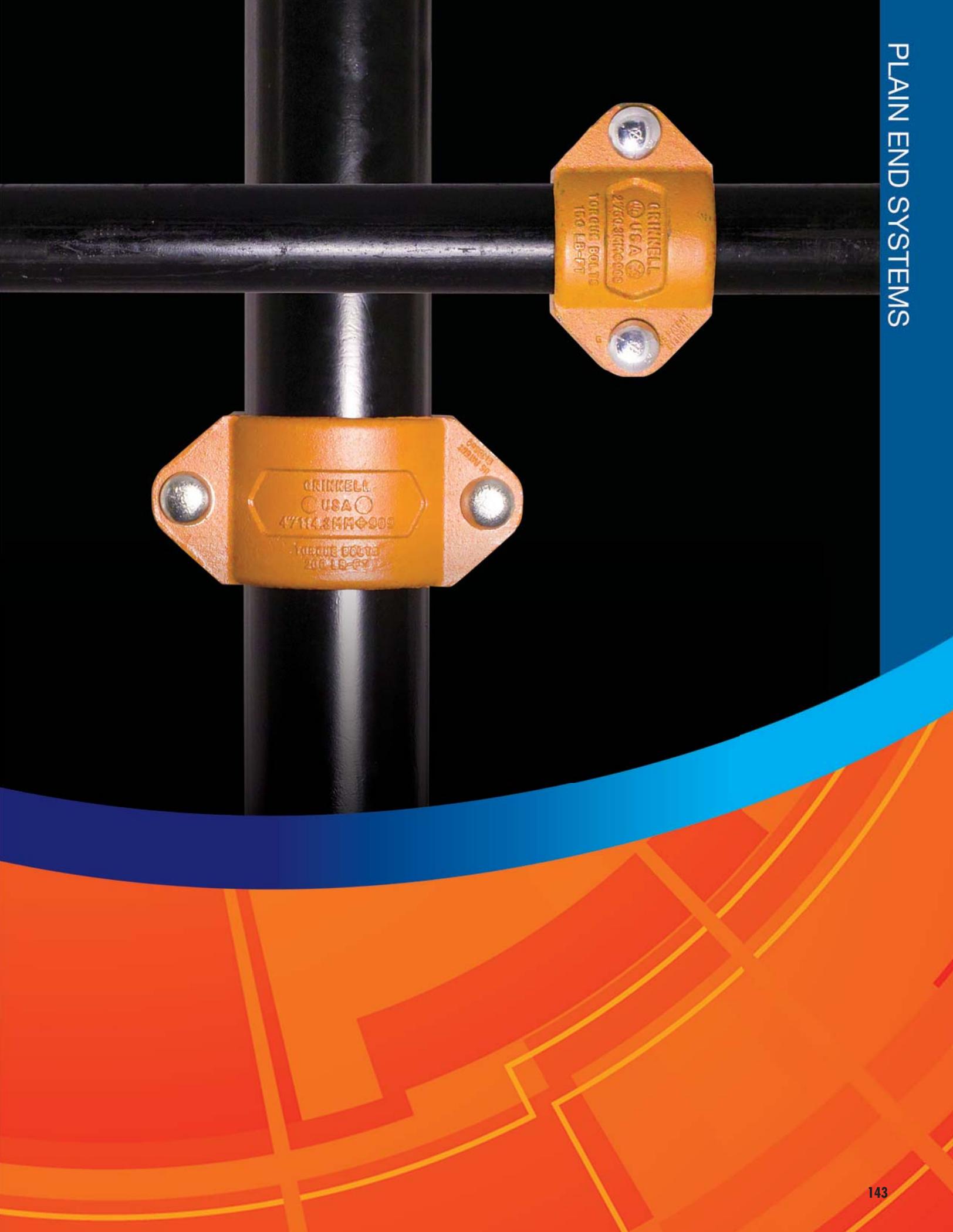


Figure 441A
Full-Flow Flange Adapter

Pipe Size		E to E Inches mm	Mating Flange Bolt Qty.	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			
2	2.375	4.00	4	6.4
50	60,3	101,6		2,8
2½	2.875	4.00	4	8.8
65	73,0	101,6		4,0
3	3.500	4.00	4	10.4
80	88,9	101,6		4,7
4	4.500	6.00	8	18.2
100	114,3	152,4		8,3
5	5.563	6.00	8	22.0
125	141,3	152,4		10,0
6	6.625	6.00	8	28.1
150	168,3	152,4		12,7
8	8.625	6.00	8	43.7
200	219,1	152,4		19,8

For information on larger sizes or PN16 sizes, contact GRINNELL Mechanical Products.
Schedule 40 fittings available upon request, contact GRINNELL Mechanical Products.
See page 133 for stainless steel fitting specifications.



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The GRINNELL Plain End Piping System is designed for use in both maintenance and new system applications and eliminates the need for pipe end preparation. The GRINNELL Figure 909 Plain End Coupling features case-hardened gripping teeth that securely grip onto the pipe surface. The coupling is designed for schedule 40 steel pipe and is not for use with steel pipe with a Brinell hardness greater than 150 HB, nor is it switchable for plastic pipe, cast, or ductile iron pipe.

Contact GRINNELL Mechanical Products about other materials and pipe schedules. Follow bolt torque ratings to ensure a properly assembled coupling.

Coupling Specifications

Tech Data Sheet: G190

MATERIAL SPECIFICATIONS

Coupling Ductile Iron Housing Specifications

- ASTM A 536 – Standard specification for ductile iron castings, Grade 65-45-12
- Tensile strength, minimum 65,000 psi (4481,6 bar)
- Yield strength, minimum 45,000 psi (3102,6 bar)
- Elongation in 2" (50mm), minimum 12%
- ASTM A 153 – Standard specification for hot-dipped galvanizing

Coatings

- Orange – Non-lead paint (standard)
- Red – Non-lead paint (optional, regional)
- Hot-Dipped, Zinc galvanized (optional)

Bolt/Nut Specifications

- **ANSI:** Carbon steel oval neck bolts and nuts are heat-treated and conform to the physical properties of ASTM A 183 Grade 2 and SAE J429 Grade 5 with a minimum tensile strength of 110,000 psi (7584.2 bar). Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 183 Grade 2 and SAE J995 Grade 5. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.

- **Metric:** Carbon steel oval neck track head bolts (Gold color coded) are heat treated and conform to the physical properties of ASTM F 568 M with a minimum tensile strength of 760 MPa. Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 563 M Class 9. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.
- Stainless steel bolts and nuts are available upon request.

Gasket Specifications

- **Grade "E" EPDM** gaskets have a Green color code identification and conform to ASTM D 2000 for service temperatures from -30°F to 230°F (-34°C to 110°C). They are recommended for hot water not to exceed 230°F (110°C), plus a variety of dilute acids, oil free air, and many chemical services. They are not recommended for petroleum services. For low temperature and vacuum systems, a Tri-Seal Grade "E" EPDM gasket with rigid coupling is recommended.
- **Grade "T" Nitrile** gaskets have an Orange color code identification and conform to ASTM D 2000 for service temperatures from -20°F to 180°F (-29°C to 82°C). They are recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapors.

Fitting Specifications

Tech Data Sheet: G192

Fitting Specifications

- Carbon steel: according to ASTM A 53, Grade B
- Tensile strength, minimum 60,000 psi (4136,9 bar)
- Yield strength, minimum 35,000 psi (2413,2 bar)
- Sizes 1¼" – 10" (32mm – 250mm) – Schedule 40
- Sizes 12" – 24" (300mm – 600mm) – Std. Wall (0.375)

Coatings

- Orange – Non-lead paint (standard)
- Red – Non-lead paint (optional, regional)
- Hot-Dipped, Zinc galvanized (optional)

Plain end fittings are manufactured to provide minimum pressure drop and uniform flow. Fittings are designed for use with the Figure 909 Plain End Couplings only.

Plain end fittings are available in a variety of styles.

Fitting dimensions may vary, contact GRINNELL Mechanical Products.

Figure 909 Plain End Couplings

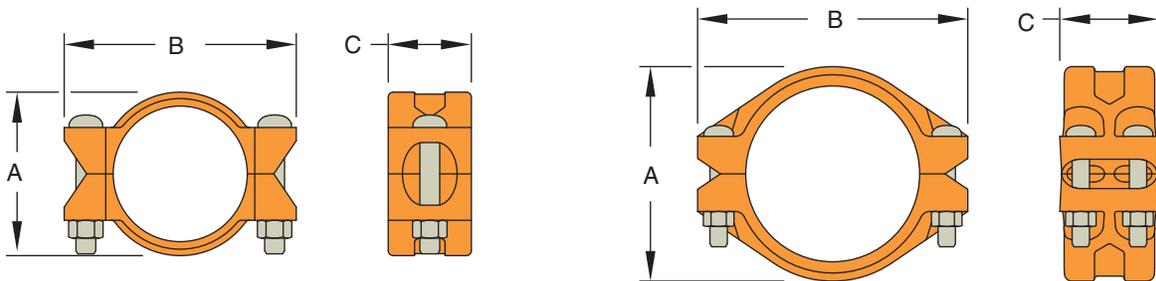
Tech Data Sheet: G190

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The GRINNELL Figure 909 Plain End Coupling utilizes hardened gripping teeth to securely grip onto plain and beveled end pipe surfaces. It is capable of pressures up to 750 psi (51,7 bar) depending on pipe size and wall thickness.

The GRINNELL Figure 909 Plain End Coupling is designed for Schedule 40 steel pipe and is not for use with steel pipe with a Brinnell hardness greater than 150 HB, plastic, cast, or ductile iron pipes. Contact GRINNELL Mechanical Products for recommendations on other materials and pipe schedules.



2" - 6" (50mm - 150mm) (2 Bolts)

8" - 10" (200mm - 250mm) (4 Bolts)

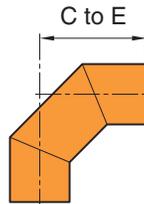
Pipe Size		Max.† Pressures psi bar	Max.† End Load Lbs. kN	Dimensions - Inches mm			Qty.	Coupling Bolts		Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			A	B	C		Size Inches mm	Bolt Torque Lbs.-ft Nm	
2	2.375	750	3322.6	3.69	5.75	3.31	2	5/8 x 3 1/2	150	5.4
50	60,3	51,7	14,78	93,7	146,1	84,1		M16 x 90	203,0	2,4
2 1/2	2.875	600	3895.1	4.17	6.25	3.31	2	5/8 x 3 1/2	150	5.9
65	73,0	41,4	17,33	105,9	158,8	84,1		M16 x 90	203,0	2,7
3	3.500	600	5772.7	4.81	7.56	3.31	2	3/4 x 4 3/4	200	9.0
80	88,9	41,4	25,68	122,2	192,0	84,1		M20 x 121	271,0	4,1
4	4.500	450	7,156.9	5.93	8.63	3.88	2	3/4 x 4 3/4	200	13.5
100	114,3	31	31,83	150,6	219,2	98,6		M20 x 121	271,0	6,1
6	6.625	300	10,341.5	8.19	11.68	4.25	2	1 x 6 1/2	250	23.5
150	168,3	20,7	46,00	208,0	296,7	108,0		M24 x 165	339,0	10,7
8	8.625	250	14,606.6	10.69	13.63	4.91	4	7/8 x 5 1/2	250	35.1
200	219,1	17,2	64,97	271,5	346,2	124,7		M22 x 140	339,0	15,9
10	10.750	250	22,690.6	13.13	15.88	4.91	4	7/8 x 5 1/2	300	48.5
250	273,0	17,2	100,93	333,5	403,4	124,7		M22 x 140	407,0	22,0

† Maximum Pressure and End Load are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ for other pipe materials and/or wall thickness. Contact GRINNELL Mechanical Products for details. For information on additional sizes or larger sizes, contact GRINNELL Mechanical Products. See page 145 for plain end coupling specifications and pages 191 - 198 for gasket information.

Figure 910 90° Plain End Elbows

Tech Data Sheet: G192

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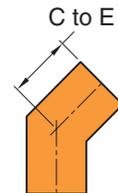
Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2	2.375	4.75	1.8
50	60,3	120,7	0,8
2½	2.875	5.50	3.1
65	73,0	139,7	1,4
76,1mm	3.000	5.50	3.2
65	76,1	139,7	1,5
3	3.500	6.25	4.8
80	88,9	158,8	2,2
4	4.500	7.75	7.5
100	114,3	196,9	3,4
139,7mm	5.500	9.75	11.3
125	139,7	248,0	5,1
5	5.563	9.75	11.6
125	141,3	248,0	5,3
165,1mm	6.500	10.00	16.9
150	165,1	254,0	7,7
6	6.625	10.00	16.6
150	168,3	254,0	7,5
8	8.625	11.00	29.6
200	219,1	279,4	13,4
10	10.750	11.50	48.5
250	273,0	292,1	22,0
12	12.750	13.50	66.4
300	323,9	342,9	30,1

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.

Figure 901 45° Plain End Elbows

Tech Data Sheet: G192

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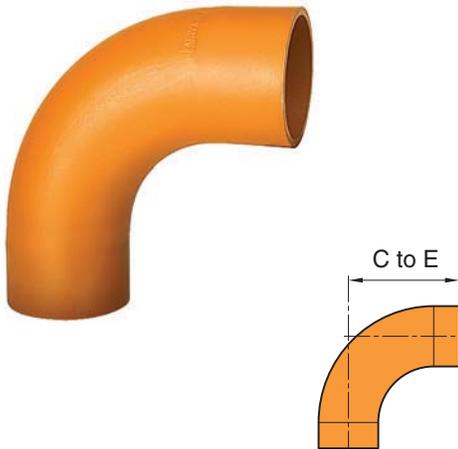
Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2	2.375	3.13	1.3
50	60,3	79,5	0,6
2½	2.875	3.50	2.1
65	73,0	88,9	1,0
76,1mm	3.000	3.50	2.2
65	76,1	88,9	1,0
3	3.500	3.75	3.5
80	88,9	95,3	1,6
4	4.500	4.25	5.5
100	114,3	108,0	2,5
139,7mm	5.500	5.00	7.7
125	139,7	127,0	3,5
5	5.563	5.00	8.1
125	141,3	127,0	3,7
165,1mm	6.500	5.75	11.0
150	165,1	146,1	5,0
6	6.625	5.75	11.2
150	168,3	146,1	5,1
8	8.625	6.00	19.0
200	219,1	152,4	8,6
10	10.750	6.50	28.0
250	273,0	165,1	12,7
12	12.750	7.00	48.0
300	323,9	177,8	22,0

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.

Figure 910LR 90° Plain End Long Radius Elbows

Tech Data Sheet: G192

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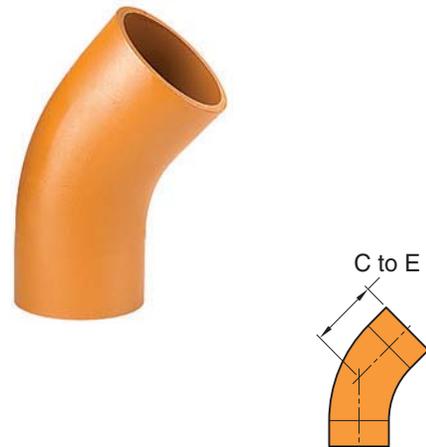
Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2	2.375	4.25	2.7
50	60,3	108,0	1,2
2½	2.875	5.50	4.2
65	73,0	139,7	1,9
76,1mm	3.000	5.50	4.4
65	76,1	139,7	2,0
3	3.500	6.25	6.5
80	88,9	158,8	2,9
4	4.500	8.00	11.5
100	114,3	203,3	5,2
139,7mm	5.500	9.75	19.0
125	139,7	248,0	8,6
5	5.563	9.75	19.4
125	141,3	248,0	8,8
165,1mm	6.500	11.13	26.4
150	165,1	282,7	12,0
6	6.625	11.13	27.9
150	168,3	282,7	12,6
8	8.625	14.13	54.5
200	219,1	358,9	24,7
10	10.750	17.13	103.7
250	273,0	435,1	47,0
12	12.750	20.13	147.8
300	323,9	511,3	67,0

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.

Figure 901LR 45° Plain End Long Radius Elbows

Tech Data Sheet: G192

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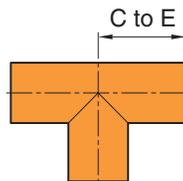


Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2	2.375	3.13	1.8
50	60,3	79,5	0,8
2½	2.875	3.50	2.9
65	73,0	88,9	1,3
76,1mm	3.000	3.50	3.1
65	76,1	88,9	1,4
3	3.500	3.75	4.6
80	88,9	95,3	2,1
4	4.500	4.50	7.5
100	114,3	114,3	3,4
139,7mm	5.500	5.00	12.5
125	139,7	127,0	5,7
5	5.563	5.00	12.5
125	141,3	127,0	5,7
165,1mm	6.500	5.88	12.0
150	165,1	149,4	5,4
6	6.625	5.88	12.0
150	168,3	149,4	5,4
8	8.625	7.13	34.0
200	219,1	181,1	15,4
10	10.750	8.38	56.0
250	273,0	212,9	25,4
12	12.750	9.36	98.0
300	323,9	244,6	44,5

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.

Figure 919 Plain End Tees

Tech Data Sheet: G192



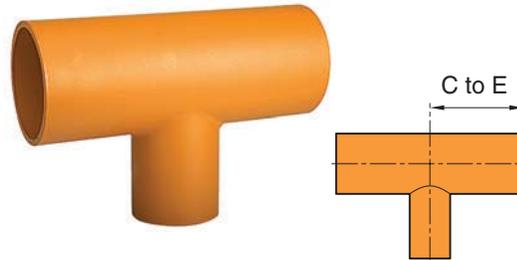
Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2	2.375	3.25	2.7
50	60,3	82,6	1,2
2½	2.875	3.75	4.4
65	73,0	95,3	2,0
76,1mm	3.000	3.75	6.5
65	76,1	95,3	2,9
3	3.500	4.25	6.5
80	88,9	108,0	2,9
4	4.500	5.00	10.7
100	114,3	127,0	4,8
139,7mm	5.500	5.50	15.2
125	139,7	139,7	6,9
5	5.563	5.50	15.5
125	141,3	139,7	7,0
165,1mm	6.500	6.50	24.2
150	165,1	165,1	11,0
6	6.625	6.50	23.0
150	168,3	165,1	10,4
8	8.625	10.00	43.7
200	219,1	254,0	19,8
10	10.750	11.50	57.0
250	273,0	292,1	25,9
12	12.750	13.50	110.0
300	323,9	342,9	49,9

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 145 for plain end fitting specifications.

Figure 921 Plain End Reducing Tees

Tech Data Sheet: G192



Pipe Size		C to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
3 x 3 x 2	3.500 x 3.500 x 2.375	5.13	7.1
80 x 80 x 50	88,9 x 88,9 x 60,3	130,3	3,2
4 x 4 x 2	4.500 x 4.500 x 2.375	5.88	9.1
100 x 100 x 50	114,3 x 114,3 x 60,3	149,4	4,1
4 x 4 x 2½	4.500 x 4.500 x 2.875	5.88	9.5
100 x 100 x 65	114,3 x 114,3 x 73,0	149,4	4,3
4 x 4 x 3	4.500 x 4.500 x 3.500	5.88	9.7
100 x 100 x 80	114,3 x 114,3 x 88,9	149,4	4,4
6 x 6 x 2	6.625 x 6.625 x 2.375	7.63	19.4
150 x 150 x 50	168,3 x 168,3 x 60,3	193,8	8,8
6 x 6 x 3	6.625 x 6.625 x 3.500	7.63	21.0
150 x 150 x 80	168,3 x 168,3 x 88,9	193,8	9,5
6 x 6 x 4	6.625 x 6.625 x 4.500	7.63	21.8
150 x 150 x 100	168,3 x 168,3 x 114,3	193,8	9,9
8 x 8 x 2	8.625 x 8.625 x 2.375	10.00	36.2
200 x 200 x 50	219,1 x 219,1 x 60,3	254,0	16,4
8 x 8 x 3	8.625 x 8.625 x 3.500	10.00	36.5
200 x 200 x 80	219,1 x 219,1 x 88,9	254,0	16,6
8 x 8 x 4	8.625 x 8.625 x 4.500	10.00	37.2
200 x 200 x 100	219,1 x 219,1 x 114,1	254,0	16,9
8 x 8 x 5	8.625 x 8.625 x 5.563	10.00	36.8
200 x 200 x 125	219,1 x 219,1 x 141,3	254,0	16,7
8 x 8 x 6	8.625 x 8.625 x 6.625	10.00	37.4
200 x 200 x 150	219,1 x 219,1 x 168,3	254,0	17,0
10 x 10 x 4	10.750 x 10.750 x 4.500	11.50	58.0
250 x 250 x 100	273,0 x 273,0 x 114,3	292,1	26,3
10 x 10 x 6	10.750 x 10.750 x 6.625	11.50	66.0
250 x 250 x 150	273,0 x 273,0 x 168,3	292,1	27,2
10 x 10 x 8	10.750 x 10.750 x 8.625	11.50	62.0
250 x 250 x 200	323,9 x 323,9 x 219,1	292,1	28,1
12 x 12 x 6	12.750 x 12.750 x 6.625	13.50	80.9
250 x 250 x 100	323,9 x 323,9 x 168,3	342,9	36,7
12 x 12 x 8	12.750 x 12.750 x 8.625	13.50	76.3
250 x 250 x 150	323,9 x 323,9 x 219,1	342,9	34,6
12 x 12 x 10	12.750 x 12.750 x 10.750	13.50	77.6
250 x 250 x 200	323,9 x 323,9 x 273,0	342,9	35,2

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 145 for plain end fitting specifications.

Figure 927 Plain End Crosses

Tech Data Sheet: G192

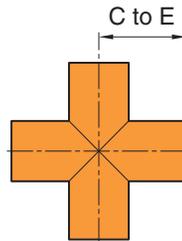
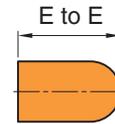


Figure 960 Plain End Caps

Tech Data Sheet: G192



Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2	2.375	4.25	3.7
50	60,3	108,0	1,7
2½	2.875	4.75	5.8
65	73,0	120,7	2,6
76,1mm	3.000	4.75	6.0
65	76,1	120,7	2,7
3	3.500	5.13	8.6
80	88,9	130,3	3,9
4	4.500	5.88	20.7
100	114,3	149,4	9,4
5	5.563	6.88	18.5
125	141,3	175,0	8,4
165,1mm	6.500	7.63	27.3
150	165,1	193,8	12,4
6	6.625	7.63	28.6
150	168,3	193,8	13,0
8	8.625	10.00	48.0
200	219,1	254,0	21,7
10	10.750	11.50	75.0
250	273,0	292,1	34,0
12	12.750	13.50	95.8
300	323,9	342,9	43,4

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.

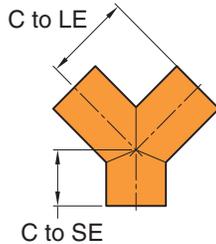
Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2	2.375	4.00	2.3
50	60,3	102,0	1,0
2½	2.875	5.00	3.0
65	73,0	127,0	1,4
3	3.500	6.00	4.5
80	88,9	152,4	2,0
4	4.500	7.00	7.5
100	114,3	178,0	3,4
5	5.563	8.50	12.5
125	141,3	216,0	5,7
6	6.625	10.00	17.0
150	168,3	254,0	7,7
8	8.625	11.00	29.0
200	219,1	279,4	13,2
10	10.750	13.00	24.5
250	273,0	330,2	11,1
12	12.750	14.00	31.0
300	323,9	355,6	14,1

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.

Figure 924 Plain End True Wyes

Tech Data Sheet: G192

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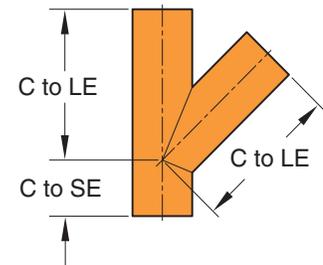
Pipe Size		C to LE Inches mm	C to SE Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			
2	2.375	4.25	2.75	2.5
50	60,3	108,0	69,9	1,1
2½	2.875	4.75	3.00	4.4
65	73,0	120,7	76,2	2,0
3	3.500	5.13	3.25	6.4
80	88,9	130,3	82,6	2,9
4	4.500	5.88	3.75	10.5
100	114,3	149,4	95,3	4,8
5	5.563	6.88	4.00	15.2
125	141,3	175,0	101,6	6,9
6	6.625	7.63	4.50	22.9
150	168,3	193,8	114,3	10,4
8	8.625	10.00	6.00	41.9
200	219,1	254,0	152,4	19,0
10	10.750	11.50	6.50	66.2
250	273,0	292,1	165,1	30,0
12	12.750	13.50	7.00	87.7
300	323,9	342,9	177,8	39,8

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.

Figure 914 Plain End Laterals

Tech Data Sheet: G192

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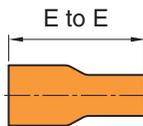
Pipe Size		C to LE Inches mm	C to SE Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm			
2	2.375	7.25	2.75	4.5
50	60,3	184,2	69,9	2,0
2½	2.875	7.75	3.00	7.7
65	73,0	197,0	76,2	3,5
3	3.500	8.75	3.25	11.0
80	88,9	222,3	82,6	5,0
4	4.500	10.75	3.75	18.7
100	114,3	273,1	95,3	8,5
5	5.563	12.75	4.00	29.4
125	141,3	324,0	101,6	13,3
6	6.625	14.00	4.50	42.2
150	168,3	355,6	114,3	19,1
8	8.625	18.00	6.00	70.9
200	219,1	457,2	152,4	32,2
10	10.750	20.75	6.50	66.2
250	273,0	527,1	165,1	30,0
12	12.750	24.50	7.00	87.7
300	323,9	622,3	177,8	39,8

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.

Figure 999 Plain End Swaged Nipples

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Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2½ x 2	2.875 x 2.375	7.00	3.5
65 x 50	73,0 x 60,3	177,8	1,6
3 x 2	3.500 x 2.375	8.00	5.0
80 x 50	88,9 x 60,3	203,2	2,3
3 x 2½	3.500 x 2.875	8.00	5.0
80 x 65	88,9 x 73,0	203,2	2,3
4 x 2	4.500 x 2.375	9.00	8.0
100 x 50	114,3 x 60,3	228,6	3,6
4 x 2½	4.500 x 2.875	9.00	8.0
100 x 65	114,3 x 73,0	228,6	3,6
4 x 3	4.500 x 3.500	9.00	8.0
100 x 80	114,3 x 88,9	228,6	3,6
5 x 2	5.563 x 2.375	11.00	12.0
125 x 50	141,3 x 60,3	279,4	5,4
5 x 3	5.563 x 3.500	11.00	12.0
125 x 80	141,3 x 88,9	279,4	5,4
5 x 4	5.563 x 4.500	11.00	12.0
125 x 100	141,3 x 114,3	279,4	5,4
6 x 2	6.625 x 2.375	12.00	19.0
150 x 50	168,3 x 60,3	304,8	8,6
6 x 2½	6.625 x 2.875	12.00	19.0
150 x 65	168,3 x 73,0	304,8	8,6
6 x 3	6.625 x 3.500	12.00	19.0
150 x 80	168,3 x 88,9	304,8	8,6
6 x 4	6.625 x 4.500	12.00	19.0
150 x 100	168,3 x 114,3	304,8	8,6
6 x 5	6.625 x 5.563	12.00	19.0
150 x 125	168,3 x 141,3	304,8	8,6
8 x 3	8.625 x 3.500	13.00	◆
200 x 80	219,1 x 88,9	330,2	-
8 x 4	8.625 x 4.500	13.00	◆
200 x 100	219,1 x 114,3	330,2	-
8 x 6	8.625 x 6.625	13.00	◆
200 x 150	219,1 x 168,3	330,2	-
10 x 3	10.750 x 3.500	15.00	◆
250 x 80	273,0 x 88,9	381,0	-
10 x 4	10.750 x 4.500	15.00	◆
250 x 100	273,0 x 114,3	381,0	-
10 x 6	10.750 x 6.625	15.00	◆
250 x 150	273,0 x 168,3	381,0	-
10 x 8	10.750 x 8.625	15.00	◆
250 x 200	273,0 x 219,1	381,0	-
12 x 6	12.750 x 6.625	16.00	◆
300 x 150	323,9 x 168,3	406,4	-
12 x 8	12.750 x 8.625	16.00	◆
300 x 200	323,9 x 219,1	406,4	-
12 x 10	12.750 x 10.750	16.00	◆
300 x 250	323,9 x 273,0	406,4	-

◆ These sizes are available. Contact GRINNELL Mechanical Products for details. For information on larger sizes, contact GRINNELL Mechanical Products. See page 145 for plain end fitting specifications.

