Grinnell

Mechanical grooved products

2024 General products catalogue

The power behind **your mission**

Johnson Controls

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Grooved Fittings continued

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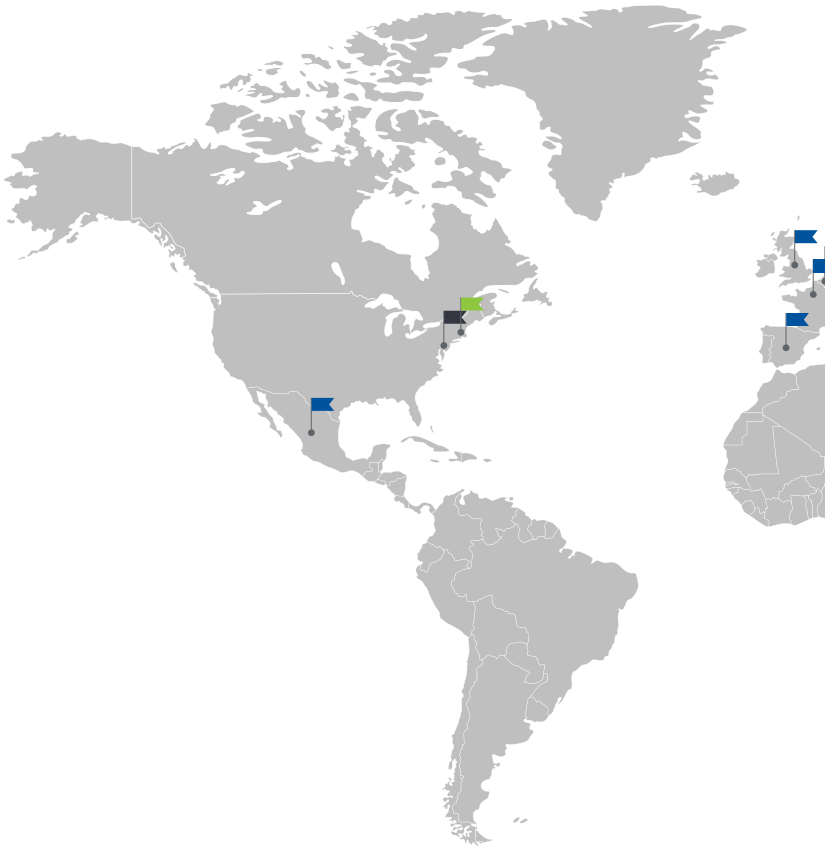
Pressure and Design Data continued

General data

Grinnell mechanical products

GRINNELL, a premium brand of Johnson Controls International, delivers reliable and cost-effective 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 grooved couplings, fittings, mechanical tees, valves, and accessories as well as complete systems for joining stainless steel.
All-inclusive, 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.

For more information, visit **www.grinnell.com.**



Making connections

North America Headquarters
- Lansdale, Pennsylvania, USA

Research and Development
- Cranston, Rhode Island, USA

Regional headquarters

North Asia
- Shanghai, China

South Asia
- Singapore

Australia
- Sunshine, Victoria

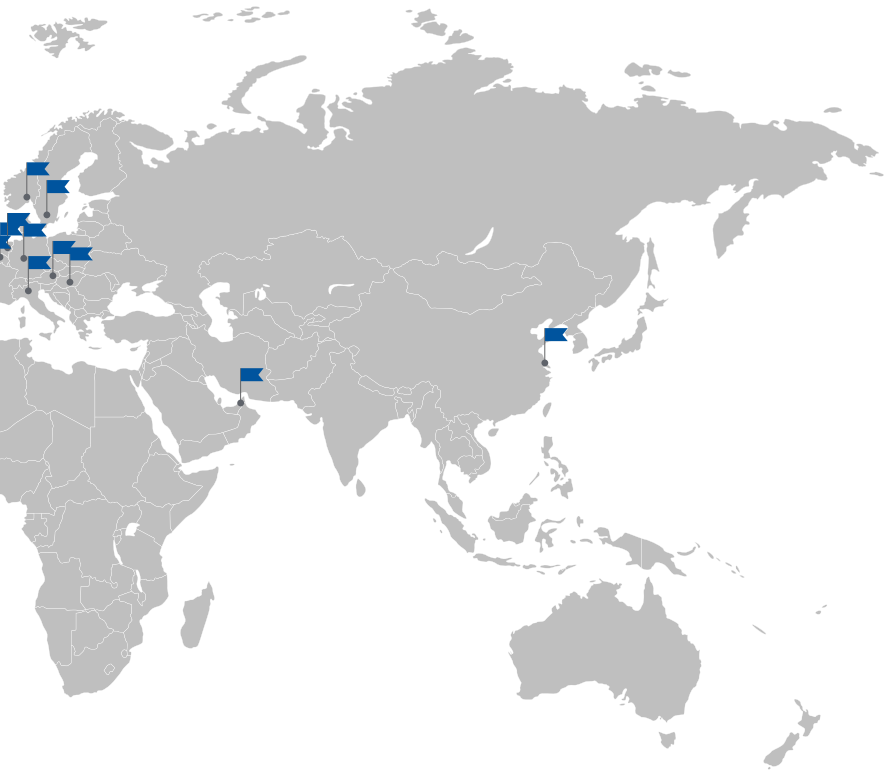
Middle East
- Dubai, United Arab Emirates

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

Mexico
- Tlalnepantla, Mexico

www.grinnell.com

Notice: This information is current as of 2021 and is provided for historical reference only. Some products may now be discontinued or have modified specifications. Consult the current product data sheet for product specifications and information.



Regional headquarters

Corporate headquarters

Research and development

Building solutions

Riverside Quarter London, United Kingdom

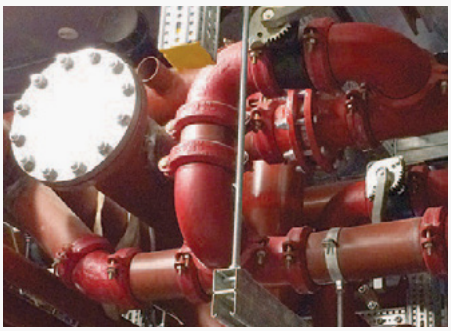
Audi N50 Paint Plant Ingolstadt, Germany

Airedale International Leeds, United Kingdom

Providence Tower London, United Kingdom

Refer to back cover for country-specific contact information

Why Grooved?



Efficient and Cost-Effective

- 30% installation cost savings compared to traditional methods, such as welding
- Helps minimize labor costs, while optimizing project time schedules
- Faster and easier installation, removing the need for special tool

Safe Pipe Joining Method

- No hot works; no welding, threading, cutting oils, fumes or flames
- Ideal method for joining pipe in enclosed, flammable or hazardous environments

For Reliable System Connections

- Durable connections with rapid assembly
- Helps maintain high pressure at connection points, without sacrificing quality and reliability

Flexible Retrofits and Repairs

- Ease of Use. Does not require special tools or skilled workers
- Removes the need for training on site
- Helps assist trouble free retrofitting
- Helps assist pipe expansion support
- Allows for fabrication on site and troubleshoots complex problems and obstacles

Why Grinnell?

Best Warranty in the Industry

- 10 – Year Limited Warranty
- 60 Year reputation for quality, backed by GRINNELL's established global brand
- Full range of products to provide sustainable pipe joining solutions

Technical Services

- Dedicated Engineering team that provides technical support service and solutions for our customers

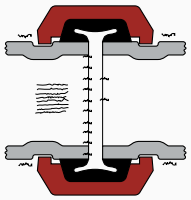
Green Solutions

- Committed to the environment through sustainable manufacturing practices
- All waste paper, used cardboard, scrap wood, and EPDM waste from our plants are recycled

Global Presence / Local Service

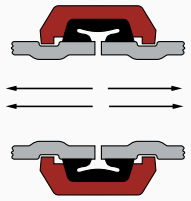
- Your committed partner and advisor from design to build
- Strategic global locations improve service to our customers
- Committed to meet our customer needs and focus on your requirements

Product Features and Benefits



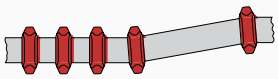
Noise and vibration

GRINNELL Grooved Couplings provide excellent noise and vibration dampening. The engineered design of these couplings and gaskets offers pipe end gapping that helps to dissipate, isolate, and minimise 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 which is encapsulated by the ductile iron housing.



Versatility

GRINNELL flexible couplings will accommodate misalignments. The maximum deflection information per coupling can be found in this catalogue.

ISO 9001 QUALITY ASSURANCE

Superior quality

GRINNELL Piping Products are manufactured according to the ISO 9001:2015 Quality Assurance standard.

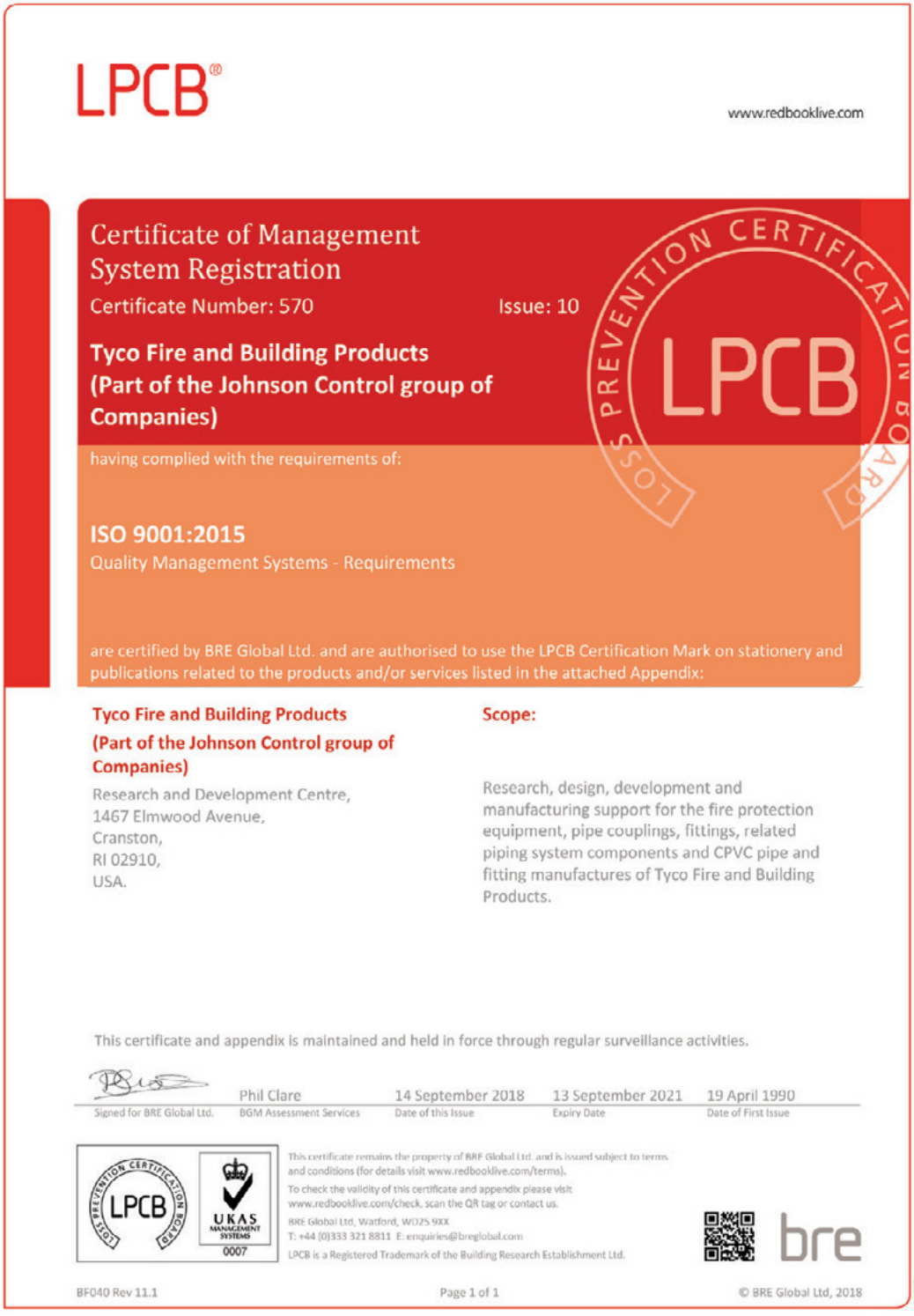
Longevity and performance

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.

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.

ISO 9001:2015 Certified



LPCB®

www.redbooklive.com

Certificate of Management System Registration

Certificate Number: 570 Issue: 10

Tyco Fire and Building Products (Part of the Johnson Control group of Companies)

having complied with the requirements of:

ISO 9001:2015

Quality Management Systems - Requirements

are certified by BRE Global Ltd. and are authorised to use the LPCB Certification Mark on stationery and publications related to the products and/or services listed in the attached Appendix:

Tyco Fire and Building Products (Part of the Johnson Control group of Companies)

Research and Development Centre,
1467 Elmwood Avenue,
Cranston,
RI 02910,
USA.

Scope:

Research, design, development and manufacturing support for the fire protection equipment, pipe couplings, fittings, related piping system components and CPVC pipe and fitting manufactures of Tyco Fire and Building Products.

This certificate and appendix is maintained and held in force through regular surveillance activities.

Signed for BRE Global Ltd.	Phil Clare, BGM Assessment Services	14 September 2018, Date of this Issue	13 September 2021, Expiry Date	19 April 1990, Date of First Issue

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To check the validity of this certificate and appendix please visit www.redbooklive.com/check, scan the QR tag or contact us.

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T: +44 (0)333 321 8811 E: enquiries@breglobal.com

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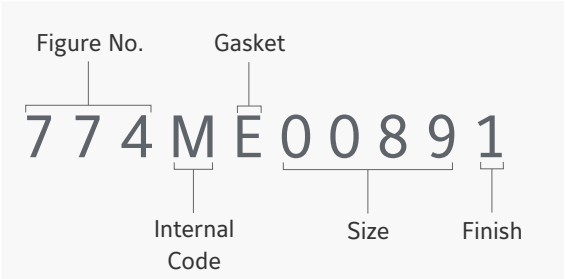
How to Build GRINNELL Part Numbers



Outlet Fitting DIGIT 05
T = BSP thread
N = NPT thread
G = Grooved

Digits **01**, **02**, & **03**: Figure number
Digit **04**: Internal Code
Digit **05**: Gasket: E for C-style EPDM (Grade E)
T for Tri-Seal EPDM (Grade E)
B for C-style Nitrile/Buna-N (Grade T)
D for C-style EPDM
(Grade EN, suitable for potable water applications)
V for C-style Fluoro Elastomer (Grade O)
S for C-style Silicone (Grade L)

Digits **06** thru **09**: Size
Digit **10**: Finish:
0 for Painted Orange
1 for Painted Red (RAL 3000)
2 for Galvanised
3 for Unpainted
4 for Stainless Steel 316
5 for Painted White (RAL 9010)
R for Rilsan

Pipe Size		Digits 06-07-08-09	
Nominal mm Inches	O.D. mm Inches	Sizes Codes for Outlet Fittings & Reducers Example: 4" x 2" 4220 (Biggest Size First)	Sizes Codes for Couplings & Fittings
15	**21.3**	05	n/a
1/2	0.840		
20	**26.9**	07	n/a
3/4	1.050		
25	**33.7**	10	0034
1	1.315		
32	**42.4**	12	0042
1 1/4	1.660		
40	**48.3**	15	0048
1 1/2	1.900		
50	**60.3**	20	0060
2	2.375		
65	**73.0**	25	0073
2 1/2	2.875		
65	**76.1**	26	0076
76.1mm	3.000		
80	**88.9**	30	0089
3	3.500		
100	**108.0**	41	0108
108.0mm	4.252		
100	**114.3**	42	0114
4	4.500		
125	**133.0**	51	0133
133.0mm	5.236		
125	**139.7**	52	0139
139.7mm	5.500		
125	**141.3**	53	0141
5	5.563		
150	**159.0**	61	0159
159.0mm	6.260		
150	**165.1**	62	0165
165.1mm	6.500		
150	**168.3**	63	0168
6	6.625		
200	**219.1**	80	0219
8	8.625		
250	**273.0**	11	0273
10	10.750		
300	**323.9**	13	0324
12	12.750		
350	**355.6**	14	0355
14	14.000		
400	**406.4**	16	0406
16	16.000		
450	**457.2**	18	0457
18	18.000		
500	**508.0**	21	0508
20	20.000		
600	**609.6**	24	0610
24	24.000		

Coupling part number example:

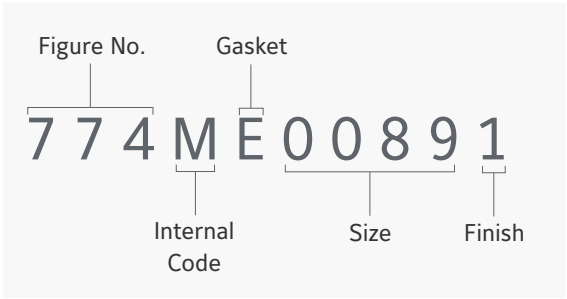


Figure Number: 774 · Rigid Standard Weight Coupling
Internal Code: M
Gasket: E · EPDM C-style
Size: 0089 · 88.9mm (3")
Finish: 1 · Painted Red

Outlet fitting part number example:

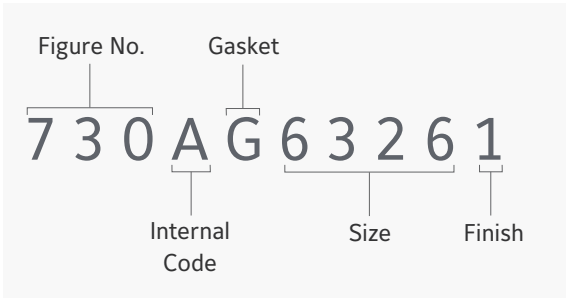


Figure number: 730 · Mechanical Tee
Internal Code: A
Outlet: G · Grooved (T for BSP Thread;
N for NPT Thread)
Size: 6326 – 168.3 x 76.1mm (6" x 2 1/2")
Finish: 1 · Painted Red
"All Mechanical Tees have standard EPDM Gaskets.
Nitrile (Buna-N) optional"

Refer to back cover for country-specific contact information

GRINNELL website

To learn more about GRINNELL Mechanical Products, visit www.grinnell.com. Our Website provides a wide variety of tools and information at your fingertips.
Please select the EMEA region on the map to see region specific information.

Browse these website features

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 catalogues, brochures, installation manuals, flyers, and price books.

Products Tab
The Products tab organises all product information such as pricing, technical data, 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.

3D CAD Library
The CAD icon provides direct access to 3D CAD drawings and the GRINNELL Mechanical Suite for Revit. It also provides access to on-line registration for automatic e-mail updates.

Notice: This information is current as of 2021 and is provided for historical reference only. Some products may now be discontinued or have modified specifications. Consult the current product data sheet for product specifications and information.

Grooved couplings

Grooved Couplings

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

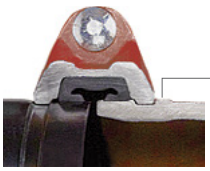
The GRINNELL Coupling Design provides economical advantages when compared to welded or flanged systems. GRINNELL Couplings provide a universal method for connecting pipe, fittings, and pipe system components.

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.

General notes: Additional information is included in our data sheets and is available upon request. 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. Always read and understand the installation constructions. Never remove any piping components nor correct or modify any piping deficiencies without first depressurising and draining the system. Material and gasket selection should be verified with the gasket recommendation listing for the specific application.

10 YEAR LIMITED WARRANTY



Full contact between Figure 772 Coupling key and groove diameter

Material Specifications

Ductile Iron Housing Specifications

- ASTM A 536 – Standard specification for ductile iron castings, Grade 65-45-12
- Tensile strength, minimum 4481.6 Bar (65,000 psi)
- Yield strength, minimum 3102.6 Bar (45,000 psi)
- Elongation minimum 12%
- ASTM A 153 – Standard specification for hot-dip galvanising

Bolt/Nut Specifications

- **Metric:** Carbon steel oval neck track head bolts (Gold colour coded) are heat treated and conform to the physical properties of ASTM F 568M 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.
- **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 7584 Bar (110,000 psi). 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.
- Stainless steel bolts and nuts are available upon request.

Coatings

- Red – Non-lead paint RAL 3000 (standard)
- White – Non-lead paint RAL 9010 (optional)
- Hot-Dipped, Zinc Galvanised (optional)

Additional Features:

- Standard industry groove does not require special tools.
- Backed by the industry's best 10-Year Limited Warranty. Review terms and conditions of sale on www.grinnell.com.

GRINNELL Coupling Gasket Specifications

- **Grade "E" EPDM** gaskets have a Green colour code stripe identification and conform to ASTM D 2000 for service temperatures from -34°C to 110°C (-30°F to 230°F). They are recommended for hot water not to exceed 110°C (230°F), 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 colour code stripe identification and conform to ASTM D 2000 for service temperatures from -29°C to 82°C (-20°F to 180°F). They are recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapours.
- **Grade "L" Silicone** gaskets are Red colour code stripe and conform to ASTM D 2000 for service temperatures from -34°C to 177°C (-30°F to 350°F). They are recommended for air without hydrocarbons, or dry heat.
- **Grade "O" Fluoroelastomer** gaskets have a Blue colour code stripe and conform to ASTM D 2000 for service temperatures from -7°C to 149°C (+20°F to 300°F). They are recommended for oxidizing acids, petroleum products, hydraulic fluids, lubricants, and halogenated hyrdrocarbons.

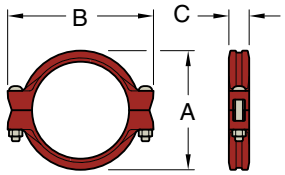
Figure 772 Rigid Couplings

Tech Data Sheet: G141

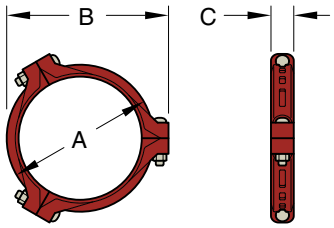
10 YEAR LIMITED WARRANTY

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 32 – 200mm (1 ¼" – 8") feature a clamshell design that makes installation easier and faster.

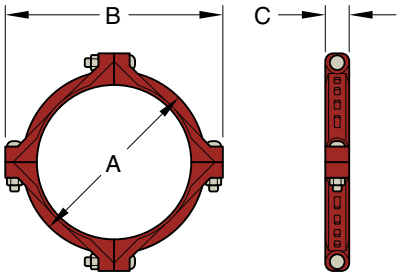
For detailed Listing / Approval information contact GRINNELL Mechanical Products.