Figures 991, 992, 993 Plain End Adapter Nipples

Tech Data Sheet: G192



Figure 991
Fabricated Adapter Nipple
Plain x Male Thread



Pipe Size		E to E Inches mm	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm		
2	2.375	4.00	1.2
50	60,3	101,6	0,5
2½	2.875	4.00	1.9
65	73,0	101,6	0,9
3	3.500	4.00	2.5
80	88,9	101,6	1,1
4	4.500	6.00	5.4
100	114,3	154,4	2,4
5	5.563	6.00	7.3
125	141,3	154,4	3,3
6	6.625	6.00	9.4
150	168,3	154,4	4,3
8	8.625	6.00	14.2
200	219,1	154,4	6,4

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.

Figure 992
Fabricated Adapter Nipple
Plain x Groove



Figure 993
Fabricated Adapter Nipple
Plain x Bevel



Figure 941 Plain End Flange Adapters (ANSI Class 150#) Figure 942 Plain End Flange Adapters (ANSI Class 300#)

Tech Data Sheet: G192



Figure 941
Plain End Flange Adapter
ANSI Class 150#

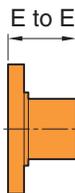
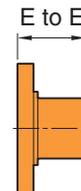


Figure 942
Plain End Flange Adapter
ANSI Class 300#



PLAIN END SYSTEMS

Pipe Size		Figure 941 ANSI Class 150#			Figure 942 ANSI Class 300#		
Nominal Inches <i>mm</i>	O.D. Inches <i>mm</i>	E to E Inches <i>mm</i>	Mating Flange Bolt Qty.	Approx. Weight Lbs. <i>kg</i>	E to E Inches <i>mm</i>	Mating Flange Bolt Qty.	Approx. Weight Lbs. <i>kg</i>
2	2.375	4.00	4	6.4	4.00	8	8.2
50	60,3	101,6		2,8	101,6		3,7
2½	2.875	4.00	4	8.8	4.00	8	11.9
65	73,0	101,6		4,0	101,6		5,4
3	3.500	4.00	4	10.4	4.00	8	15.5
80	88,9	101,6		4,7	101,6		7,0
4	4.500	6.00	8	18.2	6.00	8	28.0
100	114,3	152,4		8,3	152,4		12,7
5	5.563	6.00	8	22.0	6.00	8	37.0
125	141,3	152,4		10,0	152,4		16,8
6	6.625	6.00	8	28.1	6.00	12	48.0
150	168,3	152,4		12,7	152,4		21,8
8	8.625	6.00	8	43.7	6.00	12	79.0
200	219,1	152,4		19,8	152,4		35,8

For information on larger sizes, contact GRINNELL Mechanical Products.
See page 145 for plain end fitting specifications.



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Specifications

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The GRINNELL G-PRESS Stainless Steel Press-Fitting System provides a complete line of mechanically joined press fittings in the ½" to 2" (15 to 50mm) sizes. This press system is designed to work with Schedule 5 Stainless Steel IPS pipe sizes. Press joints can be readily achieved using several commercially available press tools. Several press by male and female threaded options are available to connect threaded components. Conversion to flanged connections can be made with the Class 125/150 Flange Adapter. Where breaks in the system may be needed, the Union Coupling can make connections / disconnections easily.

This system makes it easy to quickly and safely install a wide range of civil, industrial, and naval systems. The GRINNELL G-PRESS Stainless Steel System has a highly corrosion resistant 316 Stainless Steel housing and a variety of O-Ring Seal materials making it suitable for use in numerous installations such as HVAC, plumbing, and industrial applications.

MATERIAL SPECIFICATIONS

Fitting Housing

Stainless Steel per ANSI 316/316L with a wall thickness of 0.059" (1,5mm) and the following characteristics:

- Hygienic material often used in food and the pharmaceutical industry
- Higher surface roughness friction factor resulting in less flow loss
- Excellent corrosion resistance in chlorinated environments

For local country potable water approvals, contact GRINNELL Mechanical Products

Working Pressure

- Pressure range from full vacuum to 300 psi (20,7 bar) on Schedule 5 stainless steel pipe

O-Ring Specifications

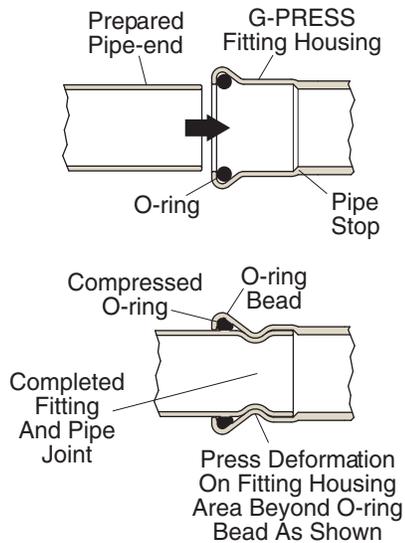
O-ring style gasket is resistant to hot water, ageing, and additives commonly used in drinking water.

- **EPDM O-Ring** (Black color) -4°F to 230°F (-20°C to 110°C) For Hot water, dilute acids, alkalis, oil free air and many chemical services. Excellent oxidation resistance. NOT FOR USE WITH HYDROCARBONS.
- **Nitrile O-Ring** (Brown color) -13°F to 230°F (-25°C to 110°C) Petroleum products, vegetable oils, mineral oils and air with oils. NOT FOR USE WITH HOT WATER OR HOT DRY AIR.
- **Fluoroelastomer O-Ring** (Green color) 32°F to 302°F (0°C to 150°C) For oxidizing acids, petroleum products, hydraulic fluids, lubricants, halogenated hydrocarbons.



G-PRESS Systems Specifications

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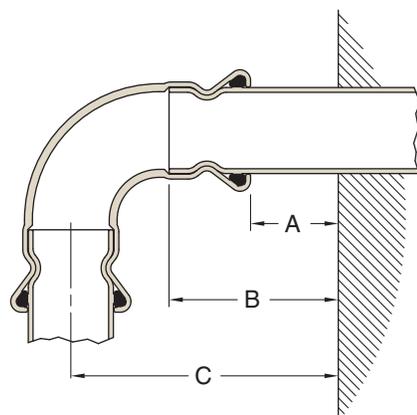
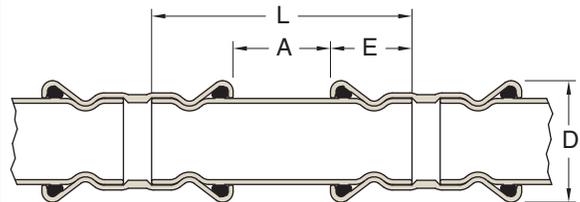


Pipe Size	
Nominal Inches mm	O.D. Inches mm
1/2	0.840
15	21,3
3/4	1.050
20	26,7
1	1.315
25	33,4
1 1/2	1.660
40	42,2
2	2.375
50	60,3

Pipe Tolerance	
Pipe OD Tolerance +/- Inches mm	Pipe Wall Thickness Schedule 5 Inches mm
0.008	0.065
0,20	1,65
0.01	0.065
0,25	1,65
0.013	0.065
0,33	1,65
0.016	0.065
0,41	1,65
0.024	0.065
0,61	1,65

Pipework Support	
Vertical Intervals Inches mm	Horizontal Intervals Inches mm
71	47
1800	1200
79	59
2000	1500
94	71
2400	1800
118	94
3000	2400
118	94
3000	2400

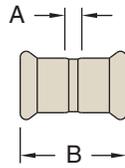
Minimum Fitting Distances					
Pipe Size		A Minimum Distance Between Fittings Inches mm	L Minimum Pipe Length Between Fittings Inches mm	E Socket Insertion Depth Inches mm	D Fitting Housing Diameter Inches mm
Nominal Inches mm	O.D. Inches mm				
1/2	0.840	0.39	1.97	1.38	3.35
15	21,3	10	50	35	85
3/4	1.050	0.39	1.97	1.38	3.50
20	26,7	10	50	35	89
1	1.315	0.39	1.97	1.38	3.74
25	33,4	10	50	35	95
1 1/2	1.660	0.39	2.44	1.38	4.76
40	42,2	10	62	35	121
2	2.375	0.79	3.15	1.38	5.79
50	60,3	20	80	35	147



Minimum Fitting Distances				
Pipe Size		A Minimum Wall to Fitting Distance Inches mm	B Minimum Horizontal Pipe Distance from Wall Inches mm	C Minimum Vertical Pipe Distance from Wall Inches mm
Nominal Inches mm	O.D. Inches mm			
1/2	0.840	1.38	1.38	3.35
15	21,3	35	35	85
3/4	1.050	1.38	1.38	3.50
20	26,7	35	35	89
1	1.315	1.38	1.38	3.74
25	33,4	35	35	95
1 1/2	1.660	1.38	1.38	4.76
40	42,2	35	35	121
2	2.375	1.38	1.38	5.79
50	60,3	35	35	147

Figure 407 Straight Couplings (Press x Press)

Tech Data Sheet: G550

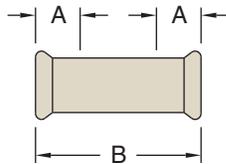


Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2	0.840	0.42	2.09	0.13
15	21,3	10,7	53,1	0,1
3/4	1.050	0.44	2.33	0.18
20	26,7	11,2	59,2	0,1
1	1.315	0.43	2.48	0.23
25	33,4	10,9	63,0	0,1
1 1/2	1.660	0.43	2.84	0.40
40	42,2	10,9	72,1	0,2
2	2.375	0.50	4.05	0.74
50	60,3	12,7	102,9	0,3

See page 157 - 158 for G-PRESS specifications.

Figure 408 Slip Couplings (Press x Press)

Tech Data Sheet: G550



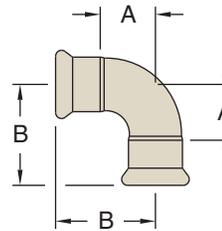
Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2	0.840	0.83	2.95	0.18
15	21,3	21,1	74,9	0,1
3/4	1.050	0.95	3.40	0.25
20	26,7	24,1	86,4	0,1
1	1.315	1.02	3.83	0.34
25	33,4	25,9	97,3	0,2
1 1/2	1.660	1.20	4.81	0.63
40	42,2	30,5	122,2	0,3
2	2.375	1.77	6.76	1.13
50	60,3	45,0	171,7	0,5

See page 157 - 158 for G-PRESS specifications.

Figure 468 90° Elbows (Press x Press)

Tech Data Sheet: G550

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WARRANTY



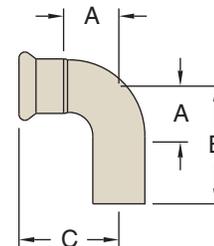
Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2	0.840	1.57	2.41	0.22
15	21,3	39,9	61,2	0,1
3/4	1.050	1.89	2.84	0.33
20	26,7	48,0	72,1	0,2
1	1.315	2.37	3.40	0.48
25	33,4	60,2	86,4	0,2
1 1/2	1.660	2.56	3.76	0.79
40	42,2	65,0	95,5	0,4
2	2.375	3.23	5.00	1.39
50	60,3	82,0	127,0	0,6

See page 157 - 158 for G-PRESS specifications.

Figure 467 90° Elbows (Male x Female)

Tech Data Sheet: G550

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YEAR
LIMITED
WARRANTY

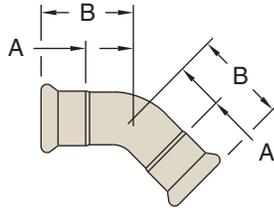


Pipe Size		Dimensions - Inches mm			Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	C	
1/2	0.840	1.57	2.87	2.41	0.24
15	21,3	39,9	72,9	61,2	0,1
3/4	1.050	1.89	3.27	2.84	0.33
20	26,7	48,0	83,1	72,1	0,2
1	1.315	2.37	3.82	3.40	0.37
25	33,4	60,2	97,0	86,4	0,2
1 1/2	1.660	2.48	4.06	3.69	0.77
40	42,2	63,0	103,1	93,7	0,4
2	2.375	3.23	5.52	5.00	1.34
50	60,3	82,0	140,2	127,0	0,6

See page 157 - 158 for G-PRESS specifications.

Figure 471 45° Elbows (Press x Press)

Tech Data Sheet: G550



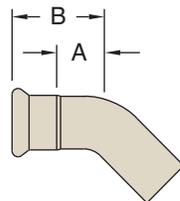
Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2	0.840	0.79	1.62	0.18
15	21,3	20,1	41,1	0,1
3/4	1.050	0.90	1.85	0.24
20	26,7	22,9	47,0	0,1
1	1.315	1.13	2.14	0.37
25	33,4	28,7	54,4	0,2
1 1/2	1.660	1.17	2.37	0.59
40	42,2	29,7	60,2	0,3
2	2.375	1.48	3.24	1.06
50	60,3	37,6	82,3	0,5

See page 157 - 158 for G-PRESS specifications.



Figure 470 45° Elbows (Male x Female)

Tech Data Sheet: G550



Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2	0.840	0.79	1.62	0.20
15	21,3	20,1	41,1	0,1
3/4	1.050	0.90	1.85	0.26
20	26,7	22,9	47,0	0,1
1	1.315	1.13	2.14	0.37
25	33,4	28,7	54,4	0,2
1 1/2	1.660	1.17	2.37	0.60
40	42,2	29,7	60,2	0,3
2	2.375	1.48	3.24	1.06
50	60,3	37,6	82,3	0,5

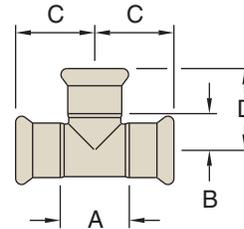
See page 157 - 158 for G-PRESS specifications.



Figure 442 Equal Tees (Press x Press x Press)

Tech Data Sheet: G550

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YEAR
LIMITED
WARRANTY



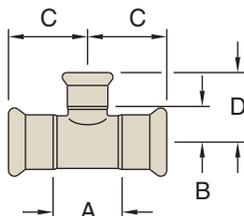
Pipe Size		Dimensions - Inches mm				Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	
1/2	0.840	1.28	0.80	1.48	1.64	0.24
15	21,3	32,5	20,3	37,6	41,7	0,1
3/4	1.050	1.50	0.92	1.70	1.87	0.33
20	26,7	38,1	23,4	43,2	47,5	0,2
1	1.315	1.78	1.07	1.91	2.09	0.46
25	33,4	45,2	27,2	48,5	53,1	0,2
1 1/2	1.660	2.40	1.36	2.41	2.57	0.84
40	42,2	61,0	34,5	61,2	65,3	0,4
2	2.375	3.22	1.61	3.39	3.39	1.48
50	60,3	81,8	40,9	86,1	86,1	0,7

See page 157 - 158 for G-PRESS specifications.

Figure 473 Reducing Tees (Press x Press x Press)

Tech Data Sheet: G550

10
YEAR
LIMITED
WARRANTY



Pipe Size		Dimensions - Inches mm				Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	
3/4 x 3/4 x 1/2	1.050 x 1.050 x 0.840	1.50	0.91	1.70	1.74	0.31
20 x 20 x 15	26,7 x 26,7 x 21,3	38,1	23,1	43,2	44,2	0,1
1 x 1 x 1/2	1.315 x 1.315 x 0.840	1.78	1.06	1.91	1.89	0.40
25 x 25 x 15	33,4 x 33,4 x 21,3	45,2	26,9	48,5	48,0	0,2
1 x 1 x 3/4	1.315 x 1.315 x 1.050	1.78	1.07	1.91	2.02	0.42
25 x 25 x 20	33,4 x 33,4 x 26,7	45,2	27,2	48,5	51,3	0,2
1 1/2 x 1 1/2 x 1 1/2	1.900 x 1.900 x 0.840	2.40	1.35	2.41	2.19	0.68
40 x 40 x 15	48,3 x 48,3 x 21,3	61,0	34,3	61,2	55,6	0,3
1 1/2 x 1 1/2 x 3/4	1.900 x 1.900 x 1.050	2.40	1.37	2.41	2.31	0.70
40 x 40 x 20	48,3 x 48,3 x 26,7	61,0	34,8	61,2	58,7	0,3
1 1/2 x 1 1/2 x 1	1.900 x 1.900 x 1.315	2.40	1.36	2.41	2.39	0.75
40 x 40 x 25	48,3 x 48,3 x 33,4	61,0	34,5	61,2	60,7	0,3
2 x 2 x 1 1/2	2.375 x 2.375 x 0.840	3.22	1.60	3.39	2.44	1.17
50 x 50 x 15	60,3 x 60,3 x 21,3	81,8	40,6	86,1	62,0	0,5
2 x 2 x 3/4	2.375 x 2.375 x 1.050	3.22	1.62	3.39	2.56	1.19
50 x 50 x 20	60,3 x 60,3 x 26,7	81,8	41,1	86,1	65,0	0,5
2 x 2 x 1	2.375 x 2.375 x 1.315	3.22	1.61	3.39	2.62	1.23
50 x 50 x 25	60,3 x 60,3 x 33,4	81,8	40,9	86,1	66,5	0,6
2 x 2 x 1 1/2	2.375 x 2.375 x 1.900	3.22	1.61	3.39	2.82	1.32
50 x 50 x 40	60,3 x 60,3 x 48,3	81,8	40,9	86,1	71,6	0,6

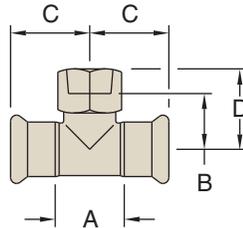
See page 157 - 158 for G-PRESS specifications.

STAINLESS STEEL G-PRESS SYSTEMS

Figure 478 Tee and Reducing Tee Adapters (Press x Press x Female NPT)

Tech Data Sheet: G550

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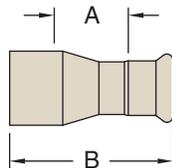
Pipe Size		Dimensions - Inches mm				Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	
1/2 x 1/2 x 1/2	0.840 x 0.840 x 0.840	1.28	0.93	1.48	1.52	0.26
15 x 15 x 15	21,3 x 21,3 x 21,3	32,5	23,6	37,6	38,6	0,1
1/2 x 1/2 x 3/4	0.840 x 0.840 x 1.050	1.28	1.30	1.48	1.84	0.37
15 x 15 x 20	21,3 x 21,3 x 26,7	32,5	33,0	37,6	46,7	0,2
3/4 x 3/4 x 1/2	1.050 x 1.050 x 0.840	1.50	1.04	1.70	1.63	0.33
20 x 20 x 15	26,7 x 26,7 x 21,3	38,1	26,4	43,2	41,4	0,2
3/4 x 3/4 x 3/4	1.050 x 1.050 x 1.050	1.50	1.27	1.70	1.81	0.40
20 x 20 x 20	26,7 x 26,7 x 26,7	38,1	32,3	43,2	46,0	0,2
3/4 x 3/4 x 1	1.050 x 1.050 x 1.315	1.50	1.29	1.70	1.97	0.46
20 x 20 x 25	26,7 x 26,7 x 33,4	38,1	32,8	43,2	50,0	0,2
1 x 1 x 1/2	1.315 x 1.315 x 0.840	1.78	1.19	1.91	1.78	0.42
25 x 25 x 15	33,4 x 33,4 x 21,3	45,2	30,2	48,5	45,2	0,2
1 x 1 x 3/4	1.315 x 1.315 x 1.050	1.78	1.42	1.91	1.96	0.48
25 x 25 x 20	33,4 x 33,4 x 26,7	45,2	36,1	48,5	49,8	0,2
1 x 1 x 1 1/4	1.315 x 1.315 x 1.660	1.78	1.38	1.91	2.13	0.66
25 x 25 x 32	33,4 x 33,4 x 42,2	45,2	35,1	48,5	54,1	0,3
1 1/2 x 1 1/2 x 1/2	1.900 x 1.900 x 0.840	2.40	1.48	2.41	2.07	0.70
40 x 40 x 15	48,3 x 48,3 x 21,3	61,0	37,6	61,2	52,6	0,3
1 1/2 x 1 1/2 x 3/4	1.900 x 1.900 x 1.050	2.40	1.71	2.41	2.25	0.77
40 x 40 x 20	48,3 x 48,3 x 26,7	61,0	43,4	61,2	57,2	0,4
1 1/2 x 1 1/2 x 1	1.900 x 1.900 x 1.315	2.40	1.59	2.41	2.27	0.84
40 x 40 x 25	48,3 x 48,3 x 33,4	61,0	40,4	61,2	57,7	0,4
1 1/2 x 1 1/2 x 1 1/2	1.900 x 1.900 x 1.900	2.40	1.74	2.41	2.58	1.21
40 x 40 x 40	48,3 x 48,3 x 48,3	61,0	44,2	61,2	65,5	0,6
2 x 2 x 1 1/2	2.375 x 2.375 x 0.840	3.22	1.73	3.39	2.32	1.19
50 x 50 x 15	60,3 x 60,3 x 21,3	81,8	43,9	86,1	58,9	0,5
2 x 2 x 3/4	2.375 x 2.375 x 1.050	3.22	1.96	3.39	2.50	1.26
50 x 50 x 20	60,3 x 60,3 x 26,7	81,8	49,8	86,1	63,5	0,6
2 x 2 x 1	2.375 x 2.375 x 1.315	3.22	1.84	3.39	2.52	1.32
50 x 50 x 25	60,3 x 60,3 x 33,4	81,8	46,7	86,1	64,0	0,6
2 x 2 x 2	2.375 x 2.375 x 2.375	3.22	2.14	3.39	3.19	1.90
50 x 50 x 50	60,3 x 60,3 x 60,3	81,8	54,4	86,1	81,0	0,9

See page 157 - 158 for G-PRESS specifications.

Figure 474 Reducers (Female Press x Male Press)

Tech Data Sheet: G550

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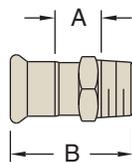
Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O. D. Inches mm	A	B	
$\frac{3}{4} \times \frac{1}{2}$	1.050 x 0.840	1.21	3.04	0.18
20 x 15	26,7 x 21,3	30,7	77,2	0,1
$1 \times \frac{1}{2}$	1.315 x 0.840	2.58	4.34	0.28
25 x 15	33,4 x 21,3	65,5	110,2	0,1
$1 \times \frac{3}{4}$	1.315 x 1.050	1.75	3.76	0.26
25 x 20	33,4 x 26,7	44,5	95,5	0,1
$1\frac{1}{2} \times \frac{1}{2}$	1.900 x 0.840	1.15	3.42	0.33
40 x 15	48,3 x 21,3	29,2	86,9	0,1
$1\frac{1}{2} \times \frac{3}{4}$	1.900 x 1.050	1.60	3.55	0.55
40 x 20	48,3 x 26,7	40,6	90,2	0,2
$1\frac{1}{2} \times 1$	1.900 x 1.315	1.29	3.56	0.37
40 x 25	48,3 x 33,4	32,8	90,4	0,2
$2 \times \frac{1}{2}$	2.375 x 0.840	1.62	4.23	0.53
50 x 15	60,3 x 21,3	41,1	107,4	0,2
$2 \times \frac{3}{4}$	2.375 x 1.050	1.59	4.34	0.35
50 x 20	60,3 x 26,7	40,4	110,2	0,2
2×1	2.375 x 1.315	1.55	4.37	0.57
50 x 25	60,3 x 33,4	39,4	111,0	0,3
$2 \times 1\frac{1}{2}$	2.375 x 1.900	2.64	5.30	0.70
50 x 40	60,3 x 48,3	67,1	134,6	0,3

See page 157 - 158 for G-PRESS specifications.

Figure 476 Straight Connectors (Female Press x Male NPT)

Tech Data Sheet: G550

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Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O. D. Inches mm	A	B	
$\frac{1}{2} \times \frac{1}{2}$	0.840 x 0.840	0.72	2.14	0.15
15 x 15	21,3 x 21,3	18,3	54,4	0,1
$\frac{1}{2} \times \frac{3}{4}$	0.840 x 1.050	0.81	2.35	0.20
15 x 20	21,3 x 26,7	20,6	59,7	0,1
$\frac{1}{2} \times 1$	0.840 x 1.315	0.83	2.44	0.29
15 x 20	21,3 x 33,4	21,1	62,0	0,1
$\frac{3}{4} \times \frac{3}{4}$	1.050 x 1.050	0.83	2.43	0.22
20 x 20	26,7 x 26,7	21,1	61,7	0,1
$\frac{3}{4} \times 1$	1.050 x 1.315	0.85	2.52	0.31
20 x 25	26,7 x 33,4	21,6	64,0	0,1
1×1	1.315 x 1.315	0.83	2.64	0.29
25 x 25	33,4 x 33,4	21,1	67,10	0,1
$1 \times 1\frac{1}{2}$	1.315 x 1.900	0.92	2.90	0.62
25 x 40	33,4 x 48,3	23,4	73,7	0,3
$1\frac{1}{2} \times 1\frac{1}{2}$	1.900 x 1.900	0.92	3.09	0.68
40 x 40	48,3 x 48,3	23,4	78,5	0,3
$2 \times 1\frac{1}{2}$	2.375 x 1.900	0.91	3.17	0.97
50 x 40	60,3 x 48,3	23,1	80,5	0,4
2×2	2.375 x 2.375	0.91	3.74	1.01
50 x 50	60,3 x 60,3	23,1	95,0	0,5

See page 157 - 158 for G-PRESS specifications.

Figure 479 Straight Connectors (Female Press x Female NPT)

Tech Data Sheet: G550



Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2 x 3/4	0.840 x 1.050	0.93	2.47	0.31
15 x 20	21,3 x 26,7	23,6	62,7	0,1
1/2 x 1	0.840 x 1.315	0.98	2.47	0.26
15 x 25	21,3 x 33,4	24,9	62,7	0,1
3/4 x 3/4	1.050 x 1.050	1.00	2.56	0.51
20 x 20	26,7 x 26,7	25,4	65,0	0,2
3/4 x 1	1.050 x 1.315	1.00	2.56	0.44
20 x 25	26,7 x 33,4	25,4	65,0	0,2
1 x 1	1.315 x 1.315	0.86	2.56	0.31
25 x 25	33,4 x 33,4	21,8	65,0	0,1
1 x 1 1/2	1.315 x 1.900	1.26	3.06	1.28
25 x 40	33,4 x 48,3	32,0	77,7	0,6
1 1/2 x 1 1/2	1.900 x 1.900	1.01	3.06	0.82
40 x 40	48,3 x 48,3	25,7	77,7	0,4
1 1/2 x 2	1.900 x 2.375	1.39	3.65	1.21
40 x 50	48,3 x 60,3	35,3	92,7	0,5
2 x 1 1/2	2.375 x 1.900	1.36	3.98	1.83
50 x 40	60,3 x 48,3	34,5	101,1	0,8
2 x 2	2.375 x 2.375	1.15	3.98	1.17
50 x 50	60,3 x 60,3	29,2	101,1	0,5

See page 157 - 158 for G-PRESS specifications.

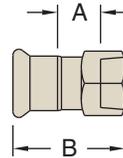
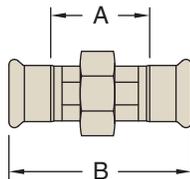


Figure 485 3-Piece Unions (Press x Press)

Tech Data Sheet: G550



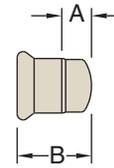
Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2	0.840	2.35	4.02	0.62
15	21,3	59,7	102,1	0,3
3/4	1.050	2.64	4.54	0.82
20	26,7	67,1	115,3	0,4
1	1.315	2.72	4.76	0.97
25	33,4	69,1	120,9	0,4
1 1/2	1.660	3.88	6.29	2.36
40	42,2	98,6	159,8	1,1
2	2.375	4.72	8.26	3.70
50	60,3	119,0	209,8	1,7

See page 157 - 158 for G-PRESS specifications.



Figure 484 End Caps (Female Press)

Tech Data Sheet: G550

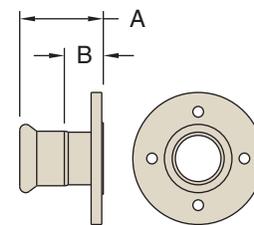


Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2	0.840	0.72	1.56	0.09
15	21,3	18,3	39,6	0,1
3/4	1.050	0.79	1.74	0.13
20	26,7	20,1	44,2	0,1
1	1.315	0.83	1.85	0.18
25	33,4	21,1	47,0	0,1
1 1/2	1.660	0.95	2.15	0.33
40	42,2	24,1	54,6	0,1
2	2.375	1.14	2.91	0.55
50	60,3	29,0	73,9	0,2

See page 157 - 158 for G-PRESS specifications.

Figure 466 Van Stone Flange Adapters (Female Press x Flange)

Tech Data Sheet: G550

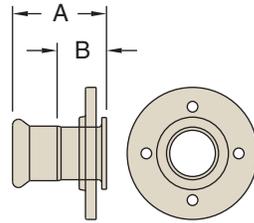


Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2	0.840	3.11	1.17	0.93
15	21,3	79,0	29,8	0,4
3/4	1.050	3.23	1.42	1.37
20	26,7	82,0	36,1	0,6
1	1.315	3.30	1.78	1.87
25	33,4	83,8	45,2	0,8
1 1/2	1.660	3.45	2.59	2.98
40	42,2	87,6	65,8	1,4
2	2.375	4.56	3.45	4.75
50	60,3	115,8	87,6	2,2

See page 157 - 158 for G-PRESS specifications.
Flange material is AISI 304 and the body is AISI 316/316L.

Figure 475 Flange Adapters (Female Press x Flange)

Tech Data Sheet: G550



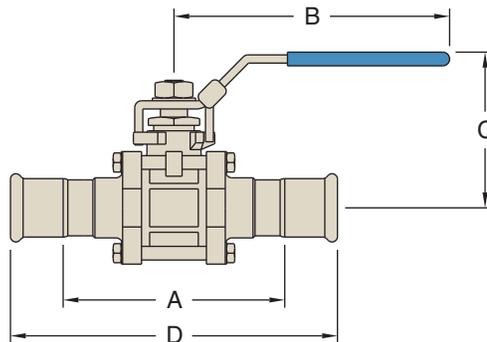
Pipe Size		Dimensions - Inches mm		Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	
1/2	0.840	1.95	0.94	0.90
15	21,3	49,5	23,9	0,4
3/4	1.050	2.15	1.16	1.30
20	26,7	54,6	29,5	0,6
1	1.315	2.52	1.44	1.83
25	33,4	64,0	36,6	0,8
1 1/2	1.660	3.39	2.08	3.03
40	42,2	86,1	52,9	1,4
2	2.375	4.87	2.90	4.91
50	60,3	123,7	73,7	2,2

See page 157 - 158 for G-PRESS specifications.



Figure 469 Ball Valves (Press x Press)

Tech Data Sheet: G550



Pipe Size		Dimensions - Inches mm				Weight lbs kg
Nominal Inches mm	O.D. Inches mm	A	B	C	D	
1/2	0.840	3.16	3.94	2.44	4.84	1.24
15	21,3	80,3	100,1	62,0	122,9	0,6
3/4	1.050	3.59	4.92	2.44	5.49	1.73
20	26,7	91,2	125,0	62,0	139,4	0,8
1	1.315	3.99	5.87	3.03	6.03	2.46
25	33,4	101,3	149,1	77,0	153,2	1,1
1 1/2	1.660	5.05	7.48	3.94	7.45	5.93
40	42,2	128,3	190,0	100,1	189,2	2,7
2	2.375	5.84	7.48	4.25	9.38	8.48
50	60,3	148,3	190,0	108,0	238,3	3,8

See page 157 - 158 for G-PRESS specifications.



Notes



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Figure 9094
HDPE Flange Couplings
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MATERIAL SPECIFICATIONS

Coupling Ductile Iron Housing Specifications

- ASTM A 536 – Standard specification for ductile iron castings, Grade 65-45-12

Bolt/Nut Specifications

- **ANSI:** Carbon steel oval neck bolts & nuts are heat-treated and conform to the physical properties of ASTM A 183 Grade 2 and SAE J429 Grade 5 with a minimum tensile strength of 110,000 psi (7584,2 bar). Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 183 Grade 2 and SAE J995 Grade 5. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.
- **Metric:** Carbon steel oval neck track head bolts (Gold color coded) are heat treated and conform to the physical properties of ASTM F 568 M with a minimum tensile strength of 760 MPa. Carbon Steel heavy hex nuts conform to the physical properties of ASTM A 563 M Class 9. Bolts and nuts are zinc-electroplated conforming to ASTM B 633.
- Stainless steel bolts and nuts are available upon request.

Gasket Specifications

- **Grade "E" EPDM** gaskets have a Green color code identification and conform to ASTM D 2000 for service temperatures from -30°F to 230°F (-34°C to 110°C). They are recommended for hot water not to exceed 230°F (110°C), plus a variety of dilute acids, oil free air, and many chemical services. They are not recommended for petroleum services.
- **Grade "T" Nitrile** (Color code: Orange stripe) Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range. Also good for water services under 150°F (66°C). Temperature range: -20°F to +180°F (-29°C to +82°C). Do not use for HOT WATER above 150°F (66°C) or HOT DRY AIR above 140°F (60°C).

Coatings

- Orange – Non-lead paint (standard)
- Red – Non-lead paint (optional, regional)
- Hot-Dipped, Zinc galvanized (optional)

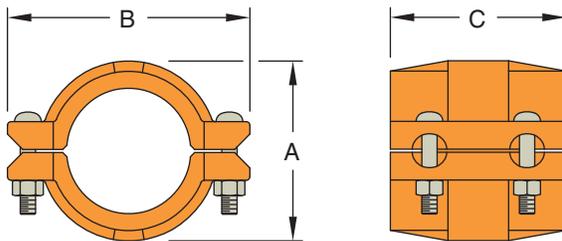
Figure 9095 HDPE Couplings

Tech Data Sheet: G580



The GRINNELL Figure 9095 HDPE Coupling is specially designed for joining sections of high-density polyethylene (HDPE) piping. The GRINNELL Figure 9095 features a four-bolt coupling design with machined gripping teeth to positively secure high-density polyethylene piping and create a leak-tight joint.

The contoured housing features an integrated ramp design that helps avoid obstacles while relocating pipe runs. This coupling is ideal for mining, irrigation, and tunnelling applications.



Pipe Size		Dimensions - Inches mm			Coupling Bolt Size Inches	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C		
2	2.375	3.39	5.24	4.61	1/2 x 2 3/8	5.7
50	60,3	86,0	133,0	117,0	—	2,6
3	3.500	4.61	6.50	4.02	1/2 x 2 3/4	7.9
80	88,9	117,0	165,0	102,0	—	3,6
4	4.500	5.75	7.99	5.75	1/2 x 3	11.4
100	114,3	146,0	203,0	146,0	—	5,2
6	6.625	7.87	10.75	5.87	5/8 x 3 1/2	18.0
150	168,3	200,0	273,0	149,0	—	8,2
8	8.625	10.39	13.11	5.98	5/8 x 3 1/2	27.5
200	219,1	264,0	333,0	152,0	—	12,5
10	10.750	12.52	15.63	6.50	3/4 x 4 3/4	44.0
250	273,0	318,0	397,0	165,0	—	20,0
12	12.750	14.37	17.64	7.87	3/4 x 4 3/4	56.1
300	323,9	365,0	448,0	200,0	—	25,5
14	14.000	16.26	19.37	10.12	1 x 6	90.6
350	355,6	413,0	492,0	257,0	—	41,2
16	16.000	18.39	21.38	10.12	1 x 6	97.2
400	406,4	467,0	543,0	257,0	—	44,2
18	18.000	20.28	23.43	10.24	1 x 6	111.1
450	457,2	515,0	595,0	260,0	—	50,5
20	20.000	22.36	25.63	10.24	1 x 6	136.0
500	508,0	568,0	651,0	260,0	—	61,8

For information on larger sizes, contact GRINNELL Mechanical Products.
 See page 170 for HDPE coupling specifications and pages 191 - 198 for gasket information.
 See page 174 for pipe wall thickness and standard dimension ratio information.

Refer to back cover for country-specific customer care numbers.

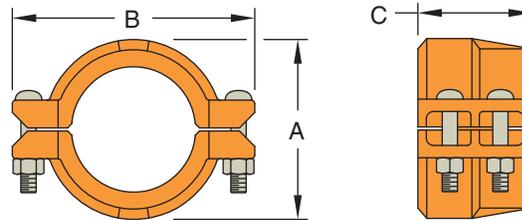
Figure 9097 HDPE Transition Couplings

Tech Data Sheet: G582



The GRINNELL Figure 9097 HDPE Transition Coupling provides for an efficient transition from grooved piping systems to high-density polyethylene (HDPE) piping. The GRINNELL Figure 9097 features a four-bolt coupling design with one side of machine gripping teeth and a grooved end creating a leak-tight joint between high-density polyethylene and grooved piping systems.

The contoured housing features the same integrated ramp design as the GRINNELL Figure 9095, which helps avoid obstacles while relocating pipe runs. This coupling is ideal for mining, irrigation, and tunnelling applications.



Pipe Size		Dimensions - Inches mm			Coupling Bolt Size Inches	Approx. Weight Lbs. kg
Nominal Inches mm	O.D. Inches mm	A	B	C		
2	2.375	3.39	5.99	3.11	1/2 x 2 3/8	4.4
50	60,3	86,0	152,0	79,0	-	2,0
3	3.500	4.49	7.13	3.11	1/2 x 3	5.9
80	88,9	114,0	181,0	79,0	-	2,7
4	4.500	5.75	8.50	3.74	1/2 x 3	8.4
100	114,3	146,0	216,0	95,0	-	3,8
6	6.625	8.00	11.26	3.74	5/8 x 3 1/2	12.5
150	168,3	203,0	286,0	95,0	-	5,7
8	8.625	10.51	13.63	4.25	5/8 x 3 1/2	21.3
200	219,1	267,0	346,0	108,0	-	9,7
10	10.750	12.64	17.00	5.00	3/4 x 4 3/4	35.2
250	273,0	321,0	432,0	127,0	-	16,0
12	12.750	14.76	19.49	5.00	3/4 x 4 3/4	43.1
300	323,9	375,0	495,0	127,0	-	19,6

For information on larger sizes, contact GRINNELL Mechanical Products.

See page 170 for HDPE coupling specifications and pages 191 - 198 for gasket information.

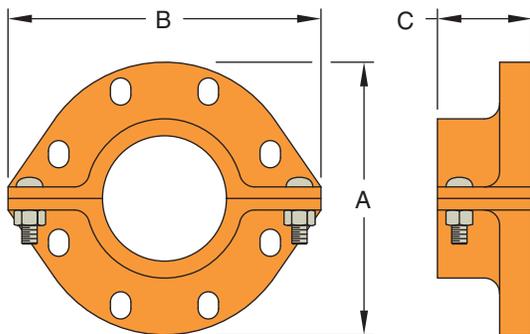
See page 174 for pipe wall thickness and standard dimension ratio information.

Figure 9094 Flange Couplings

Tech Data Sheet: G584



The GRINNELL Figure 9094 HDPE Flange Coupling provides for an efficient transition from high-density polyethylene (HDPE) piping to ANSI class 125# or 150# flanged piping system. This coupling is ideal for mining, irrigation, and tunnelling applications.



Pipe Size		Dimensions - Inches <i>mm</i>			Coupling Bolts ‡		Approx. Weight Lbs. <i>kg</i>
Nominal Inches <i>mm</i>	O.D. Inches <i>mm</i>	A	B	C	Quantity	Bolt Size Inches	
4	4.500	9.00	10.25	3.10	8	$\frac{5}{8} \times 3\frac{1}{4}$	15.0
100	114,3	229,0	260,0	79,0		–	6,8
6	6.625	11.00	12.25	3.75	8	$\frac{3}{4} \times 3\frac{1}{2}$	21.5
150	168,3	279,0	311,0	95,0		–	9,8
8	8.625	13.50	14.75	3.42	8	$\frac{3}{4} \times 3\frac{3}{4}$	28.8
200	219,1	343,0	375,0	87,0		–	13,1

‡ Mating bolts and nuts are not supplied. Flange mating bolts must be at least SAE J429, Grade 5 or stronger. It is the responsibility of the purchaser to verify correct length for the intended application.
 For information on larger sizes, contact GRINNELL Mechanical Products.
 See page 170 for HDPE coupling specifications and pages 191 - 198 for gasket information.
 See page 174 for pipe wall thickness and standard dimension ratio information.



HDPE Pipe Wall Thickness and Standard Dimension Ratios

Tech Data Sheet: G580, G582, G584

Pipe Size				Pipe Wall Thickness and Standard Dimension Ratio						
Nominal Inches mm	O.D. Inches mm	Tol. +/- Inches mm	Max. Pipe Ovality +/- Inches mm	SDR 7.3 Inches mm	SDR 9 Inches mm	SDR 11 Inches mm	SDR 15.5 Inches mm	SDR 17 Inches mm	SDR 21 Inches mm	SDR 32.5 Inches mm
2	2.375	0.006	0.035	0.325	0.264	0.216	0.153	0.140	0.113	–
50	60,3	0,15	0,89	8,3	6,7	5,5	3,9	3,6	2,9	–
3	3.500	0.016	0.040	0.479	0.389	0.318	0.226	0.206	0.167	0.108
80	88,9	0,41	1,02	12,2	9,9	8,1	5,7	5,2	4,2	2,7
4	4.500	0.020	0.040	0.616	0.500	0.409	0.290	0.265	0.214	0.138
100	114,3	0,51	1,02	15,6	12,7	10,4	7,4	6,7	5,4	3,5
6	6.625	0.030	0.050	0.908	0.736	0.602	0.427	0.327	0.265	0.204
150	168,3	0,76	1,27	23,1	18,7	15,3	10,8	8,3	6,7	5,2
8	8.625	0.039	0.075	1.182	0.958	0.784	0.556	0.507	0.340	0.265
200	219,1	0,99	1,91	30,0	24,3	19,9	14,1	12,9	8,6	6,7
10	10.750	0.048	0.075	1.473	1.194	0.977	0.694	0.632	0.512	0.331
250	273,0	1,22	1,91	37,4	30,3	24,8	17,6	16,1	13,0	8,4
12	12.750	0.057	0.075	1.747	1.417	1.159	0.823	0.750	0.607	0.392
300	323,9	1,45	1,91	44,4	36,0	29,4	20,9	19,1	15,4	10,0

Per Specification for Polyethylene (P.E.) Plastic Pipe ASTM F714, D2447, D3035.



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G-MINE PVC Systems

Tech Data Sheet: G590

Approvals:

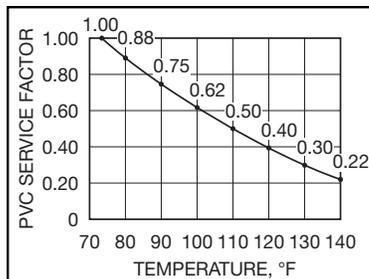
- All G-MINE Pipe and Fittings are NSF-14 Compliant except for SDR 13.5 which is NSF-61.

Materials:

- Pipe and fittings are made of high-strength PVC (Poly Vinyl Chloride) conforming to ASTM D 1784.
- G-MINE PVC Joints meet the requirements of ASTM D 3139.
- O-rings are Teflon-coated, Nitrile Butadiene Rubber (NBR) or Polyisoprene Rubber conforming to ASTM F 477.
- Spline is Nylon. Available in Acid-resistant Polyvinylidene Fluoride.

PVC Temperature Service Factor:

- All pressure ratings for PVC pipe are determined in a water environment of 73.4°F (23°C) (±3.6°F). As the temperature of the environment increases, PVC Pipe becomes more ductile. This is represented by the graph (Figure 1).
- The PVC material's impact strength increases and the tensile strength decreases as the temperature rises. Because of this effect, the pressure rating of the pipe and fittings must be decreased to allow for safe operation of the line at elevated temperatures.



**FIGURE 1
PVC TEMPERATURE
SERVICE FACTOR**

Pipe Specifications:

Nominal Property Values		
Pipe Property	Test Method	Value
Izod Impact	ASTM D 256	1.15 Ft.-Lbs./In. of Notch (16.8 N/m)
Tensile Strength	ASTM D 638	7,000 psi (482 bar)
Modulus of Elasticity	ASTM D 638	400,000 psi (27579 bar)
Deflection Temperature	ASTM D 648	158°F (70°C)
Flammability	ASTM D 635	Self-Extinguishing

Pipe Impact Strength Production Specification			
Nominal Size Inches	SDR 21 (Ft. - Lbs.) (N/m)	SDR 17 (Ft. - Lbs.) (N/m)	SDR 13.5* (Ft. - Lbs.) (N/m)
2	—	170	170
	-	2480	2480
3	—	245	245
	-	3575	3575
4	255	320	320
	3721	4670	4670
6	380	470	470
	5545	6859	6859
8	495	610	610
	7223	8902	8902

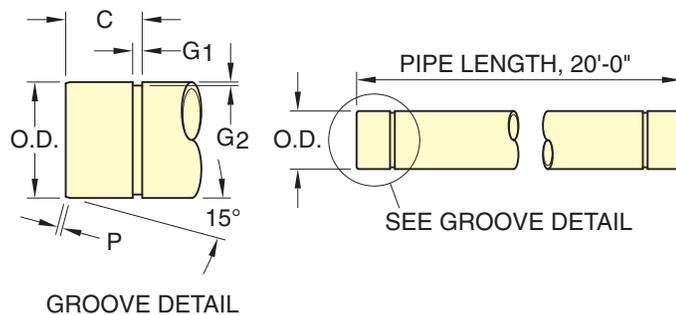
*High-pressure pipe



Figure 72900 SDR Pipe (Spline x Spline)

Tech Data Sheet: G590

The GRINNELL Figure 72900 G-MINE PVC Pipe provides a flexible piping system that is non-corrosive and resistant to harsh environments, acids, and most chemicals. Its specially formulated compound contains impact modifiers and UV (Ultraviolet) inhibitors that provide higher impact strength over an extended period of time. Pipe is available in 20 foot (6,1m) laying lengths (19 foot (5,8m) lengths are available for export from USA).



Nom. Size In. mm	O.D. In. mm	SDR	Max. Pressure Rating psi bar	P In. mm	C In. mm	G1 Width In. mm	G2 Depth In. mm	Min. Wall Thk. In. mm	Approx. Pipe Weight Lbs./Ft. Kg/M
2	2.375	SDR	250	0.188	1.75	0.250	0.100	0.140	0.64
50	60,3	17	17,2	4,8	44,5	6,4	2,5	3,6	0,3
3	3.50	SDR	250	0.188	2.50	0.375	0.135	0.206	1.37
80	88,9	17	17,2	4,8	63,5	9,5	3,4	5,2	0,6
4 L	4.50	SDR	200	0.188	3.00	0.375	0.135	0.214	1.86
100	114,3	21	13,8	4,8	76,2	9,5	3,4	5,4	0,8
4	4.50	SDR	250	0.188	3.00	0.375	0.135	0.265	2.25
100	114,3	17	17,2	4,8	76,2	9,5	3,4	6,7	1,0
4 H	4.50	SDR	315	0.188	3.00	0.375	0.135	0.333	2.85
100	114,3	13.5	21,7	4,8	76,2	9,5	3,4	8,5	1,3
6 L	6.625	SDR	200	0.313	3.00	0.375	0.135	0.316	3.99
150	168,3	21	13,8	8,0	76,2	9,5	3,4	8,0	1,8
6	6.625	SDR	250	0.313	3.00	0.375	0.135	0.390	4.87
150	168,3	17	17,2	8,0	76,2	9,5	3,4	9,9	2,2
6 H	6.625	SDR	315	0.313	3.00	0.375	0.135	0.491	6.07
150	168,3	13.5	21,7	8,0	76,2	9,5	3,4	12,5	2,8
8 L	8.625	SDR	200	0.625	3.16	0.500	0.145	0.410	6.71
200	219,1	21	13,8	16,7	80,3	12,7	3,7	10,4	3,0
8	8.625	SDR	250	0.625	3.16	0.500	0.145	0.508	8.16
200	219,1	17	17,2	16,7	80,3	12,7	3,7	12,9	3,7
8 H	8.625	SDR	315	0.625	3.16	0.500	0.145	0.639	10.30
200	219,1	13.5	21,7	16,7	80,3	12,7	3,7	16,2	4,7

Laying length is 20 foot (6,1 m) (19 foot (5,8m) lengths are available for export from USA).

G-MINE Pipe is produced with thickened ends to accommodate the G-MINE groove while maintaining their designed pressure rating. Grooving the non-thickened pipe body will result in less-than-designed pressure rating for the new joint and ultimately the entire system. When fabrication is required for non-thickened end products, apply a Figure 72905 G-MINE x Solvent Weld Transition Coupling.

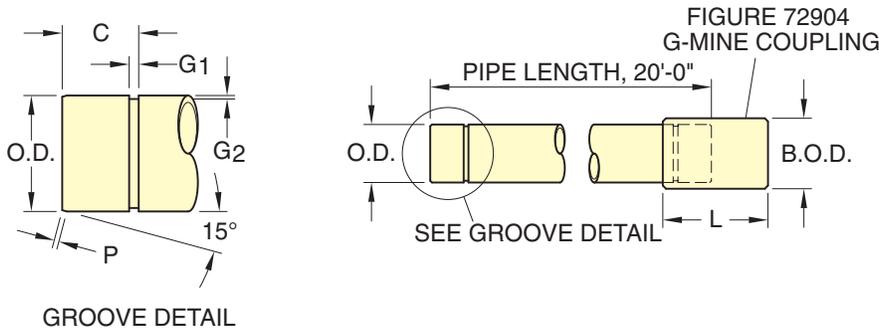
10" and 12" (250 and 300mm) are available upon request. Contact GRINNELL Mechanical Products.

See G-MINE specifications on page 177.

Figure 72901 SDR Pipe with Coupling (Male Spline x Female Spline)

Tech Data Sheet: G590

The GRINNELL Figure 72901 G-MINE PVC Pipe and Coupling (packaged together) provide a flexible piping system that is non-corrosive and resistant to harsh environments, acids, and most chemicals. GRINNELL Figure 72901 includes a G-MINE PVC Pipe and Coupling, an O-Ring and a Spline. Pipe laying length is 20 foot (6,1m) (19 foot (5,8m) lengths are available for export from USA).



Nom. Size In. mm	O.D. In. mm	SDR	Max. Pressure Rating psi bar	B.O.D. In. mm	L In. mm	P In. mm	C In. mm	G1 Width In. mm	G2 Depth In. mm	Min. Wall Thk. In. mm	Approx. Pipe Weight Lbs./Ft. Kg/M
2 50	2.375 60,3	SDR 17	250 17,2	3.20 81	5.25 133,4	0.188 4,8	1.75 44,5	0.250 6,4	0.100 2,5	0.14 3,6	0.69 0,31
3 80	3.50 88,9	SDR 17	250 17,2	4.38 111	7.25 184,2	0.188 4,8	2.50 63,5	0.375 9,5	0.135 3,4	0.21 5,2	1.48 0,67
4 L* 100	4.50 114,3	SDR 21	200 13,8	5.47 139	8.25 209,6	0.188 4,8	3.00 76,2	0.375 9,5	0.135 3,4	0.21 5,4	2.11 0,96
4 100	4.50 114,3	SDR 17	250 17,2	5.47 139	8.25 209,6	0.188 4,8	3.00 76,2	0.375 9,5	0.135 3,4	0.27 6,7	2.50 1,13
4 H* 100	4.50 114,3	SDR 13.5	315 21,7	5.96 151	8.25 209,6	0.188 4,8	3.00 76,2	0.375 9,5	0.135 3,4	0.33 8,5	3.10 1,41
6 L* 150	6.625 168,3	SDR 21	200 13,8	7.84 199	8.25 209,6	0.313 8,0	3.00 76,2	0.375 9,5	0.135 3,4	0.32 8,0	4.30 1,96
6 150	6.625 168,3	SDR 17	250 17,2	7.84 199	8.25 209,6	0.313 8,0	3.00 76,2	0.375 9,5	0.135 3,4	0.39 9,9	5.18 2,34
6 H* 150	6.625 168,3	SDR 13.5	315 21,7	8.37 213	8.25 209,6	0.313 8,0	3.00 76,2	0.375 9,5	0.135 3,4	0.49 12,5	6.59 2,99
8 L* 200	8.625 219,1	SDR 21	200 13,8	10.19 259	10.13 257,3	0.625 16,7	3.16 80,3	0.500 12,7	0.145 3,7	0.41 10,4	7.26 3,29
8 200	8.625 219,1	SDR 17	250 17,2	10.95 278	10.13 257,3	0.625 16,7	3.16 80,3	0.500 12,7	0.145 3,7	0.51 12,9	8.71 3,95
8 H* 200	8.625 219,1	SDR 13.5	315 21,7	10.95 278	10.13 257,3	0.625 16,7	3.16 80,3	0.500 12,7	0.145 3,7	0.64 16,2	11.30 5,13

Laying length is 20 foot (6,1 m) (19 foot (5,8m) lengths are available for export from USA).

G-MINE Pipe is produced with thickened ends to accommodate the G-MINE groove while maintaining their designed pressure rating. Grooving the non-thickened pipe body will result in less-than-designed pressure rating for the new joint and ultimately the entire system. When fabrication is required for non-thickened end products, apply a Figure 72905 G-MINE x Solvent Weld Transition Coupling.

G-MINE Coupling, Gaskets (O-rings) and Splines included.

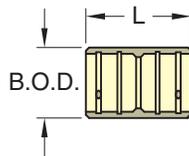
Refer to Figure 72904 for weight of G-MINE Coupling.

See G-MINE specifications on page 177.

Figure 72904 Couplings (Spline x Spline)

Tech Data Sheet: G590

The GRINNELL Figure 72904 G-MINE Coupling provides a connection between two pieces of G-MINE PVC Pipe. G-MINE Couplings are designed for non-permanent use applications and are supplied with O-rings (gaskets) for ease of assembly and disassembly.



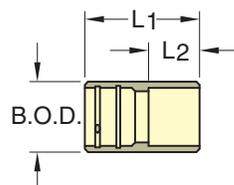
Nominal Size Inches mm	B.O.D. Inches mm	L Inches mm	Max. Pressure Rating psi bar	Approx. Weight Lbs. Kg
2	3.20	5.25	250	1.05
50	81	133,4	17,2	0,5
3	4.375	7.25	250	2.17
80	111	184,2	17,2	1,0
4	5.47	8.25	250	4.92
100	139	209,6	17,2	2,2
4H	5.96	8.25	315	5.00
100	151	209,6	21,7	2,3
6	7.84	8.25	250	6.20
150	199	209,6	17,2	2,8
6 H	8.37	8.25	315	10.40
150	213	209,6	21,7	4,7
8	10.19	10.125	250	10.93
200	259	257,3	17,2	5,0
8 H	10.95	10.125	315	20.00
200	278	257,3	21,7	9,1

G-MINE Gaskets (O-rings) and Splines included.
10" and 12" (250 and 300mm) are available upon request. Contact GRINNELL Mechanical Products.
See G-MINE specifications on page 177.