32mm - 300mm *(1¼" - 12")*



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



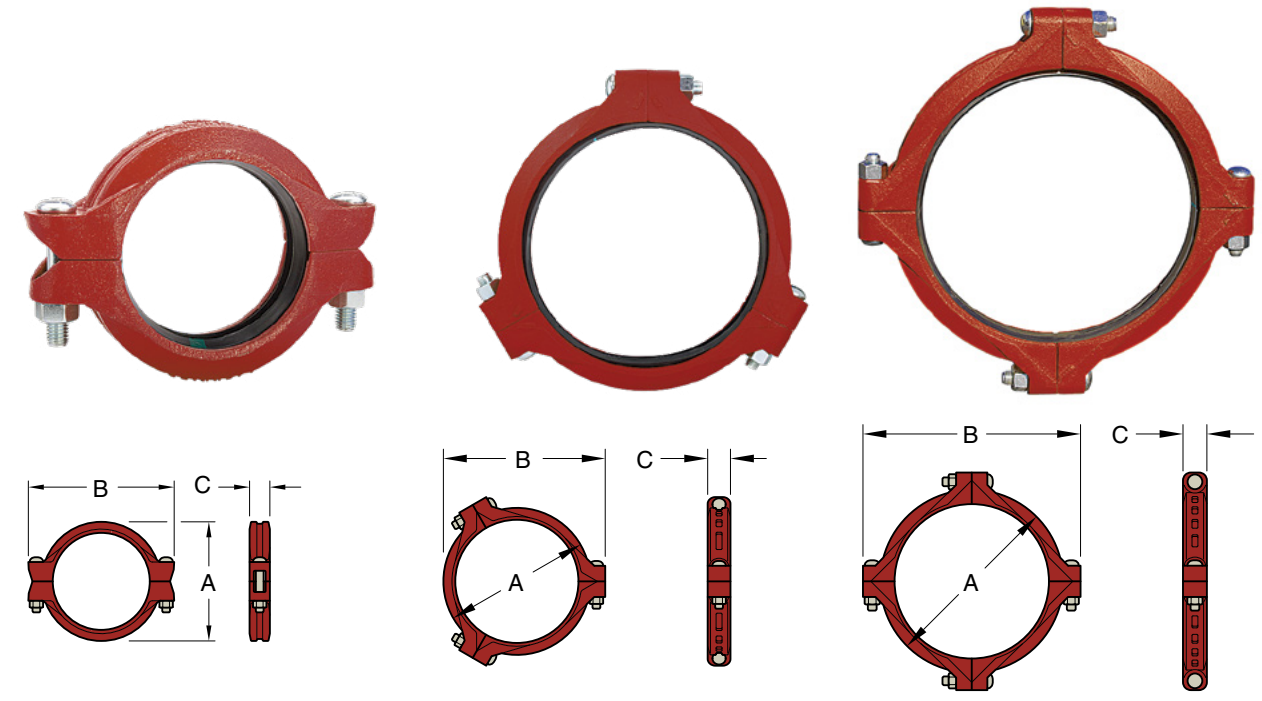
500mm - 600mm *(20" - 24")*

Part Number		Pipe Size		Max.† Pressure Bar psi	Max.† End Load kN Lbs.	Max. *‡ End Gap mm In.	Dimensions			Coupling Bolts		Approx. Weight Kg. Lbs.
Grade "E" Gasket	Grade "E" Tri-Seal Gasket	Nominal mm Inches	O.D. mm Inches				A mm In.	B mm In.	C mm In.	Qty.	Size mm Inches	
772ME0042✖	772MT0042✖	32	42.4	51.7	7.22	1.5	69.9	111.3	46.0	2	M10 x 57	0.5
		1 ¼	1.660	750	1,623	0.06	2.75	4.38	1.81		⅜ x 2 ¼	1.0
772ME0048✖	772MT0048✖	40	48.3	51.7	9.46	2.0	76.2	117.3	46.0	2	M10 x 57	0.5
		1 ½	1.900	750	2,127	0.08	3.00	4.62	1.81		⅜ x 2 ¼	1.0
772ME0060✖	772MT0060✖	50	60.3	51.7	14.78	4.8	87	145.0	48	2	M12 x 76	1.3
		2	2.375	750	3,323	0.188	3.41	5.70	1.9		½ x 3	2.9
772ME0073✖	772MT0073✖	65	73.0	51.7	21.66	4.8	101	160.0	48	2	M12 x 76	1.5
		2 ½	2.875	750	4,869	0.188	3.97	6.30	1.9		½ x 3	3.3
772ME0076✖	772MT0076✖	65	76.1	51.7	23.58	4.8	104	163.0	48	2	M12 x 76	1.6
		76,1mm	3.000	750	5,301	0.188	4.10	6.43	1.9		–	3.6
772ME0089✖	772MT0089✖	80	88.9	51.7	32.10	4.8	117	176.0	48	2	M12 x 76	1.7
		3	3.500	750	7,216	0.188	4.60	6.93	1.9		½ x 3	3.7
772ME0114✖	772MT0114✖	100	114.3	51.7	53.06	4.8	147	205.0	48	2	M12 x 76	2.0
		4	4.500	750	11,928	0.188	5.81	8.07	1.9		½ x 3	4.3
772ME0139✖	772MT0139✖	125	139.7	51.7	79.26	4.8	178.3	246.9	52.3	2	M16 x 83	3.4
		139,7mm	5.500	750	17,819	0.19	7.02	9.72	2.06		–	7.5
772ME0141✖	772MT0141✖	125	141.3	51.7	81.09	4.8	180.1	246.6	51.8	2	M16 x 83	3.4
		5	5.563	750	18,229	0.19	7.09	9.71	2.04		⅝ x 3 ¼	7.5
772ME0165✖	772MT0165✖	150	165.1	48.2	103.18	4.8	205.5	267.5	54.1	2	M16 x 83	3.4
		165,1mm	6.500	700	23,228	0.19	8.09	10.53	2.13		–	7.6
772ME0168✖	772MT0168✖	150	168.3	48.2	107.34	4.8	205.5	267.5	54.1	2	M16 x 83	3.4
		6	6.625	700	24,130	0.19	8.09	10.53	2.13		⅝ x 3 ¼	7.6
772ME0219✖	772MT0219✖	200	219.1	41.4	155.94	4.8	268.2	344.4	66.5	2	M20 x 121	8.2
		8	8.625	600	35,056	0.19	10.56	13.56	2.62		¾ x 4 ¾	18.0
772ME0273✖	772MT0273✖	250	273.0	34.5	201.87	3.3	326.1	416.8	66.5	2	M24 x 165	11.2
		10	10.750	500	45,381	0.13	12.84	16.41	2.62		1 x 6 ½ •	24.6

Figure 772 Rigid Couplings

Tech Data Sheet: G141

10 YEAR LIMITED WARRANTY



32mm - 300mm *(1¼" - 12")* | 350mm - 450mm *(14" - 18")* | 500mm - 600mm *(20" - 24")*

Part Number		Pipe Size		Max.† Pressure Bar psi	Max.† End Load kN Lbs.	Max. *‡ End Gap mm In.	Dimensions			Coupling Bolts		Approx. Weight Kg. Lbs.
Grade "E" Gasket	Grade "E" Tri-Seal Gasket	Nominal mm Inches	O.D. mm Inches				A mm In.	B mm In.	C mm In.	Qty.	Size mm Inches	
772ME0324✖	772MT0324✖	300	323.9	27.6	227.17	3.3	391.4	478.5	66.5	2	M24 x 165	19.1
		12	12.750	400	51,071	0.13	15.41	18.84	2.62		1 x 6 1/2 ·	42.0
772AE0355✖	772AE0355✖	350	355.6	24.1	239.66	3.3	423.7	517.6	74.4	3	–	21.7
		14	14.000	350	53,878	0.13	16.68	20.38	2.93		1 x 5 1/2 ·	48.0
772AE0406✖	772AE0406✖	400	406.4	24.1	313.03	3.3	469.9	575.1	74.4	3	–	23.6
		16	16.000	350	70,372	0.13	18.50	22.64	2.93		1 x 5 1/2 ·	52.1
772AE0457✖	772AE0457✖	450	457.2	24.1	396.18	6.4	541.3	638.0	77.7	3	–	30.8
		18	18.000	350	89,064	0.25	21.31	25.12	3.06		1 x 5 1/2 ·	68.0
772AE0508✖	772AE0508✖	500	508.0	24.1	489.11	6.4	596.9	708.2	77.7	4	–	40.4
		20	20.000	350	109,956	0.25	23.50	27.88	3.06		1 1/8 x 5 3/4 ·	89.0
772AE0610✖	772AE0610✖	600	609.6	24.1	704.31	6.4	701.8	812.8	81.0	4	–	43.5
		24	24.000	350	158,336	0.25	27.63	32.00	3.19		1 1/8 x 5 3/4 ·	96.0

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish

* 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 a GRINNELL Sales Representative 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.

The Fig. 772 Heavy Duty Rigid Coupling does not provide compensation for pipe system expansion and/or contraction associated with pipe system temperature changes.

For information on alternative sizes, contact a GRINNELL Sales Representative.

See page 17 for coupling specifications and pages 116 – 127 for gasket information.

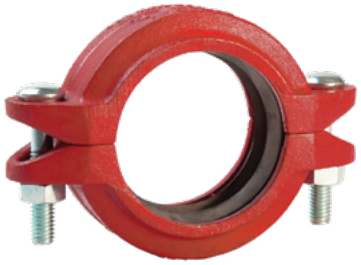
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

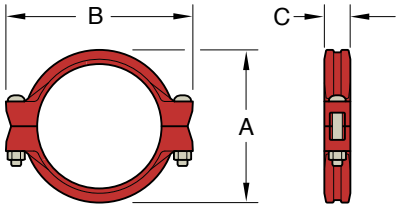
Figure 774 Rigid Couplings

Tech Data Sheet: G142

10 YEAR LIMITED WARRANTY

The GRINNELL Figure 774 Grooved Rigid Coupling provides a rigid joint by firmly gripping along the full circumference of the pipe grooves. Figure 774 Grooved Rigid Couplings are a proven dependable method of joining pipe and are an economical alternative to welding, threading, or using flanges. It is capable of pressures up to 34.5 Bar (500 psi) depending on pipe size and wall thickness.





For detailed Listing / Approval information contact GRINNELL Mechanical Products.

Part Number		Pipe Size		Max.† Pressures	Max.† End Load	Max.*‡ End Gap	Dimensions			Coupling Bolts Size ** (Qty 2)	Approx. Weight
Grade "E" Gasket	Grade "E" Tri-Seal Gasket	Nominal mm Inches	O.D. mm Inches	Bar psi	kN Lbs.	mm Inches	A mm Inches	B mm Inches	C mm Inches	mm Inches	kg Lbs.
774ME0034✖	774MT0034✖	25	33.4	34.5	2.11	1.5	41	100	42	M10 x 57	0.55
		1	1.315	500	475	0.06	1.63	3.92	1.65	3/8 x 2 1/4	1.2
774ME0042✖	774MT0042✖	32	42.4	34.5	4.81	1.5	68	112	42	M10 x 57	0.59
		1 1/4	1.660	500	1,082	0.06	2.66	4.40	1.64	3/8 x 2 1/4	1.3
774ME0048✖	774MT0048✖	40	48.3	34.5	6.31	1.5	74	118	42	M10 x 57	0.68
		1 1/2	1.900	500	1,418	0.06	2.90	4.66	1.66	3/8 x 2 1/4	1.5
774ME0060✖	774MT0060✖	50	60.3	34.5	9.85	1.5	86	132	43	M10 x 57	0.82
		2	2.375	500	2,215	0.06	3.38	5.20	1.70	3/8 x 2 1/4	1.8
774ME0073✖	774MT0073✖	65	73.0	34.5	14.44	1.5	99	143	44	M10 x 57	0.91
		2 1/2	2.875	500	3,246	0.06	3.88	5.64	1.75	3/8 x 2 1/4	2.0
774ME0076✖	774MT0076✖	65	76.1	34.5	15.72	1.5	102	147	44	M10 x 57	0.91
		76.1mm	3.000	500	3,534	0.06	4.00	5.78	1.75	–	2.0
774ME0089✖	774MT0089✖	80	88.9	34.5	21.40	1.5	114	161	44	M10 x 57	1.50
		3	3.500	500	4,811	0.06	4.50	6.33	1.75	3/8 x 2 1/4	3.3
774ME0114✖	774MT0114✖	100	114.3	34.5	35.37	1.5	145	191	46	M10 x 57	1.50
		4	4.500	500	7,952	0.06	5.70	7.50	1.83	3/8 x 2 1/4	3.3
774ME0139✖	774MT0139✖	125	139.7	34.5	52.84	3.2	173	222	49	M12 x 76	2.41
		139.7mm	5.500	500	11,879	0.125	6.80	8.75	1.91	–	5.3
774ME0141✖	774MT0141✖	125	141.3	34.5	54.06	3.2	174	224	49	M12 x 76	2.41
		5	5.563	500	12,153	0.125	6.86	8.82	1.91	1/2 x 3	5.3
774ME0165✖	774MT0165✖	150	165.1	34.5	73.80	3.2	198	248	49	M12 x 76	2.59
		165.1mm	6.500	500	16,592	0.125	7.80	9.75	1.91	–	5.7
774ME0168✖	774MT0168✖	150	168.3	34.5	76.67	3.2	215	251	49	M12 x 76	2.69
		6	6.625	500	17,236	0.125	8.47	9.88	1.91	1/2 x 3	5.9
774ME0219✖	774MT0219✖	200	219.1	27.5	103.96	3.2	260	325	61	M16 x 83	5.32
		8	8.625	400	23,371	0.125	10.25	12.78	2.40	5/8 x 3 1/4	11.7
774ME0273✖	774MT0273✖	250	273.0	16.0	94.07	6.4	318	419	65	M20 x 121	8.86
		10	10.750	233	21,148	0.25	12.50	16.50	2.56	3/4 x 4 3/4	19.5
774ME0324✖	774MT0324✖	300	323.9	12.0	99.39	6.4	368	470	65	M20 x 121	10.00
		12	12.750	175	22,343	0.25	14.50	18.50	2.56	3/4 x 4 3/4	22.0

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish, or 5 for painted white RAL 9010 coating

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

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

** Gold colour coded metric bolt sizes for 25mm – 300mm couplings are available upon request.

The Fig. 774 Standard Weight Rigid Coupling does not provide compensation for pipe system expansion and/or contraction associated with pipe system temperature changes.

For information on alternative sizes, contact a GRINNELL Sales Representative.

See page 17 for coupling specifications and pages 116 – 127 for gasket information.

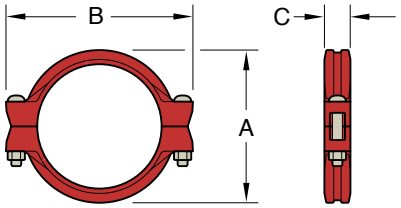
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 705 Flexible Couplings

Tech Data Sheet: G110

10 YEAR LIMITED WARRANTY

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 34.5 Bar (500 psi), 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 detailed Listing / Approval information contact GRINNELL Mechanical Products.

Part Number		Pipe Size		Max.† Pressure Bar psi	Max.† End Load kN Lbs.	Max.*‡ End Gap mm In.	Deflection ‡		Dim. – mm In.			Coupling Bolts Size (Qty 2) mm, In.	App. Wt. kg Lbs.
Grade "E" Gasket	Grade "E" Tri-Seal Gasket	Nominal DN In.	O.D. mm In.				Deg. Per Cplg	mm/m In./Ft	A	B	C		
705ME0034✖	705MT0034✖	25	33.7	34.5	1.86	3.3	5° 30'	96.7	56.9	100.1	46.0	M10 x 44	0.6
		1	1.315	500	410	0.13		1.16	2.24	3.94	1.81	3/8 x 1 3/4	1.3
705ME0042✖	705MT0042✖	32	42.4	34.5	4.81	3.3	4° 19'	75.0	65.0	106.4	46.0	M10 x 57	0.7
		1 1/4	1.660	500	1,082	0.13		0.90	2.56	4.19	1.81	3/8 x 2 1/4	1.5
705ME0048✖	705MT0048✖	40	48.3	34.5	6.30	3.3	3° 46'	65.8	69.9	112.8	46.0	M10 x 57	0.7
		1 1/2	1.900	500	1,418	0.13		0.79	2.75	4.44	1.81	3/8 x 2 1/4	1.6
705ME0060✖	705MT0060✖	50	60.3	34.5	9.85	3.3	3° 1'	52.5	82.6	124.0	47.8	M10 x 57	0.8
		2	2.375	500	2,215	0.13		0.63	3.25	4.88	1.88	3/8 x 2 1/4	1.7
705ME0073✖	705MT0073✖	65	73.0	34.5	14.43	3.3	2° 29'	43.3	93.7	139.7	47.8	M10 x 57	0.9
		2 1/2	2.875	500	3,246	0.13		0.52	3.69	5.50	1.88	3/8 x 2 1/4	2.0
705ME0076✖	705MT0076✖	65	76.1	34.5	15.72	3.3	2° 23'	41.7	101.6	146.10	47.8	M12 x 76	1.4
		76.1mm	3.000	500	3,534	0.13		0.50	4.00	5.75	1.88		3.0
705ME0089✖	705MT0089✖	80	88.9	34.5	21.39	3.3	2° 3'	35.8	111.3	165.1	47.8	M12 x 76	1.4
		3	3.500	500	4,811	0.13		0.43	4.38	6.50	1.88	1/2 x 3	3.1
705ME0108✖	705MT0108✖	100	108.0	34.5	31.55	6.4	3° 22'	58.3	139.7	190.5	52.3	M12 x 76	1.9
		108.0mm	4.252	500	7,093	0.25		0.70	5.50	7.50	2.06		4.2
705ME0114✖	705MT0114✖	100	114.3	34.5	35.35	6.4	3° 11'	55.8	144.5	196.9	52.3	M12 x 89	1.8
		4	4.500	500	7,952	0.25		0.67	5.69	7.75	2.06	1/2 x 3	4.0
705ME0133✖	705MT0133✖	125	133.0	31.0	43.33	6.4	2° 44'	46.7	166.6	241.3	52.3	M16 x 83	3.3
		133.0mm	5.236	450	9,741	0.25		0.56	6.56	9.50	2.06	–	7.2
705ME0139✖	705MT0139✖	125	139.7	31.0	47.56	6.4	2° 36'	45.5	173.0	247.7	52.3	M16 x 83	3.3
		139.7mm	5.500	450	10,691	0.25		0.55	6.81	9.75	2.06	–	7.2
705ME0141✖	705MT0141✖	125	141.3	31.0	48.63	6.4	2° 35'	45.0	174.8	247.7	52.3	M16 x 83	3.2
		5	5.563	450	10,938	0.25		0.54	6.88	9.75	2.06	5/8 x 3 1/4	7.1
705ME0159✖	705MT0159✖	150	159.0	31.0	61.41	6.4	2° 17'	40.0	192.0	261.9	52.3	M16 x 83	3.4
		159.0mm	6.260	450	13,806	0.25		0.48	7.56	10.31	2.06	–	7.4
705ME0165✖	705MT0165✖	150	165.1	31.0	66.36	6.4	2° 12'	38.3	196.9	271.5	52.3	M16 x 83	3.2
		165.1mm	6.500	450	14,932	0.25		0.46	7.75	10.69	2.06	–	7.1
705ME0168✖	705MT0168✖	150	168.3	31.0	68.97	6.4	2° 10'	37.5	201.7	271.5	52.3	M16 x 83	3.2
		6	6.625	450	15,512	0.25		0.45	7.94	10.69	2.06	5/8 x 3 1/4	7.1
705ME0200✖	705MT0200✖	200	216.3	31.0	113.59	6.4	1° 40'	29.2	255.8	342.9	58.7	M20 x 121	5.6
		216.3mm	8.500	450	25,535	0.25		0.35	10.07	13.50	2.31	-	12.4
705ME0219✖	705MT0219✖	200	219.1	31.0	116.89	6.4	1° 40'	29.2	258.8	344.4	63.5	M20 x 121	6.6
		8	8.625	450	26,292	0.25		0.35	10.19	13.56	2.50	3/4 x 4 3/4	14.5
705ME0273✖	705MT0273✖	250	273.0	24.1	141.31	6.4	1° 20'	23.3	322.3	416.1	66.8	M24 x 165	12.7
		10	10.750	350	31,767	0.25		0.28	12.69	16.38	2.63	1 x 6 1/2	28.0
705ME0324✖	705MT0324✖	300	323.9	24.1	198.78	6.4	1° 7'	19.2	379.5	479.6	66.8	M24 x 165	16.6
		12	12.750	350	44,687	0.25		0.23	14.94	18.88	2.63	1 x 6 1/2	36.5

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish, or 5 for painted white RAL9010 coating

* 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 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 alternative sizes, contact a GRINNELL Sales Representative.

See page 17 for coupling specifications and pages 116 – 127 for gasket information.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

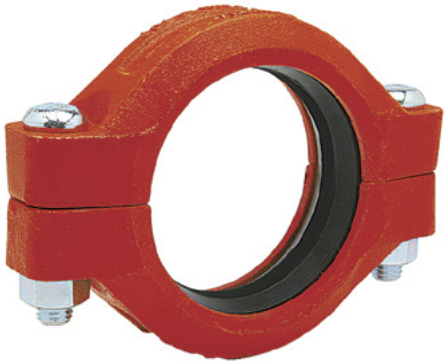
Figure 707
Heavy Duty Flexible Couplings

Tech Data Sheet: G130

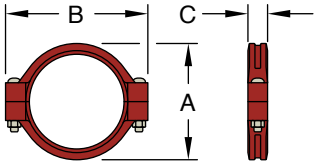
10 YEAR LIMITED WARRANTY

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 68.9 Bar (1,000 psi), depending on pipe size and wall thickness.

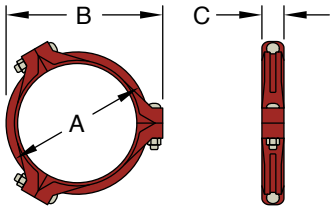
Suitable for use in a variety of applications, the Figure 707 Coupling provides a dependable method of joining pipe.



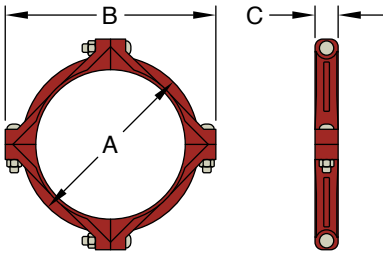
For detailed Listing / Approval information contact GRINNELL Mechanical Products.