Figure 72905 Couplings (Spline x Solvent Weld)

Tech Data Sheet: G590

The GRINNELL Figure 72905 G-MINE Transition Coupling (Female x Solvent Weld) provides an efficient transition from G-MINE PVC Pipe to plain-end PVC pipe.



Nominal Size Inches mm	B.O.D. Inches mm	Max. Pressure Rating psi bar	L1 Inches mm	L 2 Inches mm	Approx. Weight Lbs. Kg
2	3.20	250	5.50	2.375	1.00
50	81,3	17,2	139,7	60,5	0,5
3	4.375	250	8.00	3.50	2.20
80	111,1	17,2	203,2	88,9	1,0
4	5.47	250	9.00	4.00	3.50
100	138,9	17,2	228,6	101,6	1,6
6	7.84	250	9.00	4.00	6.40
150	199,1	17,2	228,6	101,6	2,9
8	10.19	250	10.125	4.50	11.30
200	258,8	17,2	257,3	114,3	5,1

G-MINE Gasket O-ring and Spline included.
See G-MINE specifications on page 177.

Figure 72919 Reducing Couplings (Male Spline x Female Spline)

Tech Data Sheet: G590

Nominal Size Inches mm	O.D. Inches mm	B.O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
4 x 2 100 x 50	2.375 60,3	5.47 139	250 17,2	15.25 387,4	5.00 2,3
4 x 3 100 x 80	3.50 88,9	5.47 139	250 17,2	16.56 420,6	5.70 2,6
6 x 2 150 x 50	2.375 60,3	7.84 199	250 17,2	15.75 400,1	10.40 4,7
6 x 3 150 x 80	3.50 88,9	7.84 199	250 17,2	16.50 419,1	11.00 5,0
6 x 4 150 x 100	4.50 114,3	7.84 199	250 17,2	17.38 441,5	11.10 5,0
8 x 2 200 x 50	2.375 60,3	10.19 259	250 17,2	17.00 431,8	11.10 5,0
8 x 4 200 x 100	4.50 114,3	10.19 259	250 17,2	15.63 397,0	24.10 10,9
8 x 6 200 x 150	6.625 168,3	10.19 259	250 17,2	18.50 469,9	24.60 11,2

G-MINE Gasket (O-ring) and Spline included.
See G-MINE specifications on page 177.

The GRINNELL Figure 72919 G-MINE Reducing Coupling (Female x Male) allows for a direct transition between two different pipe sizes.

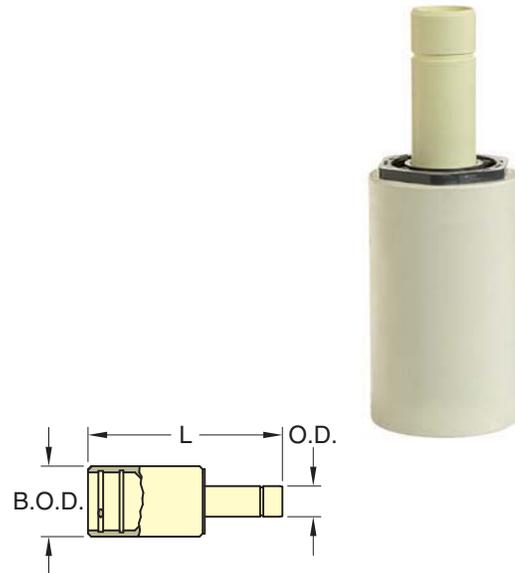


Figure 72940 Outlet Couplings (Male Spline x Female Spline x Female Thread)

Tech Data Sheet: G590

Nominal Size Run x Outlet Inches x NPT	O.D. Inches mm	B.O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
2 x 3/4 50 x 20	2.375 60,3	3.20 81	250 17,2	10.13 257,3	1.60 0,7
2 x 1 50 x 25	2.375 60,3	3.20 81	250 17,2	10.13 257,3	1.50 0,7
3 x 1 1/2 80 x 40	3.50 88,9	4.375 111	250 17,2	13.50 342,9	3.60 1,6
4 x 1 1/2 100 x 40	4.50 114,3	5.47 139	250 17,2	15.00 381,0	5.80 2,6
6 x 1 1/2 150 x 40	6.625 168,3	7.84 199	250 17,2	17.00 431,8	11.50 5,2
6 x 2 150 x 50	6.625 168,3	7.84 199	250 17,2	17.00 431,8	11.40 5,2
8 x 1 1/2 200 x 40	8.625 219,1	10.19 259	250 17,2	19.00 482,6	20.60 9,3
8 x 2 200 x 50	8.625 219,1	10.19 259	250 17,2	19.00 482,6	21.40 9,7

G-MINE Gasket (O-ring) and Spline included.
See G-MINE specifications on page 177.

The GRINNELL Figure 72940 G-MINE Threaded Outlet Coupling (Female x Male x Female NPT) provides a threaded branch outlet connection.

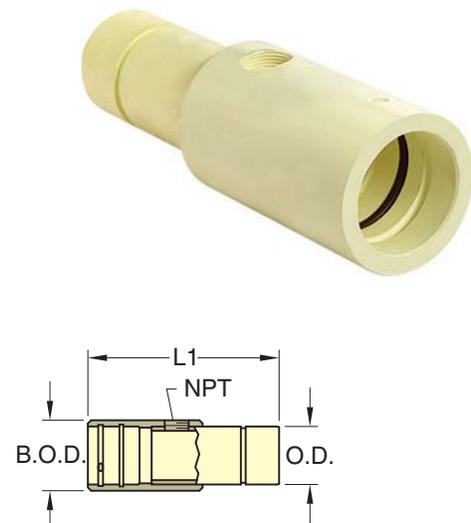
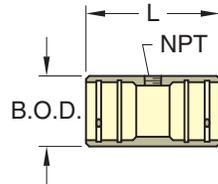


Figure 72930 Outlet Couplings (Spline x Spline x Female Thread)

Tech Data Sheet: G590

The GRINNELL Figure 72930 G-MINE Threaded Outlet Coupling (Female x Female x Female NPT) provides a connection between two pieces of G-MINE PVC Pipe and includes a threaded branch connection.

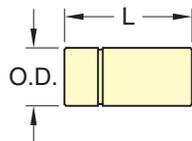


Nominal Size Run x Outlet Inches x NPT	B.O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
2 x 3/4	3.20	200	7.00	1.50
50 x 20	81	13,8	177,8	0,7
2 x 1	3.20	200	7.00	1.40
50 x 25	81	13,8	177,8	0,6
3 x 3/4	4.375	200	9.50	2.60
80 x 20	111	13,8	241,3	1,2
3 x 1	4.375	200	9.50	2.90
80 x 25	111	13,8	241,3	1,3
3 x 1 1/2	4.375	160	9.50	2.70
80 x 40	111	11,0	241,3	1,2
4 x 3/4	5.47	200	10.50	4.10
100 x 20	139	13,8	266,7	1,9
4 x 1	5.47	200	10.50	4.10
100 x 25	139	13,8	266,7	1,9
4 x 1 1/2	5.47	160	10.50	4.00
100 x 40	139	11,0	266,7	1,8
6 x 3/4	7.84	200	11.25	7.90
150 x 20	199	13,8	285,8	3,6
6 x 1	7.84	200	11.25	7.90
150 x 25	199	13,8	285,8	3,6
6 x 1 1/2	7.84	200	11.25	7.90
150 x 40	199	13,8	285,8	3,6
8 x 1	10.19	200	12.50	15.00
200 x 25	259	13,8	317,5	6,8
8 x 1 1/2	10.19	200	12.50	15.00
200 x 40	259	13,8	317,5	6,8

G-MINE Gaskets (O-rings) and Splines included.
See G-MINE specifications on page 177.

Figure 72906 Nipples (Spline x Plain End)

Tech Data Sheet: G590



The GRINNELL Figure 72906 G-MINE Nipple (Male x Plain-End) provides an economical and efficient method of converting a solvent weld-end pipe run to a G-MINE grooved connection.

Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
2	2.375	250	7.00	0.60
50	60,3	17,2	177,8	0,3
3	3.50	250	9.00	1.40
80	88,9	17,2	228,6	0,6
4	4.50	250	10.00	2.30
100	114,3	17,2	254,0	1,0
6	6.625	250	12.00	5.20
150	168,3	17,2	304,8	2,4
8	8.625	250	13.00	9.70
200	219,1	17,2	330,2	4,4

See G-MINE specifications on page 177.

Figure 72907 Nipples (Spline x Groove)

Tech Data Sheet: G590

The GRINNELL Figure 72907 G-MINE Transition Coupling (G-MINE x Grooved) provides an efficient transition from G-MINE PVC Pipe to grooved steel pipe that meets AWWA C-606 IPS Groove Standards.

Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
2	2.375	250	7.00	0.60
50	60,3	17,2	177,8	0,3
3	3.50	250	9.00	1.60
80	88,9	17,2	228,6	0,7
4	4.50	250	10.00	2.50
100	114,3	17,2	254,0	1,1
4 H	4.50	250	10.00	3.10
100	114,3	17,2	254,0	1,4
6	6.625	250	12.00	5.20
150	168,3	17,2	304,8	2,4
6 H	6.625	250	12.00	7.20
150	168,3	17,2	304,8	3,3
8	8.625	250	13.50	9.00
200	219,1	17,2	342,9	4,1

Requires thrust blocking to eliminate end loads; use only with GRINNELL Flexible Couplings only.
See G-MINE specifications on page 177.



Figure 72908 Nipples (Spline x Male Thread)

Tech Data Sheet: G590

The GRINNELL Figure 72908 G-MINE Threaded Nipple (Male x Male NPT) provides an economical and efficient method of connecting a G-MINE piping system to a female threaded adapter or device.

Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
2	2.375	200	7.00	0.60
50	60,3	13,8	177,8	0,3
3	3.50	190	9.00	1.30
80	88,9	13,1	228,6	0,6
4	4.50	160	10.00	2.40
100	114,3	11,0	254,0	1,1
6	6.625	140	12.00	5.20
150	168,3	9,7	304,8	2,4
8	8.625	120	13.00	9.00
200	219,1	8,3	330,2	4,1

See G-MINE specifications on page 177.

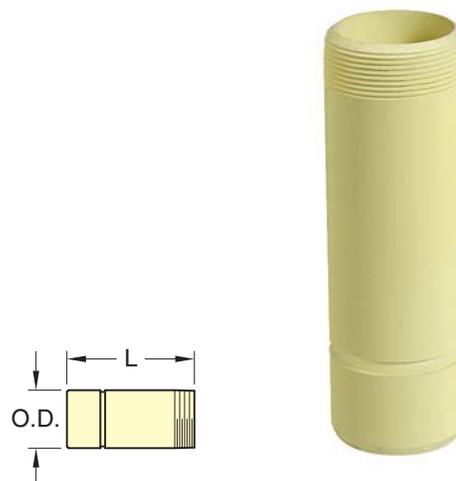
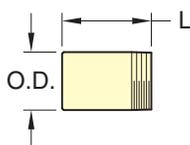


Figure 72909 Nipples (Plain End x Male Thread)

Tech Data Sheet: G590

The GRINNELL Figure 72909 G-MINE Threaded Nipple (Plain-end x Male NPT) provides an economical and efficient method of connecting a solvent weld-end pipe run to a female threaded adapter or device.



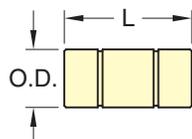
Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
2 50	2.375 60,3	200 13,8	5.25 133,4	0.60 0,3
3 80	3.50 88,9	190 13,1	6.50 165,1	1.25 0,6
4 100	4.50 114,3	160 11,0	7.00 177,8	2.50 1,1
6 150	6.625 168,3	140 9,7	9.00 228,6	5.70 2,6
8 200	8.625 219,1	120 8,3	9.80 248,9	10.25 4,7

See G-MINE specifications on page 177.

Figure 72911 Nipples (Spline x Spline)

Tech Data Sheet: G590

The GRINNELL Figure 72911 G-MINE Nipple (Male x Male) provides an economical and efficient method of connecting two female G-MINE components.



Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
4 100	4.50 114,3	250 17,2	10.00 254,0	2.30 1,0
6 150	6.625 168,3	250 17,2	12.00 304,8	5.20 2,4
8 200	8.625 219,1	250 17,2	13.00 330,2	9.70 4,4

See G-MINE specifications on page 177.

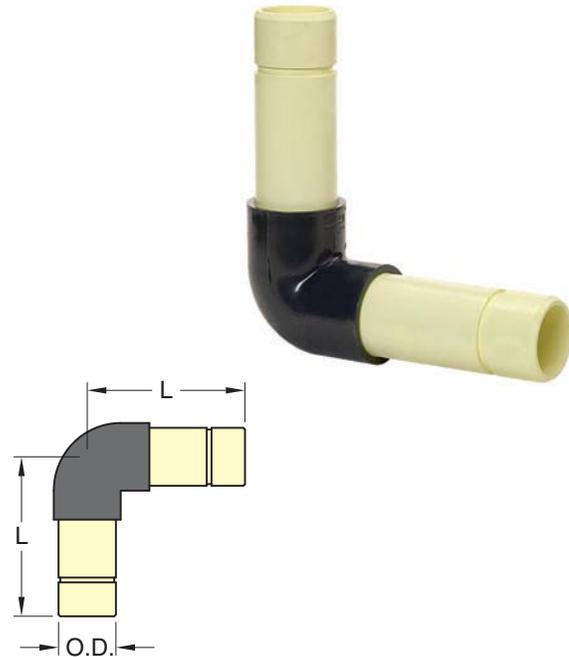
The GRINNELL Figure 72910 G-MINE 90° Degree Elbow (Male x Male) provides an economical and efficient method of changing pipe direction.

Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
2	2.375	250	8.00	1.70
50	60,3	17,2	203,2	0,8
3	3.50	250	10.18	4.10
80	88,9	17,2	258,6	1,9
4	4.50	250	12.375	7.50
100	114,3	17,2	314,5	3,4
6	6.625	250	15.625	17.40
150	168,3	17,2	397,0	7,9
8	8.625	250	18.00	33.70
200	219,1	17,2	457,2	15,3

See G-MINE specifications on page 177.

Figure 72910 90° Elbows (Spline x Spline)

Tech Data Sheet: G590



The GRINNELL Figure 72912 G-MINE 45° Degree Elbow (Male x Male) provides an economical and efficient method of changing pipe direction.

Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
2	2.375	250	7.75	1.60
50	60,3	17,2	196,9	0,7
3	3.50	250	9.75	3.90
80	88,9	17,2	247,7	1,8
4	4.50	250	11.25	7.10
100	114,3	17,2	285,8	3,2
6	6.625	250	13.00	16.10
150	168,3	17,2	330,2	7,3
8	8.625	250	15.00	30.90
200	219,1	17,2	381,0	14,0

See G-MINE specifications on page 177.

Figure 72912 45° Elbows (Spline x Spline)

Tech Data Sheet: G590

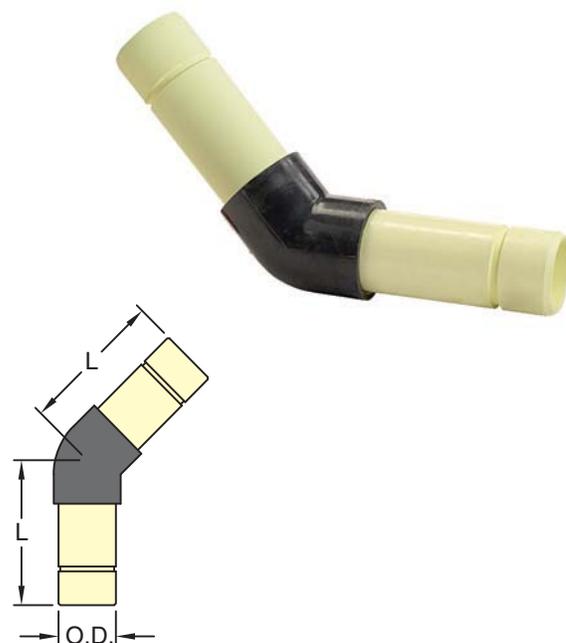
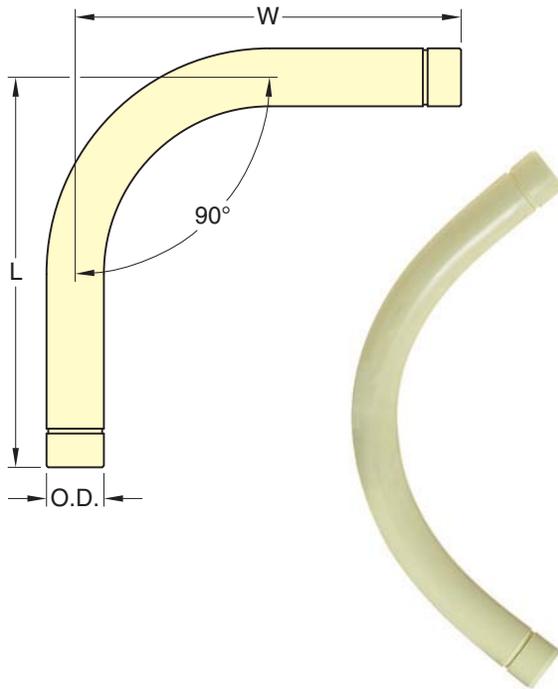


Figure 72913 90° Sweep Elbows

(Spline x Spline)

Tech Data Sheet: G590

The GRINNELL Figure 72913 G-MINE 90° Degree Sweep Elbow provides an economical and efficient method of changing pipe direction.



Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	W Inches mm	Approx. Weight Lbs. Kg
2	2.375	250	16.06	16.06	2.40
50	60,3	17,2	408	408	1,1
3	3.50	250	23.125	23.125	6.40
80	88,9	17,2	587,4	587,4	2,9
4	4.50	250	30.25	30.25	12.70
100	114,3	17,2	408,0	408,0	5,8
4 H	4.50	315	30.25	30.25	14.90
100	114,3	21,7	768,4	768,4	6,8
6	6.625	250	42.00	42.00	31.00
150	168,3	17,2	1066,8	1066,8	14,1
6 H	6.625	315	42.00	42.00	45.30
150	168,3	21,7	1066,8	1066,8	20,6
8	8.625	250	46.625	46.625	59.00
200	219,1	17,2	1184,3	1184,3	26,8

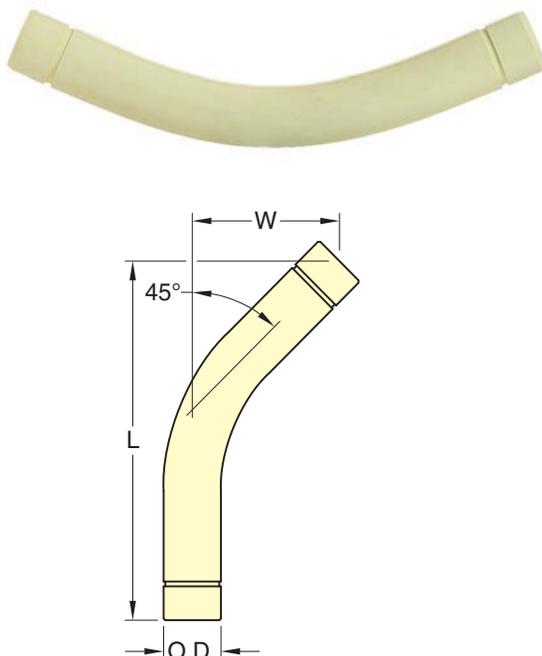
See G-MINE specifications on page 177.

Figure 72914 45° Sweep Elbows

(Spline x Spline)

Tech Data Sheet: G590

The GRINNELL Figure 72914 G-MINE 45° Degree Sweep Elbow provides an economical and efficient method of changing pipe direction.



Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	W Inches mm	Approx. Weight Lbs. Kg
2	2.375	250	18.125	7.50	2.00
50	60,3	17,2	460,4	190,5	0,9
3	3.50	250	25.69	10.75	4.90
80	88,9	17,2	652,5	273,1	2,2
4	4.50	250	28.75	11.875	7.50
100	114,3	17,2	730,3	301,6	3,4
4 H	4.50	315	28.75	11.875	11.60
100	114,3	21,7	730,3	301,6	5,3
6	6.625	250	39.19	16.25	18.30
150	168,3	17,2	995,4	412,8	8,3
6 H	6.625	315	39.19	16.25	26.20
150	168,3	21,7	995,4	412,8	11,9
8	8.625	250	52.00	21.57	35.00
200	219,1	17,2	1320,8	547,7	15,9

See G-MINE specifications on page 177.

Figure 72915 Caps & Plugs (Spline)

Tech Data Sheet: G590

Figure 72915 End Plug				
Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
2	2.375	250	7.50	0.90
50	60	17,2	190,5	0,4
3	3.50	250	10.00	2.00
80	89	17,2	254,0	0,9

Figure 72915 End Cap*				
Nominal Size Inches mm	B.O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Approx. Weight Lbs. Kg
4	5.47	250	9.00	4.20
100	139	17,2	228,6	1,9
6	7.84	250	9.00	9.00
150	199	17,2	228,6	4,1
8	10.19	250	10.125	17.00
200	259	17,2	257,3	7,7

* G-MINE Gasket (O-ring) and Spline included.
See G-MINE specifications on page 177.

The GRINNELL Figure 72915 G-MINE End Plug and End Cap provide an economical and efficient method of capping a piping system.



Figure 72915 End Plug (Male Spline)

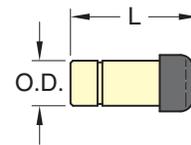


Figure 72915 End Cap (Female Spline)

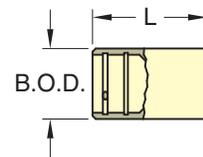


Figure 72916 Flange Adapters (Spline x Flange 150psi)

Tech Data Sheet: G590

The GRINNELL Figure 72916 G-MINE Flange Adapter provides a direct transition from flanged components to G-MINE PVC piping components.

Nominal Size Inches mm	Outlet ¹ O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	Flange ² O.D. Inches mm	R Inches mm	Bolt Circle Diameter Inches mm	Bolt Size	Bolt Holes	Approx. Weight Lbs. Kg
2	2.375	150	7.19	6.00	0.81	4.75	5/8	4	1.6
50	60,3	10,3	182,6	152,4	20,6	120,7	5/8	4	0,7
3	3.50	150	9.25	7.50	1.06	6.00	5/8	4	3.2
80	88,9	10,3	235,0	190,5	26,9	152,4	5/8	4	1,5
4	4.50	150	10.25	9.00	1.125	7.50	5/8	8	5.0
100	114,3	10,3	260,4	228,6	28,7	190,5	5/8	8	2,3
6	6.625	150	12.44	11.00	1.28	9.50	3/4	8	9.0
150	168,3	10,3	316	279,4	32,5	241,3	3/4	8	4,1
8	8.625	150	13.38	13.50	1.375	11.75	3/4	8	16.0
200	219,1	10,3	339,9	342,9	35,1	298,5	3/4	8	7,3

All flanges are Van Stone style with glass-filled PVC ring.
ANSI Class 125 and 150 bolt pattern.
See G-MINE specifications on page 177.

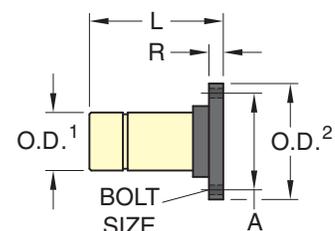
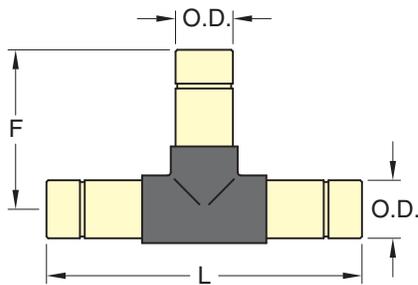


Figure 72917 Tees (Spline x Spline x Spline)

Tech Data Sheet: G590



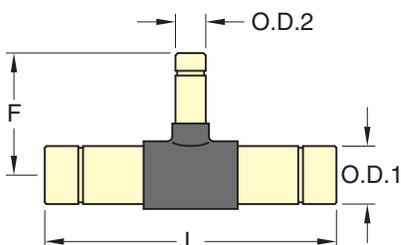
The GRINNELL Figure 72917 G-MINE Tee (Male) provides an economical and efficient method of adding a G-MINE PVC Branch Run to a piping system.

Nominal Size Inches mm	O.D. Inches mm	Max. Pressure Rating psi bar	L Inches mm	F Inches mm	Approx. Weight Lbs. Kg
2	2.375	250	16.50	10.875	2.30
50	60,3	17,2	419,1	276,4	1,0
3	3.50	250	21.50	11.25	5.80
80	88,9	17,2	546,1	280,0	2,6
4	4.50	250	24.75	12.375	10.70
100	114,3	17,2	628,7	314,5	4,9
6	6.625	250	31.00	15.50	25.00
150	168,3	17,2	787,4	393,7	11,3
8	8.625	250	36.25	17.75	48.00
200	219,1	17,2	920,8	450,9	21,8

See G-MINE specifications on page 177.

Figure 72918 Reducing Tees (Spline x Spline x Spline)

Tech Data Sheet: G590



The GRINNELL Figure 72918 G-MINE Reducing Tee (Male) provides an economical and efficient method of adding a reduced diameter G-MINE PVC Branch Run to a piping system.

Nominal Size Run x Run x Branch Inches mm	Run O.D. 1 Inches mm	Outlet O.D. 2 Inches mm	Max. Pressure Rating psi bar	L Inches mm	F Inches mm	Approx. Weight Lbs. Kg
3 x 2	3.50	2.375	250	21.00	8.84	5.00
80 x 50	88,9	60,3	17,2	533,4	224,5	2,3
4 x 2	4.50	2.375	250	22.875	9.47	10.10
100 x 50	114,3	60,3	17,2	581,2	240,5	4,6
4 x 3	4.50	3.50	250	24.19	11.66	10.80
100 x 80	114,3	88,9	17,2	614,4	296,2	4,9
6 x 2	6.625	2.375	250	28.125	11.75	22.83
150 x 50	168,3	60,3	17,2	714,5	298,5	10,4
6 x 3	6.625	3.50	250	28.125	12.75	24.20
150 x 80	168,3	88,9	17,2	714,5	323,9	11,0
6 x 4	6.625	4.50	250	29.19	13.75	24.40
150 x 100	168,3	114,3	17,2	741,4	349,3	11,1
8 x 6	8.625	6.625	250	33.50	16.81	50.90
200 x 150	219,1	168,3	17,2	850,9	427,0	23,1

See G-MINE specifications on page 177.

Model B8200L G-MINE Butterfly Valves (Spline x Spline)

Tech Data Sheet: G592

GRINNELL Model B8200 Butterfly Valves are designed for use with the G-MINE PVC Piping System. Available sizes include 2" to 6" (50 to 150mm) diameters. Precision machined grooves in the valve body provide easy alignment of the valve and G-MINE Coupling, allowing for the insertion of the spline to connect the GRINNELL Model B8200 Valve to the G-MINE PVC System. Flow may enter the valve from either direction and valve can be orientated in any direction.

MATERIAL SPECIFICATIONS

Maximum Working Pressure

- 320 psi (22,1 bar)

Working Temperature Range

- 32°F to 140°F (0°C to 60°C)

Body

- Ductile iron conforming to ASTM A 536, Grade 65-45-12

Body Coating

- Black epoxy-coated

Disc

- Ductile iron conforming to ASTM A 536, Grade 65-45-12

Disc Seal

- Grade "T" Nitrile encapsulated rubber

Stem

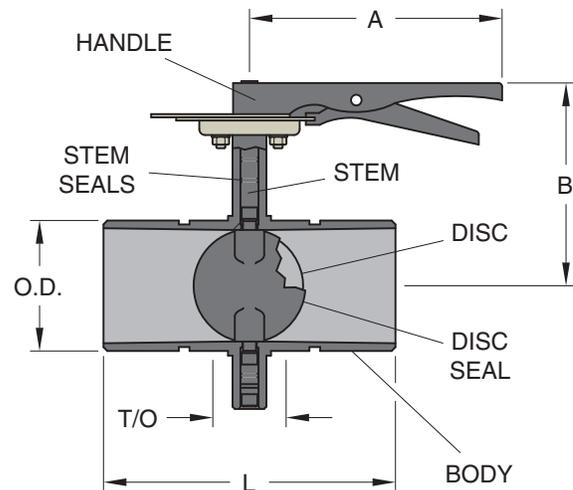
- Two-piece Type 316 Stainless Steel Splines

Stem Seal

- EPDM O-rings, upper and lower stem

Handle

- Zinc-plated carbon steel



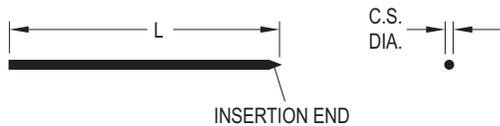
Nominal Pipe Size		Dimensions Inches mm			Approx. Weight Lbs kg
ANSI Inches mm	O.D. Inches mm	A	B	L	
2	2.375	7.95	5.16	7.50	8.8
50	60,3	202,0	131,0	191,1	4,0
3	3.500	7.95	5.75	9.18	17.6
80	88,9	202,0	146,0	233,2	8,0
4	4.500	7.95	7.05	10.18	26.4
100	114,3	202,0	179,0	258,6	12,0
6	6.625	10.28	8.39	10.41	50.6
150	168,3	261,0	213,1	264,6	23,0

See G-MINE specifications on page 177.

Figure 72999 Splines

Tech Data Sheet: G590

The GRINNELL Figure 72999 G-MINE Spline securely locks the coupling or fitting to the pipe. The spline is made of Nylon and is also available in Acid-Resistant Polypropylene.



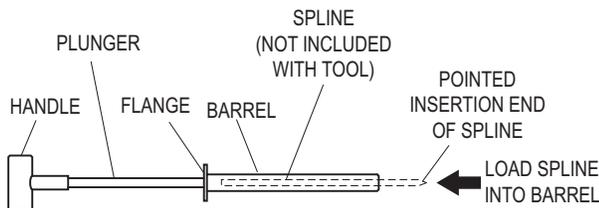
Nominal Size Inches mm	L Inches mm	Cross Section Diameter C.S. Inches mm	Configuration
2 50	10.50 266,7	0.19 4,8	ROUND
3 80	16.00 406,4	0.25 6,4	ROUND
4 100	18.00 457,2	0.25 6,4	ROUND
4 H 100	18.00 457,2	0.25 6,4	SQUARE
6 150	24.00 609,6	0.25 6,4	ROUND
6 H 150	24.00 609,6	0.25 6,4	SQUARE
8 200	32.00 812,8	0.31 8,0	SQUARE

See G-MINE specifications on page 177.

Figure ITGM Insertion Tools

Tech Data Sheet: G590

The GRINNELL Figure ITGM G-MINE Spline Insertion Tool assists with the insertion of the spline into the groove, locking the fitting to the pipe.



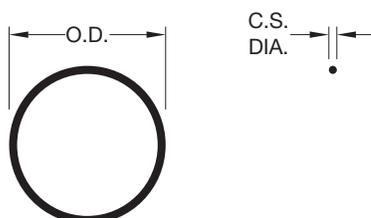
Nominal Size Inches mm	Part Number
3 - 6 80 - 150	ITGM 36
8 200	ITGM 8

See G-MINE specifications on page 177.

Figure 72899 Replacement Gaskets

Tech Data Sheet: G590

The GRINNELL Figure 72899 G-MINE Gasket (O-ring) provides a hydraulic seal. Most G-MINE Fittings and Couplings are manufactured to include an O-ring, a flexible elastomeric seal. G-MINE O-rings are Teflon-coated, Nitrile Butadiene Rubber (NBR) or Polyisoprene Rubber conforming to ASTM F 477 (Solvent weld and plain end fittings are designed for use without o-ring).



* Registered trademark of Dupont.

Nominal Size Inches mm	O.D. Inches mm	Cross Section Diameter C.S. Inches mm	Material Teflon-Coated
2 50	2.770 70,4	0.210 5,3	Nitrile Butadiene Rubber
3 80	3.895 98,9	0.210 5,3	Nitrile Butadiene Rubber
4 100	4.895 124,3	0.210 5,3	Nitrile Butadiene Rubber
6 150	7.176 182,3	0.275 7,0	Nitrile Butadiene Rubber
8 200	9.350 237,5	0.375 9,5	Polyisoprene Rubber

See G-MINE specifications on page 177.



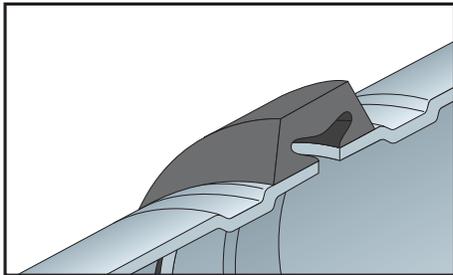
GRINNELL Gasket Types

Tech Data Sheet: G610

Pressure responsive gaskets are offered in a variety of types. Although they each serve a specific function they all utilize the same sealing design.

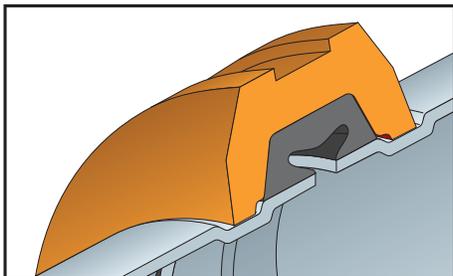
The GRINNELL gasket is designed to provide a three-way sealing action.

- (1) Installation of the gasket over the outside sealing surface of the pipe compresses the lip seal and forms the initial seal.
- (2) The installation of the housing segments around the gasket and into the pipe groove properly positions the gasket. Tightening of the housing segments forms the gasket to the inside of the housing and compresses it around the pipe-sealing surface thus increasing the gasket's sealing against the pipe.
- (3) The introduction of the system pressure energizes the pressure responsive seal of the gasket and further enhances the sealing action.



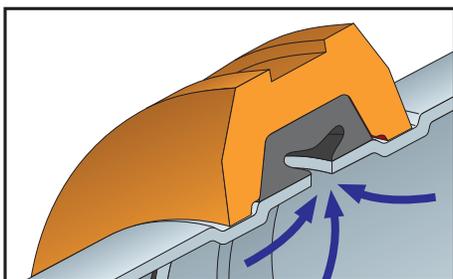
First Seal

C-shaped rubber gasket seals on pipe ends.



Second Seal

The housings compress the gasket to increase the sealing capacity.



Third Seal

The system pressure or vacuum will then maximize the leak-tight seal.



For additional listings or approvals, see page 11 or visit our website at www.grinnell.com



Gasket Styles

Tech Data Sheet: G610

Standard

The standard style gasket, with a "C" shape configuration, is the most commonly used. It is provided as the standard gasket in the Figure 705, 707, 770, 772, 405, and 472 GRINNELL Couplings. The gasket is available in Grade "E" and "EN" EPDM, Grade "T" Nitrile, Grade "L" Silicone, and Grade "O" Fluoroelastomer.



Tri-Seal

The tri-seal gasket is designed to close off the gap or gasket cavity. This is accomplished by positioning the center "rib" of the gasket over the gap between the pipes. The tri-seal gasket has two tapered sealing edges in addition to the center rib for additional strength and sealing.



The Tri-Seal gasket can be used with the Figure 705, 707, 770, 772, 672, 405, and 472 GRINNELL Couplings. It is recommended for use in low temperature and vacuum services (greater than 10" Hg (250mm Hg)) applications and potable water systems. Note only a petroleum-free silicone based lubricant is recommended for low temperature applications. The gasket is available in Grade "E", "EN" EPDM, and Grade "T" Nitrile.

Note: Rigid couplings are recommended for vacuum and low temperature applications.

Center-Stop, Push-On

The Grade "EHT" EPDM Center-Stop, Push-On Style Gasket is specially designed for easy installation of the GRINNELL Figure 640 Pivot-Bolt Coupling.



Reducing Coupling

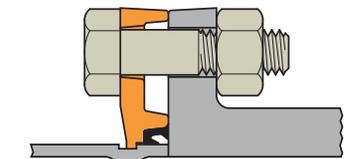
The reducing gasket is provided with ribs used to position the larger pipe so that the sealing lip is located on the sealing surface of the pipe. This gasket is used only with the Figure 716 GRINNELL Reducing Coupling and is available in Grade "E" EPDM and Grade "T" Nitrile.



Reducing couplings are not recommended for low temperature applications.

Flange Adapter

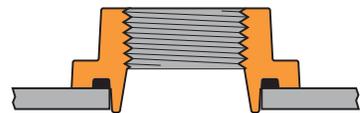
This gasket is specifically designed for use with the Figure 61 and 71 Flange Adapter. The gasket has an optimum amount of rubber to provide a dependable seal between both the pipe and mating surface. The gasket is available in Grade "E" EPDM and Grade "T" Nitrile.



Mechanical Tee and Strap

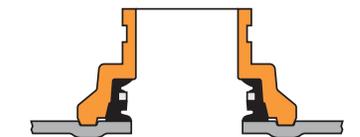
The gasket provides a compression type seal, which is designed to conform to the exterior curve (OD) of the pipe. This design is unique to both the Figure 730 Mechanical Tee (threaded and grooved) and Figure 40-5 Strap. The gasket is available in Grade "E" EPDM and Grade "T" Nitrile.

Note: When used in low temperature applications, use a petroleum-free silicone based lubricant, otherwise no lubricant is required on Mechanical Tee and Strap gaskets.



Outlet Coupling

This gasket is specifically designed for use with the GRINNELL Figure 702 Outlet Coupling.



Plain End Coupling

This gasket is designed for use with the Figure 909 Plain End Coupling.



GRINNELL gaskets are designed exclusively for use with GRINNELL manufactured coupling housings. The mixing of other manufacturer's gaskets or housings with GRINNELL gaskets or housings may result in pipe joint leakage or failure and will void the GRINNELL Mechanical Products Limited Warranty.

GRINNELL Gasket Grade & Recommendations

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The Gasket Recommendation Table has been developed to assure maximum service life. The table was developed from information supplied by the material manufacturers of the elastomer, technical reference literature, and testing conducted by GRINNELL Mechanical Products.

In evaluating the gasket grade for intended service applications the following consideration must be reviewed: system operating temperature, fluid or solution concentration, and duration of service.

All gasket recommendations are based on a temperature of 70°F (21°C) unless otherwise noted.

Technical and Engineering Services should be consulted if combinations of service solutions are being considered.

Middle East email: Mechserv-EMEA@GRINNELL.com

U.S.A.: Phone 866-500-4768 or 1-401-781-8220

Contact GRINNELL Mechanical Products for recommendations for services not listed.

Gasket recommendations apply to GRINNELL gaskets and valves only.

Grade	Temperature Range	Compound	Color Code	General Service Application
"E"	-30°F to 230°F (-34°C to 110°C)	EPDM	Green	Hot water, dilute acids, alkalies, oil free air, and many chemical services not involving petroleum products. Excellent oxidation resistance. Not for use with hydrocarbons. Not recommended for steam service.
"E" Tri-Seal	-30°F to 230°F (-34°C to 110°C)	EPDM	Green	Hot water, dilute acids, alkalies, and many chemical services not involving petroleum products. Excellent oxidation resistance. Not for use with hydrocarbons. Recommended for low temperature and vacuum services.
"EN" and "EN" Tri-Seal for IPS Pipe	Potable Water up to 180°F (82°C)	EPDM	Green/Yellow Stripe	IPS Sizes Only, NSF 61 Approved for potable water. Not recommended for hydrocarbons.
"EN" Tri-Seal for Copper Tubing	Potable Water up to 180°F (82°C)	EPDM	Copper	CTS Sizes Only, NSF 61 Approved for potable water. Not recommended for hydrocarbons.
"EHT" Center-Stop Push-On Style Copper Tubing	For closed-loop heating systems -30°F to 250°F (-34°C to 120°C) Potable Water up to 180°F (82°C)	EPDM	Red and Copper Striped	CTS Sizes Only, NSF 61 Approved for potable water. Recommended for use in low temperature and vacuum systems Not recommended for hydrocarbons.
"T" and "T" Tri-Seal	-20°F to 180°F (-29°C to 82°C)	Nitrile	Orange	Compressed air, petroleum products, vegetable oils, mineral oils, and air with oils. High-End oil vapor temperature, decrease to 150°F (66°C). Not recommended for hot water systems. Not recommended for hot dry air systems.
"O" and "O" Tri-Seal	+20°F to 300°F (-7°C to 149°C)	Fluoroelastomer	Blue	Oxidizing acids, petroleum products, hydraulic fluids, lubricants, halogenated hydrocarbons.
"L"	-30°F to 350°F (-34°C to 177°C)	Silicone *	Red Gasket	Air without hydrocarbons, dry heat.

* To prevent gasket from deteriorating, NEVER use silicone-based lubricants with Grade "L" Silicone gaskets.
For local country potable water approvals contact GRINNELL Mechanical Products.

Gasket Air, Water & Chemical Recommendations

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- Contact GRINNELL Mechanical Products for an engineering evaluation and recommendation where the gasket grade is shown in parenthesis.
- Specify gasket grade when ordering.
- For vacuum or low temperature systems, use tri-seal gasket. For low temperature applications, use a petroleum-free silicone lubricant.
- Gasket Grade "EHT" can be used where "E" is marked.
- Check gasket color code to be certain it is recommended for the service intended.
- Unless otherwise noted, all gasket listings are based upon a temperature of 70°F (21°C).
- For services not listed, contact GRINNELL Mechanical Products for recommendation.
- Where more than one gasket is shown, the preferred gasket grade is listed first.

Service	Gasket Grade
Air, (no oil vapors) Temp. -30°F to 230°F (-34°C to 110°C)	E
Air, Oil Vapor Temp. -20°F to 150°F (-29°C to 66°C)	T
Water, Temp. to 230°F (110°C) (NOT RECOMMENDED FOR STEAM SERVICE)	E
Water, Acid Mine	E/T
Water, Chlorine	E
Water, Deionized	E
Water, Seawater	E
Water, Waste (NO PETROLEUM PRODUCTS)	E

Chemical Composition	Gasket Grade
ASTM #3 Oil	T
Acetaldehyde	E
Acetamide	T
Acetic Acid up to 10% 100°C/38°C	E
Acetic Acid up to 10-50% 100°C/38°C	L
Acetic Acid, Glacial 100°C/38°C	L
Acetic Anhydride	E
Acetone	E
Acetonitrile	T
Acetylene	E/T
Adipic Acid	T
Alkalis	E
Allyl Alcohol to 96%	E
Alum Sulfuric Acid	O
Alums	E/T
Aluminum Chloride	E/T
Aluminum Fluoride	E/T
Aluminum Hydroxide	E
Aluminum Nitrate	E/T
Aluminum Oxychloride	T
Aluminum Phosphate	E
Aluminum Salts	T
Aluminum Sulfate	E/T
Ammonia Gas, Cold	E
Ammonia, Liquid	E
Ammonium Bifluoride	T
Ammonium Carbonate	E

Chemical Composition	Gasket Grade
Ammonium Chloride	E/T
Ammonium Fluoride	E
Ammonium Hydroxide	E
Ammonium Metaphosphate	E
Ammonium Nitrate	T
Ammonium Nitrite	E
Ammonium Persulfate, to 10%	E
Ammonium Phosphate	T
Ammonium Sulfamate	T
Ammonium Sulfate	E/T
Ammonium Sulfide	E
Ammonium Thiocyanate	E
Amyl Acetate	E
Amyl Alcohol	E
Amyl Chloronaphthalene	T
Anderol	O
Aniline	E
Aniline Dyes	E
Aniline Hydrochloride	E
Aniline Oil	E
Antimony Chloride	E
Antimony Trichloride	E
Argon Gas	E/O
Aroclor(S)	O
Arsenic Acid, to 75%	T
Barium Carbonate	E

Chemical Composition	Gasket Grade
Barium Chloride	E/T
Barium Hydroxide	E/T
Barium Sulfide	T
Benzaldehyde	E
Benzene	O
Benzene (see Petroleum Ether)	O
Benzoic Acid	E
Benzol	O
Benzyl Alcohol	E
Benzyl Benzoate	E
Black Sulfate Liquor	T
Blast Furnace Gas	T
Bleach, 12% Active	E
Borax Solutions	E
Bordeaux Mixture	E
Boric Acid	E/T
Bromine	O
Butane Gas	T
Butanol (see Butyl Alcohol)	E/T
Butyl Acetate Ricinoleate	E
Butyl Alcohol	E/T
Butyl "Cellosolve Adipate"	E/T
Butyl Phenol	E
Butyl Stearate	T
Butylene	T
Butylene Glycol	E
Calcium Acetate	T
Calcium Bisulphite	T
Calcium Chloride	E/T
Calcium Hydroxide	E/T

Chemical Composition	Gasket Grade
Calcium Hypochlorite	E
Calcium Hypochloride	E
Calcium Nitrate	E/T
Calcium Sulfate	E/T
Calcium Sulfide	E/T
Caliche Liquors	T
Carbitol	E/T
Carbonic Acid, Phenol	O
Carbon Bisulfide	O
Carbon Dioxide, Dry	E/T
Carbon Dioxide, Wet	E/T
Carbon Disulfide	O
Carbon Monoxide	E
Carbon Tetrachloride	O
Caustic Potash	E/T
Cellosolve Acetate	E
Cellosolve (Alcohol Ether)	E
Cellulose Acetate	E
Cellulube 220 (Tri-Aryl-Phosphate)	E
Cellulube Hydraulic Fluids	E
China Wood Oil, Tung Oil	T
Chloric Acid to 20%	E
Chlorine, Dry	O
Chlorine, Water 4000 PPM (max.)	E
Chlorinated Paraffin (Chlorococane)	T
Chloroacetic Acid	E

Gasket Air, Water & Chemical Recommendations

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Chemical Composition	Gasket Grade
Chloroacetone	E
Chlorobenzene	O
Chloroform	O
Chrome Alum	T
Chrome Plating Solutions	O
Chromic Acid, to 25%	O
Citric Acid	E/T
Coke Oven Gas	T/O
Copper Chloride	T
Copper Cyanide	E/T
Copper Fluoride	E
Copper Nitrate	E/T
Copper Sulfate	E/T
Creosol, Cresylic Acid	O
Creosote, Coal Tar	O
Creosote, Wood	O
Cupric Fluoride	T
Cupric Sulfate	T
Cyclohexane (Alicyclic Hydrocarbon)	O
Cyclohexanone	E
Deionized Water	E
Dextrin	T
Dibutyl Phthalate	E
Dichloro Difloro Methane	T
Dicyclohexylamine	T
Diesel Oil	T
Diethyl Ether	T
Diethyl Sebacate	E
Diethylamine	T
Diethylene Glycol	E/T
Digester Gas	T
Dimethylamine	T
Diocetyl Phthalate	E
Dioxane	E
Dipentene (Terpene-Hydrocarbon)	T
Dipropylene Glycol	T
Dowtherm A	O
Dowtherm E	O
Dowtherm SR-1	T/E
Ethane	E
Ethanolamine	E
Ethyl Acetoacetate	E
Ethyl Acrylate	L
Ethyl Alcohol	E
Ethyl Cellulose	E
Ethyl "Cellusolve"	E
Ethyl Chloride	E

Chemical Composition	Gasket Grade
Ethyl Ether	T
Ethyl Oxalate	E
Ethyl Silicate	T
Ethylene Chlorohydrin	E
Ethylene Diamine	T
Ethylene Dichloride (Dichloroethane)	O
Ethylene Glycol	E/T
Ferric Chloride, to 35%	E/T
Ferric Chloride, Saturated	E
Ferric Hydroxide	E
Ferric Sulfate	T
Fire Fighting Foam Concentrate	E/O
Fluboric Acid	E/T
Fly Ash	E
FM200 HFC-227ea	E
Fog Oil	T
Formaldehyde	E/T
Formamide	E/T
Formic Acid	E
Freon 11, 130°F/54°C	T
Freon 12, 130°F/54°C	T
Freon 113 130°F/54°C	T
Freon 114,130°F/54°C	T
Freon 134a,176°/80°C	E/T
Fructose	E/T
Fuel Oil	T
Fumaric Acid	E
Furfuryl Alcohol	E
Gasoline, Refined	T
Gasoline, Refined, Unleaded	O
Glue	E/T
Glycerin	E/T
Glycerol	E/T
Glycol	E/T
Glycolic Acid	E
Grease	T
Green Sulfate Liquor	T
Halon 1301	E
Heptane	T
Hexaldehyde	E
Hexane	T
Hexanol Tertiary	T
Hexyl Alcohol	T
Hexylene Glycol	T

Chemical Composition	Gasket Grade
Hydrobromic Acid, to 40%	E
Hydrochloric Acid, to 36%, 75°F/24°C	E
Hydrochloric Acid, to 36%,158°F/70°C	O
Hydrocyanic Acid	E
Hydrofluoric Acid, to 75%, 75°F/24°C	O
Hydrofluosilicic Acid	E
Hydrogen Gas, Cold	E/T
Hydrogen Gas, Hot	E
Hydrogen Peroxide, to 50%	L
Hydrogen Peroxide, to 90%	O
Hydrogen Sulfide	E
Hydroquinone	T
Hydroxylamine Sulfate	E
Hypochlorous Acid, Dilute	E
Iso Octane, 100°F/38°C	T
Isobutyl Alcohol	E
Isopropyl Acetate	E
Isopropyl Alcohol	E
Isopropyl Ether	T
JP-3	T
JP-4	T
JP-5, 6, 7, 8	T
Kerosene	T
Ketones	E
Latex (1% Styrene & Butadiene)	O
Lauric Acid	T
Lavender Oil	T
Lead Acetate	T
Lead Chloride	E
Lead Sulfate	T
Lime and H2O	E/T
Linoleic Acid	O
Lithium Bromide	T
Lithium Chloride	T
Lubricating Oil, Refined	T
Lubricating Oil, Sour	T
Lubricating Oil, to 150°F/66°C	T
Magnesium Chloride	E/T
Magnesium Hydroxide	E/T
Magnesium Sulfate	E/T
Maleic Acid	T
Malic Acid	T
Mercuric Chloride	E/T

Chemical Composition	Gasket Grade
Mercuric Cyanide	T
Mercurous Nitrate	E/T
Mercury	T
Methane	T
Methyl Alcohol, Methanol	E/T
Methyl Chloride	O
Methyl Ethyl Ketone	E
Methyl Isobutyl Carbinol	E
Methylene Chloride	O
Methylene Dichloride 100°F/38°C	O
MIL-L7808	O
MIL-05606	O
MIL-08515	O
Mineral Oils	T
Naptha, 160°F/71°C	O
Napthenic Acid	T
Natural Gas	T
Nevoil	E
Nickel Chloride	E/T
Nickel Plating Solution 125°F/52°C	E/T
Nickel Sulfate	E/T
Nitric Acid to 10%, 75°F/24°C	E
Nitric Acid, 10-50%, 75°F/24°C	O
Nitric Acid, 50-86%, 75°F/24°C	O
Nitric Acid, Red Fuming	O
Nitromethane	E
Nitrous Oxide	E
NOVEC 1230 FK-5-1-12	E
Ogisogiric Acid, to 75%, 150°F/66°C	O
Oil, Crude Sour	T
Oil, Motor	T
Oleic Acid	T
Oronite 8200 Silicate Ester Fluid	O
Orthodichloro-benzene	O
OS-45 Silicate Ester Fluid	O
OS-45-1	O
Oxalic Acid	E
Oxygen, Cold	E
Ozone	E
Palmitic Acid	T
Pentane	T
Perchloroethylene	O

Gasket Air, Water & Chemical Recommendations

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Chemical Composition	Gasket Grade
Petroleum Ether (see Benzene)	O
Petroleum Oils	T
Phenol (Carbolic Acid)	O
Phenylhydrazine	E
Phenylhydrazine Hydrochloride	E
Phosphate Ester	E
Phosphoric Acid, to 75% and 70°F	E/T
Phosphoric Acid, to 85% and 200°F	O
Photographic Solutions	T
Phthalic Anhydride	E
Polybutene	T
Polyvinyl Acetate, Solid (In Liquid State is 50% solution of Methanol or 60% solution of H ₂ O)	E
Potassium Alum	E/T
Potassium Bicarbonate	E/T
Potassium Bichromate	E/T
Potassium Borate	E
Potassium Bromate	E
Potassium Bromide	E/T
Potassium Carbonate	E/T
Potassium Chlorate	E
Potassium Chloride	E
Potassium Chromate	T
Potassium Cyanide	E/T
Potassium Dichromate	E
Potassium Ferricyanide	E
Potassium Ferrocyanide	E
Potassium Fluoride	E
Potassium Hydroxide	T
Potassium Nitrate	T
Potassium Perborate	E
Potassium Perchlorate	T
Potassium Permanganate, Saturated to 10%	E
Potassium Permanganate Saturate 10-25%	E
Potassium Persulfate	T
Potassium Silicate	E/T

Chemical Composition	Gasket Grade
Potassium Sulfate	T
Prestone	T
Propane Gas	T *
Propanol	E
Propargyl Alcohol	E
Propyl Alcohol	T
Propylene Dichloride	L
Propylene Glycol	E
Pyranol 1467	T
Pyranol 1476	T
Pyroguard "C"	T
Pyroguard "D"	T
Pyroguard 55	E
Pyrrrole	E
Ref. Fuel (70 ISO Octane, 30 Toluene)	T
Rosin Oil	T
Salicylic Acid	E
Secondary Butyl Alcohol	T
Sewage	E/T
Silver Nitrate	E
Silver Sulfate	E
Skydrol, 200°F/93°C	L
Skydrol 500 Phosphate Ester	E
Soap Solutions	E/T
Soda Ash, Sodium Carbonate	E/T
Sodium Acetate	E
Sodium Alum	T
Sodium Benzoate	E
Sodium Bicarbonate	E/T
Sodium Bisulfate	E/T
Sodium Bisulfite (Black Liquor)	E/T
Sodium Bromide	E/T
Sodium Carbonate	E/T
Sodium Chlorate	E
Sodium Chloride	E/T
Sodium Cyanide	E/T
Sodium Dichromate, to 20%	E/T
Sodium Ferricyanide	E/T
Sodium Ferrocyanide	E/T
Sodium Fluoride	E/T
Sodium Hydro Sulfide	T
Sodium Hydroxide to 50%	E
Sodium Hypochlorite, to 20%	E

Chemical Composition	Gasket Grade
Sodium Metaphosphate	T
Sodium Nitrate	E
Sodium Nitrite	E/T
Sodium Perborate	E
Sodium Peroxide	E
Sodium Phosphate, Dibasic	T
Sodium Phosphate, Monobasic	T
Sodium Phosphate, Tribasic	T
Sodium Silicate	T
Sodium Sulfate	E/T
Sodium Sulfide	T
Sodium Sulfite Solution, to 20%	T
Sodium Thiosulfate, "Hypo"	T
Sohovis 47	T
Sohovis 78	T
Solvasol #1	T
Solvasol #2	T
Solvasol #3	T
Solvasol #73	T
Spindle Oil	T
Stannic Chloride	T
Stannous Chloride, to 15%	T
Starch	T
Stearic Acid	T
Stoddard Solvent	T
Styrene	O
Sulfonic Acid	E
Sulphite Acid Liquor	E
Sulfur	E
Sulfur Chloride	O
Sulfur Dioxide, Dry	E/T
Sulfur Dioxide, Liquid	E
Sulfur Trioxide, Dry	O
Sulfuric Acid, to 25%, 150°F/66°C	E
Sulfuric Acid, 25-50%, 200°F/93°C	O
Sulfuric Acid, 50-95%, 150°F/66°C	O
Sulfuric Acid, Fuming	O
Sulfuric Acid, Oleum	O
Sulfurous Acid	O
Tall Oil	T

Chemical Composition	Gasket Grade
Tanning Liquors (50g. alum. solution, 50g. dichromate solution)	T
Tartaric Acid	E
Tertiary Butyl Alcohol	E/T
Tetrabutyl Titanate	E
Tetrachloroethylene	O
Thionyl Chloride	T
Terpineol	T
Titanium Tetrachloride	O
Toluene, 30%	T
Transmission Fluid, Type A	O
Triacetin	T
Trichloroethane	O
Trichloroethylene, to 200°F/93°	O
Tricresyl Phosphate	E
Triethanolamine	E/T
Trisodium Phosphate	E
Tung Oil	T
Turbo Oil #15 Diester Lubricant	O
Turpentine	T
Urea	T
Vegetable Oils	T
Vinyl Acetate	E
Vi-Pex	T
Water, to 150°F/66°C	E/T
Water, to 200°F/93°C	E
Water, to 230°F/110°C	E
Water, Acid Mine	E/T
Water, Chlorine	E
Water, Deionized	E
Water, Potable	EN
Water, Seawater	E
Water, Waste	E/T
White Liquor	E
Wood Oil	T
Xylene	O
Zinc Chloride, to 50%	E
Zinc Nitrate	E
Zinc Sulfate	E/T

* Conditional, contact GRINNELL Mechanical Products

GRINNELL Gasket Lubricants

Tech Data Sheet: G610

During installation of a GRINNELL Coupling, always lubricate the gasket. For couplings using the tri-seal gasket in a low temperature application, use a petroleum-free silicone based lubricant. For mechanical tees and straps when used in low temperature applications, use a petroleum-free silicone based lubricant, otherwise no lubricant is required.