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



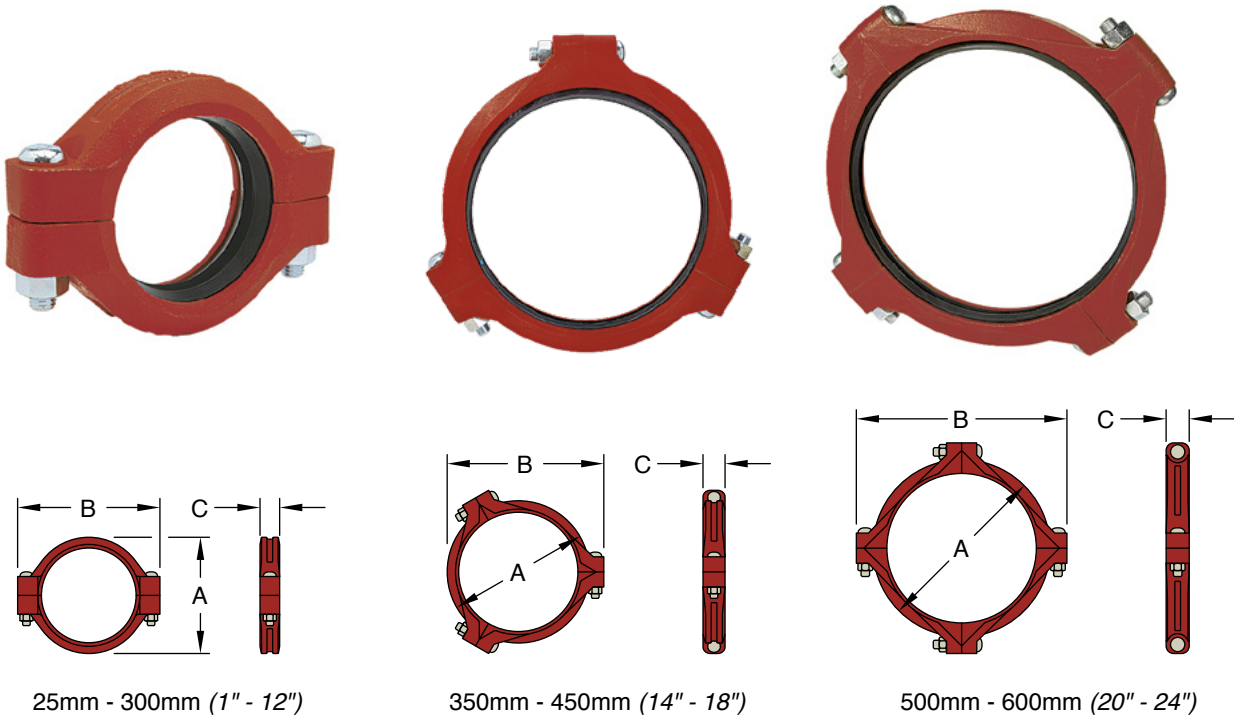
350mm - 450mm *(14" - 18")*



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

Part Number	Pipe Size		Max.† Pressure	Max.† End Load	Max.*‡ End Gap	Deflection ‡		Dimensions – mm In.			Coupling Bolts		Approx. Weight
	Nominal mm Inches	O.D. mm Inches	Bar psi	kN Lbs.	mm Inches	Degrees Per Coupling	mm/m Inches/ Ft	A	B	C	Qty.	Size mm Inches	Kg. Lbs.
707AE0034✖	25	33.7	68.9	6.10	3.3	5° 26'	98.4	60.5	101.6	46.0	2	M12 x 57	0.9
	1	1.315	1000	1,360	0.13		1.14	2.38	4.00	1.81		1/2 x 2-1/4	2.0
707ME0042✖	32	42.4	68.9	9.63	3.3	4° 19'	75.0	70.0	111.0	46.0	2	M12 x 76	1.0
	1 1/4	1.660	1000	2,165	0.13		0.90	2.76	4.37	1.81		1/2 x 3	2.2
707AE0048✖	40	48.3	68.9	12.61	3.3	3° 46'	65.8	75.4	117.6	46.0	2	M12 x 76	1.1
	1 1/2	1.900	1000	2,835	0.13		0.79	2.97	4.63	1.81		1/2 x 3	2.5
707AE0060✖	50	60.3	68.9	19.71	3.3	3° 1'	52.5	89.9	133.4	47.8	2	M12 x 76	1.4
	2	2.375	1000	4,430	0.13		0.63	3.54	5.25	1.88		1/2 x 3	3.0
707AE0073✖	65	73.0	68.9	28.88	3.3	2° 29'	43.3	103.1	146.1	47.8	2	M12 x 76	1.6
	2 1/2	2.875	1000	6,492	0.13		0.52	4.06	5.75	1.88		1/2 x 3	3.5
707AE0076✖	65	76.1	68.9	31.44	3.3	2° 23'	41.7	106.4	146.1	47.8	2	M12 x 76	1.8
	76,1mm	3.000	1000	7,069	0.13		0.50	4.19	5.75	1.88		–	4.0
707AE0089✖	80	88.9	68.9	42.80	3.3	2° 3'	35.8	119.1	162.1	47.8	2	M12 x 76	1.8
	3	3.500	1000	9,621	0.13		0.43	4.69	6.38	1.88		1/2 x 3	4.0
707AE0114✖	100	114.3	68.9	70.75	6.4	3° 11'	55.8	151.1	209.6	52.3	2	M16 x 83	3.2
	4	4.500	1000	15,904	0.25		0.67	5.95	8.25	2.06		5/8 x 3 1/4	7.0
707AE0139✖	125	139.7	68.9	105.6	6.4	2° 30'	43.3	178.3	254.0	51.8	2	M20 x 121	3.8
	139,7mm	5.500	1000	23,758	0.25		0.52	7.02	10.00	2.04		3/4 x 4 3/4	8.3
707AE0141✖	125	141.3	68.9	108.12	6.4	2° 35'	45.0	179.8	254.0	52.3	2	M20 x 121	4.5
	5	5.563	1000	24,306	0.25		0.54	7.08	10.00	2.06		3/4 x 4 3/4	10.0
707AE0165✖	150	165.1	68.9	147.61	6.4	2° 12'	38.4	208.0	285.8	52.3	2	M20 x 121	5.4
	165,1mm	6.500	1000	33,183	0.25		0.46	8.19	11.25	2.06		–	12.0
707AE0168✖	150	168.3	68.9	153.34	6.4	2° 10'	37.5	210.8	285.8	52.3	2	M20 x 121	5.0
	6	6.625	1000	34,472	0.25		0.45	8.30	11.25	2.06		3/4 x 4 3/4	11.1
707AE0219✖	200	219.1	55.2	207.91	6.4	1° 40'	29.2	271.3	355.6	62.7	2	M22 x 165	9.7
	8	8.625	800	46,741	0.25		0.35	10.68	14.00	2.47		7/8 x 6 1/2	21.4

Figure 707
Heavy Duty Flexible Couplings
Tech Data Sheet: G130



25mm - 300mm *(1" - 12")* 350mm - 450mm *(14" - 18")* 500mm - 600mm *(20" - 24")*

Part Number	Pipe Size		Max.† Pressure	Max.† End Load	Max.*‡ End Gap	Deflection ‡		Dimensions - mm In.			Coupling Bolts		Approx. Weight
	Nominal mm Inches	O.D. mm Inches	Bar psi	kN Lbs.	mm Inches	Degrees Per Coupling	mm/m Inches/ Ft	A	B	C	Qty.	Size mm Inches	Kg. Lbs.
707AE0273✖	250	273.0	55.2	322.99	6.4	1° 20'	23.3	331.7	417.6	66.8	2	M24 x 165	13.2
	10	10.750	800	72,610	0.25		0.28	13.06	16.44	2.63		1 x 6 1/2	29.0
707AE0324✖	300	323.9	55.2	454.35	6.4	1° 7'	19.2	390.9	478.5	66.8	2	M24 x 165	16.8
	12	12.750	800	102,141	0.25		0.23	15.39	18.84	2.63		1 x 6 1/2	37.0
707AE0355✖	350	355.6	24.1	239.66	6.4	1° 2'	18.3	423.4	517.7	74.7	2	–	20.9
	14	14.000	350	53,878	0.25		0.22	16.67	20.38	2.94		1 x 5 1/2 •	46.0
707AE0406✖	400	406.4	24.1	313.03	6.4	0° 54'	15.8	478.3	575.1	74.7	3	–	26.8
	16	16.000	350	70,372	0.25		0.19	18.83	22.64	2.94		1 x 5 1/2 •	59.0
707AE0457✖	450	457.2	20.7	339.58	6.4	0° 48'	14.2	541.3	638.0	77.7	3	–	35.4
	18	18.000	300	76,341	0.25		0.17	21.31	25.12	3.06		1 x 5 1/2 •	78.0
707AE0508✖	500	508.0	20.7	419.23	6.4	0° 43'	12.5	596.1	708.2	77.7	4	–	40.4
	20	20.000	300	94,248	0.25		0.15	23.47	27.88	3.06		1 1/8 x 5 3/4 •	89.0
707AE0610✖	600	609.6	24.1	704.31	6.4	0° 36'	10.8	700.5	812.8	81.0	4	–	50.8
	24	24.000	350	158,336	0.25		0.13	27.58	32.00	3.19		1 1/8 x 5 3/4 •	112.0

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish

* 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 a GRINNELL Sales Representative 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 alternative sizes, contact a GRINNELL Sales Representative.

For coupling sizes above 300mm (12") bolt sizes only available in ANSI.

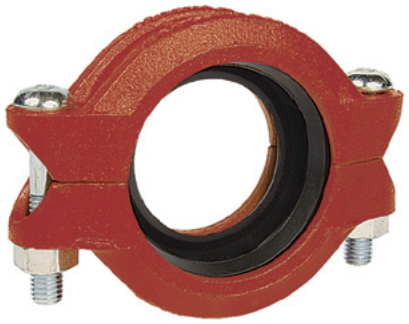
See page 17 for coupling specifications and pages 116 - 127 for gasket information.

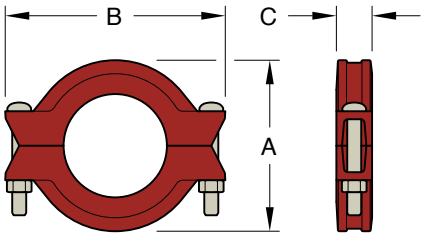
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

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 34.5 Bar (500 psi) depending on pipe size and wall thickness. A flexible reducing coupling is not recommended for low-temperature applications.





For detailed Listing / Approval information contact GRINNELL Mechanical Products.

Part Number	Pipe Size		Max.† Pressures Bar	Max.† End Load kN	Max.*‡ End Gap mm	Deflection ‡		Dimensions mm			Coupling Bolts Size (Qty 2) mm	Approx. Weight kg
	Nominal DN	O.D. mm				Degrees Per Coupling	mm/m	A	B	C		
716ae2015✖	50 x 40	60.3 x 48.3	34.5	6.31	3.3	1° 53'	32.9	88.9	128.5	47.8	M10 x 57	1.3
716ae2520✖	65 x 50	73.0 x 60.3	34.5	9.85	3.3	1° 33'	27.1	101.6	139.7	47.8	M10 x 57	1.5
716me2620✖	65 x 50	76.1 x 60.3	34.5	9.85	3.3	1° 34'	26.7	106.4	149.4	47.8	M12 x 76	1.4
716ae3020✖	80 x 50	88.9 x 60.3	34.5	9.85	3.3	1° 17'	22.5	119.1	165.1	47.8	M12 x 76	1.9
716ae3025✖	80 x 65	88.9 x 73.0	34.5	14.44	3.3	1° 17'	22.5	119.1	165.1	47.8	M12 x 76	2.0
716me3026✖	80 x 65	88.9 x 76.1	34.5	15.72	3.3	1° 17'	22.5	119.1	165.1	47.8	M12 x 76	1.9
716ae4220✖	100 x 60	114.3 x 60.3	34.5	9.85	4.8	2° 38'	45.8	152.4	206.5	50.8	M16 x 83	2.5
716ae4225✖	100 x 65	114.3 x 73.0	34.5	14.44	4.8	2° 38'	45.8	152.4	206.5	50.8	M16 x 83	2.9
716me4226✖	100 x 65	114.3 x 76.1	34.5	15.72	4.8	2° 38'	45.8	152.4	206.5	50.8	M16 x 83	2.9
716ae4230✖	100 x 80	114.3 x 88.9	34.5	21.40	4.8	2° 38'	45.8	152.4	206.5	50.8	M16 x 83	2.8
716me5242✖	125 x 100	139.7 x 114.3	34.5	35.37	6.4	2° 38'	45.8	179.3	241.3	52.3	M20 x 121	4.3
716ae5342✖	125 x 100	141.3 x 114.3	34.5	35.37	6.4	2° 5'	36.7	181.1	242.8	52.3	M20 x 121	4.4
716me6242✖	150 x 100	165.1 x 114.3	27.6	28.30	6.4	1° 50'	31.7	207.8	274.6	52.3	M20 x 121	5.7
716ae6342✖	150 x 100	168.3 x 114.3	27.6	28.30	6.4	1° 44'	30.0	212.9	276.4	52.3	M20 x 121	5.7
716ae6353✖	150 x 125	168.3 x 141.3	27.6	43.25	6.4	1° 44'	30.0	212.9	276.4	52.3	M20 x 121	5.2
716ae8063✖	200 x 150	219.1 x 168.3	27.6	61.33	6.4	1° 15'	21.7	271.5	349.3	57.2	M22 x 165	9.4

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish

* 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 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.

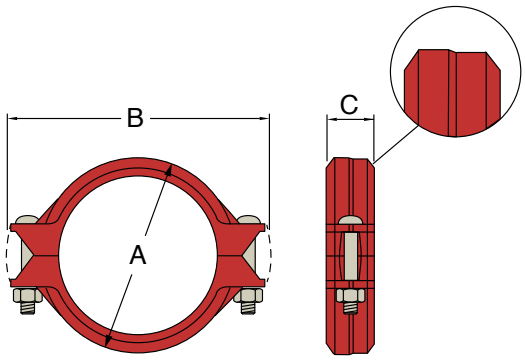
For information on alternative sizes, contact a GRINNELL Sales Representative.

See page 17 for coupling specifications and pages 116 – 127 for gasket information.

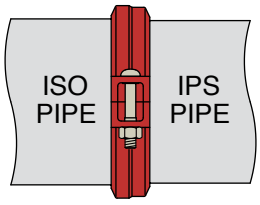
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 7706T
Transition Couplings

10 YEAR LIMITED WARRANTY



Model 7706-T Transition Couplings allows for a direct transition from IPS pipe sizes to ISO pipe sizes.



Ductile Iron Housing

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

Finish

- Standard painted finishes in orange or RAL 3000 red.
- Hot dip zinc galvanised (Option)
- Epoxy Coatings in RAL 3000 red or other colours (Option)

Gaskets

- Grade "E" EPDM
  Green colour code stripe
  -34°C to 110°C (-30°F to 230°F)
- Grade "L" Silicone
  Red colour code stripe
  -34°C to 177°C (-30°F to 350°F)
- Grade "T" Nitrile
  Orange colour code stripe
  -29°C to 82°C (-20°F to 180°F)
- Grade "O" Fluoroelastomer
  Blue colour code stripe
  -7°C to 149°C (+20°F to 300°F)

Part Number	Pipe Size		Max. End Load kN Lbs.	Axial Displacement mm Inches	Angular Movement		Dim.- mm In			Bolt / Nut Size in	Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches			Per Coupling Degree	Per Pipe mm/m in/ft.	A	B	C		
7706T2526✖	65 x 65	73.0 x 76.1	5.90	0 ~ 3.2	2° -24'	21.0	102	138	48	M10 x 55	1.2
	2 1/2 x 76.1mm	2.875 x 3.000	1330	- ~ 0.13		0.25	4.02	5.43	1.89	3/8 x 2 1/8	2.6
7706T6362✖	150 x 150	168.3 x 165.1	44.29	0 ~ 6.4	1° - 06'	19.0	200	270	53	M16 x 90	3.5
	6 x 165.1mm	6.625 x 6.500	9960	0 ~ 0.25		0.23	7.87	10.63	2.09	5/8 x 3 1/2	7.7

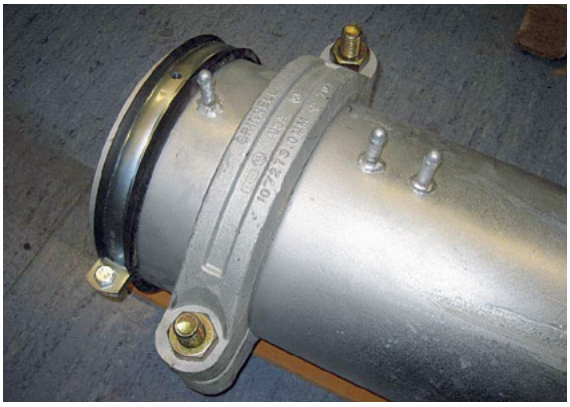
*Deflection or angular movement is the maximum value that a coupling allows with no internal pressure.
Refer to the technical data sheet for complete technical information and installation instructions.
For information on alternative sizes, contact a GRINNELL Sales Representative.
In the mechanical catalog, See page 17 for coupling specifications and pages 116 - 127 for gasket information.
For instructions on part numbers, ordering information, and availability, refer to page 13 in the mechanical catalog or contact a GRINNELL Sales Representative.

Electrical Continuity

10 YEAR LIMITED WARRANTY

Couplings in Painted / Galvanized Finishes

Most GRINNELL Grooved Couplings in painted and galvanized finishes comply to the electric conductivity according to clause 11.1.2 of EN 61537-2007. Tests were performed by TÜV Rheinland® and test reports are available upon request.

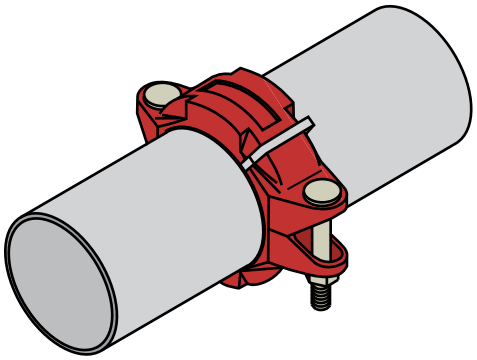


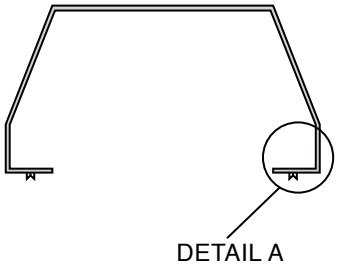
Test pipe at TÜV Rheinland®

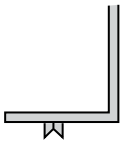
Couplings in Other Finishes

Earth bonding of the GRINNELL couplings in other finishes (such as epoxy, Rilsan, etc...) can be made in steel pipework systems with an electrical continuity clip. This clip, manufactured from 301-grade stainless steel, is designed to ensure electrical continuity in situations of high current loading and /or corrosive environments, providing equipotential bonding of the conductive parts.

It is recommended that the pipework is assembled and installed as recommended and that the pipework is bonded to the electrical earth and tested in accordance with the I.E.E. regulations for bonding (earthing). Installation should be regularly checked for equipotential bonding (earthing) in case of accidental damage or unauthorized pipework modifications. Following any future modification, electrical continuity clips must be used and the installation re-tested for equipotential bonding.







Part Number	Suitable for size Coupling Inches	Approx Weight kg
CLIP0103	1 - 3	0.005
CLIP0406	4 - 6	0.005
CLIP0812	8 - 12	0.005
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.		

GRINNELL Coupling Installation Information

Installation Handbook: IH-1000M

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-pressurised and drained. Failure to due 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 117 to 121 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.

EPDM, 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.

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 Products Installation Handbook (refer to IH-1000M). Always review the GRINNELL 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 Products Installation Handbook or individual product tech data sheets. Current documentation can be obtained by contacting your GRINNELL sales Representative or visiting **www.grinnell.com**.

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 68.9 bar (1,000 psi).

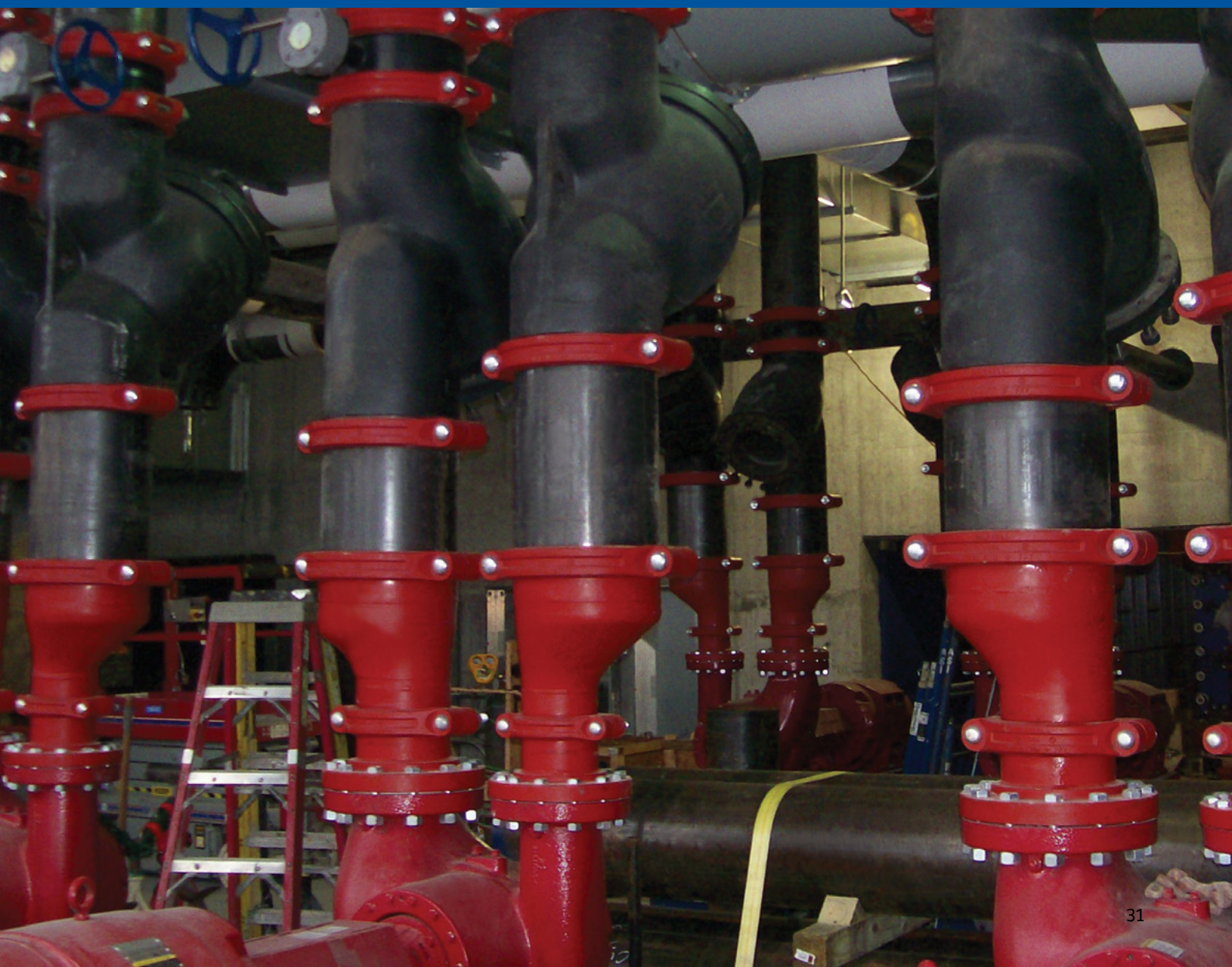
*Note: The material of both the fittings and couplings used in this testing is found in the GRINNELL Handbook. This material is Ductile Iron Casting Grade 65-45-12, which has an elongation in 51mm (2") of 12%.

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 224.1 bar (3,250 psig).

Notes

Flange Adapters



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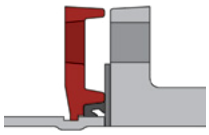

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Figure 343 & 344
Flange Adapters (PN10/PN16 BS 4504)
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For detailed Listing / Approval information contact GRINNELL Mechanical Products.

Material Specifications

Ductile Iron Housing Specifications

- ASTM A 536 – Standard specification for ductile iron castings, Grade 65-45-12
- Tensile strength, minimum 448,159 kPa (65,000 psi)
- Yield strength, minimum 310,264 kPa (45,000psi)
- Elongation in 50mm (2"), minimum 12%
- ASTM A 153 – Standard specification for hot-dip galvanising

Bolt/Nut Specifications

- Carbon steel oval neck bolts and nuts are heat-treated and conform to the physical properties of ASTM A 183 with a minimum tensile strength of 758,422 kPa (110,000 psi). Bolts and nuts are zinc electroplated to ASTM B 633.
- Gold colour coded metric bolts conforming to the physical properties of ASTM F 568M are available upon request. Contact GRINNELL Products.
- Stainless Steel nuts and bolts are UL Listed and comply with UL requirements. Bolts conform to ASTM A 193M, Class 2, Austenitic Stainless Steel. Nuts conform to ASTM A 194 Type 316, Grade 8M.

Coatings

Red – Non-lead paint RAL 3000(standard)
Orange – Non-lead paint (Optional)
Hot-Dipped, Zinc Galvanised (Optional)
Gasket Specifications

- Grade "E" EPDM gaskets have a green colour code stripe identification and conform to ASTM D 2000 for service temperatures from -34°C to 110°C (-30°F to 230°F). They are recommended for hot water not to exceed 110°C (230°F). They are not recommended for petroleum services.
- Grade "T" Nitrile gaskets have an Orange colour code stripe identification and conform to ASTM D 2000 for service temperatures from -29°C to 82°C (-20°F to 180°F). They are recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapours.

General notes: 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. Always read and understand the installation constructions. Never remove any piping components nor correct or modify any piping deficiencies without first depressurising and draining the system. Material should be verified to be compatible for the specific application.

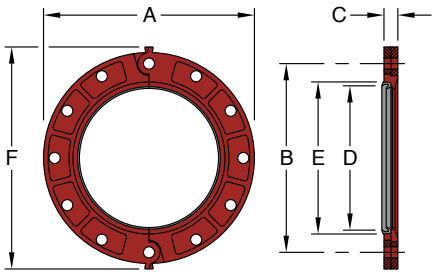
Figure 71
Flange Adapters
(PN10/PN16 BS 4504)

Tech Data Sheet: G150

10 YEAR LIMITED WARRANTY

The Figure 71 Flange Adapter is capable of pressures up to 20.7 Bar (300 psi) 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.



UL UL C VdS FM APPROVED LPCB Issue 03, 04, 07 Cert No. 570, 669, 673

For detailed Listing / Approval information contact GRINNELL Mechanical Products.

Part Number	Pipe Size		Flange Type	Max † End Load N Lbs.	Dimensions – mm In.						Recommended Flange Mating Bolts ‡		Approx. Wt. kg Lbs
	Nominal DN In.	O.D. mm In.			A	B	C	*D	*E	F	Size Dia. x Lg mm In.	Qty.	
71dae0060✖	50	60.3	PN10 / PN16	5889	162.1	125.0	19.1	60.5	86.6	184.2	M16 x 76	4	1.4
	2	2.375		1,324	6.38	4.92	0.75	2.38	3.41	7.25			3.0
71dae0076✖	65	76.1	PN10 / PN16	8665	184.9	145.0	22.4	76.1	102.4	205.5	M16 x 76	4	2.3
	76.1mm	3.000		1,948	7.28	5.71	0.88	3.00	4.03	8.09			5.0
71dae0089✖	80	88.9	PN10 / PN16	12.838	200.2	160.0	23.9	88.9	115.1	222.5	M16 x 76	8	2.5
	3	3.500		2,886	7.88	6.30	0.94	3.50	4.53	8.76			5.6
71dae0114✖	100	114.3	PN10 / PN16	21.222	219.9	180.1	23.9	114.3	140.5	239.5	M16 x 76	8	3.2
	4	4.500		4,771	8.66	7.09	0.94	4.50	5.53	9.43			7.0
71dme0139✖	125	139.7	PN10 / PN16	32.436	249.9	210.1	25.4	139.7	165.9	271.5	M16 x 89	8	4.2
	139.7mm	5.500		7,292	9.84	8.27	1.00	5.50	6.53	10.69			9.2
71dae0165✖	150	165.1	PN10 / PN16	44.282	285.0	240.3	24.5	165.1	194.6	307.3	M20 x 89	8	4.5
	165.1mm	6.500		9,955	11.22	9.46	1.00	6.50	7.66	12.10			10.0
71dae0168✖	150	168.3	PN10 / PN16	45.999	279.4	241.1	25.4	168.1	197.6	301.8	M20 x 89	8	7.5
	6	6.625		10,341	11.00	9.49	1.00	6.62	7.78	11.88			16.6
71dme8219✖	200 8	219.1 8.625	PN10	77.968	336.8	292.1	28.6	218.9	254.5	358.6	M20 x 89	8	9.9
				17,528	13.26	11.50	1.125	8.62	9.94	14.12			21.8
71dme0219✖			PN16	77.968	339.8	295.1	28.6	218.9	254.5	362.7	M20 x 89	12	9.9
				17,528	13.38	11.62	1.125	8.62	9.94	14.28			21.8
71dae8273✖	250 10	273.0 10.750	PN10	121.121	395.2	350.0	30.2	273.1	312.4	419.1	M20 x 102	12	10.2
				27,229	15.56	13.78	1.188	10.75	12.31	16.50			22.5
71dae0273✖			PN16	170.380	406.4	355.1	30.2	273.1	312.7	428.8	M22 x 102	12	11.0
				38,303	16.00	13.98	1.188	10.75	12.31	16.88			24.2
71dme8324✖	300 12	323.9 12.750	PN10	170.380	445.0	399.8	31.8	323.9	363.5	470.4	M22 x 102	12	12.5
				38,303	17.52	15.74	1.25	12.75	14.31	18.52			27.5
71dme0324✖			PN16	170.380	460.2	410.0	31.8	323.9	363.5	486.2	M22 x 102	12	12.7
				38,303	18.12	16.14	1.25	12.75	14.31	19.14			28.0

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish
Maximum Pressure rating is 20,7 Bar (300 psi).

* 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 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 alternative sizes, contact a GRINNELL Sales Representative.

See page 30 for specifications and pages 116 – 127 for gasket information.

See page 32 for flange washer Adaptor and page 144 Flange Drilling Specifications

The effective sealing area of the mating flange must be free from gouges, undulations or deformities of any type to ensure proper sealing of the gasket. The Fig. 71 Flange provides a rigid joint when used on standard grooved pipe in accordance with GRINNELL specifications, therefore, no linear or angular movement at the joint is allowed.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

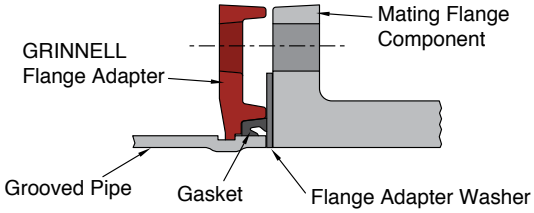
Flange Adapter Washers

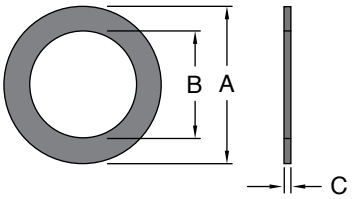
10 YEAR LIMITED WARRANTY

Carbon steel Flange Adapter Washers are required when the 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 a GRINNELL Sales Representative for additional information.





Part Number	Pipe Size		Dimensions		
PN10/PN16	Nominal mm Inches	O.D. mm Inches	A mm Inches	B mm Inches	C mm Inches
insdin060m	50	60.3	100.1	57.2	3.0
	2	2.375	3.94	2.25	0.12
–	65	73.0	119.1	69.9	3.0
	2 1/2	2.875	4.69	2.75	0.12
insdin076m	65	76.1	124.2	73.2	3.0
	76,1mm	3.000	4.89	2.88	0.12
insdin089m	80	88.9	131.8	85.9	3.0
	3	3.500	5.19	3.38	0.12
insdin114m	100	114.3	169.9	111.3	3.0
	4	4.500	6.69	4.38	0.12
insdin139m	125	139.7	189.2	135.1	3.0
	139,7mm	5.500	7.45	5.32	0.12
–	125	141.3	192.0	136.7	3.0
	5	5.563	7.56	5.38	0.12
INSdin165M	150	165.1	215.1	160.5	3.0
	165,1mm	6.500	8.47	6.32	0.12
insdin168m	150	168.3	217.4	163.6	3.0
	6	6.625	8.56	6.44	0.12
insdin219m	200	219.1	274.6	214.4	3.0
	8	8.625	10.81	8.44	0.12
insdin273m	250	273.0	335.0	266.7	3.0
	10	10.750	13.19	10.50	0.12
insdin324m	300	323.9	404.9	317.5	3.0
	12	12.750	15.94	12.50	0.12
–	350	355.6	444.5	342.9	3.2
	14	14.000	17.50	13.50	0.13
–	400	406.4	508.0	393.7	3.2
	16	16.000	20.00	15.50	0.13
–	450	457.2	542.9	444.5	3.2
	18	18.000	21.38	17.50	0.13
–	500	508.0	600.1	495.3	3.2
	20	20.000	23.63	19.50	0.13
–	600	609.6	711.2	596.9	3.2
	24	24.000	28.00	23.50	0.13

For information on alternative sizes, contact a GRINNELL Sales Representative.
Plate material: stainless steel ASTM A666 Type 304-2B
See Flange Drilling Specifications on page 144.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Flange Adapter Technical Data

Fig 71 GRINNELL Flange Notes:

A. Fig 71 Flange Adapters have an anti-rotational feature or "Gripping Teeth" cast inside the shoulder.

B. GRINNELL grooved Flanges are to be assembled on butterfly valves so as not to interfere with actuator, or handle operation.
The Flange might not fit all Grooved butterfly valve sizes. Contact a GRINNELL Sales Representative for details

C. Figure 71 Flange Adapters are not recommended for application which incorporate tierods for anchoring or on a standard fitting within 90° of each other. Contact a GRINNELL Sales Representative for recommendations prior to using with plastic pipe.

D. Fig 71 GRINNELL Flange sealing gaskets require a hard flat surface for adequate sealing. The use of a metal adaptor insert is required for applications against rubber faced valves or other equipment. The adaptor insert is installed between the GRINNELL Flange sealing gasket and the mating flange or surface to provide an effective sealing surface area.

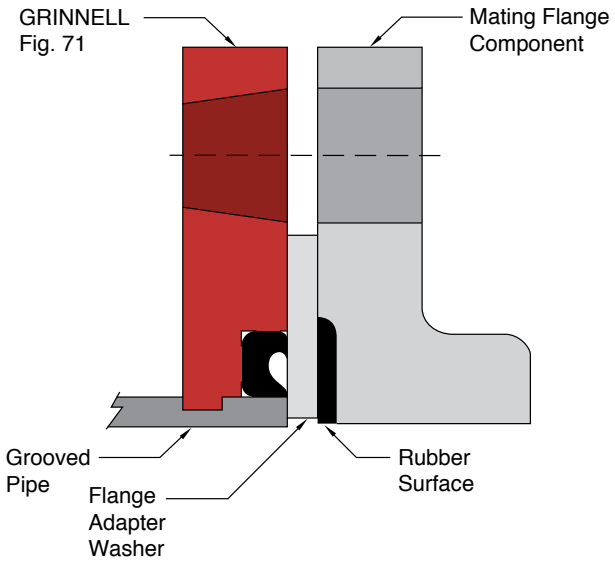


Exhibit A

Metal Flange Washer Adapters are required when Figure 71 Flange Adapter is used against surfaces such as:

1. Rubber Surfaces
(see exhibit A)
2. Adapting AWWA Cast Flanges
3. Rubber Faced Wafer Valves
4. Serrated Flange Surfaces
(see exhibit B)

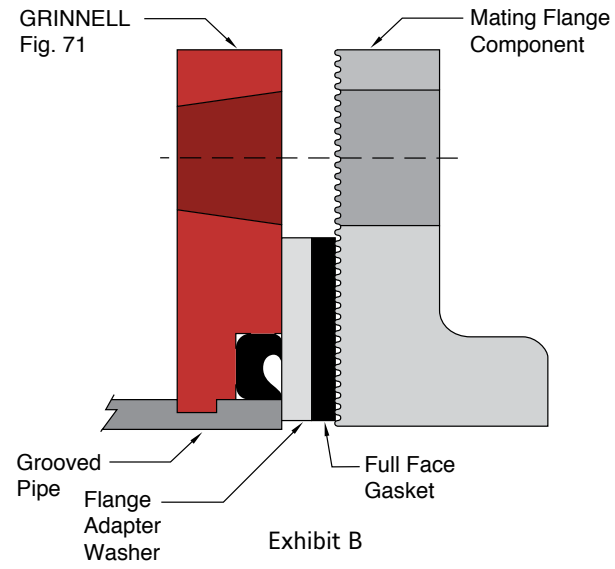


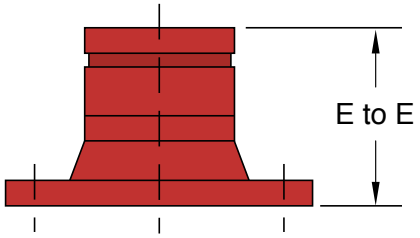
Exhibit B

Special attention required during installation to ensure that the gasket is installed correctly with the small side on the inside.

See the picture on the left side.

Figure 343 & 344
Flange Adapters (PN10/PN16 BS 4504)

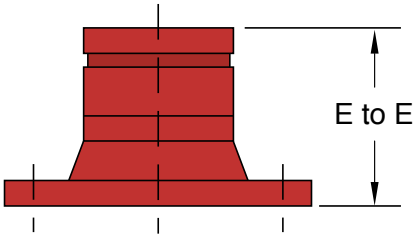
10 YEAR LIMITED WARRANTY



Part Number	Pipe Size		Flange Drilling	E to E mm Inches	Mating Flange		Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches			Bolt Qty.	Bolt Size mm	
343F00060✖	50	60.3	PN10 & PN16	95.0	4	M16 x 65	2.3
	2	2.375		3.74			5.07
343F00076✖	65	76.1	PN10 & PN16	95.0	4	M16 x 65	3.3
	76.1mm	3.000		3.74			7.27
343F00089✖	80	88.9	PN10 & PN16	100.0	4	M16 x 70	4.0
	3	3.500		3.94			8.82
343F00108✖	100	108.0	PN10 & PN16	102.0	8	M16 x 70	4.5
	108.0mm	4.252		4.02			9.92
343F00114✖	100	114.3	PN10 & PN16	102.0	8	M16 x 70	4.6
	4	4.500		4.02			10.14
343F00133✖	125	133.0	PN10 & PN16	105.0	8	M16 x 75	5.9
	133.0mm	5.236		4.13			13.00
343F00139✖	125	139.7	PN10 & PN16	105.0	8	M16 x 75	6.0
	139,7mm	5.500		4.13			13.23
343F00159✖	125	159.0	PN10 & PN16	105.0	8	M16 x 75	7.1
	159.0mm	6.260		4.13			15.65
343F00165✖	150	165.1	PN10 & PN16	105.0	8	M20 x 80	7.2
	165,1mm	6.500		4.13			15.87
343F00168✖	150	168.3	PN10 & PN16	105.0	8	M20 x 80	7.2
	6	6.625		4.13			15.87
344F00219✖	200 8**	219.1 8.625	PN10	112.0	8	M20 x 80	10.2
				4.41			22.49
343F00219✖			PN16	112.0	12	M20 x 90	10.2
				4.41			22.49
344F00273✖	250 10**	273.0 10.750	PN10	138.0	12	M20 x 90	18.0
				5.43			39.68
343F00273✖			PN16	138.0		M24 x 100	18.0
				5.43			39.68
344F00324✖	300 12**	323.9 12.750	PN10	138.0	12	M20 x 90	22.4
				5.43			49.38
343F00324✖			PN16	138.0		M24 x 100	22.4
				5.43			49.38

Figure 343 & 344
Flange Adapters (PN10/PN16 BS 4504)

10 YEAR LIMITED WARRANTY



Part Number	Pipe Size		Flange Drilling	E to E mm Inches	Mating Flange		Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches			Bolt Qty.	Bolt Size mm	
344T00355✖	350 14	355.6 14.000	PN10	203.2	16	M20 x 100	55.3
				8.00			121.9
343T00355✖			PN16	132.0		M24 x 115	38.0
				5.20			83.8
344T00406✖	400 16	406.4 16.000	PN10	203.2	16	M24 x 110	61.7
				8.00			136.0
343T00406✖			PN16	135.0		M27 x 125	48.0
				5.31			105.8
344T00457✖	450 18	457.2 18.000	PN10	203.2	20	M24 x 115	76.2
				8.00			168.0
343T00457✖			PN16	203.2		M27 x 140	76.2
				8.00			168.0
344T00508✖	500 20	508.0 20.000	PN10	125.0	20	M24 x 115	94.3
				4.92			207.9
343T00508✖			PN16	134.0		M30 x 160	94.3
				5.28			207.9
344T00610✖	600 24	609.6 24.000	PN10	132.0	20	M24 x 115	124.3
				5.20			274.0
343T00610✖			PN16	138.0		M33 x 180	124.3
				5.43			274.0

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish

♦ Contact GRINNELL Sales Representative for dimension details.

For information on alternative sizes, contact a GRINNELL Sales Representative.

See Flange Drilling Specifications on page 144.

See specifications on page 30.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Notes

Grooved Fittings

Grooved Fittings

Table of Contents

General notes: Additional information is included in our data sheets and is available upon request. 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. Always read and understand the installation constructions. Never remove any piping components nor correct or modify any piping deficiencies without first depressurising and draining the system. Material and gasket selection should be verified with the gasket recommendation listing for the specific application.

Fittings Specifications

Tech Data Sheet: G180

Fitting Friction Resistance Chart

Pipe Size		Elbows 90°	Elbows 45°	Tee Branch	Tee Run
Nominal mm Inches	O.D. mm Inches	m Feet	m Feet	m Feet	m Feet
25	33.7	0.5	0.2	1.3	0.5
1	1.315	1.6	0.7	4.3	1.6
32	42.4	0.6	0.3	1.5	0.6
1 1/4	1.660	1.9	1.0	4.8	1.9
40	48.3	0.7	0.4	1.8	0.7
1 1/2	1.900	2.3	1.2	5.8	2.3
50	60.3	1.0	0.5	2.5	1.0
2	2.375	3.2	1.6	8.0	3.2
65	73.0	1.2	0.6	3.0	1.2
2 1/2	2.875	3.9	2.0	9.8	3.9
65	76.1	1.2	0.6	3.1	1.2
76,1mm	3.000	4.1	2.1	10.3	4.1
80	88.9	1.5	0.7	3.7	1.5
3	3.500	4.9	2.4	12.2	4.9
100	108.0	2.0	1.0	5.0	2.0
108.0mm	4.252	6.5	3.3	16.3	6.5
100	114.3	2.0	1.0	5.0	2.0
4	4.500	6.5	3.3	16.3	6.5
125	133.0	2.4	1.3	6.1	2.4
133.0mm	5.236	8.0	4.1	20.0	8.0
125	139.7	2.4	1.3	6.1	2.4
139,7mm	5.500	8.0	4.1	20.0	8.0
125	141.3	2.5	1.3	6.3	2.5
5	5.563	8.2	4.1	20.5	8.2
125	159.0	2.9	1.4	7.2	2.9
159.0mm	6.260	9.5	4.8	23.8	9.5
150	165.1	2.9	1.4	7.2	2.9
165,1mm	6.500	9.5	4.8	23.8	9.5
150	168.3	3.0	1.5	7.6	3.0
6	6.625	9.9	5.0	24.8	9.9
200	219.1	4.0	2.0	10.0	4.0
8	8.625	13.1	6.6	32.8	13.1
250	273.0	5.0	2.5	12.6	5.0
10	10.750	16.5	8.3	41.3	16.5
300	323.9	6.1	3.0	15.1	6.1
12	12.750	19.9	9.9	49.7	19.9
350	355.6	7.0	5.5	20.7	7.0
14	14.000	23.0	18.0	67.9	23.0
400	406.4	7.9	6.1	23.8	7.9
16	16.000	25.9	20.0	78.1	25.9
450	457.2	8.8	7.0	25.9	8.8
18	18.000	28.9	23.0	85.0	28.9
500	508.0	10.1	7.9	30.5	10.1
20	20.000	33.1	25.9	100.1	33.1
600	609.6	12.2	9.1	35.1	12.2
24	24.000	40.0	29.9	115.2	40.0

For reducing tee branches, use value corresponding to the branch size.
For example, for a 200 x 200 x 50mm (8" x 8" x 2") tee, use a branch value of 50mm (2") is 2,5m (8.0').
For sizes not listed, interpolate from the values shown.
Expressed as Equivalent Straight Pipe.

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.

Material Specifications

Ductile Iron Fitting Specifications

- ASTM A 536 - Standard specification for ductile iron castings, Grade 65-45-12
- Tensile Strength, minimum 4482 Bar (65,000 psi)
- Yield Strength, minimum 3103 Bar (45,000 psi)
- Elongation in 50mm (2"), minimum 12%
- ASTM A 153 – Standard specification for hot-dip galvanising

Fabricated Steel Fitting Specifications

- Conform Standard EN 10253
- Carbon Steel: According to ASTM A 53, Grade B
- Tensile Strength, minimum 4137 Bar (60,000 psi)
- Yield Strength, minimum 2413 Bar (35,000 psi)
- Sizes 32mm – 250mm (1 1/4" – 10") Schedule 40
- Sizes 300mm – 600mm (12" – 24") STD (.375)

Coatings

- Red – Non-lead paint (RAL 3000) (standard)
- White – Non-lead paint (RAL 9010) (optional)
- Hot-Dipped, Zinc Galvanised (optional)

Threads

- BSP (standard)

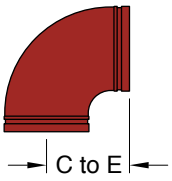
UL FM APPROVED

For detailed Listing / Approval information contact GRINNELL Mechanical Products

Figure 210
90° Elbows

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY



Part Number	Pipe Size		C to E mm Inches	Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches		
210M00034✖	25	33.7	57.0	0.4
	1	1.315	2.24	0.9
210M00042✖	32	42.4	69.9	0.5
	1 1/4	1.660	2.75	1.0
210M00048✖	40	48.3	69.9	0.6
	1 1/2	1.900	2.75	1.3
210M00060✖	50	60.3	82.6	0.8
	2	2.375	3.25	1.8
210M00073✖	65	73.0	95.3	1.4
	2 1/2	2.875	3.75	3.1
210M00076✖	65	76.1	95.3	1.5
	76,1mm	3.000	3.75	3.2
210M00089✖	80	88.9	108.0	2.2
	3	3.500	4.25	4.8
210M00108✖	100	108.0	121.0	3.9
	108,0mm	4.252	4.76	86
210M00114✖	100	114.3	127.0	3.4
	4	4.500	5.00	7.5
210M00133✖	125	133.0	133.0	5.1
	133.0mm	5.236	5.24	11.3
210M00139✖	125	139.7	139.7	5.1
	139,7mm	5.500	5.50	11.3
210M00141✖	125	141.3	139.7	5.3
	5	5.563	5.50	11.6
210M00159✖	150	159.0	152.0	6.6
	159,0mm	6.260	5.98	14.6
210M00165✖	150	165.1	165.1	7.7
	165,1mm	6.500	6.50	16.9
210M00168✖	150	168.3	165.1	7.5
	6	6.625	6.50	16.6
210M00219✖	200	219.1	196.9	13.4
	8	8.625	7.75	29.6
210M00273✖	250	273.0	228.6	22.0
	10	10.750	9.00	48.5
210M00324✖	300	323.9	254.0	30.1
	12	12.750	10.00	66.4

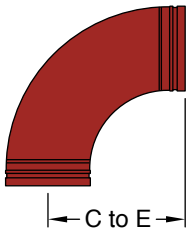
✖ = 1 for red paint finish, 2 for hot dipped galvanised finish.
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 210LR & 310LR
90° Long Radius Elbows

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

Figure 310LR
90° Fabricated Elbow
(Shown)