Application	La-Co Industries Lubri-Joint	Dow Corning* 7 Release Compound (Silicone)
Chilled Water	•	•
Heating	•	•
Compressed Air	•	•
Drainage	•	•
Sewage	•	•
Low Temp./Vacuum	•	•
Fire Protection	•	•

The table below will give an indication on the approximate number of gaskets which can be lubricated with one container of lubricant.

Gasket Size	Lubri-Joint 1 qt (946 ml) Container	Silicone 5.3 oz (150 g) Tube
1 1/4" / 32mm	650	116
1 1/2" / 40mm	570	94
2" / 50mm	440	73
3" / 80mm	300	50
4" / 100mm	220	36
6" / 150mm	135	22
8" / 200mm	110	18
10" / 250mm	85	14
12" / 300mm	65	10
14" / 350mm	55	9
16" / 400mm	50	8
18" / 450mm	38	6
20" / 500mm	33	5
24" / 600mm	20	3

* Dow Corning is a registered trademark of Dow Corning Corporation.

GRINNELL Mechanical Piping Products recommends two kinds of lubricant:

- La-Co Industries Lubri-Joint
- Dow Corning* 7 Release Compound (Silicone)

Check lubricant chart to be certain the proper lubricant is recommended for the service intended. For information on health safety, contact GRINNELL Mechanical Products for Material Safety Data Sheets (MSDS).



Available in:

- 1 Quart (0,95 Liter)
- 1 Gallon (3,8 Liter)

Silicone Gasket Lubricant recommended for use with tri-seal gasket (Dow Corning D.C. No. 7)* available in:

- 5.3 oz (150 grams) Tube
- 8 lb (3,6 kg) Can



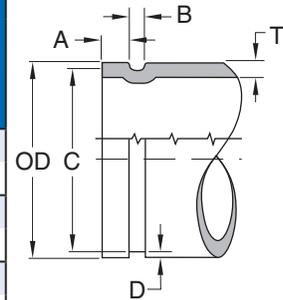
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Roll Groove Standard Specification for Steel & Other IPS Pipe

Tech Data Sheet: G710

Nominal Pipe Size Inches mm	Pipe O.D. Inches mm			A ±0.030" ±0,76mm Inches mm	B ±0.030" ±0,76mm Inches mm	C Groove Diameter Inches mm		D Groove Depth (ref. only) Inches mm	T Minimum Wall Inches mm	Maximum Allow Flare Diameter Inches mm
	O.D.	Tolerance				Actual	Tol. +0.000			
		+	-							
1¼	1.660	0.016	0.016	0.625	0.281	1.535	-0.015	0.062	0.065	1.77
32	42,4	0,41	0,41	15,88	7,14	38,99	-0,38	1,60	1,65	44,96
1½	1.900	0.019	0.019	0.625	0.281	1.775	-0.015	0.062	0.065	2.01
40	48,3	0,48	0,48	15,88	7,14	45,09	-0,38	1,60	1,65	51,05
2	2.375	0.024	0.024	0.625	0.344	2.250	-0.015	0.062	0.065	2.48
50	60,3	0,61	0,61	15,88	8,74	57,15	-0,38	1,60	1,65	62,99
2½	2.875	0.029	0.029	0.625	0.344	2.720	-0.018	0.078	0.083	2.98
65	73,0	0,74	0,74	15,88	8,74	69,09	-0,46	1,98	2,11	75,69
76,1mm	3.000	0.030	0.030	0.625	0.344	2.845	-0.018	0.076	0.083	3.10
65	76,1	0,76	0,76	15,88	8,74	72,26	-0,46	1,93	2,11	78,74
3	3.500	0.035	0.031	0.625	0.344	3.344	-0.018	0.078	0.083	3.60
80	88,9	0,89	0,79	15,88	8,74	84,94	-0,46	1,98	2,11	91,44
4	4.500	0.045	0.031	0.625	0.344	4.334	-0.020	0.083	0.083	4.60
100	114,3	1,14	0,79	15,88	8,74	110,08	-0,51	2,11	2,11	116,84
139,7mm	5.500	0.056	0.031	0.625	0.344	5.334	-0.022	0.083	0.109	5.60
125	139,7	1,42	0,79	15,88	8,74	135,48	-0,56	2,11	2,77	142,24
5	5.563	0.056	0.031	0.625	0.344	5.395	-0.022	0.084	0.109	5.66
125	141,3	1,42	0,79	15,88	8,74	137,03	-0,56	2,13	2,77	143,76
165,1mm	6.500	0.063	0.031	0.625	0.344	6.330	-0.022	0.085	0.109	6.60
150	165,1	1,60	0,79	15,88	8,74	160,78	-0,56	2,16	2,77	167,64
6	6.625	0.063	0.031	0.625	0.344	6.455	-0.022	0.085	0.109	6.73
150	168,3	1,60	0,79	15,88	8,74	163,96	-0,56	2,16	2,77	170,94
8	8.625	0.063	0.031	0.750	0.469	8.441	-0.025	0.092	0.109	8.80
200	219,1	1,60	0,79	19,05	11,91	214,40	-0,64	2,34	2,77	223,52
10	10.750	0.063	0.031	0.750	0.469	10.562	-0.027	0.094	0.134	10.92
250	273,0	1,60	0,79	19,05	11,91	268,27	-0,69	2,39	3,40	277,37
12	12.750	0.063	0.031	0.750	0.469	12.531	-0.030	0.109	0.156	12.92
300	323,9	1,60	0,79	19,05	11,91	318,19	-0,76	2,77	3,96	328,17
14	14.000	0.063	0.031	0.938	0.469	13.781	-0.030	0.109	0.156	14.10
350	355,6	1,60	0,79	23,83	11,91	350,04	-0,76	2,77	3,96	358,14
16	16.000	0.063	0.031	0.938	0.469	15.781	-0.030	0.109	0.165	16.10
400	406,4	1,60	0,79	23,83	11,91	400,84	-0,76	2,77	4,19	408,94
18	18.000	0.063	0.031	1.000	0.469	17.781	-0.030	0.109	0.165	18.16
450	457,2	1,60	0,79	25,40	11,91	451,64	-0,76	2,77	4,19	461,26
20	20.000	0.063	0.031	1.000	0.469	19.781	-0.030	0.109	0.188	20.16
500	508,0	1,60	0,79	25,40	11,91	502,44	-0,76	2,77	4,78	512,06
24	24.000	0.063	0.031	1.000	0.500	23.656	-0.030	0.172	0.218	24.20
600	609,6	1,60	0,79	25,40	12,70	600,86	-0,76	4,37	5,54	614,68



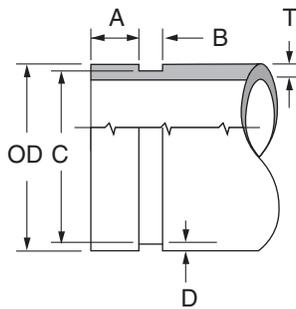
GRINNELL Roll Grooves conform to AWWA C-606 specification.

- The maximum allowable tolerances for IPS Pipe from square cut ends is:
0.030" (0,76mm) for sizes 1¼" thru 3" (32 – 80mm);
0.045" (1,14mm) for sizes 4" – 6" (100 – 150mm); and
0.060" (1,52mm) for sizes 8" (200mm) and above.
- Gasket Seating Surface "A" must be free from score marks, ridges, indentations, projections, loose paint, scale, dirt chips, grease, rust, etc. that would prevent a positive seal.
- Groove Diameter "C" must be of uniform depth around the circumference of the pipe.
- Groove Depth "D" is a reference dimension only. The Groove Diameter "C" must be maintained.
- Minimum Wall Thickness "T" is the minimum wall thickness that should be roll grooved.
- Maximum allowable pipe end flare diameter is measured at the pipe end diameter.

Refer to back cover for country-specific customer care numbers.

Cut Groove Standard Specification for Steel & Other IPS Pipe

Tech Data Sheet: G710



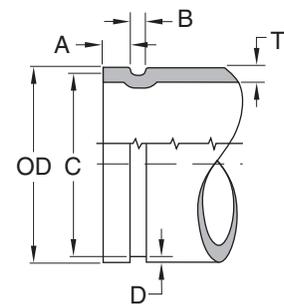
Nominal Pipe Size Inches mm	Pipe O.D. Inches mm			A ±0.030" ± 0,76mm Inches mm	B ±0.030" ± 0,76mm Inches mm	C Groove Diameter Inches mm		D Groove Depth (ref. only) Inches mm	T Minimum Wall Inches mm
	O.D.	Tolerance				Actual	Tol. +0.000		
		+	-						
1¼	1.660	0.016	0.016	0.625	0.313	1.535	-0.015	0.062	0.062
32	42,4	0,41	0,41	15,88	7,95	38,99	-0,38	1,60	1,60
1½	1.900	0.019	0.019	0.625	0.313	1.775	-0.015	0.062	0.062
40	48,3	0,48	0,48	15,88	7,95	45,09	-0,38	1,60	1,60
2	2.375	0.024	0.024	0.625	0.313	2.250	-0.015	0.062	0.062
50	60,3	0,61	0,61	15,88	7,95	57,15	-0,38	1,60	1,60
2½	2.875	0.029	0.029	0.625	0.313	2.720	-0.018	0.078	0.078
65	73,0	0,74	0,74	15,88	7,95	69,09	-0,46	1,98	1,98
76,1mm	3.000	0.030	0.030	0.625	0.313	2.845	-0.018	0.076	0.076
65	76,1	0,76	0,76	15,88	7,95	72,26	-0,46	1,93	1,93
3	3.500	0.035	0.031	0.625	0.313	3.344	-0.018	0.078	0.078
80	88,9	0,89	0,79	15,88	7,95	84,94	-0,46	1,98	1,98
4	4.500	0.045	0.031	0.625	0.375	4.334	-0.020	0.083	0.083
100	114,3	1,14	0,79	15,88	9,53	110,08	-0,51	2,11	2,11
139,7mm	5.500	0.056	0.031	0.625	0.375	5.334	-0.020	0.083	0.083
125	139,7	1,42	0,79	15,88	9,53	135,48	-0,51	2,11	2,11
5	5.563	0.056	0.031	0.625	0.375	5.395	-0.022	0.084	0.084
125	141,3	1,42	0,79	15,88	9,53	137,03	-0,56	2,13	2,13
165,1mm	6.500	0.063	0.031	0.625	0.375	6.330	-0.022	0.085	0.085
150	165,1	1,60	0,79	15,88	9,53	160,78	-0,56	2,16	2,16
6	6.625	0.063	0.031	0.625	0.375	6.455	-0.022	0.085	0.085
150	168,3	1,60	0,79	15,88	9,53	163,96	-0,56	2,16	2,16
8	8.625	0.063	0.031	0.750	0.438	8.441	-0.025	0.092	0.092
200	219,1	1,60	0,79	19,05	11,13	214,40	-0,64	2,34	2,34
10	10.750	0.063	0.031	0.750	0.500	10.562	-0.027	0.094	0.094
250	273,0	1,60	0,79	19,05	12,70	268,27	-0,69	2,39	2,39
12	12.750	0.063	0.031	0.750	0.500	12.531	-0.030	0.109	0.109
300	323,9	1,60	0,79	19,05	12,70	318,19	-0,76	2,77	2,77
14	14.000	0.063	0.031	0.938	0.500	13.781	-0.030	0.109	0.281
350	355,6	1,60	0,79	23,83	12,70	350,04	-0,76	2,77	7,14
16	16.000	0.063	0.031	0.938	0.500	15.781	-0.030	0.109	0.312
400	406,4	1,60	0,79	23,83	12,70	400,84	-0,76	2,77	7,92
18	18.000	0.063	0.031	1.000	0.500	17.781	-0.030	0.109	0.312
450	457,2	1,60	0,79	25,40	12,70	451,64	-0,76	2,77	7,92
20	20.000	0.063	0.031	1.000	0.500	19.781	-0.030	0.109	0.312
500	508,0	1,60	0,79	25,40	12,70	502,44	-0,76	2,77	7,92
24	24.000	0.063	0.031	1.000	0.562	23.656	-0.030	0.172	0.375
600	609,6	1,60	0,79	25,40	14,27	600,86	-0,76	4,37	9,53

- The maximum allowable tolerances for IPS Pipe from square cut ends is:
0.030" (0,76mm) for sizes 1¼" thru 3" (32 – 80mm);
0.045" (1,14mm) for sizes 4" – 6" (100 – 150mm); and
0.060" (1,52mm) for sizes 8" (200mm) and above.
- Gasket Seating Surface "A" must be free from score marks, ridges, indentations, projections, loose paint, scale, dirt chips, grease, rust, etc. that would prevent a positive seal.
- Groove Diameter "C" must be of uniform depth around the circumference of the pipe.
- Groove Depth "D" is a reference dimension only. The Groove Diameter "C" must be maintained.
- Minimum Wall Thickness "T" is the minimum wall thickness that should be cut grooved.

Roll Groove Standard Specification for Copper Tubing

Tech Data Sheet: G720

Nominal Tubing Size Inches mm	Tubing O.D. Inches mm			A ±0.030" ±0.76mm Inches mm	B ±0.030" ±0.76mm Inches mm	C Groove Diameter Inches mm		D Nominal Groove Depth Inches mm	T Minimum Wall Inches mm	Maximum Flare Diameter Inches mm
	O.D.	Tolerance				Actual	Tol. 0.000			
		+	-							
2"	2.125	0.002	0.002	0.610	0.300	2.029	-0.020	0.048	0.058	2.220
50	54,0	0,05	0,05	15,5	7,6	51,5	-0,51	1,2	1,5	56,4
2½"	2.625	0.002	0.002	0.610	0.300	2.525	-0.020	0.050	0.065	2.720
65	66,7	0,05	0,05	15,5	7,6	64,1	-0,51	1,2	1,7	69,1
3"	3.125	0.002	0.002	0.610	0.300	3.025	-0.020	0.050	DWV	3.220
80	79,4	0,05	0,05	15,5	7,6	76,8	-0,51	1,2	-	81,8
4"	4.125	0.002	0.002	0.610	0.300	4.019	-0.020	0.053	DWV	4.220
100	104,8	0,05	0,05	15,5	7,6	102,1	-0,51	1,4	-	107,2
5"	5.125	0.002	0.002	0.610	0.300	4.999	-0.020	0.053	DWV	5.220
125	130,2	0,05	0,05	15,5	7,6	127,0	-0,51	1,4	-	132,6
6"	6.125	0.002	0.002	0.610	0.300	5.999	-0.020	0.063	DWV	6.220
150	155,6	0,05	0,05	15,5	7,6	152,3	-0,51	1,6	-	158,0
8"	8.125	0.002	0.004	0.610	0.300	7.959	-0.020	0.083	DWV	8.220
200	206,4	0,05	0,10	15,5	7,6	202,2	-0,51	2,1	-	208,8



- (1) Nominal Tubing, ASTM B-88 drawn copper tubing size.
- (2) Outside Diameter "OD", of roll grooved tubing shall not vary more than the tolerance listed. The maximum tolerance from square cut ends is: 0.030" (0,76mm) for sizes 2" – 3" (54,0 – 79,4mm); 0.045" (1,14mm) for sizes 4" – 6" (104,8 – 155,6mm); measured from true square line.
- (3) Gasket Seating Surface "A", must be free from roll marks, indentations, projections, loose scale, dirt, chips, grease, etc. that would prevent a positive seal.
- (4) Groove Width Bottom "B", to be free of loose dirt, chips and scale that may interfere with proper coupling assembly.
- (5) The Groove Diameter "C", must be uniform in depth for the entire circumference of the tubing. Groove must be maintained within the tolerance listed.
- (6) Groove Depth "D", is a reference dimension only. The Groove Diameter "C" must be maintained.
- (7) Minimum Wall Thickness "T", per ASTM B-306 drain waste and vent (DWV) is minimum wall thickness copper tubing, which may be roll grooved.
- (8) Maximum Flare Diameter is the O.D. at the most extreme tubing diameter.

Pipe Tape

Model PT 1000 was developed to check the groove diameter in roll-grooved pipe. The tape measures the groove in steel pipe 1" – 12" (25mm - 305mm) and copper tube 2" – 8" (50mm - 200mm).

The loop extending from the metal housing consists of a clear-plastic window with a vertical indicator line and the adjustable metal measuring tape. The adjustable measuring tape has groove tolerance blocks (thick black lines) that are visible through the plastic view window. The groove tolerance blocks are marked with the associated pipe diameters.

Model PT 2000 measures the groove in steel pipe from 1" – 36" (25mm - 915mm) in 100th's of inches.



Note: The GRINNELL Roll Pipe Measuring Tape is not a calibrated tool and is to be used for reference only. To ensure accuracy, always check grooved pipe dimensions with calibrated gauges or calipers. For Roll Groove Standard Specifications for Steel Pipe and Other IPS Pipe, refer to Data Sheet G710. For Roll Groove Standard Specification for Copper Tube, refer to Data Sheet G720.

Portable Roll Groovers With Electric Motor

Self-contained portable roll grooving machines are supplied with electric motors for roll grooving pipe on the job site. Each machine comes in a shipping/storage box and includes a hydraulic hand pump, top and bottom rolls, guards and foot switch.

Additional rolls may be ordered with machines. Contact GRINNELL Mechanical Products.

Pace Model	Size Range - Inches <i>mm</i>				Drive
	Schedule 40	Schedule 10	Std. Wall	Copper	
1112	1" – 12" <i>25mm - 300mm</i>	1¼" - 12" <i>32mm - 300mm</i>	– <i>–</i>	2" – 6" <i>50mm - 150mm</i>	1½ HP, 110 v
1023	1¼" – 12" <i>32mm - 300mm</i>	1¼" - 24" <i>32mm - 600mm</i>	12" – 24" <i>300mm - 600mm</i>	2" – 6" <i>50mm - 150mm</i>	1½ HP, 110 v

Roll Grooving Machines are available for rent. Contact your GRINNELL Mechanical Products representative for details and availability.
*Please specify power outlet when ordering

Model 1112 Portable Roll Groovers With Electric Motor



- Schedule 40 Capacity 1" – 12" (25mm - 300mm)
- Copper Tube 2" – 6" (50mm - 150mm) (K, L, M and DWV)
- Pipe Rotation Speed of 35 RPM
- Spindle height from floor is 35" (889mm)
- Hydraulic Pressure at Roller is 15,000 PSI (1034,2 bar) Max
- Electric Motor 1½ HP, 60 Hz, 110 v.1 PH*

Floor Space Required: 32" x 32" (813mm x 813mm)

Weight: 220 lbs (99,8 kg)

Standard Equipment:

Electric Drive Motor, Groove Depth Gauge, Hydraulic Hand Pump, Top and Bottom Rolls 1" – 12" (25mm - 300mm), Shipping/Storage Box, Guards, Foot Switch

Optional Equipment:

Top and Bottom copper Rolls, Nipple Bracket, Mounting Feet

* Other current characteristics available contact GRINNELL Mechanical Products.

Model 1023 Portable Roll Groovers With Electric Motor



- Schedule 40 1¼" – 12" (32mm – 300mm)
- Standard Wall 12" – 24" (300mm – 600mm)
- Copper Tube 2" – 6" (50mm - 150mm) (K, L, M and DWV)
- Pipe Rotation Speed of 30 RPM
- Spindle height from floor is 33" (838mm)
- Hydraulic Pressure at Roller is 16,000 PSI (1103,2 bar) Max
- Electric Motor 1½ HP, 60 Hz, 110 v or 220v

Floor Space Required: 31½" x 33½" (800mm - 851mm)

Weight: 430 lbs (195 kg)

Standard Equipment:

Electric Motor, Groove Depth Gauge, Hydraulic Pump, Shipping/Storage Box, Rolls as Specified on Price List, Guards, Foot Switch

Optional Equipment:

Top and Bottom Copper Rolls, Nipple Bracket, Mounting Feet

Portable Roll Groovers For Ridgid® 300 Pipe Threader

Models 1012, 1022 and 1041 Roll Grooving Machines are designed to be mounted quickly and easily on a Ridgid® Model 300 unit.*

Pace Model	Size Range - Inches mm				Drive
	Schedule 40	Schedule 10	Std. Wall	Copper	
1012	1" - 12" 25mm - 300mm	-	-	2" - 6" 50mm - 150mm	Ridgid® 300
1022	1¼" - 12" 32mm - 300mm	-	12" - 16" 300mm - 400mm	2" - 6" 50mm - 150mm	Ridgid® 300
1041	1" - 6" 25mm - 150mm	1" - 12" 25mm - 300mm	-	2" - 6" 50mm - 150mm	Ridgid® 300

* Ridgid is a registered trademark of Ridgid Tool Company.

Model 1012 Portable Roll Groovers



- Schedule 40 1" - 12" (25mm - 300mm)
- Copper Tube Capacity 2" - 6" (50mm - 150mm) (K, L, M and DWV)
- Hydraulic Hand Pump

Weight: 125 lbs (56,7 kg)

Standard Equipment:

Top and Bottom Rolls 1" - 12" (25mm - 300mm), Groove Depth Gauge, Hydraulic Hand Pump, Guards

Optional Equipment:

Top and Bottom Copper Rolls, Pipe Nipple, and Stabilizer Bracket

Model 1022 Portable Roll Groovers



- Schedule 40 Capacity 1¼" - 12" (32mm - 300mm)
- Standard Wall Capacity 12" - 16" (300mm - 400mm)
- Copper Tube Capacity 2" - 6" (50mm - 150mm) (K, L, M)
- Hydraulic Pressure at Roller is 16,000 PSI (1103,2 bar) Max

Weight: 285 lbs (129 kg)

Standard Equipment:

Top and Bottom Rolls 1¼" - 16" (32mm - 400mm), Hydraulic Hand Pump, Grooved Depth Gauge, Shipping/Storage Box, Pipe Nipple and Stabilizer Bracket, Guards

Optional Equipment:

Top and Bottom Copper Rolls

Model 1041 Portable Roll Groovers



- Schedule 40 Capacity 1" - 6" (25mm - 150mm)
- Schedule 10 Capacity 1" - 12" (25mm - 300mm)
- Copper Tube Capacity 2" - 6" (50mm - 150mm) (K, L, M and DWV)
- Hydraulic Pressure at Roller is 8,000 PSI (551,6 bar) Max

Weight: 94 lbs (42 kg)

Standard Equipment:

Top and Bottom Rolls 1" - 12" (25mm - 300mm), Hydraulic Hand Pump, Grooved Depth Gauge and Guards

Optional Equipment:

Top and Bottom Copper Rolls

MINI-MITES Field Portable

Field Portable Mini-Mites are designed to be adapted for use with Ridgid® Model 300 machines. Model 1039-66 can be operated with its own hand ratchet so that no other tools are required.

Pace Model	Size Range - Inches <i>mm</i>				Drive
	Schedule 40	Schedule 10	Std. Wall	Copper	
1039-66	-	-	-	2" - 8" 50mm - 200mm	Ridgid® 300, hand crank
1039-66	1¼" - 6" 32mm - 150mm	-	-	-	Ridgid® 300, hand crank
1034	1¼" - 6" 32mm - 150mm	-	-	-	Ridgid® 300
1066	-	-	-	2" - 8" 50mm - 200mm	Ridgid® 300

Model 1039-66 MINI-MITES Field Portable



- Copper Tube Capacity 2" - 8" (50mm - 200mm) (K, L, M and DWV)
- Manual Grooving With Ratchet Hand Crank
- Can be Used with Ridgid® Model 300 With No Gearbox Removal
- Self-contained

Standard Equipment:

Copper Rolls 2" - 8" (50mm - 200mm), Multi-Function Ratchet Hand Crank

Optional Equipment:

Top and Bottom Rolls Steel Pipe

Model 1039 MINI-MITES Field Portable



- Schedule 40 Capacity 1¼" - 6" (32mm - 150mm)
- Manual Grooving With Ratchet Hand Crank
- Can be Used with Ridgid® Model 300 With No Gearbox Removal
- Self-contained

Standard Equipment:

Steel Rolls 1¼" - 6" (32mm - 150mm), Multi-Function Ratchet Hand Crank

Optional Equipment:

Top and Bottom Rolls Copper Tube

Model 1034 MINI-MITES Field Portable



- Schedule 40 Capacity 1¼" - 6" (32mm - 150mm)
- Used with the Ridgid® Model 300 Threader

Standard Equipment:

Steel Pipe Rolls 1¼" - 6" (32mm - 150mm)

Model 1066 MINI-MITES Field Portable



- Copper Tube Capacity 2" - 8" (50mm - 200mm) (K, L, M and DWV)
- Used With the Ridgid® Model 300 Threader

Standard Equipment:

Copper Rolls 2" - 8" (50mm - 200mm)

AUTOMATED ROLL GROOVERS

The Automated Roll Grooving Machines are designed for use in the shop. The machines have a self-contained hydraulic system that produces consistent quality roll grooves in high production runs.