Pipe Size		Figure 210LR – Cast			Figure 310LR – Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.
50	60.3	210lr0060✖	111.3	1.1	–	–	–
2	2.375		4.38	2.4		–	–
65	73.0	210lr0073✖	127.0	2.3	–	–	–
2 1/2	2.875		5.00	5.1		–	–
65	76.1	210lr0076✖	127.0	2.0	–	–	–
76,1mm	3.000		5.00	4.4		–	–
80	88.9	210lr0089✖	149.4	3.0	–	–	–
3	3.500		5.88	6.6		–	–
100	114.3	210lr0114✖	190.5	5.3	–	–	–
4	4.500		7.50	11.6		–	–
125	139.7	210lr0139✖	241.3	8.6	–	–	–
139,7mm	5.500		9.50	19.0		–	–
125	141.3	210lr0141✖	241.3	9.1	–	–	–
5	5.563		9.50	20.0		–	–
150	165.1	210lr0165✖	273.1	12.0	–	–	–
165,1mm	6.500		10.75	26.4		–	–
150	168.3	210lr0168✖	273.1	13.4	–	–	–
6	6.625		10.75	29.5		–	–
200	219.1	210lr0219✖	362.0	28.2	–	–	–
8	8.625		14.25	62.1		–	–
250	273.0	210lr0273✖	438.0	27.2	–	–	–
10	10.750		17.24	60.0		–	–
300	323.9	210lr0324✖	521.0	30.4	–	–	–
12	12.750		20.51	67.0		–	–
350	355.6	210lr0355✖	533.4	59.4	310T00355✖	583.0	76.7
14	14.000		21.00	131.0		22.95	169.1
400	406.4	210lr0406✖	609.6	81.6	310T00406✖	660.0	100.7
16	16.000		24.00	180.0		25.98	222.0
450	457.2	–	–	–	310T00457✖	736.0	127.0
18	18.000		–	–		28.98	280.0
500	508.0	–	–	–	310T00508✖	812.0	156.0
20	20.000		–	–		31.97	343.9
600	609.6	–	–	–	310T00610✖	964.0	222.3
24	24.000		–	–		37.95	490.1

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish.
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 201, 301 & 201LR 45° Elbows

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

Figure 201
45° Cast Elbow

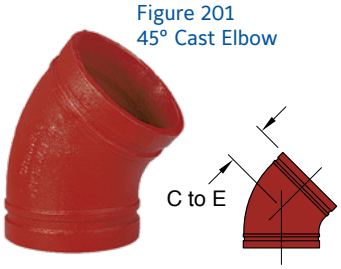


Figure 301
45° Fabricated Elbow
(Full Flow)

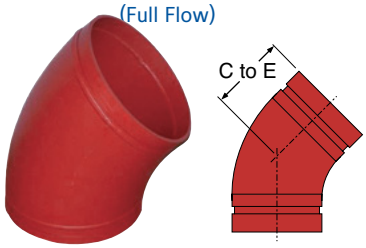
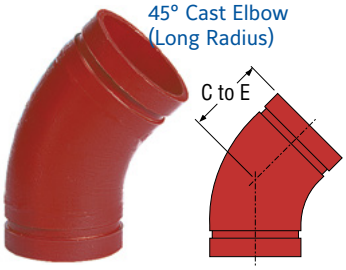


Figure 201LR
45° Cast Elbow
(Long Radius)



Pipe Size		Figure 201 – Cast			Figure 301 – Fabricated			Figure 201LR – Long Radius, Cast		
Nominal mm Inches	O.D. mm Inches	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.
25	33.7	201M00034✖	45.0	0.3	–			–		
1	1.315		1.77	0.7						
32	42.4	201M00042✖	44.5	0.4	–			–		
1 1/4	1.660		1.75	0.8						
40	48.3	201M00048✖	44.5	0.4	–			–		
1 1/2	1.900		1.75	0.9						
50	60.3	201M00060✖	50.8	0.6	–			–		
2	2.375		2.00	1.3						
65	73.0	201M00073✖	57.2	1.0	–			–		
2 1/2	2.875		2.25	2.1						
65	76.1	201M00076✖	57.2	1.0	–			–		
76,1mm	3.000		2.25	2.2						
80	88.9	201M00089✖	63.5	1.6	–			–		
3	3.500		2.50	3.5						
100	108.0	201M00108✖	73.0	2.5	–			–		
108,0mm	4.252		2.87	5.5						
100	114.3	201M00114✖	76.2	2.5	–			–		
4	4.500		3.00	5.5						
125	133.0	201M00133✖	82.6	3.5	–			–		
133.0mm	5.236		3.25	7.7						
125	139.7	201M00139✖	82.6	3.5	–			–		
139,7mm	5.500		3.25	7.7						
125	141.3	201M00141✖	82.6	3.7	–			–		
5	5.563		3.25	8.1						
150	159.0	201M00159✖	88.9	5.4	–			–		
159,0mm	6.260		3.50	11.9						
150	165.1	201M00165✖	88.9	5.4	–			–		
165,1mm	6.500		3.50	11.9						
150	168.3	201M00168✖	88.9	5.4	–			–		
6	6.625		3.50	11.9						
200	219.1	201M00219✖	108.0	8.6	–			–		
8	8.625		4.25	19.0						
250	273.0	201M00273✖	120.7	12.7	–			–		
10	10.750		4.75	28.0						
300	323.9	201M00324✖	133.4	22.0	–			–		
12	12.750		5.25	48.0						
350	355.6	–			301T00355✖	271.0	41.7	201LR00355✖	379.0	40.1
14	14.000					10.67	91.9		14.92	88.4
400	406.4	–			301T00406✖	303.0	53.1	201LR00406✖	434.0	47.9
16	16.000					11.93	117.1		17.09	105.6
450	457.2	–			301T00457✖	340.0	66.2	–		
18	18.000					13.39	145.9			
500	508.0	–			301T00508✖	366.0	81.2	–		
20	20.000					14.41	179.0			
600	609.6	–			301T00610✖	429.0	115.7	–		
24	24.000					16.89	255.1			

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish and 5 (201 only) for white paint finish

Note: Fabricated Full Flow 1.5D. C to E Dimensions differ from DIN 2605/01 to allow for insulation.

For information on alternative sizes, contact a GRINNELL Sales Representative.

See page 39 for fitting specifications.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 212 & 312
22 ½° Elbows

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

Figure 212
22 ½° Cast Elbow

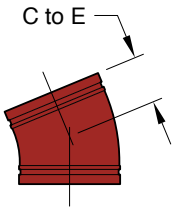
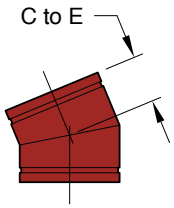


Figure 312
22 ½° Fabricated Elbow



Pipe Size		Figure 212 – Cast			Figure 312 – Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.
32	42.4	212A00042✖	44.5	0.4	–	–	–
1 ¼	1.660		1.75	0.8		–	–
40	48.3	212A00048✖	44.5	0.5	–	–	–
1 ½	1.900		1.75	1.0		–	–
50	60.3	212A00060✖	47.8	0.6	–	–	–
2	2.375		1.88	1.3		–	–
65	73.0	–	–	–	312F00073✖	50.8	0.8
2 ½	2.875		–	–		2.00	1.8
65	76.1	212M00076✖	50.8	0.9	–	–	–
76,1mm	3.000		2.00	2.0		–	–
80	88.9	212A00089✖	57.2	1.3	–	–	–
3	3.500		2.25	2.9		–	–
100	114.3	212A00114✖	66.8	2.1	–	–	–
4	4.500		2.63	4.7		–	–
125	139.7	212M00139✖	73.2	3.1	–	–	–
139,7mm	5.500		2.88	6.9		–	–
125	141.3	–	–	–	312F00141✖	73.2	3.0
5	5.563		–	–		2.88	6.7
150	165.1	–	–	–	312F00165✖	79.5	4.3
165,1mm	6.500		–	–		3.13	9.4
150	168.3	212A00168✖	79.5	4.3	–	–	–
6	6.625		3.13	9.4		–	–
200	219.1	–	–	–	312F00219✖	98.6	8.1
8	8.625		–	–		3.88	17.8
250	273.0	–	–	–	312F00273✖	111.3	6.4
10	10.750		–	–		4.38	14.0
300	323.9	–	–	–	312F00324✖	124.0	10.0
12	12.750		–	–		4.88	22.0
350	355.6	–	–	–	312T00355✖	127.0	20.9
14	14.000		–	–		5.00	46.0
400	406.4	–	–	–	312T00406✖	127.0	23.7
16	16.000		–	–		5.00	52.2
450	457.2	–	–	–	312T00457✖	139.7	29.5
18	18.000		–	–		5.50	65.0
500	508.0	–	–	–	312T00508✖	152.4	36.3
20	20.000		–	–		6.00	80.0
600	609.6	–	–	–	312T00610✖	177.8	50.8
24	24.000		–	–		7.00	112.0

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 211 & 311
11 ¼° Elbows
Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

Figure 211
11 ¼° Cast Elbow

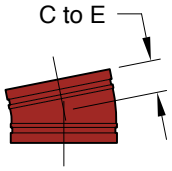
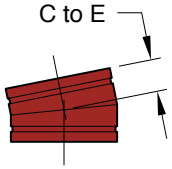


Figure 311
11 ¼° Fabricated Elbow



Pipe Size		Figure 211 - Cast			Figure 311 - Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.
32	42.4	211A00042✖	35.1	0.3	–	–	–
1 ¼	1.660		1.38	0.7		–	–
40	48.3	211A00048✖	35.1	0.4	–	–	–
1 ½	1.900		1.38	0.8		–	–
50	60.3	211A00060✖	35.1	0.5	–	–	–
2	2.375		1.38	1.1		–	–
65	73.0	–	–	–	311F00073✖	38.1	0.6
2 ½	2.875		–	–		1.50	1.3
65	76.1	211M00076✖	38.1	0.7	–	–	–
76,1mm	3.000		1.50	1.7		–	–
80	88.9	211A00089✖	38.1	1.0	–	–	–
3	3.500		1.50	2.2		–	–
100	114.3	211A00114✖	44.5	1.5	–	–	–
4	4.500		1.75	3.4		–	–
125	139.7	211m00139✖	50.8	2.3	–	–	–
139,7mm	5.500		2.00	5.1		–	–
125	141.3	–	–	–	311F00141✖	50.8	2.0
5	5.563		–	–		2.00	4.4
150	165.1	211m00165✖	50.8	2.9	–	–	–
165,1mm	6.500		2.00	6.4		–	–
150	168.3	211A00168✖	50.8	2.9	–	–	–
	6.625		2.00	6.5		–	–
200	219.1	–	–	–	311F00219✖	50.8	4.0
8	8.625		–	–		2.00	8.6
250	273.0	–	–	–	311F00273✖	54.1	4.1
10	10.750		–	–		2.13	9.1
300	323.9	–	–	–	311F00324✖	57.2	7.6
12	12.750		–	–		2.25	16.7
350	355.6	–	–	–	311F00355✖	88.9	14.6
14	14.000		–	–		3.50	32.1
400	406.4	–	–	–	311F00406✖	101.6	19.1
16	16.000		–	–		4.00	42.0
450	457.2	–	–	–	311F00457✖	114.3	24.2
18	18.000		–	–		4.50	53.2
500	508.0	–	–	–	311F00508✖	127.0	29.8
20	20.000		–	–		5.00	65.7
600	609.6	–	–	–	311F00610✖	152.4	43.5
24	24.000		–	–		6.00	96.0

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 219 & 319 Tees

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

Pipe Size		Figure 219 – Cast			Figure 319 – Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	C to E mm Inches	Approx Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx Weight Kg. Lbs.
32	42.4	219M00042✖	69.9	0.8	–	–	–
1 1/4	1.660		2.75	1.7			
40	48.3	219M00048✖	69.9	1.0	–	–	–
1 1/2	1.900		2.75	2.1			
50	60.3	219M00060✖	82.6	1.3	–	–	–
2	2.375		3.25	2.7			
65	73.0	219M00073✖	95.3	2.0	–	–	–
2 1/2	2.875		3.75	4.4			
65	76.1	219M00076✖	95.3	2.9	–	–	–
76,1mm	3.000		3.75	6.5			
80	88.9	219M00089✖	108.0	2.9	–	–	–
3	3.500		4.25	6.5			
100	114.3	219M00114✖	127.0	4.8	–	–	–
4	4.500		5.00	10.7			
125	139.7	219M00139✖	139.7	6.9	–	–	–
139,7mm	5.500		5.50	15.2			
125	141.3	219M00141✖	139.7	7.0	–	–	–
5	5.563		5.50	15.5			
150	165.1	219M00165✖	165.1	11.0	–	–	–
165,1mm	6.500		6.50	24.2			
150	168.3	219M00168✖	165.1	10.4	–	–	–
6	6.625		6.50	23.0			
200	219.1	219M00219✖	196.9	19.8	–	–	–
8	8.625		7.75	43.7			
250	273.0	219M00273✖	228.6	25.9	–	–	–
10	10.750		9.00	57.0			
300	323.9	219M00324✖	254.0	49.9	–	–	–
12	12.750		10.00	110.0			
350	355.6	219M00355✖	279.0	61.2	319T00355✖	329.0	53.6
14	14.000		11.00	135.0		12.95	118.2
400	406.4	219M00406✖	305.0	61.7	319T00406✖	355.0	66.3
16	16.000		12.00	136.0		13.98	146.2
450	457.2	–	–	–	319T00457✖	393.0	99.0
18	18.000					15.47	218.3
500	508.0	–	–	–	319T00508✖	431.0	125.0
20	20.000					16.97	275.6
600	609.6	–	–	–	319T00610✖	482.0	172.0
24	24.000					18.98	379.2

Figure 219
Cast Tee

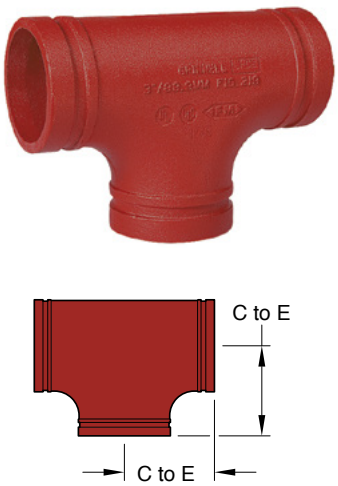
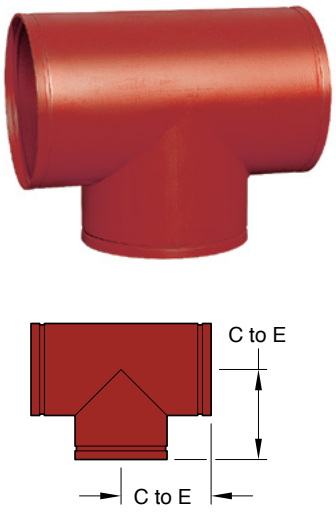


Figure 319
Fabricated Tee

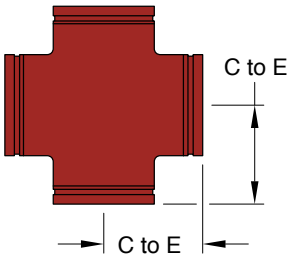


✖ = 1 for red paint finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 227 Cross

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY



Part Number	Pipe Size		C to E	Approx Weight
	Nominal mm Inches	O.D. mm Inches	mm Inches	Kg. Lbs.
227M00042✖	32	42.4	69.9	1.0
	1 1/4	1.660	2.75	2.2
227M00048✖	40	48.3	69.9	1.1
	1 1/2	1.900	2.75	2.5
227M00060✖	50	60.3	82.6	1.7
	2	2.375	3.25	3.7
227M00073✖	65	73.0	95.3	2.6
	2 1/2	2.875	3.75	5.8
227M00076✖	65	76.1	95.3	2.7
	76,1mm	3.000	3.75	6.0
227M00089✖	80	88.9	108.0	3.9
	3	3.500	4.25	8.6
227M00108✖	100	108.0	121.0	5.3
	108.0mm	4.252	4.76	11.7
227M00114✖	100	114.3	127.0	9.4
	4	4.500	5.00	20.7
222M0139✖	125	139.7	139.7	6.8
	139,7mm	5.500	5.50	15.0
327F00141✖	125	141.3	139.7	8.0
	5	5.563	5.50	17.6
327F00165✖	150	165.1	165.1	12.4
	165,1mm	6.500	6.50	27.3
227M00168✖	150	168.3	165.1	13.0
	6	6.625	6.50	28.6
227M00219✖	200	219.1	196.9	21.7
	8	8.625	7.75	48.0
227M002732	250	273.0	228.6	34.0
	10	10.750	9.00	75.0
227M003242	300	323.9	254.0	43.4
	12	12.750	10.00	95.8

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 260 & 360
End Caps

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

Figure 260 Cap
Cast

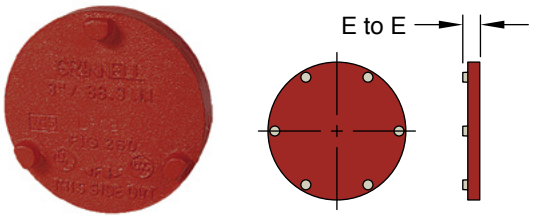


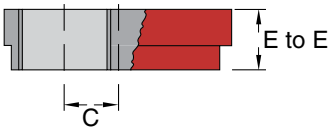
Figure 360 Cap
Fabricated

Pipe Size		Figure 260 - Cast			Figure 360 - Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	E to E mm Inches	Approx Weight Kg. Lbs.	Part Number	E to E mm Inches	Approx Weight Kg. Lbs.
25	33.7	260m00034✖	21.1	0.1	–	–	–
1	1.315		0.83	0.2		–	–
32	42.4	260m00042✖	21.1	0.1	–	–	–
1 1/4	1.660		0.83	0.3		–	–
40	48.3	260m00048✖	21.1	0.2	–	–	–
1 1/2	1.900		0.83	0.4		–	–
50	60.3	260M00060✖	23.4	0.3	–	–	–
2	2.375		0.92	0.7		–	–
65	73.0	260M00073✖	23.4	0.5	–	–	–
2 1/2	2.875		0.92	1.0		–	–
65	76.1	260M00076✖	21.8	0.6	–	–	–
76,1mm	3.000		0.86	1.3		–	–
80	88.9	260M00089✖	23.4	0.6	–	–	–
3	3.500		0.92	1.4		–	–
100	114.3	260M00114✖	25.4	1.2	–	–	–
4	4.500		1.00	2.6		–	–
125	139.7	260M00139✖	23.4	2.1	–	–	–
139,7mm	5.500		0.92	4.7		–	–
125	141.3	260M00141✖	25.4	2.3	–	–	–
5	5.563		1.00	5.0		–	–
125	159.0	260M00159✖	25.0	3.8	–		
159,0mm	6.260		0.98	8.4			
150	165.1	260M00165✖	23.4	2.9	–	–	–
165,1mm	6.500		0.92	6.4		–	–
150	168.3	260M00168✖	25.4	2.8	–	–	–
6	6.625		1.00	6.2		–	–
200	219.1	260M00219✖	27.0	3.2	–	–	–
8	8.625		1.06	7.1		–	–
250	273.0	260m00273✖	25.8	11.1	–	–	–
10	10.750		1.02	24.5		–	–
300	323.9	260m00324✖	25.8	14.1	–	–	–
12	12.750		1.02	31.0		–	–
350	355.6	–	–	–	360T00355✖	154.0	16.6
14	14.000		–	–		6.06	36.6
400	406.4	–	–	–	360T00406✖	228.6	19.7
16	16.000		–	–		9.00	43.5
450	457.2	–	–	–	360T00457✖	173.0	25.6
18	18.000		–	–		6.81	56.4
500	508.0	–	–	–	360T00508✖	279.4	34.3
20	20.000		–	–		11.00	75.7
600	609.6	–	–	–	360T00610✖	205.0	45.8
24	24.000		–	–		8.07	101.0

✖ = 1 for red paint (RAL 3000) finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 361, 362, 363, 364 & 365
End Caps with ISO R7 Threaded Outlets

10 YEAR LIMITED WARRANTY



Pipe Size		E to E	Fig. 363 – DN20 ¾"			
Nominal mm In.	O.D. mm In.	mm In.	Part Number	C mm In.	Outlet size ISO R7 In.	Approx. Weight Kg. Lbs.
50	60.3	25	363M00060✖	–	DN20	0.2
2	2.375	0.98		–	¾	0.4
65	76.1	25	363M00076✖	9	DN20	0.4
76.1mm	3.000	0.98		0.35	¾	0.9
80	88.9	25	363M00089✖	15	DN20	0.5
3	3.500	0.98		0.59	¾	1.1
100	114.3	25	363M00114✖	28	DN20	1.3
4	4.500	0.98		1.10	¾	2.9
125	139.7	25	363M00139✖	40	DN20	1.8
139.7mm	5.500	0.98		1.57	¾	4.0
125	141.3	25	363M00141✖	41	DN20	1.8
5	5.563	0.98		1.61	¾	4.0
150	165.1	25	363M00165✖	53	DN20	2.7
165.1mm	6.500	0.98		2.09	¾	6.0
150	168.3	25	363M00168✖	54	DN20	2.7
6	6.625	0.98		2.13	¾	6.0
200	219.1	31	363M00219✖	79	DN20	5.0
8	8.625	1.22		3.11	¾	11.0

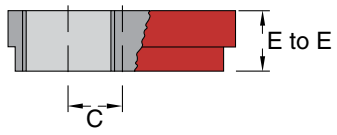
✖ = 1 for red paint (RAL 3000) finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Pipe Size		E to E	Fig. 364 – DN25 1"				Fig. 365 – DN32 1 ¼"			
Nominal mm In.	O.D. mm In.	mm In.	Part Number	C mm In.	Outlet size ISO R7 In.	Approx. Weight Kg. Lbs.	Part Number	C mm In.	Outlet size ISO R7 In.	Approx. Weight Kg. Lbs.
50	60.3	25	364M00060✖	–	DN25	0.2	365M00060✖	–	DN32	0.2
2	2.375	0.98		–	1	0.4		–	1 ¼	0.4
65	76.1	25	364M00076✖	9	DN25	0.4	365M00076✖	9	DN32	0.4
76.1mm	3.000	0.98		0.35	1	0.9		0.35	1 ¼	0.9
80	88.9	25	364M00089✖	15	DN25	0.5	365M00089✖	15	DN32	0.5
3	3.500	0.98		0.59	1	1.1		0.59	1 ¼	1.1
100	114.3	25	364M00114✖	28	DN25	1.3	365M00114✖	28	DN32	1.3
4	4.500	0.98		1.10	1	2.9		1.10	1 ¼	2.9
125	139.7	25	364M00139✖	40	DN25	1.8	365M00139✖	40	DN32	1.8
139.7mm	5.500	0.98		1.57	1	4.0		1.57	1 ¼	4.0
125	141.3	25	364M00141✖	41	DN25	1.8	–	–	–	–
5	5.563	0.98		1.61	1	4.0		–	–	–
150	165.1	25	364M00165✖	53	DN25	2.7	365M00165✖	53	DN32	2.7
165.1mm	6.500	0.98		2.09	1	6.0		2.09	1 ¼	6.0
150	168.3	25	364M00168✖	54	DN25	2.7	365M00168✖	54	DN32	2.7
6	6.625	0.98		2.13	1	6.0		2.13	1 ¼	6.0
200	219.1	31	364M00219✖	79	DN25	5.0	365M00219✖	79	DN32	5.0
8	8.625	1.22		3.11	1	11.0		3.11	1 ¼	11.0

✖ = 1 for red paint (RAL 3000) finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 361, 362, 363, 364 & 365
End Caps with ISO R7 Threaded Outlets (Continued)

10 YEAR LIMITED WARRANTY



Pipe Size		E to E mm In.	Fig. 361 – DN40 1 ½"				Fig. 362 – DN50 2"			
Nominal mm In.	O.D. mm In.		Part Number	C mm In.	Outlet size ISO R7 In.	Approx. Weight Kg. Lbs.	Part Number	C mm In.	Outlet size ISO R7 In.	Approx. Weight Kg. Lbs.
50	60.3	25	361m00060✖	-	DN40	0.2	–	-	-	-
2	2.375	0.98		-	1 ½	0.4		-	-	-
65	76.1	25	361M00076✖	9	DN40	0.4	362M00076✖	4	DN50	0.3
76.1mm	3.000	0.98		0.35	1 ½	0.9		0.16	2	0.7
80	88.9	25	361M00089✖	15	DN40	0.5	362M00089✖	9	DN50	1.3
3	3.500	0.98		0.59	1 ½	1.1		0.35	2	2.9
100	114.3	25	361M00114✖	28	DN40	1.3	362M00114✖	22	DN50	1.3
4	4.500	0.98		1.10	1 ½	2.9		0.87	2	2.9
125	139.7	25	361M00139✖	40	DN40	1.8	362M00139✖	34	DN50	1.8
139.7mm	5.500	0.98		1.57	1 ½	4.0		1.34	2	4.0
125	141.3	25	361M00141✖	41	DN40	1.8	362M00141✖	34	DN50	1.8
5	5.563	0.98		1.61	1 ½	4.0		1.34	2	4.0
150	165.1	25	361M00165✖	53	DN40	2.7	362M00165✖	47	DN50	2.7
165.1mm	6.500	0.98		2.09	1 ½	6.0		1.85	2	6.0
150	168.3	25	361M00168✖	54	DN40	2.7	362M00168✖	48	DN50	2.7
6	6.625	0.98		2.13	1 ½	6.0		1.89	2	6.0
200	219.1	31	361M00219✖	79	DN40	5.0	362M00219✖	73	DN50	5.0
8	8.625	1.22		3.11	1 ½	11.0		2.87	2	11.0
250	273.0	31	361m00273✖	90	DN40	7.2	362m00273✖	90	DN50	7.2
10	10.750	1.22		3.54	1 ½	15.9		3.54	2	15.9

✖ = 1 for red paint (RAL 3000) finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 221 & 321
Reducing Tees

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

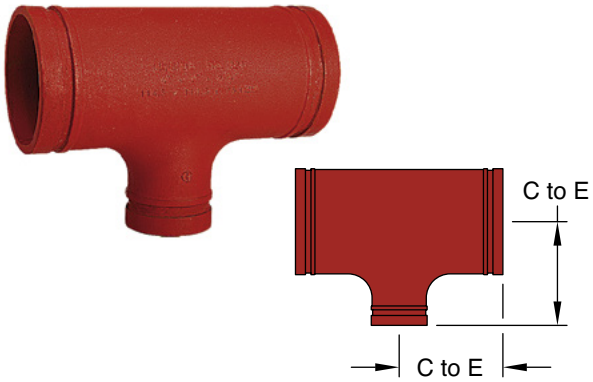


Figure 221 Reducing Tee Cast

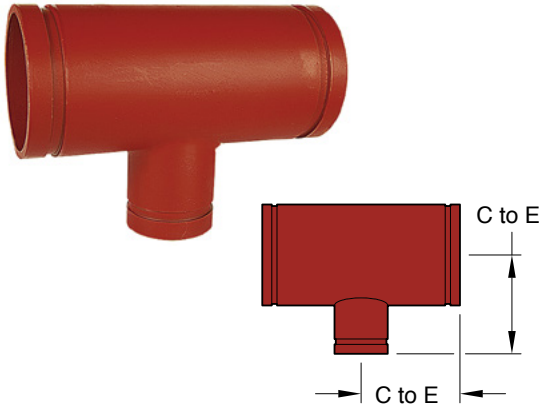


Figure 321 Reducing Tee Fabricated

Pipe Size		Figure 221 - Cast			Figure 321 - Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.
50 x 50 x 25	60.3 x 60.3 x 33.7	–	–	–	321F02010✖	88.6	0.74
2 x 2 x 1	2.375 x 2.375 x 1.315		–	–		3.25	1.6
50 x 50 x 40	60.3 x 60.3 x 48.3	221M02015✖	82.6	1.2	–	–	–
2 x 2 x 1 1/2	2.375 x 2.375 x 1.900		3.25	2.7		–	–
65 x 65 x 50	73.0 x 73.0 x 60.3	221m02520✖	95.3	1.9	–	–	–
2 1/2 x 2 1/2 x 2	2.875 x 2.875 x 2.375		3.75	4.2		–	–
65 x 65 x 40	76.1 x 76.1 x 48.3	221m02615✖	95.3	2.0	–	–	–
76,1mm x 76,1mm x 1 1/2	3.000 x 3.000 x 1.900		3.75	4.5		–	–
65 x 65 x 50	76.1 x 76.1 x 60.3	221m02620✖	95.3	2.0	–	–	–
76,1mm x 76,1mm x 2	3.000 x 3.000 x 2.375		3.75	4.3		–	–
80 x 80 x 25	88.9 x 88.9 x 33.7	221m03010✖	108.0	2.5	–	–	–
3 x 3 x 1	3.500 x 3.500 x 1.315		4.25	5.6		–	–
80 x 80 x 40	88.9 x 88.9 x 48.3	–	–	–	321F03015✖	108.0	2.5
3 x 3 x 1 1/2	3.500 x 3.500 x 1.900		–	–		4.25	5.6
80 x 80 x 50	88.9 x 88.9 x 60.3	221m03020✖	108.0	2.7	–	–	–
3 x 3 x 2	3.500 x 3.500 x 2.375		4.25	6.0		–	–
80 x 80 x 65	88.9 x 88.9 x 73.0	221m03025✖	108.0	2.8	–	–	–
3 x 3 x 2 1/2	3.500 x 3.500 x 2.875		4.25	6.2		–	–
80 x 80 x 65	88.9 x 88.9 x 76.1	221m03026✖	108.0	2.7	–	–	–
3 x 3 x 76,1mm	3.500 x 3.500 x 3.000		4.25	6.0		–	–
100 x 100 x 50	114.3 x 114.3 x 60.3	221m04220✖	127.0	4.1	–	–	–
4 x 4 x 2	4.500 x 4.500 x 2.375		5.00	9.1		–	–
100 x 100 x 65	114.3 x 114.3 x 73.0	221m04225✖	127.0	4.3	–	–	–
4 x 4 x 2 1/2	4.500 x 4.500 x 2.875		5.00	9.5		–	–
100 x 100 x 65	114.3 x 114.3 x 76.1	221m04226✖	127.0	4.3	–	–	–
4 x 4 x 76,1mm	4.500 x 4.500 x 3.000		5.00	9.5		–	–
100 x 100 x 80	114.3 x 114.3 x 88.9	221m04230✖	127.0	4.4	–	–	–
4 x 4 x 3	4.500 x 4.500 x 3.500		5.00	9.7		–	–
125 x 125 x 80	139.7 x 139.7 x 76.1	–	–	–	321F05226✖	139.7	6.6
139,7 x 139,7 x 76,1mm	5.500 x 5.500 x 3.000		–	–		5.50	14.5
125 x 125 x 80	139.7 x 139.7 x 88.9	221m05230✖	139.7	5.8	–	–	–
139,7 x 139,7mm x 3	5.500 x 5.500 x 3.500		5.50	12.7		–	–
125 x 125 x 100	139.7 x 139.7 x 114.3	221m05242✖	139.7	6.1	–	–	–
139,7 x 139,7mm x 4	5.500 x 5.500 x 4.500		5.50	13.4		–	–

Figures 221 & 321
Reducing Tees

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

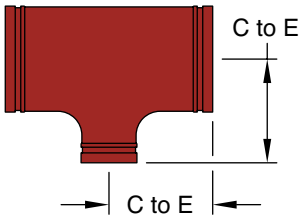


Figure 221 Reducing Tee Cast

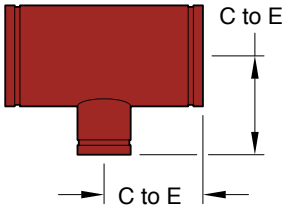


Figure 321 Reducing Tee Fabricated

Pipe Size		Figure 221 – Cast			Figure 321 – Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.
125 x 125 x 65	141.3 x 141.3 x 73.0	–	–	–	321F05325✖	139.7	6.4
5 x 5 x 2 1/2	5.563 x 5.563 x 2.875		–	–		5.50	14.0
125 x 125 x 80	141.3 x 141.3 x 88.9	–	–	–	321F05330✖	139.7	6.5
5 x 5 x 3	5.563 x 5.563 x 3.500		–	–		5.50	14.3
125 x 125 x 100	141.3 x 141.3 x 114.3	–	–	–	321F05342✖	139.7	6.7
5 x 5 x 4	5.563 x 5.563 x 4.500		–	–		5.50	14.8
150 x 150 x 50	165.1 x 165.1 x 60.3	–	–	–	321F06220✖	165.1	11.9
165,1 x 165,1mm x 2	6.500 x 6.500 x 2.375		–	–		6.50	26.2
150 x 150 x 65	165.1 x 165.1 x 76.1	–	–	–	321F06226✖	165.1	12.1
165,1 x 165,1 x 76,1mm	6.500 x 6.500 x 3.000		–	–		6.50	26.7
150 x 150 x 80	165.1 x 165.1 x 88.9	221M06230✖	165.1	8.2		–	–
165,1 x 165,mm x 3	6.500 x 6.500 x 3.500		6.50	18.0		–	–
150 x 150 x 100	165.1 x 165.1 x 114.3	221M06242✖	165.1	8.9	–	–	–
165,1 x 165,mm x 4	6.500 x 6.500 x 4.500		6.50	19.5		–	–
150 x 150 x 50	168.3 x 168.3 x 60.3	221M06320✖	165.1	8.8	–	–	–
6 x 6 x 2	6.625 x 6.625 x 2.375		6.50	19.4		–	–
150 x 150 x 65	168.3 x 168.3 x 73.0	221M06325✖	165.1	9.8	–	–	–
6 x 6 x 2 1/2	6.625 x 6.625 x 2.875		6.50	21.2		–	–
150 x 150 x 65	168.3 x 168.3 x 76.1	221M06326✖	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 80	168.3 x 168.3 x 88.9	221M06330✖	165.1	9.5	–	–	–
6 x 6 x 3	6.625 x 6.625 x 3.500		6.50	21.0		–	–
150 x 150 x 100	168.3 x 168.3 x 114.3	221M06342✖	165.1	9.9	–	–	–
6 x 6 x 4	6.625 x 6.625 x 4.500		6.50	21.8		–	–
150 x 150 x 125	168.3 x 168.3 x 139.7	221M06352✖	165.1	10.4	–	–	–
6 x 6 x 139,7mm	6.625 x 6.625 x 5.500		6.50	23.0		–	–
200 x 200 x 100	219.1 x 219.1 x 114.1	221A08042✖	196.9	16.9	–	–	–
8 x 8 x 4	8.625 x 8.625 x 4.500		7.75	37.2		–	–
200 x 200 x 125	219.1 x 219.1 x 139.7	221M08052✖	196.9	17.1	–	–	–
8 x 8 x 139,7mm	8.625 x 8.625 x 5.500		7.75	37.7		–	–
200 x 200 x 150	219.1 x 219.1 x 165.1	221M08062✖	196.9	17.1	–	–	–
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 168.3	221A08063✖	196.9	17.0	–	–	–
8 x 8 x 6	8.625 x 8.625 x 6.625		7.75	37.4		–	–
250 x 250 x 50	273.0 x 273.0 x 60.3	–	–	–	321T01120✖	228.0	29.0
10 x 10 x 2	10.750 x 10.750 x 2.375		–	–		8.98	63.9
250 x 250 x 80	273.0 x 273.0 x 88.9	–	–	–	321T01130✖	228.0	29.0
10 x 10 x 3	10.750 x 10.750 x 3.500		–	–		8.98	63.9
250 x 250 x 100	273.0 x 273.0 x 114.3	221M01142✖	228.6	29.9	321T01142✖	228.0	29.0
10 x 10 x 4	10.750 x 10.750 x 4.500		9.00	65.9		8.98	63.9
250 x 250 x 125	273.0 x 273.0 x 139.7	–	–	–	321F01152✖	228.6	26.2
10 x 10 x 139,7mm	10.750 x 10.750 x 5.500		–	–		9.00	57.8
250 x 250 x 150	273.0 x 273.0 x 165.1	–	–	–	321F01162✖	228.6	26.2
10 x 10 x 165,1mm	10.750 x 10.750 x 6.500		–	–		9.00	57.8
250 x 250 x 150	273.0 x 273.0 x 168.3	221M01163✖	228.6	30.8	321T01163✖	228.0	29.0
10 x 10 x 6	10.750 x 10.750 x 6.625		9.00	67.9		8.98	63.9

Figures 221 & 321
Reducing Tees

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

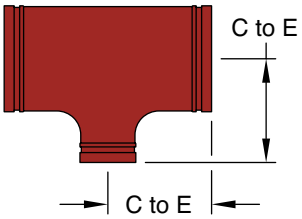


Figure 221 Reducing Tee Cast

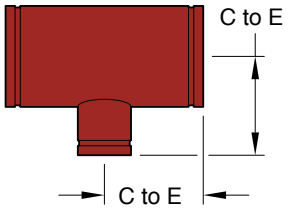


Figure 321 Reducing Tee Fabricated

Pipe Size		Figure 221 – Cast			Figure 321 – Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.
250 x 250 x 200	273.0 x 273.0 x 219.1	221M01180✖	228.6	31.8	321T01180✖	228.0	29.0
10 x 10 x 8	10.750 x 10.750 x 8.625		9.00	70.1		8.98	63.9
300 x 300 x 80	323.9 x 323.9 x 88.9	–	–	–	321T01330✖	253.0	40.0
12 x 12 x 3	12.750 x 12.750 x 3.500		–	–		9.96	88.2
300 x 300 x 100	323.9 x 323.9 x 114.3	–	–	–	321T01342✖	253.0	40.0
12 x 12 x 4	12.750 x 12.750 x 4.500		–	–		9.96	88.2
300 x 300 x 125	323.9 x 323.9 x 139.7	–	–	–	321F01352✖	254.0	40.0
12 x 12 x 139,7mm	12.750 x 12.750 x 5.500		–	–		10.00	88.2
300 x 300 x 150	323.9 x 323.9 x 165.1	–	–	–	321F01362✖	254.0	36.7
12 x 12 x 165,1mm	12.750 x 12.750 x 6.500		–	–		10.00	80.9
300 x 300 x 150	323.9 x 323.9 x 168.3	–	–	–	321T01363✖	253.0	40.0
12 x 12 x 6	12.750 x 12.750 x 6.625		–	–		9.96	88.2
300 x 300 x 200	323.9 x 323.9 x 219.1	–	–	–	321T01380✖	253.0	40.0
12 x 12 x 8	12.750 x 12.750 x 8.625		–	–		9.96	88.2
300 x 300 x 250	323.9 x 323.9 x 273.0	–	–	–	321T01311✖	253.0	40.0
12 x 12 x 10	12.750 x 12.750 x 10.750		–	–		9.96	88.2
350 x 350 x 100	355.6 x 355.6 x 114.3	–	–	–	321T01442✖	279.4	46.9
14 x 14 x 4	14.000 x 14.000 x 4.500		–	–		11.00	103.3
350 x 350 x 150	355.6 x 355.6 x 168.3	–	–	–	321T01463✖	380.0	45.2
14 x 14 x 6	14.000 x 14.000 x 6.625		–	–		14.96	99.6
350 x 350 x 200	355.6 x 355.6 x 219.1	–	–	–	321T01480✖	380.0	45.2
14 x 14 x 8	14.000 x 14.000 x 8.625		–	–		14.96	99.6
350 x 350 x 250	355.6 x 355.6 x 273.0	–	–	–	321T01411✖	380.0	45.2
14 x 14 x 10	14.000 x 14.000 x 10.750		–	–		14.96	99.6
350 x 350 x 300	355.6 x 355.6 x 323.9	–	–	–	321T01413✖	380.0	45.2
14 x 14 x 12	14.000 x 14.000 x 12.750		–	–		14.96	99.6
400 x 400 x 100	406.4 x 406.4 x 114.3	–	–	–	321T01642✖	406.0	59.2
16 x 16 x 4	16.000 x 16.000 x 4.500		–	–		15.98	130.5
400 x 400 x 150	406.4 x 406.4 x 168.3	–	–	–	321T01663✖	406.0	59.2
16 x 16 x 6	16.000 x 16.000 x 6.625		–	–		15.98	130.5
400 x 400 x 200	406.4 x 406.4 x 219.1	–	–	–	321T01680✖	406.0	59.2
16 x 16 x 8	16.000 x 16.000 x 8.625		–	–		15.98	130.5
400 x 400 x 250	406.4 x 406.4 x 273.0	–	–	–	321T01611✖	406.0	59.2
16 x 16 x 10	16.000 x 16.000 x 10.750		–	–		15.98	130.5
400 x 400 x 300	406.4 x 406.4 x 323.9	–	–	–	321T01613✖	406.0	59.2
16 x 16 x 12	16.000 x 16.000 x 12.750		–	–		15.98	130.5
400 x 400 x 350	406.4 x 406.4 x 355.6	–	–	–	321T01614✖	406.0	59.2
16 x 16 x 14	16.000 x 16.000 x 14.000		–	–		15.98	130.5
450 x 450 x 150	457.2 x 457.2 x 168.3	–	–	–	321T01863✖	431.0	85.0
18 x 18 x 6	18.000 x 18.000 x 6.625		–	–		16.97	187.4
450 x 450 x 200	457.2 x 457.2 x 219.1	–	–	–	321T01880✖	431.0	85.0
18 x 18 x 8	18.000 x 18.000 x 8.625		–	–		16.97	187.4
450 x 450 x 250	457.2 x 457.2 x 273.0	–	–	–	321T01811✖	431.0	85.0
18 x 18 x 10	18.000 x 18.000 x 10.750		–	–		16.97	187.4
450 x 450 x 300	457.2 x 457.2 x 323.9	–	–	–	321T01813✖	431.0	85.0
18 x 18 x 12	18.000 x 18.000 x 12.750		–	–		16.97	187.4

Figures 221 & 321
Reducing Tees

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

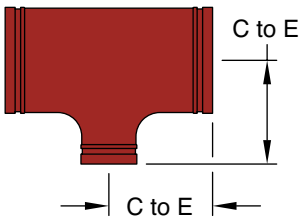


Figure 221 Reducing Tee Cast

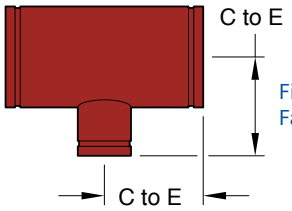


Figure 321 Reducing Tee Fabricated

Pipe Size		Figure 221 - Cast			Figure 321 - Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	C to E mm Inches	Approx. Weight Kg. Lbs.
450 x 450 x 350	457.2 x 457.2 x 355.6	–	–	–	321T01814✖	431.0	85.0
18 x 18 x 14	18.000 x 18.000 x 14.000		–	–		16.97	187.4
450 x 450 x 400	457.2 x 457.2 x 406.4	–	–	–	321T01816✖	431.0	85.0
18 x 18 x 16	18.000 x 18.000 x 16.000		–	–		16.97	187.4
500 x 500 x 150	508.0 x 508.0 x 168.3	–	–	–	321T02163✖	558.0	120.0
20 x 20 x 6	20.000 x 20.000 x 6.625		–	–		21.97	264.6
500 x 500 x 200	508.0 x 508.0 x 219.1	–	–	–	321T02180✖	558.0	120.0
20 x 20 x 8	20.000 x 20.000 x 8.625		–	–		21.97	264.6
500 x 500 x 250	508.0 x 508.0 x 273.0	–	–	–	321T02111✖	558.0	120.0
20 x 20 x 10	20.000 x 20.000 x 10.750		–	–		21.97	264.6
500 x 500 x 300	508.0 x 508.0 x 323.9	–	–	–	321T02113✖	558.0	120.0
20 x 20 x 12	20.000 x 20.000 x 12.750		–	–		21.97	264.6
500 x 500 x 350	508.0 x 508.0 x 355.6	–	–	–	321T02114✖	558.0	120.0
20 x 20 x 14	20.000 x 20.000 x 14.000		–	–		21.97	264.6
500 x 500 x 400	508.0 x 508.0 x 406.4	–	–	–	321T02116✖	558.0	120.0
20 x 20 x 16	20.000 x 20.000 x 16.000		–	–		21.97	264.6
500 x 500 x 450	508.0 x 508.0 x 457.2	–	–	–	321T02118✖	558.0	120.0
20 x 20 x 18	20.000 x 20.000 x 18.000		–	–		21.97	264.6
600 x 600 x 200	609.6 x 609.6 x 219.1	–	–	–	321T02480✖	558.0	162.0
24 x 24 x 8	24.000 x 24.000 x 8.625		–	–		21.97	357.1
600 x 600 x 250	609.6 x 609.6 x 273.0	–	–	–	321T02411✖	558.0	162.0
24 x 24 x 10	24.000 x 24.000 x 10.750		–	–		21.97	357.1
600 x 600 x 300	609.6 x 609.6 x 323.9	–	–	–	321T02413✖	558.0	162.0
24 x 24 x 12	24.000 x 24.000 x 12.750		–	–		21.97	357.1
600 x 600 x 350	609.6 x 609.6 x 355.6	–	–	–	321T02414✖	558.0	162.0
24 x 24 x 14	24.000 x 24.000 x 14.000		–	–		21.97	357.1
600 x 600 x 400	609.6 x 609.6 x 406.4	–	–	–	321T02416✖	558.0	162.0
24 x 24 x 16	24.000 x 24.000 x 16.000		–	–		21.97	357.1
600 x 600 x 450	609.6 x 609.6 x 457.2	–	–	–	321T02418✖	558.0	162.0
24 x 24 x 18	24.000 x 24.000 x 18.000		–	–		21.97	357.1
600 x 600 x 500	609.6 x 609.6 x 508.0	–	–	–	321T02421✖	558.0	162.0
24 x 24 x 20	24.000 x 24.000 x 20.000		–	–		21.97	357.1

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish

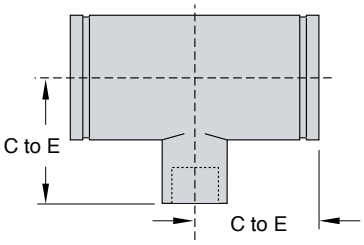
For information on alternative sizes, contact a GRINNELL Sales Representative.