Pace Model	Size Range - Inches <i>mm</i>				Drive
	Schedule 40	Schedule 10	Std. Wall	Copper	
2021	1¼" - 12"	-	12" - 24"	2" - 8"	3 HP, 220 v
	32mm - 300mm	-	300mm - 600mm	50mm - 200mm	
2050	4" - 12"	4" - 30"	-	-	5 HP, 220 v
	100mm - 200mm	100mm - 800mm	-	-	
2112	1" - 12"	-	-	2" - 8"	1½ HP, 110 v
	25mm - 300mm	-	-	50mm - 200mm	

Model 2021 AUTOMATED ROLL GROOVERS



- Schedule 40 1¼" - 12" (32mm - 300mm)
- Standard Wall 12" - 24" (300mm - 600mm)
- Copper Tubing 2" - 8" (50mm - 200mm) (K, L, M and DWV)
- Pipe Rotation Speed of 30 RPM
- Hydraulic Pressure at the Roller is 16,000 PSI (1103,2 bar) Max
- Electric Motor 3 HP, 60 Hz, 220 v, 3 PH
- Hydraulic Pump Motor 1 HP, 60 Hz, 220 v, 3 PH
- Ships Completely Assembled With 4" - 6" (100m - 150mm) Top and Bottom Rollers

Floor Space Required: 30" x 20" (762mm - 508mm)

Standard Equipment:

Electric Drive Motor, Limit Switch for Depth Gauging, Groove Depth Gauge, Hydraulic Pump, Model 4037 Nipple Bracket, Rolls As Specified in Price List, Guards, Foot Switch

AUTOMATED ROLL GROOVERS

Model 2050 AUTOMATED ROLL GROOVERS

- Schedule 40 4" – 12" (100mm - 300mm)
- Schedule 10 4" – 30" (100mm - 800mm)
- Pipe Rotation Speed of 30 RPM
- Hydraulic Pressure at the Roller is 20,000 PSI (1378 Bar) Max
- Spindle height from floor is 36" (914mm)
- Electric Drive Motor 5 HP, 60 Hz, 220 V.3PH
- Hydraulic Pump Motor 2 HP, 60 Hz, 220 V.3PH
- Ships Completely Assembled With 4" – 6" (100mm - 150mm) Top and Bottom rollers

Floor Space Required: 40" x 36" (1016mm - 914mm)

Weight: 1,500 lbs (680 kg)

Standard Equipment:

Electric Drive Motor, Limit Switch for Depth Gauging, Groove Depth Gauge, Hydraulic Pump Motor, Hydraulic Pump, Rolls As Specified in Price List, Guards, Foot Switch



Model 2112 AUTOMATED ROLL GROOVERS

- Schedule 40 1" – 12" (40mm - 150mm)
- Copper Tubing 2" – 8" (50mm - 200mm) (K, L, M and DWV)
- Pipe Rotation Speed of 35 RPM
- Spindle height from floor is 35" (889mm)
- Hydraulic Pressure at the Roller is 15,000 PSI (1034 bar) Max
- Electric Motor ½ HP, 60 Hz, 110 v, 1 PH
- Hydraulic Pump Motor 1 HP, 60 Hz, 110 v, 1 PH
- Ships Completely Assembled With 1" – 12" (100mm - 150mm) Top and Bottom rollers

Floor Space Required: 30" x 22" (762mm - 559mm)

Weight: 470 lbs (213 kg)

Standard Equipment:

Electric Drive Motor, Limit Switch for Depth Gauging, Groove Depth Gauge, Hydraulic Pump, Model 4037 Nipple Bracket, Rolls As Specified in Price List, Guards, Foot Switch



Model 1000 PORTABLE CUT GROOVER

Pace Model	Size Range - Inches <i>mm</i>				Drive
	Schedule 40	Schedule 10	Schedule 80	Std. Wall	
1000	2" - 12" *	-	2½" - 8"	-	1 HP, 115-230 v
	50mm - 300mm	-	65mm - 200mm	-	

* With optional collet chucks for 10" - 12" (250mm - 300mm) pipe.



- Schedule 40 2" - 12" (50mm - 300mm)
- Schedule 80 2½" - 8" (65mm - 200mm)
- Tooling for Cut Grooving Ductile Iron Pipe Also Available
- Special collet chucks for Non-Standard Dimension Pipe Can Be Supplied
- Motor is 1 HP, 115-230 v, 1 PH

Weight: 185 lbs (84 kg)

Height: 38" (965,2 mm)

Standard Equipment:

Collet chucks for 2" - 8" (50mm - 200mm), 4 High Speed Steel Grooving Blades, Groove Gauge, Shipping/Storage Box

ACCESSORIES

Model 4031 Pipe Support Stands

Capacity: 1" – 4" (25mm - 100mm) Pipe; 600 lbs (272,2 kg) max

A 22" (559mm) diameter base with 2" (50mm) column gives this stand plenty of strength for supporting any pipe size in its size range. The saddle has two roller bar bearings for free rotation of the pipe, and absorbs vibration to ensure a smooth, uniform groove. Saddle height is adjustable over a 10" (250mm) range.



Model 4000 Pipe Support Stands

Capacity: 2" – 8" (50mm - 200mm) Pipe; 900 lbs (408,2 kg) max

The base of this stand is the same as used in the Model 4031. A saddle with four roller bearings provides greater side support for the pipe and increases dampening of vibration without impairing the unit's free-rolling characteristics. Saddle height is adjustable over a 10" (250mm) range.



Model 4033 Pipe Support Stands

Capacity: 2" – 14" (50mm - 350mm) Pipe; 1,200 lbs (544,3 kg) max

This extra-heavy-duty pipe support stand uses two 2" (50mm) columns on a 22" (550mm) diameter base to give it exceptional stability and resistance to vibration and pendulum effect. Each column incorporates a sturdy, threaded post infinitely adjustable over a 10" (250mm) range. The saddle utilizes six roller bearings in an array that provides excellent support for all pipes in its size range.



Model 4040 Pipe Support Stands

Capacity: 12" – 24" (300mm - 600mm) Pipe; 4,000 lbs (1814,4 kg) max

Fabricated of 6" (150mm) diameter steel pipe welded to a 36" (914,4mm) base, the stand can support up to two tons of pipe during grooving operations. Pipe saddle height is adjustable over a 5" (127mm) range.



ACCESSORIES

Model 3013 Porta-Bore



- Solid Alloy Aluminum Construction
- Motor is a 10 Amp draw industrial drill motor 110 v with internal 4-speed gear box 110, 175, 245, 385 RPM
- Circuit breaker assures no safety hazard to the operator or machine
- Chain clamp is standard on all units and clamps to 1¼" – 12" (32mm - 300mm) pipe diameters
- Optional speed toggle clamps; 1¼" – 6" (32mm - 150mm) pipe
- Oil feed

Weight: 42 lbs (19 kg)

Model 4037 Nipple Bracket



- Capacity: 8" – 24" (200mm - 600mm) Pipe
- Fits Models 1020, 1021, 1023, 2020, 2021, and 2050 Roll Groovers

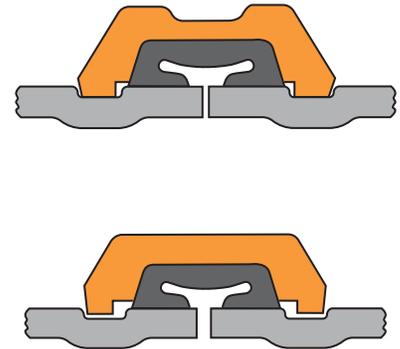


Design

Tech Data Sheets: G810, G820, G830

Rigid Joints

GRINNELL Rigid Couplings provide rigid gripping of the pipe. They are designed to bring the pipe ends close together and to ensure the coupling clamps firmly onto the pipe OD and the bottom of the grooves. Because rigid couplings clamp around the entire pipe surface, they provide resistance to flexural and torsional loads and therefore permit longer spacing to ASME/ANSI B 31.1 (Power Piping) and ASME/ANSI B 39.1 (Building Services) requirements.

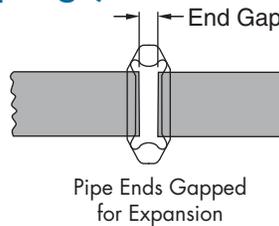


Flexible Joints

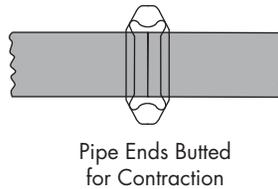
GRINNELL Flexible Couplings act as an "expansion joint", allowing linear and angular movement of the pipe. They are designed with the coupling keys engaging the pipe without gripping on the bottom of the grooves, while still providing for a restrained mechanical joint. This is particularly useful to allow for pipe expansion/contraction and piping misalignment.

Linear Movement (Flexible Couplings)

For thermal expansion with flexible couplings, the pipe ends at each joint should be fully gapped to the maximum amount. This can be accomplished by pressurizing the system and then anchoring the system.

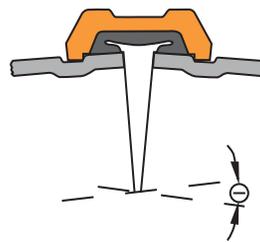


For thermal contraction with flexible couplings, the pipe ends at each joint should be fully butted. The system can then be anchored in place to prevent the pipe ends from opening up to the maximum end gap when pressurized.



Angular Deflection

GRINNELL Flexible Couplings are capable of accommodating angular deflection.



Expansion/Contraction

GRINNELL Flexible Couplings are capable of accommodating pipe thermal movements provided they are properly gapped and a sufficient quantity of flexible couplings are used. Note that flexible couplings will not accommodate both full maximum linear movement and the maximum available angular deflection concurrently at the same joint.

If it is desired to have both deflection and linear movement available, then the system should have sufficient flexible joints to accommodate the requirement.



For design purposes, the maximum pipe end gap should be reduced to account for field practices as follows:

End Gap Reduction	
Pipe Size Inches mm	Maximum Pipe End Gap
1¼ – 3 42,4 – 88,9	50%
4 – 24 114,3 – 610,0	25%

The following values should be used as available pipe end movements for GRINNELL Figure 705, 707, and 716 Flexible Couplings:

Pipe End Movements		
Pipe Size Inches mm	Cut Grooved Inches mm	Roll Grooved Inches mm
1¼ – 3 42,4 – 88,9	0 – 0.063 0 – 1,6	0 – 0.031 0 – 0,8
4 – 24 114,3 – 610,0	0 – 0.188 0 – 2,4	0 – 0.094 0 – 2,4

* Roll grooved joints provide half the available movement of cut grooved joints.

The deflection published is a maximum value. For design purposes the maximum deflection should be reduced to account for field practices as shown:

Deflection	
Pipe Size Inches mm	Maximum Pipe Deflection Reduction
1¼ – 3 42,4 – 88,9	50%
4 – 24 114,3 – 610,0	25%

Thermal Movement

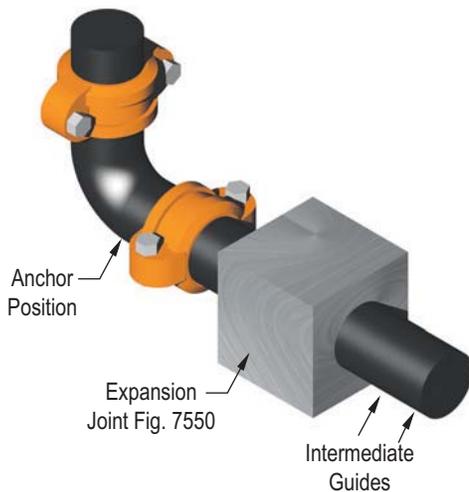
Tech Data Sheets: G810, G820, G830

The following guidelines are similar to any expansion joint:

It is recommended that anchors be installed at changes of direction on the pipe lines to control the pipe movement. The thermal expansion/contraction in the piping system can be accommodated using GRINNELL Flexible Couplings. In designing anchoring systems, it is suggested that the following be taken into consideration:

- Pressure Thrusts
- Frictional Resistance of Any Guides or Supports
- Centrifugal Thrust Due to Velocity at Changes of Direction
- Activation Force Required to Compress or Expand a Flexible Coupling

Three methods are available as examples to accommodate thermal expansion/contraction:

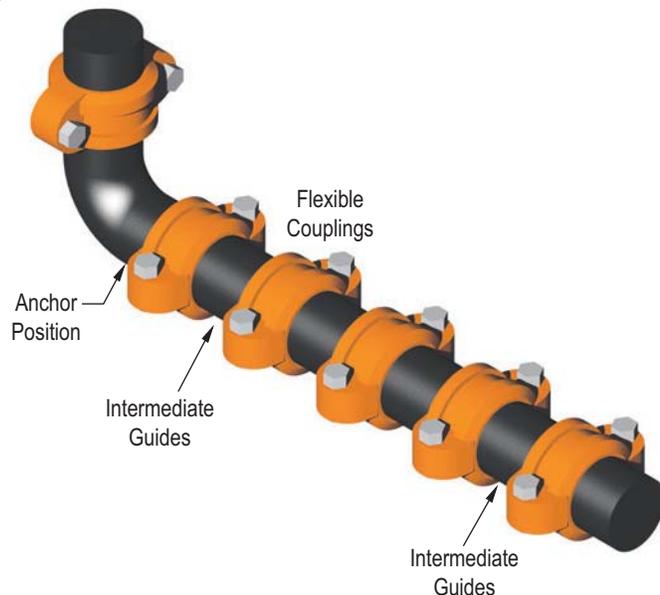


- (1) Design the system with rigid couplings and place expansion joints at the proper locations. Expansion joints may be a series of flexible grooved couplings of a sufficient quantity to accommodate the movement.
- (2) Design the system with flexible and/or rigid couplings and allow the pipe to move in directions desired, with the use of anchors and guides if so required. With this method, it is important to ensure that movement at branch connections, changes of direction, equipment hookup, etc., will not cause damage or harmful stresses.
- (3) Design the system with flexible couplings utilizing the expansion/contraction capabilities of these products.

Activation Force	
Pipe Size Inches mm	Activation Force lbs N
1¼	35
42,4	156
1½	45
48,3	200
2	70
60,3	311
2½	100
73,0	645
76,1mm	110
76,1	489
3	145
88,9	645
4	240
114,3	1068
5	375
141,3	1668
165,1mm	500
165,1	2224
6	520
168,3	2313
8	880
219,1	3914
10	1365
273,0	6072
12	1915
323,9	8518

The following example illustrates this method:

- 6" (150mm) Schedule 40 steel pipe, roll grooved, 150' (45,7m) long, anchored at each end
- Maximum Temperature = 200°F (93.3°C)
- Minimum Temperature = 40°F (4.4°C)
- Install Temperature = 80°F (26.6°C)



Thermal Movement

Tech Data Sheets: G810, G820, G830

Directions to calculate the number of couplings required to compensate for the thermal expansion and contraction of pipe (by example):

(1) Thermal Contraction

Utilize the Thermal Expansion Table. Allowance for the minimum installation temperature, in this case 80°F to 40°F (26.6°C to 4.4°C), is calculated as:

$$80^{\circ}\text{F} = 0.61" \text{ per } 100'$$

$$40^{\circ}\text{F} = 0.30" \text{ per } 100'$$

$$\text{Difference} = 0.31" \text{ per } 100'$$

$$\text{For } 150' \text{ of pipe} = 0.31" \times 1.5 = 0.47" \text{ per } 150'$$

$$(26.6^{\circ}\text{C} = 15,5\text{mm per } 30,5\text{m})$$

$$4.4^{\circ}\text{C} = 7,6\text{mm per } 30,5\text{m})$$

$$\text{Difference} = 7,9\text{mm per } 30,5\text{m})$$

$$\text{For } 45,7\text{m of pipe} = 7,9\text{mm} \times 1.5 = 11,9\text{mm per } 45,7\text{m})$$

(2) Thermal Expansion

Utilize the Thermal Expansion Table. Allowance for the minimum installation temperature, in this case 26.6°C to 93.3°C (80°F to 200°F), is calculated as:

$$200^{\circ}\text{F} = 1.52" \text{ per } 100'$$

$$80^{\circ}\text{F} = 0.61" \text{ per } 100'$$

$$\text{Difference} = 0.91" \text{ per } 100'$$

$$\text{For } 150' \text{ of pipe} = 0.91 \times 1.5 = 1.36" \text{ per } 150'$$

$$(93.3^{\circ}\text{C} = 38,6\text{mm per } 30,5\text{m})$$

$$26.6^{\circ}\text{C} = 15,5\text{mm per } 30,5\text{m})$$

$$\text{Difference} = 23,1\text{mm per } 30,5\text{m})$$

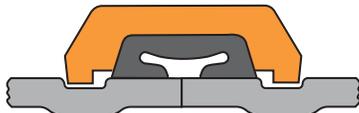
$$\text{For } 45,7\text{m of pipe} = 23,1\text{mm} \times 1.5 = 34,5\text{mm per } 45,7\text{m})$$

(3) Couplings Required

Available linear movement for a 6" (150mm) Figure 707 Flexible Coupling on roll grooved pipe = 0.094" (2,4mm) per coupling.

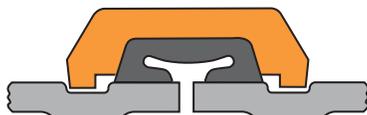
Fully butted together for contraction only. Therefore the number of Figure 707 Flexible Couplings required:

- $0.47" / 0.094" \text{ per coupling} = 5.0$
($11,9\text{mm} / 2,4\text{mm per coupling} = 4.96$)



- Use 5 Figure 707 couplings for pipe contraction
- (b) Fully gapped apart for expansion only. Therefore the number of Figure 707 Flexible Couplings required:

- $1.36" / 0.094" \text{ per coupling} = 14.47$
($34,5\text{mm} / 2,4\text{mm per coupling} = 14.38$)
- Use 15 Figure 707 Flexible Couplings for pipe expansion



Thermal Expansion of Carbon Steel in Inches/100 Feet (milliMeters/30.5 Meters) Between 0°F (-18°C) and Indicated Temperature

Temperature F° C°	Thermal Expansion Inches/100 Feet mm/30.5M
-40	-0.30
-40	-7,62
-30	-0.23
-34,4	-5,84
-20	-0.15
-28,9	-3,81
-10	-0.08
-23,3	-2,03
0	0.00
-17,8	0,00
10	0.08
-12,2	2,03
20	0.15
-6,7	3,81
30	0.23
-1,1	5,84
40	0.30
4,4	7,62
50	0.38
10,0	9,65
60	0.46
15,6	11,68
70	0.53
21,1	13,46
80	0.61
26,7	15,50
90	0.68
32,2	17,27
100	0.76
37,8	19,30
110	0.84
43,3	21,34
120	0.91
48,9	23,11
130	0.99
54,4	25,15
140	1.06
60,0	26,92
150	1.14
65,6	28,96
160	1.22
71,1	30,99
170	1.29
76,7	32,77
180	1.37
82,2	34,80
190	1.44
87,8	36,58
200	1.52
93,3	38,61
210	1.60
98,9	40,64
220	1.67
104,4	42,42
230	1.75
110,0	44,45

Mean Coef. of thermal expansion = 0.00000633 in/in/°F Source: ASME B31.9

Misalignment and Deflection

Tech Data Sheets: G810, G820, G830

GRINNELL Flexible Couplings provide for restrained joints and allow for deflection to aid where the pipe or equipment is misaligned.

Note that flexible couplings will not accommodate both full maximum linear movement and the maximum available angular deflection concurrently at the same joint.



If it is desired to have both deflection and linear movement available, then the system should have sufficient flexible joints to accommodate the requirement.



Flexible couplings are also useful in laying out curved piping systems.

$$R = \frac{L}{(2) \left(\sin \frac{\phi}{2}\right)}$$

$$L = (2) (R) \left(\sin \frac{\phi}{2}\right)$$

$$N = \frac{T}{\phi}$$

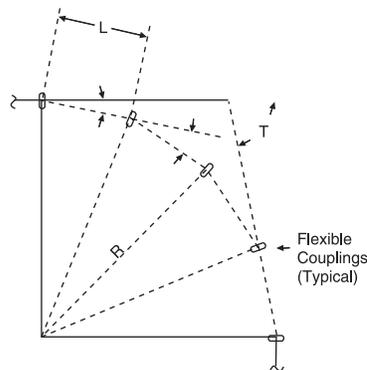
R = Radius of curve

L = Pipe length

ϕ = Deflection from centerline, in degrees, for each coupling (see table)

N = Number of flexible couplings needed

T = Total deflection, in degrees, required



Design Deflection for Roll Grooved Pipe

Deflection ϕ (Roll Grooved Pipe)	
Pipe Size Inches mm	Figures 705 & 707
1¼ 42,4	1.08°
1½ 48,3	0.94°
2 60,3	0.75°
2½ 73,0	0.62°
76,1mm 76,1	0.60°
3 88,9	0.51°
4 114,3	1.19°
5 141,3	0.97°
165,1mm 165,1	0.83°
6 168,3	0.81°
8 219,1	0.63°
10 273,0	0.50°
12 323,9	0.42°
Incorporates the recommended safety factor reduction for field practices (50% for sizes 1¼ – 3" (32mm - 80mm) and 25% for sizes 4" – 12" (100mm - 300mm)).	

Pipe Support

Tech Data Sheets: G810, G820, G830

All piping systems require that the support system accommodate the weight of the pipe, joint connections, fluid, and other system components. In addition, consideration may be necessary in reducing stresses, accommodating thermal expansion or contraction, building settlement, seismic movement, etc. The following tables provide guidelines for grooved steel piping products without concentrated loads between supports.

Flexible Joints

For pipe runs when linear movement is accommodated by the flexible coupling:

Number of Hangers Per Pipe Length								
Pipe Size Inches mm	Pipe Length in Feet <i>Meters</i>							
	3.3	3.7	4.6	6.7	7.6	9.1	10.7	12.2
	10	12	15	22	25	30	35	40
Average Number of Hangers Per Pipe Length								
1¼ - 2 42,4 - 60,3	2	2	2	3	4	4	5	6
2½ - 4 73,0 - 114,3	1	2	2	2	2	3	4	4
5 - 24 141,3 - 609,6	1	1	2	2	2	3	3	3

For pipe runs when linear movement is not required:

Distance Between Supports	
Nominal Size Inches mm	Maximum Distance Between Supports Feet <i>Meters</i>
1¼ - 1½ 42,4 - 48,3	12 3,7
2 - 8 60,3 - 219,1	15 4,6
10 - 12 273,0 - 323,9	16 4,9
14 - 16 355,6 - 406,4	18 5,5
18 - 24 457,2 - 609,6	20 6,1

Note: The requirements of ANSI, ASME or other code groups may require additional supports.

Rigid Joints

For pipe runs with rigid couplings:

Pipe Size Inches mm	Suggested Maximum Span Between Supports - Feet <i>Meters</i>			
	Water Service		Air Service	
	I	II	I	II
1¼ 42,4	7 2,1	11 3,4	9 2,7	11 3,4
1½ 48,3	7 2,1	12 3,7	9 2,7	13 4,0
2 60,3	10 3,0	13 4,0	13 4,0	15 4,6
2½ 73,0	11 3,4	14 4,3	14 4,3	16 4,9
76,1mm 76,1	11 3,4	14 4,3	14 4,3	16 4,9
3 88,9	12 3,7	15 4,6	15 4,6	17 5,2
4 114,3	14 4,3	17 5,2	17 5,2	21 6,4
5 141,3	16 4,9	19 5,8	20 6,1	24 7,3
165,1mm 165,1	17 5,2	20 6,1	21 6,4	25 7,6
6 168,3	17 5,2	20 6,1	21 6,4	25 7,6
8 219,1	19 5,8	21 6,4	24 7,3	28 8,5
10 273,0	19 5,8	21 6,4	24 7,3	31 9,4
12 323,9	23 7,0	21 6,4	30 9,1	33 10,1
14 355,6	23 7,0	21 6,4	30 9,1	33 10,1
16 406,4	27 8,2	21 6,4	35 10,7	33 10,1
18 457,2	27 8,2	21 6,4	35 10,7	33 10,1
20 508,0	30 9,1	21 6,4	39 11,9	33 10,1
24 609,6	32 9,8	21 6,4	42 12,8	33 10,1

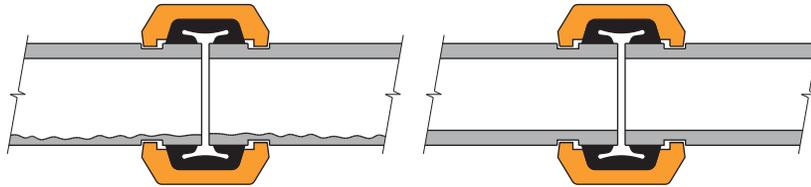
Pipe Support

Tech Data Sheets: G810, G820, G830

Rotational Movement

GRINNELL Flexible Couplings are suitable for use in seismic as well as mining applications. The inherent capability of the flexible coupling to allow for linear movement, angular deflection, and rotational movement make it an excellent choice for reducing stresses in a piping system and to increase pipe life in slurry applications.

For mining applications where the pipe needs to be rotated, the system should be depressurized. The pipe coupling bolts/nuts can be loosened, pipe rotated, the bolts/nuts re-tightened, and the system be put back in service.

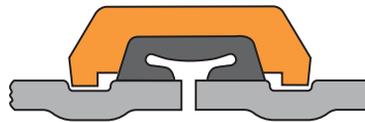


Even distribution of pipe wear can be achieved with this method on the inner service of the pipe.

Note: Precautions are necessary to monitor pipe wall thickness to evaluate pressure capability of the pipe with reduced wall.

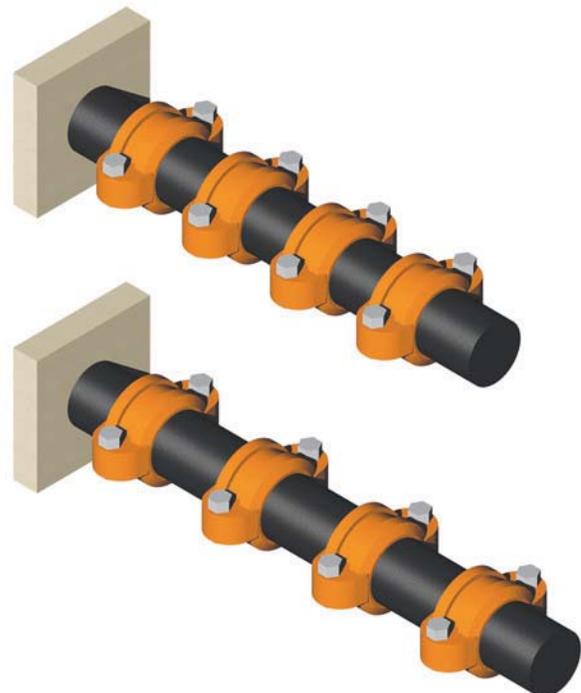
Linear Movement

Flexible couplings are designed with the couplings keys engaging the pipe without gripping on the bottom of the groove while still providing for a restrained mechanical joint.



The inherent flexibility of the coupling must be considered when deciding on support arrangements for the piping system as movement can occur in more than one plane (linear movement, angular deflection, and rotational movement).

Upon system pressurization, each pipe end within the flexible couplings will expand to the maximum published value. The coupling keys make contact with the face of the groove and restrain the joint. In piping systems, this movement will be accumulative.



Pipe Support

Tech Data Sheets: G810, G820, G830

Angular Movement

System movement can be accommodated by providing for sufficient offset lengths. Temperature increases/decreases can further increase this movement.

When systems are anchored with partially deflected joints, the system can move to the fully deflected condition upon pressurization resulting in the “snaking” of the piping system. Lightweight hangers may not be suitable to prevent the lateral motion.

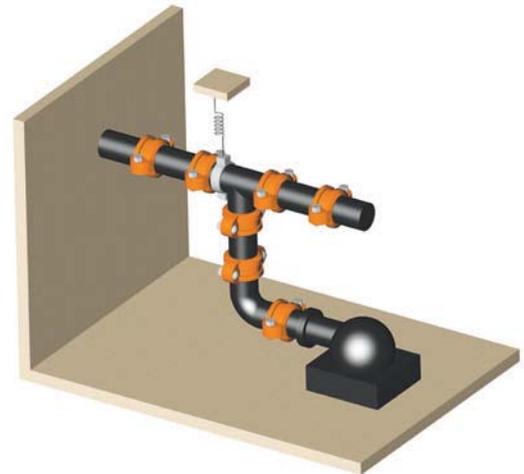


Pipe Support

Pipe hanger positioning is important when considering pipe “sagging” due to the flexible nature of the piping system. Proper positioning of hangers near the elbow, for example, should be considered.

The use of spring hangers or other methods can be considered to accommodate vibrations. Base supports, pressure thrust anchors, and pipe offsets can be used to direct pipe movement.