See page 39 for fitting specifications.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 322 Reducing Tees
(Groove x Groove x Female BSP Thread)

10 YEAR LIMITED WARRANTY

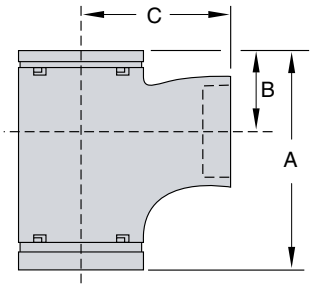


Part Number	Pipe Size		C to GE & C to TE mm Inches	Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches		
322f020202	50 x 50 x 50	60.3 x 60.3 x 60.3 ISO R7	82.6	1.2
	2 x 2 x 2	2.375 x 2.375 x 2.375	3.25	2.6
322f026202	65 x 65 x 50	76.1 x 76.1 x 60.3 ISO R7	95.2	1.8
	76.1 x 76.1mm x 2	3.000 x 3.000 x 2.375	3.75	4.0
322f026252	65 x 65 x 50	76.1 x 76.1 x 76.1 ISO R7	95.2	1.9
	76.1 x 76.1 x 76.1mm	3.000 x 3.000 x 3.000	3.75	4.2
322f030202	80 x 80 x 50	88.9 x 88.9 x 60.3 ISO R7	108.0	2.2
	3 x 3 x 2	3.500 x 3.500 x 2.375	4.25	4.9
322f030252	80 x 80 x 65	88.9 x 88.9 x 73.0 ISO R7	108.0	2.3
	3 x 3 x 2 1/2	3.500 x 3.500 x 2.875	4.25	5.1
322f042202	100 x 100 x 50	114.3 x 114.3 x 60.3 ISO R7	127.0	2.6
	4 x 4 x 2	4.500 x 4.500 x 2.375	5.00	5.7
322f042262	100 x 100 x 65	114.3 x 114.3 x 76.1 ISO R7	127.0	2.8
	4 x 4 x 76.1mm	4.500 x 4.500 x 3.00	5.00	6.2

Only available in hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 222 Hydrant Tee
(Groove x Groove X Female BSP Thread)

10 YEAR LIMITED WARRANTY



Part Number	Pipe Size		Hydrant Outlet ISO	Max. Working Pressure psi Bar	A mm In.	B mm In.	C mm In.	Approx. Weight Kg. Lbs.
	Nominal Size DN In.	Pipe OD mm In.						
222V42262	100	114.3	R7	20.7	190	70	133	4.6
	4	4.500	DN65	300	7.48	2.76	5.24	10.1

Available in hot dipped galvanising only.
See page 39 for fitting specifications.
For information on alternative sizes, contact a GRINNELL Sales Representative.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 250 & 350
Concentric Reducers
Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

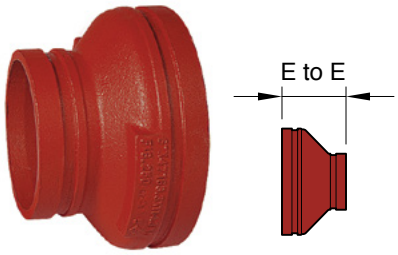


Figure 250
Concentric Reducer Cast

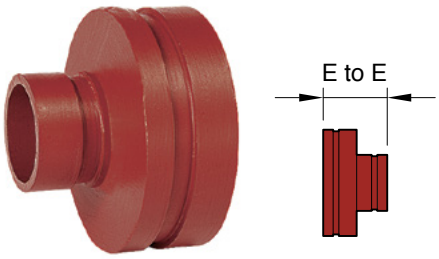


Figure 350
Concentric Reducer Fabricated

Pipe Size		Figure 250 – Cast			Figure 350 – Fabricated		
Nominal DN In.	O.D. mm In.	Part Number	E to E mm In.	Approx. Weight kg Lbs.	Part Number	E to E mm In.	Approx. Weight kg Lbs.
32 x 25	42.4 x 33.7	250M01210✖	63.5	0.3	–	–	–
1-¼ x 1	1.660 x 1.315		2.50	0.7		–	–
40 x 25	48.3 x 33.7	250M01510✖	63.5	0.3	–	–	–
1-½ x 1	1.900 x 1.315		2.50	0.7		–	–
40 x 32	48.3 x 42.4	250A01512✖	63.5	0.3	–	–	–
1-½ x 1-¼	1.900 x 1.660		2.50	0.8		–	–
50 x 25	60.3 x 33.7	250M02010✖	63.5	0.4	–	–	–
2 x 1	2.375 x 1.315		2.50	0.9		–	–
50 x 32	60.3 x 42.4	250M02012✖	63.5	0.4	–	–	–
2 x 1-¼	2.375 x 1.660		2.50	0.9		–	–
50 x 40	60.3 x 48.3	250M02015✖	63.5	0.5	–	–	–
2 x 1-½	2.375 x 1.900		2.50	1.0		–	–
65 x 25	73.0 x 33.7	–	–	–	350F02610✖	63.5	0.5
2-½ x 1	2.875 x 1.315		–	–		2.50	1.2
65 x 50	73.0 x 60.3	250M02520✖	63.5	0.6	–	–	–
2-½ x 2	2.875 x 2.375		2.50	1.3		–	–
65 x 32	76.1 x 42.4	250M02612✖	63.5	0.6	–	–	–
76.1mm x 1-¼	3.000 x 1.660		2.50	1.4		–	–
65 x 40	76.1 x 48.3	250M02615✖	63.5	0.6	–	–	–
76.1mm x 1-½	3.000 x 1.900		2.50	1.4		–	–
65 x 50	76.1 x 60.3	250M02620✖	63.5	0.7	–	–	–
76.1mm x 2	3.000 x 2.375		2.50	1.5		–	–
80 x 40	88.9 x 48.3	250A03015✖	63.5	0.8	–	–	–
3 x 1-½	3.500 x 1.900		2.50	1.8		–	–
80 x 50	88.9 x 60.3	250M03020✖	63.5	0.8	–	–	–
3 x 2	3.500 x 2.375		2.50	1.7		–	–
80 x 65	88.9 x 73.0	250M03025✖	63.5	0.8	–	–	–
3 x 2-½	3.500 x 2.875		2.50	1.7		–	–
80 x 65	88.9 x 76.1	250M03026✖	63.5	0.9	–	–	–
3 x 76.1mm	3.500 x 3.000		2.50	2.0		–	–
100 x 50	114.3 x 60.3	250M04220✖	76.2	1.1	–	–	–
4 x 2	4.500 x 2.375		3.00	2.4		–	–
100 x 65	114.3 x 73.0	250M04225✖	76.2	1.2	–	–	–
4 x 2-½	4.500 x 2.875		3.00	2.7		–	–
100 x 65	114.3 x 76.1	250M04226✖	76.2	1.5	–	–	–
4 x 76.1mm	4.500 x 3.000		3.00	3.2		–	–
100 x 80	114.3 x 88.9	250M04230✖	76.2	1.3	–	–	–
4 x 3	4.500 x 3.500		3.00	2.8		–	–
100 x 100	114.3 x 108.0	–	–	–	350F04241✖	140.0	1.5
4 x 108.0mm	4.500 x 4.252		–	–		5.51	3.3
125 x 80	139.7 x 88.9	250M05230✖	88.9	1.9	–	–	–
139.7mm x 3	5.500 x 3.500		3.50	4.2		–	–
125 x 100	139.7 x 114.3	250M05242✖	88.9	2.0	–	–	–
139.7mm x 4	5.500 x 4.500		3.50	4.4		–	–
125 x 100	141.3 x 114.3	250M05342✖	88.9	2.0	–	–	–
5 x 4	5.563 x 4.500		3.50	4.4		–	–
150 x 80	165.1 x 88.9	250M06230✖	101.6	2.5	–	–	–
165.1mm x 3	6.500 x 3.500		4.00	5.5		–	–
150 x 100	165.1 x 114.3	250M06242✖	101.6	2.7	–	–	–
165.1mm x 4	6.500 x 4.500		4.00	6.0		–	–
150 x 125	165.1 x 139.7	250M06252✖	101.6	2.5	–	–	–
165.1 x 139.7mm	6.500 x 5.500		4.00	5.6		–	–
150 x 50	168.3 x 60.3	250M06320✖	101.6	2.7	–	–	–
6 x 2	6.625 x 2.375		4.00	6.1		–	–

Figures 250 & 350 Concentric Reducers

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

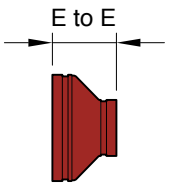


Figure 250
Cast Concentric
Reducer

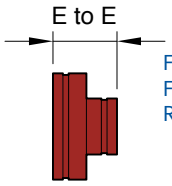


Figure 350
Fabricated Concentric
Reducer

Pipe Size		Figure 250 – Cast			Figure 350 – Fabricated		
Nominal DN In.	O.D. mm In.	Part Number	E to E mm In.	Approx. Weight kg Lbs.	Part Number	E to E mm In.	Approx. Weight kg Lbs.
150 x 65	168.3 x 76.1	250M06326✖	101.6	2.7	–	–	–
6 x 76.1mm	6.625 x 3.000		4.00	6.1		–	–
150 x 80	168.3 x 88.9	250A06330✖	101.6	2.6	–	–	–
6 x 3	6.625 x 3.500		4.00	5.8		–	–
150 x 100	168.3 x 114.3	250M06342✖	101.6	2.7	–	–	–
6 x 4	6.625 x 4.500		4.00	6.0		–	–
150 x 125	168.3 x 139.7	250M06352✖	101.6	2.3	–	–	–
6 x 139.7mm	6.625 x 5.500		4.00	6.3		–	–
150 x 125	168.3 x 141.3	250M06353✖	101.6	2.8	–	–	–
6 x 5	6.625 x 5.563		4.00	6.2		–	–
150 x 125	168.3 x 159.0	–	–	–	350F06361✖	140.0	3.2
6 x 159.0mm	6.625 x 6.260		–	–		5.00	7.1
150 x 150	168.3 x 165.1	–	–	–	350F06362✖	127.0	5.5
6 x 165.1mm	6.625 x 6.500		–	–		5.00	12.1
200 x 100	219.1 x 114.3	250A08042✖	127.0	4.9	–	–	–
8 x 4	8.625 x 4.500		5.00	10.7		–	–
200 x 125	219.1 x 139.7	250M08052✖	127.0	4.5	–	–	–
8 x 139.7mm	8.625 x 5.500		5.00	10.0		–	–
200 x 125	219.1 x 141.3	–	127.0	4.9	350F08053✖	–	–
8 x 5	8.625 x 5.563		5.00	10.8		–	–
200 x 150	219.1 x 165.1	250M08062✖	127.0	5.0	–	–	–
8 x 165.1mm	8.625 x 6.500		5.00	11.0		–	–
200 x 150	219.1 x 168.3	250A08063✖	127.0	5.1	–	–	–
8 x 6	8.625 x 6.625		5.00	11.3		–	–
250 x 100	273.0 x 114.3	–	–	–	350F01142✖	152.4	9.3
10 x 4	10.750 x 4.500		–	–		6.00	20.5
250 x 125	273.0 x 139.7	–	–	–	350F01152✖	152.4	9.1
10 x 139.7mm	10.750 x 5.500		–	–		6.00	20.1
250 x 150	273.0 x 165.1	250M01162✖	152.4	8.0	–	–	–
10 x 165.1mm	10.750 x 6.500		6.00	17.8		–	–
250 x 150	273.0 x 168.3	250A01163✖	152.4	7.4	–	–	–
10 x 6	10.750 x 6.625		6.00	16.3		–	–
250 x 200	273.0 x 219.1	250A01180✖	152.4	8.3	–	–	–
10 x 8	10.750 x 8.625		6.00	18.3		–	–
300 x 100	323.9 x 114.3	–	–	–	350F01342✖	177.8	12.5
12 x 4	12.750 x 4.500		–	–		7.00	27.5
300 x 150	323.9 x 165.1	–	–	–	350F01362✖	303.0	11.3
12 x 165.1mm	12.750 x 6.500		–	–		7.00	24.9
300 x 150	323.9 x 168.3	–	–	–	350F01363✖	177.8	12.7
12 x 6	12.750 x 6.625		–	–		7.00	28.1
300 x 200	323.9 x 219.1	250A01380✖	177.8	11.7	–	–	–
12 x 8	12.750 x 8.625		7.00	25.8		–	–
300 x 250	323.9 x 273.0	250A01311✖	177.8	12.8	–	–	–
12 x 10	12.750 x 10.750		7.00	28.2		–	–
350 x 150	355.6 x 165.1	–	–	–	350T01462✖	330.2	24.6
14 x 165.1mm	14.000 x 6.500		–	–		13.0	54.3
350 x 150	355.6 x 168.3	–	–	–	350T01463✖	380.0	26.4
14 x 6	14.000 x 6.625		–	–		14.96	58.2
350 x 200	355.6 x 219.1	–	–	–	350T01480✖	330.2	24.7
14 x 8	14.000 x 8.625		–	–		13.0	54.5
350 x 250	355.6 x 273.0	–	–	–	350T01411✖	380.0	27.0
14 x 10	14.000 x 10.750		–	–		14.96	59.5
350 x 300	355.6 x 323.9	–	–	–	350T01413✖	380.0	27.3
14 x 12	14.000 x 12.750		–	–		14.96	60.2
400 x 200	406.4 x 219.1	–	–	–	350T01680✖	406.0	31.1
16 x 8	16.000 x 8.625		–	–		15.98	68.6

Figures 250 & 350
Concentric Reducers

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

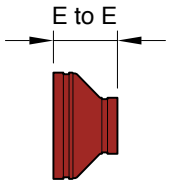


Figure 250
Cast Concentric
Reducer

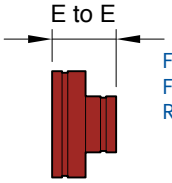


Figure 350
Fabricated Concentric
Reducer

Pipe Size		Figure 250 – Cast			Figure 350 – Fabricated		
Nominal DN In.	O.D. mm In.	Part Number	E to E mm In.	Approx. Weight kg Lbs.	Part Number	E to E mm In.	Approx. Weight kg Lbs.
400 x 250	406.4 x 273.0	–	–	–	350T01611✖	406.0	31.1
16 x 10	16.000 x 10.750		–	–		15.98	68.6
400 x 300	406.4 x 323.9	–	–	–	350T01613✖	406.0	31.8
16 x 12	16.000 x 12.750		–	–		15.98	70.1
400 x 350	406.4 x 355.6	–	–	–	350T01614✖	406.0	32.3
16 x 14	16.000 x 14.000		–	–		15.98	71.2
450 x 300	457.2 x 323.9	–	–	–	350T01813✖	381.0	37.9
18 x 12	18.000 x 12.750		–	–		15.0	83.6
450 x 350	457.2 x 355.6	–	–	–	350T01814✖	431.0	38.2
18 x 14	18.000 x 14.000		–	–		16.97	84.2
450 x 400	457.2 x 406.4	–	–	–	350T01816✖	381.0	39.6
18 x 16	18.000 x 16.000		–	–		15.0	87.2
500 x 250	508.0 x 273.0	–	–	–	350T02111✖	508.0	56.6
20 x 10	20.000 x 10.750		–	–		20.0	124.7
500 x 300	508.0 x 323.9	–	–	–	350T02113✖	508.0	56.6
20 x 12	20.000 x 12.750		–	–		20.0	124.7
500 x 350	508.0 x 355.6	–	–	–	350T02114✖	508.0	58.5
20 x 14	20.000 x 14.000		–	–		20.0	129.0
500 x 400	508.0 x 406.4	–	–	–	350T02116✖	558.0	56.4
20 x 16	20.000 x 16.000		–	–		21.97	124.3
500 x 450	508.0 x 457.2	–	–	–	350T02118✖	508.0	60.5
20 x 18	20.000 x 18.000		–	–		20.0	133.4
600 x 250	609.6 x 273.0	–	–	–	350T02411✖	508.0	67.6
24 x 10	24.000 x 10.750		–	–		20.0	149.1
600 x 300	609.6 x 323.9	–	–	–	350T02413✖	508.0	68.2
24 x 12	24.000 x 12.750		–	–		20.0	150.4
600 x 350	609.6 x 355.6	–	–	–	350T02414✖	508.0	68.8
24 x 14	24.000 x 14.000		–	–		20.0	151.6
600 x 400	609.6 x 406.4	–	–	–	350T02416✖	508.0	69.3
24 x 16	24.000 x 16.000		–	–		20.0	152.8
600 x 450	609.6 x 457.2	–	–	–	350T02418✖	508.0	69.9
24 x 18	24.000 x 18.000		–	–		20.0	154.1
600 x 500	609.6 x 508.0	–	–	–	350T02421✖	508.0	70.5
24 x 20	24.000 x 20.000		–	–		20.0	155.5

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish

♦ Contact GRINNELL Sales Representative for dimension details.

For information on alternative sizes, contact a GRINNELL Sales Representative.

See page 39 for fitting specifications.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figures 251 & 351
Eccentric Reducers

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

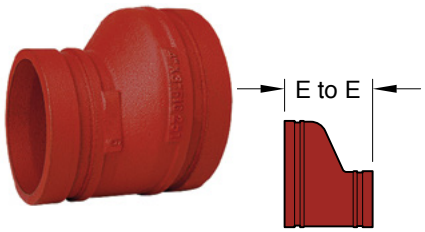


Figure 251
Cast Eccentric Reducer

Figure 351
Fabricated Eccentric Reducer
(Segment Welded)

Pipe Size		Figure 251 – Cast			Figure 351 – Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	E to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	E to E mm Inches	Approx. Weight Kg. Lbs.
50 x 25	60.3 x 33.7	–	–	–	351F02010✖	223.6	1.0
2 x 1	2.375 x 1.315		–	–		9.0	2.2
50 x 32	60.3 x 42.4	–	–	–	351F02012✖	228.6	1.1
2 x 1 1/4	2.375 x 1.660		–	–		9.0	2.4
50 x 40	60.3 x 48.3	–	–	–	351F02015✖	228.6	1.1
2 x 1 1/2	2.375 x 1.900		–	–		9.0	2.5
65 x 40	76.1 x 48.3	–	–	–	351F02615✖	241.3	1.6
76,1mm x 1 1/2	3.000 x 1.900		–	–		9.5	3.6
65 x 50	76.1 x 60.3	–	–	–	351F02620✖	241.3	1.8
76,1mm x 2	3.000 x 2.375		–	–		9.5	4.0
80 x 50	88.9 x 60.3	–	–	–	351F03020✖	241.3	2.1
3 x 2	3.500 x 2.375		–	–		9.5	4.8
80 x 65	88.9 x 73.0	251a03025✖	88.9	1.0	–	–	–
3 x 2 1/2	3.500 x 2.875		3.5	2.2		–	–
80 x 65	88.9 x 76.1	–	–	–	351F03026✖	241.3	2.8
3 x 76,1mm	3.500 x 3.000		–	–		9.5	6.1
100 x 50	114.3 x 60.3	–	–	–	351F04220✖	254.0	3.1
4 x 2	4.500 x 2.375		–	–		10.0	6.9
100 x 65	114.3 x 73.0	251a04225✖	101.6	1.4	–	–	–
4 x 2 1/2	4.500 x 2.875		4.0	3.1		–	–
100 x 65	114.3 x 76.1	–	–	–	351F04226✖	254.0	3.7
4 x 76,1mm	4.500 x 3.000		–	–		10.0	8.2
100 x 80	114.3 x 88.9	–	–	–	351F04230✖	254.0	3.6
4 x 3	4.500 x 3.500		–	–		10.0	7.9
125 x 80	139.7 x 88.9	–	–	–	351F05230✖	279.4	5.7
139.7mm x 3	5.500 x 3.500		–	–		11.0	12.6
125 x 100	139.7 x 114.3	–	–	–	351F05242✖	279.4	5.9
139.7mm x 4	5.500 x 4.500		–	–		11.0	13.0
125 x 100	141.3 x 114.3	251A05342✖	127.5	2.6	–	–	–
5 x 4	5.563 x 4.500		5.0	5.7		–	–
150 x 50	165.1 x 60.3	–	–	–	351F06220✖	292.1	6.7
165,1mm x 2	6.500 x 2.375		–	–		11.5	14.8
150 x 80	165.1 x 88.9	–	–	–	351F06230✖	292.1	6.2
165,1mm x 3	6.500 x 3.500		–	–		11.5	14.7
150 x 100	165.1 x 114.3	–	–	–	351F06242✖	292.1	7.1
165,1mm x 4	6.500 x 4.500		–	–		11.5	14.9
150 x 100	165.1 x 139.7	–	–	–	351F06252✖	292.1	7.2
165,1 x 139.7mm	6.500 x 5.500		–	–		11.5	15.9
150 x 50	168.3 x 60.3	–	–	–	351F06320✖	292.1	5.5
6 x 2	6.625 x 2.375		–	–		11.5	12.2
150 x 80	168.3 x 88.9	–	–	–	351F06330✖	292.1	6.1
6 x 3	6.625 x 3.500		–	–		11.50	13.5
150 x 100	168.3 x 114.3	–	–	–	351F06342✖	292.1	6.7
6 x 4	6.625 x 4.500		–	–		11.50	14.8

Figures 251 & 351
Eccentric Reducers

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

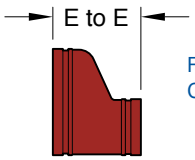


Figure 251
Cast Eccentric Reducer

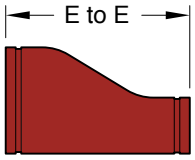


Figure 351
Fabricated Eccentric Reducer
(Segment Welded)

Pipe Size		Figure 251 - Cast			Figure 351 - Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	E to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	E to E mm Inches	Approx. Weight Kg. Lbs.
150 x 125	168.3 x 139.7	–	–	–	351F06352✖	292.1	7.2
6 x 139.7mm	6.625 x 5.500		–	–		11.5	15.9
150 x 125	168.3 x 141.3	251a06353✖	139.7	3.7	–	–	–
6 x 5	6.625 x 5.563		5.5	8.1		–	–
200 x 80	219.1 x 88.9	–	–	–	351F08030✖	304.8	8.1
8 x 3	8.625 x 3.500		–	–		12.0	17.9
200 x 100	219.1 x 114.3	–	–	–	351F08042✖	304.8	9.8
8 x 4	8.625 x 4.500		–	–		12.0	19.7
200 x 125	219.1 x 139.7	–	–	–	351F08052✖	304.8	9.7
8 x 139.7mm	8.625 x 5.500		–	–		12.0	21.4
200 x 125	219.1 x 141.3	–	–	–	351F08053✖	304.8	9.7
8 x 5	8.625 x 5.563		–	–		12.0	21.4
200 x 150	219.1 x 165.1	–	–	–	351F08062✖	304.8	10.9
8 x 165,1mm	8.625 x 6.500		–	–		12.0	24.0
200 x 150	219.1 x 168.3	–	–	–	351F08063✖	304.8	10.9
8 x 6	8.625 x 6.625		–	–		12.0	24.0
250 x 100	273.0 x 114.3	–	–	–	351F01142✖	330.2	13.5
10 x 4	10.750 x 4.500		–	–		13.0	29.7
250 x 125	273.0 x 139.7	–	–	–	351F01152✖	330.2	14.4
10 x 139.7mm	10.750 x 5.500		–	–		13.0	31.7
250 x 125	273.0 x 141.3	–	–	–	351F01153✖	330.2	14.4
10 x 5	10.750 x 5.563		–	–		13.0	31.7
250 x 150	273.0 x 165.1	–	–	–	351F01162✖	330.2	15.4
10 x 165,1mm	10.750 x 6.500		–	–		13.0	34.0
250 x 150	273.0 x 168.3	–	–	–	351F01163✖	330.2	15.4
10 x 6	10.750 x 6.625		–	–		13.0	34.0
250 x 200	273.0 x 219.1	–	–	–	351F01180✖	330.2	15.6
10 x 8	10.750 x 8.625		–	–		13.0	34.4
300 x 100	323.9 x 114.3	–	–	–	351F01342✖	355.6	20.3
12 x 4	12.750 x 4.500		–	–		14.0	44.8
300 x 150	323.9 x 165.1	–	–	–	351F01362✖	355.6	20.5
12 x 165,1mm	12.750 x 6.500		–	–		14.0	45.2
300 x 150	323.9 x 168.3	–	–	–	351F01363✖	355.6	20.5
12 x 6	12.750 x 6.625		–	–		14.0	45.2
300 x 200	323.9 x 219.1	–	–	–	351F01380✖	355.6	21.6
12 x 8	12.750 x 8.625		–	–		14.0	47.7
300 x 250	323.9 x 273.0	–	–	–	351F01411✖	355.6	23.6
12 x 10	12.750 x 10.750		–	–		14.0	52.0
350 x 150	355.6 x 165.1	–	–	–	351T01462✖	482.6	35.4
14 x 165,1mm	14.000 x 6.500		–	–		19.0	78.0
350 x 150	355.6 x 168.3	–	–	–	351T01463✖	482.6	35.4
14 x 6	14.000 x 6.625		–	–		19.0	78.0
350 x 200	355.6 x 219.1	–	–	–	351T01480✖	482.6	36.3
14 x 8	14.000 x 8.625		–	–		19.0	80.0
350 x 250	355.6 x 273.0	–	–	–	351T01411✖	482.6	38.1
14 x 10	14.000 x 10.750		–	–		19.0	84.0
350 x 300	355.6 x 323.9	–	–	–	351T01413✖	380.0	27.3
14 x 12	14.000 x 12.750		–	–		14.96	60.2