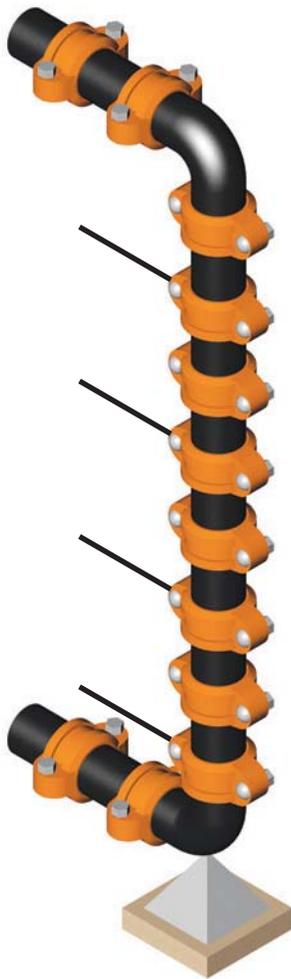
The use of rigid couplings can be considered to reduce the movement available with flexible couplings. Consideration of other methods of accommodation of pipe movements may be required.



Vertical Piping

Tech Data Sheets: G810, G820, G830

Risers comprised of rigid couplings can be considered instead of welded or flanged systems. Where thermal movement exists, expansion joints and/or flexible couplings with offsets may be required.



When using flexible couplings, the movement that occurs in long lengths of piping needs to be considered. Each joint can move up to the maximum pipe end separation published. This movement can accumulate and result in the growth of the piping system, for example at the top. Offsets may be necessary.

Should the riser contain branch connections, the movement which occurs at these locations with flexible couplings will also need to be considered.

One solution would be to anchor the vertical piping at appropriate locations to prevent movement which can cause stresses at the branches or equipment. The use of rigid couplings can be an advantage.

As always, good piping practice should prevail. It is the designer's responsibility to select products suitable for the intended service and to ensure that pressure ratings and performance data is not exceeded. Never remove any piping component or correct or modify any piping deficiencies without first depressurizing and draining the system. Material and gasket selection should be verified to be compatible for the specific application.

Maximum Pressure Ratings (psi) on ANSI 304/316 Stainless Steel

Tech Data Sheets: G810, G820, G830

Pipe Size		Pipe Schedule	Wall Thickness Inches mm	Maximum Pressure Rating - psi bar						
Inches mm	O.D.			Figure 705	Figure 707	Figure 772	Figure 405	Figure 472	Figure 770	Figure 71
1 25	1.315 33,4	5	0.065	–	400	–	325	–	–	–
			1,7	–	–	–	22	–	–	–
		10	0.109	–	500	–	500	–	–	–
2,8	–		–	–	34	–	–	–		
40	0.133	–	750	–	500	–	–	–	–	
		3,4	–	–	–	34	–	–	–	
1¼ 32	1.660 42,4	5	0.0625	325	400	400	325	200	–	–
			2,0	22	28	28	22	14	–	–
		10	0.109	500	500	500	500	300	–	–
2,8	34		34	34	34	21	–	–		
40	0.140	500	750	750	750	600	–	–		
		3,6	34	52	52	52	41	–	–	
1½ 32	1.900 48,3	5	0.065	325	400	400	325	200	–	–
			1,7	22	28	28	22	14	–	–
		10	0.109	500	500	500	500	300	–	–
2,8	34		34	34	34	21	–	–		
40	0.145	500	750	750	750	600	–	–		
		3,7	34	52	52	52	41	–	–	
2 50	2.375 60,3	5	0.065	250	325	325	225	200	325	175
			1,7	17	22	22	16	14	22	12
		10	0.109	500	500	500	350	300	500	275
2,8	34		34	34	24	21	34	19		
40	0.154	500	750	750	500	600	700	275		
		3,9	34	52	52	34	41	52	19	
2½ 65	2.875 73,0	5	0.083	250	325	325	225	200	325	175
			2,1	17	22	22	16	14	22	12
		10	0.120	400	500	500	350	300	500	275
3,0	28		34	34	24	21	34	19		
40	0.203	500	750	750	500	600	750	275		
		5,2	34	52	52	34	41	52	19	
76,1mm 65	3.000 76,1	5	0.079	250	325	325	225	200	–	175
			2,0	17	22	22	16	14	–	12
		10	0.118	300	500	500	350	300	–	275
3,0	21		34	34	24	21	–	19		
40	0.205	500	500	750	500	600	–	275		
		5,2	34	34	52	34	41	–	19	
3 80	3.500 88,9	5	0.083	250	325	325	225	200	325	175
			2,1	17	22	22	16	14	22	12
		10	0.120	300	500	500	350	300	500	275
3,0	21		34	34	24	21	34	19		
40	0.216	500	500	750	500	600	750	275		
		5,5	34	34	52	34	41	52	19	
4 100	4.500 114,3	5	0.083	200	250	250	200	200	250	175
			2,1	14	17	17	14	14	17	12
		10	0.120	300	400	500	300	300	400	275
3,0	21		28	34	21	21	28	19		
40	0.237	500	750	750	325	600	750	275		
		6,0	34	52	52	22	41	52	19	

Maximum Pressure Ratings (psi) on ANSI 304/316 Stainless Steel (cont.)

Tech Data Sheets: G810, G820, G830

Pipe Size		Pipe Schedule	Wall Thickness Inches mm	Maximum Pressure Rating - psi bar						
Inches mm	O.D.			Figure 705	Figure 707	Figure 772	Figure 405	Figure 472	Figure 770	Figure 71
139,7mm 125	5.500 139,7	5	0.109	200	-	250	200	200	-	175
			2,8	14	-	17	14	14	-	12
		10	0.134	300	-	500	300	300	-	275
3,4	21		-	34	21	21	-	19		
40	0.258	500	-	750	325	600	-	275		
	6,6	34	-	52	22	41	-	19		
5 125	5.563 141,3	5	0.118	125	200	200	125	200	200	125
			3,0	9	14	145	9	14	14	9
		10	0.201	200	300	300	200	300	300	200
5,1	14		21	21	14	21	21	14		
40	0.252	300	500	500	200	600	750	250		
	6,4	21	34	34	14	41	52	17		
165,1mm 150	6.500 165,1	5	0.109	125	200	200	125	200	-	125
			2,8	9	14	14	9	14	-	9
		10	0.134	200	300	300	200	300	-	200
3,4	14		21	21	14	21	-	14		
40	0.280	300	500	500	200	600	-	250		
	7,1	21	34	34	14	41	-	17		
6 150	6.625 168,3	5	0.118	75	125	200	125	200	125	75
			3,0	5	9	14	9	14	9	5
		10	0.201	200	200	200	200	300	300	125
5,1	14		14	14	14	21	21	14		
40	0.252	300	500	450	200	600	750	150		
	6,4	21	34	31	14	41	52	10		
8 200	8.625 219,1	5	0.109	50	75	200	50	200	75	N/R
			2,8	3	5	14	3	14	5	N/R
		10	0.148	75	125	300	75	300	300	75
3,8	5		9	21	5	21	21	5		
40	0.322	300	400	400	200	600	600	125		
	8,2	21	28	28	14	41	41	9		
10 250	10.750 273,0	5	0.134	N/R	N/R	N/R	-	N/R	N/R	N/R
			3,4				-			
		10	0.165	75	75	75	-	300	300	75
4,2	5		5	5	-	21	21	5		
40	0.365	75	325	325	-	600	600	125		
	9,3	5	22	22	-	41	41	9		
12 300	12.750 323,9	5	0.156	N/R	N/R	N/R	-	N/R	N/R	N/R
			4,0				-			
		10	0.180	50	125	125	-	125	250	50
4,6	3		9	9	-	9	17	3		
40	0.375	50	250	250	-	300	600	125		
	9,5	3	17	17	-	21	41	9		

For parts installed in accordance with Bureau Veritas rules and regulations, a one-time only field-test is required to a maximum working pressure of 1-1/2 times the rated pressure, as per BV NR 467, Pt. C, Ch. 1, Sec. 10, [20.4.2.], where applicable. Tests are to be attended by a local BV Surveyor. Refer to the specific technical data sheet for coupling pressure ratings. Grooved fittings described in this document that meet BV Approval include Figures: 71, 201, 210, 219, 260, 301, 303, 311, 312, 321, 327, 341, 350, 522, 577, 705, 707, 716, 730, and 772.

Refer to back cover for country-specific customer care numbers.

Global Pipe Size Designations

GRINNELL Mechanical Products product data is utilized worldwide and all technical data is shown in both metric and imperial terms. The following chart shows a comparison between typical metric and IPS pipe sizes.

Nominal Size (DN)		Outside Diameter (OD)								
Inches (Imperial)	mm (Metric)	mm (Specification Reference)	DIN mm	BS mm	ISO mm	JIS mm	ANSI Inches	GB China mm	India	
									IS 1239	IS3589
1/2	15	21,3mm	DN 15	DN 15	DN 15	21,7mm	1/2	DN 15	DN 15	-
3/4	20	26,7mm	26,9mm	DN 20	DN 20	27,2mm	3/4	DN 20	DN 20	-
1	25	33,4mm	33,7mm	DN 25	DN 25	34mm	1	DN 25	DN 25	-
1 1/4	32	42,2mm	42,4mm	DN 32	DN 32	42,7mm	1 1/4	DN 32	DN 32	-
1 1/2	40	48,3mm	DN 40	DN 40	DN 40	48,6mm	1 1/2	DN 40	DN 40	-
2	50	60,3mm	DN 50	DN 50	DN 50	60,5mm	2	DN 50	DN 50	-
2 1/2	65	73,1mm	-	-	-	-	2 1/2	-	-	-
		76,1mm BS/ISO	76,1mm	76,1mm	76,1mm	76,3mm	-	76,1mm **	76,1mm	-
3	80	88,9mm	DN 80	DN 80	DN 80	DN 80	3	DN 80	DN 80	-
3 1/2	90	101,6mm	-	-	-	-	-	-	-	-
4	100	108mm China (& old DIN)	DIN 133mm	-	-	-	-	108mm **	-	-
		114,3mm	DN 100	DN 100	DN 101	DN 100	4	DN 100	DN 100	-
-	127mm	127mm	-	-	-	-	-	-	-	-
5	125	133mm China	-	-	-	-	-	133mm **	-	-
		139,7mm BS/ISO	DN 125	139,7mm	139,7mm	139,8mm	-	139,7mm	139,7mm	-
		141,3mm	-	-	-	-	5	-	-	-
-	152,4mm	152,4mm	-	-	-	-	-	-	-	-
6	150	159mm China	-	-	-	-	-	159mm	-	-
		165,1mm JIS/BS	-	165,1mm	-	165,2mm	-	-	165,1mm	-
		168,3mm	DN 150	-	DN 150	-	6	DN 150	-	DN 150
-	175	193,7mm	-	-	-	-	-	-	-	193,7mm
-	203,2mm	203,2mm	-	-	-	-	-	-	-	-
8	200	216,3mm JIS	-	-	-	216,3mm	-	-	-	-
		219,1mm	DN 200	DN 200	DN 200	-	8	DN 200	DN 200	DN 200
-	254mm	254mm	-	-	-	-	-	-	-	-
10	250	267,4mm JIS	-	-	-	267,4mm	-	-	-	-
		273mm	DN 250	DN 250	DN 250	-	10	DN 250	DN 250	DN 250
-	304,8mm	304,8mm	-	-	-	-	-	-	-	-
12	300	318,5mm JIS	-	-	-	318,5mm	-	-	-	-
		323,9mm	DN 300	DN 300	DN 300	-	12	-	-	-
14	350	355,6mm	DN 350	DN 350	DN 350	DN 350	14	DN 350	-	-
		377mm China	-	-	-	-	-	377mm	-	-
16	400	406,4mm	DN 400	DN 400	DN 400	DN 400	16	DN 400	-	-
		426mm China	-	-	-	-	-	426mm	-	-
18	450	457,2mm	DN 450	DN 450	DN 450	DN 450	18	DN 450	-	-
		480mm China	-	-	-	-	-	480mm	-	-
20	500	508mm	DN 500	DN 500	DN 500	DN 500	20	DN 500	-	-
		530mm China	-	-	-	-	-	530mm	-	-
22	550	558,8mm	-	-	-	DN 550	22	559mm	-	-
		580mm China	-	-	-	-	-	580mm	-	-
24	600	610mm	DN 600	DN 600	DN 600	DN 600	24	DN 600	-	-
		630mm China	-	-	-	-	-	630mm	-	-

IMPORTANT NOTE:

Nominal designations are used where the actual OD of the pipe matches the ANSI size. Otherwise both the nominal and actual OD are listed.

China sizes are listed as actual OD in mm.

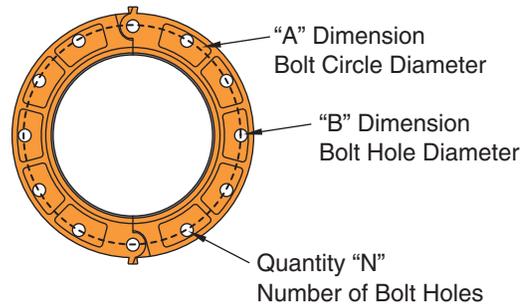
** China sizes are tubing sizes.

Metric/Imperial Conversion Chart

This chart is provided as a guide for converting metric and imperial measurements.

Convert Metric to Imperial			Convert Imperial to Metric		
Millimeters (mm)	X	0.03937	Inches (in)	X	25,4
Meters (m)	X	3.281	Feet (ft)	X	0,3048
Kilograms (kg)	X	2.205	Pounds (lb)	X	0,4536
Grams (g)	X	0.03527	Ounces (oz)	X	28,35
Kilopascals (kPa)	X	0.145	Pressure (psi)	X	6,894
Bar	X	14.5	Pressure (psi)	X	0,069
Newtons (N)	X	0.2248	End Load (lb)	X	4,45
Newton Meters (N•m)	X	0.738	Torque (lbft)	X	1,356
Celsius (°C)		$C + 17.78 \times 1.8$	Temp. (°F)		$F - 32 \div 1,8$
Watts (w)	X	1.341×10^{-3}	Horsepower (hp)	X	745,7
Liters per min. (L/M)	X	0.2642	Gal. per Min. (gpm)	X	3,785
Cubic Meters per min. (m3/m)	X	264.2	10 ⁻³ Gal. per Min. (gpm)	X	3,7865

Flange Drilling Specifications



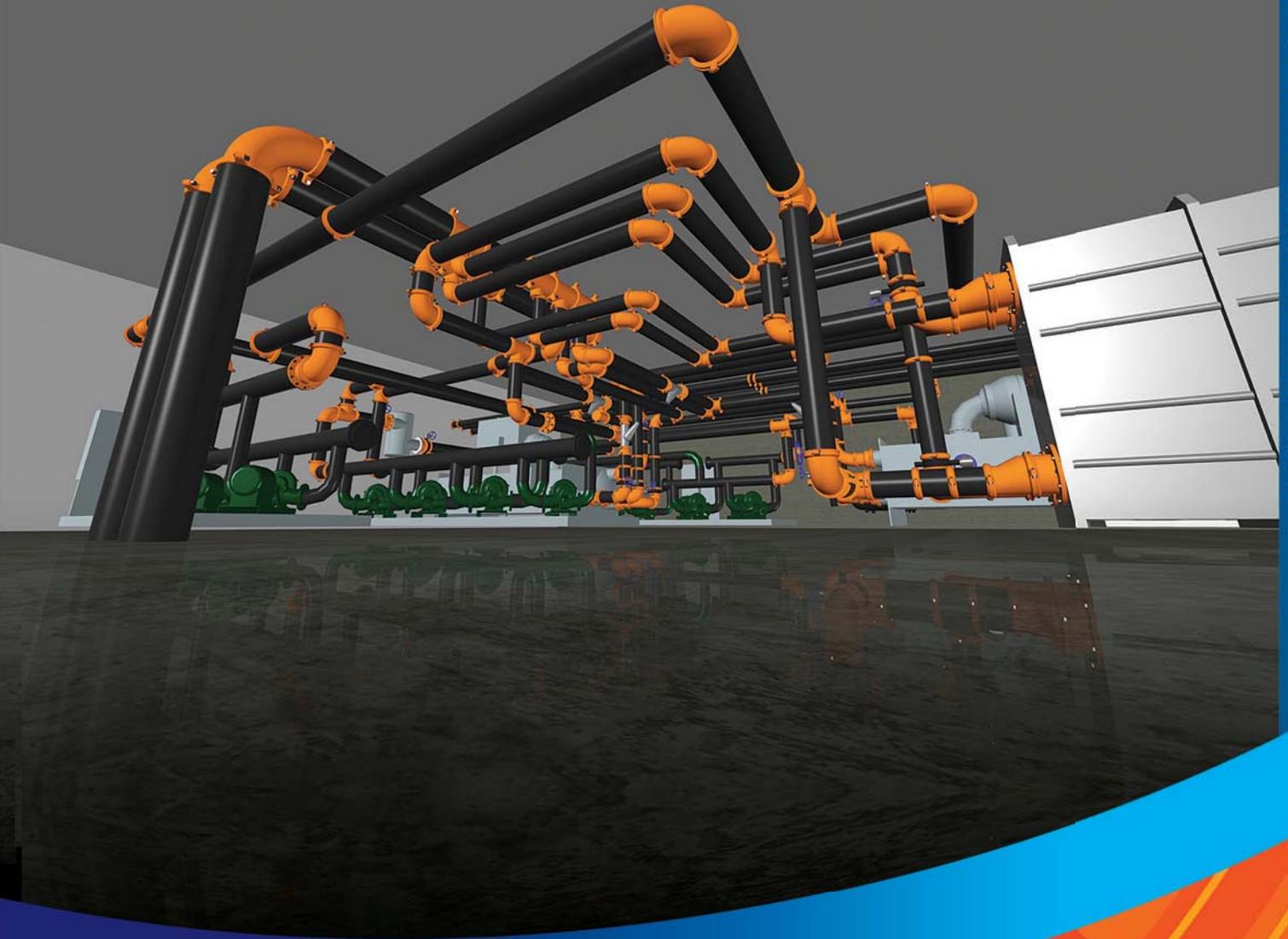
Valve Size		ANSI B16.1 (Class 125#) ¹			ISO 2084 (PN10) ²			ISO 2084 (PN16) ³			JIS B 2210 (10K)			AS 2129 (Table E)		
		Dimensions - Inches mm														
Nominal Inches mm	O.D. Inches mm	A	B	Qty. N	A	B	Qty. N	A	B	Qty. N	A	B	Qty. N	A	B	Qty. N
2	2.375	4.75	0.75	4	4.92	0.71	4	4.92	0.71	4	4.72	0.75	4	4.49	0.71	4
50	60,3	120,6	19,0	4	125,0	18,0	4	125,0	18,0	4	120,0	19,0	4	114,0	18,0	4
2½	2.875	5.50	0.75	4	5.71	0.71	4	5.71	0.71	4	5.51	0.75	4	5.00	0.71	4
65	73,0	139,7	19,0	4	145,0	18,0	4	145,0	18,0	4	140,0	19,0	4	127,0	18,0	4
3	3.500	6.00	0.75	4	6.30	0.71	8	6.30	0.71	8	5.91	0.75	8	5.75	0.71	4
80	88,9	152,4	19,0	4	160,0	18,0	8	160,0	18,0	8	150,0	19,0	8	146,0	18,0	4
4	4.500	7.50	0.75	8	7.09	0.71	8	7.09	0.71	8	6.89	0.75	8	7.00	0.71	8
100	114,3	190,5	19,1	8	180,0	18,0	8	180,0	18,0	8	175,0	19,0	8	178,0	18,0	8
5	5.563	8.50	0.88	8	8.27	0.71	8	8.27	0.71	8	8.27	0.91	8	8.27	0.71	8
125	141,3	215,9	22,4	8	210,0	18,0	8	210,0	18,0	8	210,0	23,0	8	210,0	18,0	8
6	6.625	9.50	0.88	8	9.45	0.87	8	9.45	0.87	8	9.45	0.91	8	9.25	0.87	8
150	168,3	241,3	22,4	8	240,0	22,0	8	240,0	22,0	8	240,0	23,0	8	235,0	22,0	8
8	8.625	11.75	0.88	8	11.61	0.87	8	11.61	0.87	12	11.42	0.91	12	11.50	0.87	8
200	219,1	298,5	22,2	8	295,0	22,0	8	295,0	22,0	12	290,0	23,0	12	292,0	22,0	8
10	10.750	14.25	1.00	12	13.78	0.87	12	13.98	1.02	12	13.98	0.87	12	14.02	0.87	12
250	273,0	362,0	25,4	12	350,0	22,0	12	355,0	26,0	12	355,0	22,0	12	356,0	22,0	12
12	12.750	17.00	1.00	12	15.75	0.87	12	16.14	1.02	12	15.75	0.98	16	15.98	1.02	12
300	323,9	431,8	25,4	12	400,0	22,0	12	410,0	26,0	12	400,0	25,0	16	406,0	26,0	12
14	14.000	18.76	1.12	12	18.11	0.87	16	18.50	1.02	16	17.52	0.98	16	18.50	1.02	12
350	355,6	476,5	28,4	12	460,0	22,0	16	470,0	26,0	16	445,0	25,0	16	470,0	26,0	12
16	16.000	21.25	1.12	16	20.28	1.02	16	20.67	1.18	16	20.08	1.06	16	20.51	1.02	12
400	406,4	539,8	28,4	16	515,0	26,0	16	525,0	30,0	16	510,0	27,0	16	521,0	26,0	12
18	18.000	22.75	1.25	16	22.24	1.02	20	23.03	1.18	20	22.24	1.06	20	22.99	1.02	16
450	457,2	577,9	31,8	16	565,0	26,0	20	585,0	30,0	20	565,0	27,0	20	584,0	26,0	16
20	20.000	25.00	1.25	20	24.41	1.02	20	25.59	1.30	20	24.41	1.06	20	25.24	1.02	16
500	508,0	635,0	31,8	20	620,0	26,0	20	650,0	33,0	20	620,0	27,0	20	641,0	26,0	16
24	24.000	29.50	1.38	20	28.54	1.18	20	30.31	1.42	20	28.74	1.30	24	29.76	1.30	16
600	609,6	749,3	35,1	20	725,0	30,0	20	770,0	36,0	20	730,0	33,0	24	756,0	33,0	16

¹ Same drilling as for B16.5 (Class 150#) and B16.42 (Class 250#).

² Same drilling as for BS 4504 Section 3.2 (PN10) and DIN 2532 (PN10).

³ Same drilling as for BS 4504 Section 3.2 (PN16) and DIN 2532 (PN16).

For additional information, contact GRINNELL Mechanical Products.





Results We Deliver

Shop Drawings - This service creates easy-to-follow, tagged 3D Isometric Drawings with complete Bill of Material (BOM) tables and fully dimensioned piping plans of your mechanical equipment rooms. We provide pipe cut lengths to minimize field cutting and fitting and to simplify your installations.

Pump Assemblies and Equipment Connections - Our 3D Modeling with tagged BOM tables provides clear, accurate representations of grooved piping hook-ups. Based on equipment submittals and bid drawings (flow diagrams, HVAC details, and plan views), we create detailed assemblies that you can use for submittals, reviews, and assembly instructions.

Cost Comparisons - Using industry-standard, man-hour data estimations and our BOMs, we compare the cost savings of grooved piping solutions over traditional welded/flanged joining methods. By utilizing the benefits of grooved piping, our technical experts recommend ways to save you money.

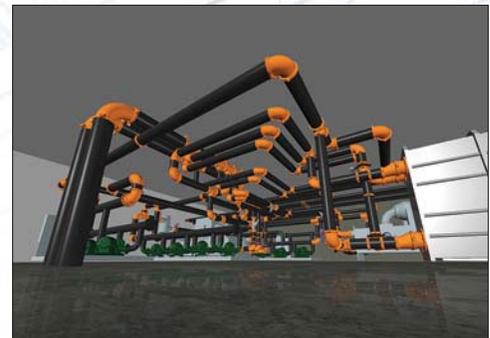
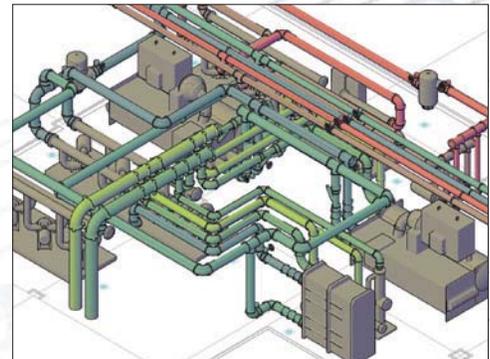
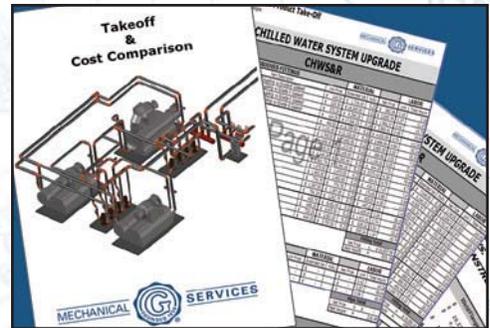
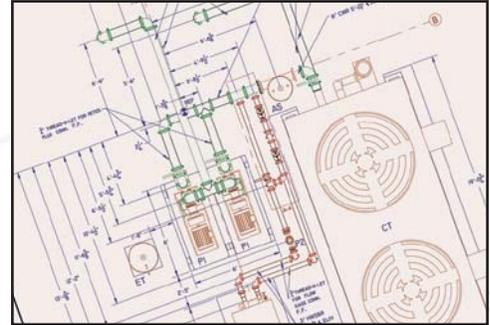
Crate and Tag Handling - We provide an effective material handling process to help increase your labor productivity by 25% or more. We deliver complete, tagged pump or equipment hook-up BOMs directly to equipment rooms for easy access, eliminating your need to reference multiple shipments and back orders and reducing your material waste and overages.

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Technical Expertise - We provide direct access to the individuals who design, test, and build our products every day. Contact us; we'll be glad to assist you.



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Training



Technical Expertise



Design Work

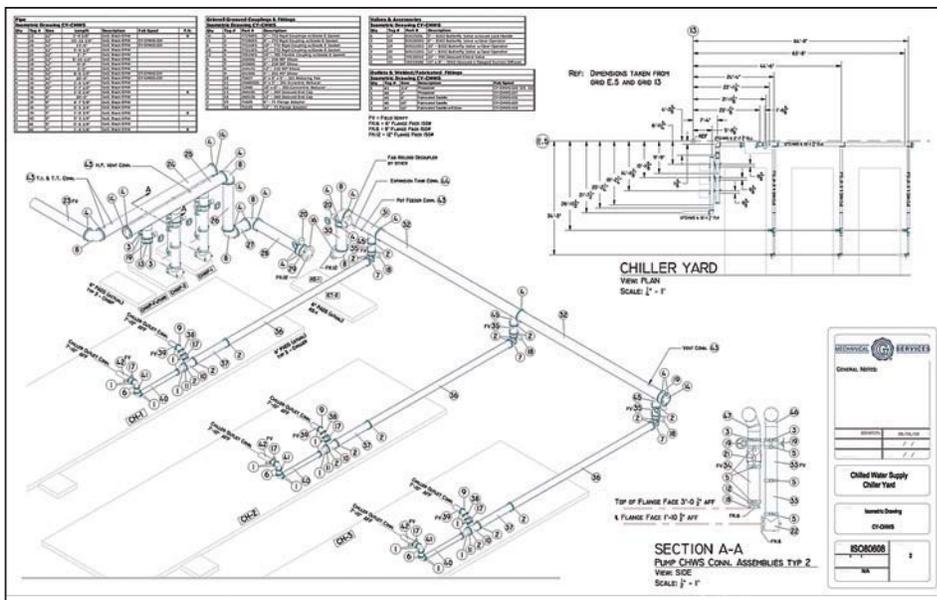




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