Figures 251 & 351
Eccentric Reducers

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY

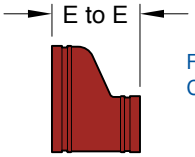


Figure 251
Cast Eccentric Reducer

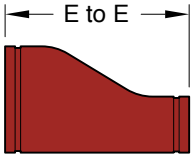


Figure 351
Fabricated Eccentric Reducer
(Segment Welded)

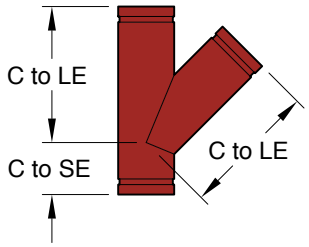
Pipe Size		Figure 251 – Cast			Figure 351 – Fabricated		
Nominal mm Inches	O.D. mm Inches	Part Number	E to E mm Inches	Approx. Weight Kg. Lbs.	Part Number	E to E mm Inches	Approx. Weight Kg. Lbs.
400 x 200	406.4 x 219.1	–	–	–	351T01680✖	508.0	41.3
16 x 8	16.000 x 8.625		–	–		20.0	91.0
400 x 250	406.4 x 273.0	–	–	–	351T01611✖	508.0	43.5
16 x 10	16.000 x 10.750		–	–		20.0	96.0
400 x 300	406.4 x 323.9	–	–	–	351T01613✖	406.0	31.8
16 x 12	16.000 x 12.750		–	–		15.98	70.1
400 x 350	406.4 x 355.6	–	–	–	351T01614✖	406.0	32.3
16 x 14	16.000 x 14.000		–	–		15.98	71.2
450 x 300	457.2 x 323.9	–	–	–	351T01813✖	533.0	51.3
18 x 12	18.000 x 12.750		–	–		21.0	113.0
450 x 350	457.2 x 355.6	–	–	–	351T01814✖	533.0	53.1
18 x 14	18.000 x 14.000		–	–		21.0	117.0
450 x 400	457.2 x 406.4	–	–	–	351T01816✖	533.0	54.9
18 x 16	18.000 x 16.000		–	–		21.0	121.0
500 x 250	508.0 x 273.0	–	–	–	351T02111✖	660.4	65.8
20 x 10	20.000 x 10.750		–	–		26.0	145.0
500 x 300	508.0 x 323.9	–	–	–	351T02113✖	660.4	67.6
20 x 12	20.000 x 12.750		–	–		26.0	149.0
500 x 350	508.0 x 355.6	–	–	–	351T02114✖	660.4	68.9
20 x 14	20.000 x 14.000		–	–		26.0	152.0
500 x 400	508.0 x 406.4	–	–	–	351T02116✖	660.4	70.8
20 x 16	20.000 x 16.000		–	–		26.0	156.0
500 x 450	508.0 x 457.2	–	–	–	351T02118✖	660.4	72.6
20 x 18	20.000 x 18.000		–	–		26.0	160.0
600 x 250	609.6 x 273.0	–	–	–	351T02411✖	660.4	78.9
24 x 10	24.000 x 10.750		–	–		26.0	147.0
600 x 300	609.6 x 323.9	–	–	–	351T02413✖	660.4	81.2
24 x 12	24.000 x 12.750		–	–		26.0	179.0
600 x 350	609.6 x 355.6	–	–	–	351T02414✖	660.4	83.5
24 x 14	24.000 x 14.000		–	–		26.0	184.0
600 x 400	609.6 x 406.4	–	–	–	351T02416✖	660.4	85.7
24 x 16	24.000 x 16.000		–	–		26.0	189.0
600 x 450	609.6 x 457.2	–	–	–	351T02418✖	660.4	88.0
24 x 18	24.000 x 18.000		–	–		26.0	194.0
600 x 500	609.6 x 508.0	–	–	–	351T02421✖	660.4	90.3
24 x 20	24.000 x 20.000		–	–		26.0	199.0

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 314
45° Laterals

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY



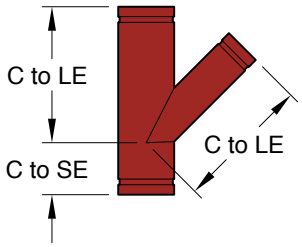
Part Number	Pipe Size		C to LE mm Inches	C to SE mm Inches	Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches			
314F00034✖	25	33.7	127.0	57.0	0.7
	1	1.315	5.00	2.24	1.5
314F00042✖	32	42.4	146.1	63.5	1.11
	1 1/4	1.660	5.75	2.50	2.4
314F00048✖	40	48.3	158.8	69.9	1.6
	1 1/2	1.900	6.25	2.75	3.5
314F00060✖	50	60.3	177.8	69.9	2.0
	2	2.375	7.00	2.75	4.4
314F00076✖	65	76.1	196.9	76.2	4.5
	76,1mm	3.000	7.75	3.00	9.9
314F00089✖	80	88.9	215.9	82.6	5.0
	3	3.500	8.50	3.25	11.0
314F00114✖	100	114.3	266.7	95.3	8.3
	4	4.500	10.50	3.75	18.3
314F00139✖	125	139.7	317.5	102.0	13.6
	139,7mm	5.500	12.50	4.00	30.0
314F00165✖	150	165.1	355.6	114.3	21.1
	165,1mm	6.500	14.00	4.50	46.5
314F00168✖	150	168.3	355.6	114.3	21.1
	6	6.625	14.00	4.50	46.5
314F00219✖	200	219.1	457.2	152.4	37.6
	8	8.625	18.00	6.00	82.9
314F00273✖	250	273.0	520.7	165.71	57.4
	10	10.750	20.50	6.50	126.5
314F00324✖	300	323.9	584.2	177.8	74.8
	12	12.750	23.00	7.00	164.9

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 325 45° Reducing Laterals

Tech Data Sheet: G180

10 YEAR LIMITED WARRANTY



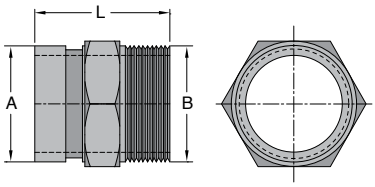
Part Number	Pipe Size		C to LE mm Inches	C to SE mm Inches	Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches			
325F03020✖	80 x 50	88.9 x 60.3	215.9	82.6	4.1
	3 x 2	3.500 x 2.375	8.50	3.25	9.0
325F03026✖	80 x 76.1	88.9 x 76.1	216.0	83.0	5.2
	3 x 76,1mm	3.500 x 3.000	8.50	3.25	11.5
325F04220✖	100 x 50	114.3 x 60.3	266.7	95.3	6.7
	4 x 2	4.500 x 2.375	10.50	3.75	14.7
325F04226✖	100 x 65	114.3 x 76.1	267.0	95.0	7.7
	4 x 76,1mm	4.500 x 3.000	10.50	3.75	16.9
325F04230✖	100 x 80	114.3 x 88.9	266.7	95.3	7.7
	4 x 3	4.500 x 3.500	10.50	3.75	16.9
325F05220✖	125 x 50	139.7 x 60.3	318.1	102.0	10.2
	139,7mm x 2	5.500 x 2.375	12.50	4.00	22.4
325F05230✖	125 x 80	139.7 x 88.9	318.0	102.0	12.0
	139,7mm x 3	5.500 x 3.500	12.50	4.00	26.5
325F05242✖	125 x 100	139.7 x 114.3	318.0	102.0	13.8
	139,7mm x 4	5.500 x 4.500	12.50	4.00	30.4
325F06220✖	150 x 50	165.1 x 60.3	356.0	114.0	15.0
	165,1mm x 2	6.500 x 2.375	14.00	4.50	33.1
325F06230✖	150 x 80	165.1 x 88.9	356.0	114.0	16.8
	165,1mm x 3	6.500 x 3.500	14.00	4.50	37.0
325F06242✖	150 x 100	165.1 x 114.3	356.0	114.0	18.1
	165,1mm x 4	6.500 x 4.500	14.00	4.50	39.9
325F06252✖	150 x 125	165.1 x 139.7	356.0	114.0	20.4
	165,1 x 139,7mm	6.500 x 5.500	14.00	4.50	45.0
325F06320✖	150 x 50	168.3 x 60.3	355.6	114.3	14.4
	6 x 2	6.625 x 2.375	14.00	4.50	31.7
325F06330✖	150 x 80	168.3 x 88.9	355.6	114.3	15.6
	6 x 3	6.625 x 3.500	14.00	4.50	34.4
325F06342✖	150 x 100	168.3 x 114.3	355.6	114.3	16.6
	6 x 4	6.625 x 4.500	14.00	4.50	36.5
325F06352✖	150 x 125	168.3 x 139.7	356.0	114.0	20.4
	6 x 139,7mm	6.625 x 5.500	14.00	4.50	45.0
325F08042✖	200 x 100	219.1 x 114.1	457.2	152.4	26.7
	8 x 4	8.625 x 4.500	18.00	6.00	58.9
325F08052✖	200 x 125	219.1 x 139.7	457.0	152.0	30.8
	8 x 139,7mm	8.625 x 5.500	18.00	6.00	67.9
325F08063✖	200 x 150	219.1 x 168.3	457.2	152.4	30.0
	8 x 6	8.625 x 6.625	18.00	6.00	66.1
325F01042✖	250 x 100	273.0 x 114.3	520.7	165.1	39.6
	10 x 4	10.750 x 4.500	20.50	6.50	87.3
325F01052✖	250 x 125	273.0 x 139.7	521.0	165.0	45.4
	10 x 139,7mm	10.750 x 5.500	20.50	6.50	100.1
325F01063✖	250 x 150	273.0 x 168.3	520.7	165.1	43.0
	10 x 6	10.750 x 6.625	20.50	6.50	94.7
325F01080✖	250 x 200	273.0 x 219.1	520.7	165.1	45.0
	10 x 8	10.750 x 8.625	20.50	6.50	99.2
325F01242✖	300 x 100	323.9 x 114.3	584.2	177.8	54.7
	12 x 4	12.750 x 4.500	23.00	7.00	120.6
325F01263✖	300 x 150	323.9 x 168.3	584.2	177.8	58.3
	12 x 6	12.750 x 6.625	23.00	7.00	128.5
325F01280✖	300 x 200	323.9 x 219.1	584.2	177.8	60.4
	12 x 8	12.750 x 8.625	23.00	7.00	133.1

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 304
Groove x Male BSP Thread Nipple, Machined

10 YEAR LIMITED WARRANTY

Part Number	Nominal Size mm Inches	ØA mm Inches	B mm Inches	L mm Inches	Approx. Weight Kg. Lbs.
304h000342	25	33.7	33.2	55	0.1
	1	1.315	1.31	2.17	0.2
304h000422	32	42.4	41.9	63	0.2
	1 1/4	1.660	1.65	2.48	0.4
304h000482	40	48.3	47.8	59	0.3
	1 1/2	1.900	1.88	2.32	0.7
304h000602	50	60.3	59.6	68	0.5
	2	2.375	2.35	2.68	1.1
304h000762	65	76.1	75.2	75	0.8
	76.1mm	3.000	2.96	2.95	1.8
304h000892	80	88.9	87.9	80	1.4
	3	3.500	3.46	3.15	3.1

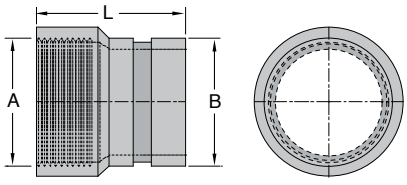


Only available in galvanised finish.
A range of fabricated adaptor nipple; grooved to plain or BSP is also available on request. Please contact your GRINNELL sales representative or Sales Office for further information
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 305
Groove x Female BSP Thread Nipple, Machined

10 YEAR LIMITED WARRANTY

Part Number	Nominal Size mm Inches	ØA mm Inches	B mm Inches	L mm Inches	Approx. Weight Kg. Lbs.
305H000342	25	33.2	33.7	50	0.1
	1	1.31	1.315	1.97	0.2
305H000422	32	41.9	42.4	50	0.2
	1 1/4	1.65	1.660	1.97	0.4
305H000482	40	47.8	48.3	50	0.3
	1 1/2	1.88	1.900	1.97	0.7
305H000602	50	59.6	60.3	100	0.5
	2	2.35	2.375	3.94	1.1
305H000762	65	75.1	76.1	100	0.8
	76,1mm	2.96	3.000	3.94	1.8
305H000892	80	88.5	88.9	100	1.2
	3	3.48	3.500	3.94	2.6



Only available in galvanised finish.
For information on alternative sizes, contact a GRINNELL Sales Representative.
See page 39 for fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Notes

Outlet Fittings

Outlet Fittings
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Female Threaded Tees
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Figure 730
Grooved Tees
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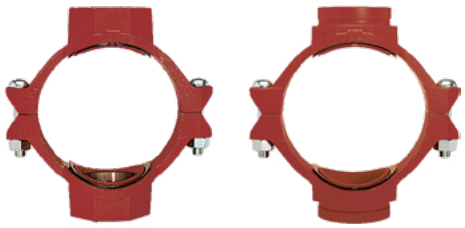
The GRINNELL Figure 730 Mechanical Tee is rated at 34.5 Bar (500 psi) on standard weight pipe. It can be used in place of a tee, a cross connection, or a welded outlet where a threaded or grooved outlet is needed. The Mechanical Tee is ideal for use in retrofit or equipment hookup installations as it 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.

In addition, all sizes can be made into a cross configuration, threaded x threaded, groove x groove, and groove x threaded.



Material Specifications

Housing Specifications

- ASTM A 536 – Standard specification for ductile iron castings, Grade 65-45-12
- Tensile Strength, minimum 4482 Bar (65,000 psi)
- Yield Strength, minimum 3103 Bar (45,000 psi)
- Elongation in 50mm (2"), minimum 12%
- ASTM A 153 – Standard specification for hot-dip galvanising

Bolt/Nut Specifications

- Metric: Carbon steel oval neck track head bolts (Gold colour 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.
- 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 7584 Bar (110,000 psi).
- 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.
- Stainless steel bolts and nuts are available upon request.

Gasket Specifications

- Grade "E" EPDM gaskets have a Green colour code stripe identification and conform to ASTM D 2000 for service temperatures from -34°C to 110°C (-30°F to 230°F). They are recommended for hot water not to exceed 110°C (230°F), 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 colour code stripe identification and conform to ASTM D 2000 for service temperatures from -29°C to 82°C (-20°F to 180°F). They are recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapours.

Coatings

- Red – Non-lead paint (standard)
- Hot-Dipped, Zinc Galvanised (optional)

Issue 03, 04, 07
Cert No. 570, 669, 673

For detailed Listing / Approval information contact GRINNELL Mechanical Products.

General notes: Additional information is included in our data sheets and is available upon request. 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. Always read and understand the installation constructions. Never remove any piping components nor correct or modify any piping deficiencies without first depressurising and draining the system Material and gasket selection should be verified with the gasket recommendation listing for the specific application.

Figure 730
Mechanical Tees – Threaded

Tech Data Sheet: G210

10 YEAR LIMITED WARRANTY

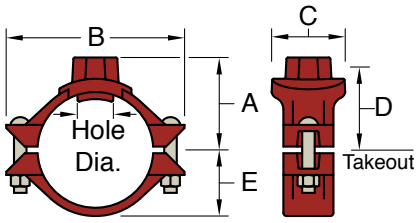


Figure 730 Branch Outlet with Female BSP Threaded Branch (Tee Configuration)

Part Number	Nominal Size Run x Branch DN In.	Hole Dia.†		Max.‡ Branch End Load kN Lbs.	Dimensions – mm In.					Bolt Size mm In.	Approx. Weight kg Lbs.
		Min. mm In.	Max. mm In.		A	B	C	D	E		
730AT2005✖	50 x 15	38.1	41.3	1.2	66.5	124.0	78.0	53.8	40.4	M10 x 57	1.1
	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
730AT2007✖	50 x 20	38.1	41.3	1.9	66.5	124.0	78.0	53.8	40.4	M10 x 57	1.0
	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
730AT2010✖	50 x 25	38.1	41.3	3.0	66.5	124.0	78.0	53.8	40.4	M10 x 57	1.0
	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
730AT2012✖	50 x 32	44.5	47.6	4.8	70.6	124.0	84.3	49.0	40.4	M10 x 57	1.1
	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
730AT2015✖	50 x 40	44.5	47.6	6.3	69.9	124.0	84.3	49.0	40.4	M10 x 57	1.1
	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
730AT2505✖	65 x 15	38.1	41.3	1.2	73.2	133.4	78.0	60.5	46.0	M10 x 57	1.1
	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
730AT2507✖	65 x 20	38.1	41.3	1.9	73.2	133.4	78.0	60.5	46.0	M10 x 57	1.1
	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
730AT2510✖	65 x 25	38.1	41.3	3.0	73.2	133.4	78.0	60.5	46.0	M10 x 57	1.1
	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
730AT2512✖	65 x 32	50.8	54.0	4.8	76.2	133.4	90.4	55.6	46.0	M10 x 57	1.1
	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
730AT2515✖	65 x 40	50.8	54.0	6.3	78.0	133.4	91.2	55.1	46.0	M10 x 57	1.2
	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
730MT2520✖	65 x 50	50.8	54.0	9.9	81.0	133.4	101.6	62.0	46.0	M10 x 57	1.2
	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
730AT2605✖	65 x 15	38.1	41.3	1.2	74.5	142.7	78.0	62.0	47.5	M10 x 57	1.1
	76.1mm x 1/2	1.50	1.63	277.1	2.94	5.62	3.07	2.44	1.87	–	2.5
730AT2607✖	65 x 20	38.1	41.3	1.9	74.5	142.7	78.0	62.0	47.5	M10 x 57	1.1
	76.1mm x 3/4	1.50	1.63	433.0	2.94	5.62	3.07	2.44	1.87	–	2.5
730AT2610✖	65 x 25	38.1	41.3	3.0	74.5	142.7	78.0	62.0	47.5	M10 x 57	1.1
	76.1mm x 1	1.50	1.63	679.1	2.94	5.62	3.07	2.44	1.87	–	2.5
730MT2612✖	65 x 32	50.8	54.0	4.8	77.7	142.7	90.4	57.2	47.5	M10 x 57	1.5
	76.1mm x 1-1/4	2.00	2.13	1082.1	3.06	5.62	3.56	2.25	1.87	–	3.3
730MT2615✖	65 x 40	50.8	54.0	6.3	79.5	142.7	90.4	57.2	47.5	M10 x 57	1.6
	76.1mm x 1-1/2	2.00	2.13	1417.6	3.13	5.62	3.56	2.25	1.87	–	3.6
730MT2620✖	65 x 50	50.8	54.0	9.9	82.6	142.7	101.6	63.5	47.5	M10 x 57	1.7
	76.1mm x 2	2.00	2.13	2215.1	3.25	5.62	4.00	2.50	1.87	–	3.7
730MT3005✖	80 x 15	38.1	41.3	1.2	81.0	155.7	78.0	65.0	56.1	M12 x 89	1.7
	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

Figure 730
Mechanical Tees – Threaded

Tech Data Sheet: G210

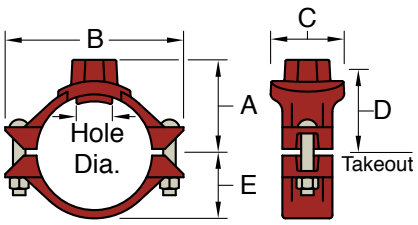


Figure 730 Branch Outlet with Female BSP Threaded Branch (Tee Configuration)

Part Number	Nominal Size Run x Branch DN In.	Hole Dia.†		Max.‡ Branch End Load kN Lbs.	Dimensions – mm In.					Bolt Size mm In.	Approx. Weight kg Lbs.
		Min. mm In.	Max. mm In.		A	B	C	D	E		
730mt3007✖	80 x 20	38.1	41.3	1.9	81.0	155.7	78.0	65.0	56.1	M12 x 89	1.7
	3 x ¾	1.50	1.63	433.0	3.19	6.13	3.07	2.56	2.21	½ x 3	3.7
730mt3010✖	80 x 25	38.1	41.3	3.0	81.0	155.7	78.0	65.0	56.1	M12 x 89	1.7
	3 x 1	1.50	1.63	679.1	3.19	6.13	3.07	2.56	2.21	½ x 3	3.7
730mt3012✖	80 x 32	44.5	47.6	4.8	84.8	155.7	84.3	63.5	56.1	M12 x 89	1.6
	3 x 1–¼	1.75	1.88	1082.1	3.34	6.13	3.32	2.50	2.21	½ x 3	3.5
730mt3015✖	80 x 40	50.8	54.0	6.3	85.9	155.7	90.4	63.0	56.1	M12 x 89	1.7
	3 x 1–½	2.00	2.13	1417.6	3.38	6.13	3.56	2.48	2.21	½ x 3	3.7
730mt3020✖	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 x 2	2.50	2.63	2215.1	3.50	6.13	4.09	2.75	2.21	½ x 3	4.7
730mt4205✖	100 x 15	38.1	41.3	1.2	93.7	181.1	78.0	77.7	70.6	M12 x 89	2.2
	4 x ½	1.50	1.63	277.1	3.69	7.13	3.07	3.06	2.78	½ x 3	4.8
730mt4207✖	100 x 20	38.1	41.3	1.9	93.7	181.1	78.0	77.7	70.6	M12 x 89	2.2
	4 x ¾	1.50	1.63	433.0	3.69	7.13	3.07	3.06	2.78	½ x 3	4.8
730mt4210✖	100 x 25	38.1	41.3	3.0	93.7	181.1	78.0	77.7	70.6	M12 x 89	2.2
	4 x 1	1.50	1.63	679.1	3.69	7.13	3.07	3.06	2.78	½ x 3	4.8
730at4212✖	100 x 32	44.5	47.6	4.8	99.6	181.1	84.3	76.2	70.6	M12 x 89	2.2
	4 x 1–¼	1.75	1.88	1082.1	3.92	7.13	3.32	3.00	2.78	½ x 3	4.8
730at4215✖	100 x 40	50.8	54.0	6.3	101.6	181.1	90.4	75.7	70.6	M12 x 89	2.3
	4 x 1–½	2.00	2.13	1417.6	4.00	7.13	3.56	2.98	2.78	½ x 3	5.1
730mt4220✖	100 x 50	63.5	66.7	9.9	101.6	181.1	103.1	82.6	70.6	M12 x 89	2.5
	4 x 2	2.50	2.63	2215.1	4.00	7.13	4.06	3.25	2.78	½ x 3	5.5
730mt4226✖	100 x 65	69.9	73.0	15.7	101.6	181.1	111.3	79.2	70.6	M12 x 89	2.8
	4 x 76.1mm	2.75	2.88	3534.3	4.00	7.13	4.38	3.12	2.78	–	6.2
730mt4230✖	100 x 80	88.9	92.1	21.4	104.9	181.1	130.3	84.1	70.6	M12 x 89	3.5
	4 x 3	3.50	3.63	4810.6	4.13	7.13	5.13	3.31	2.78	½ x 3	7.8
730mt5315✖	125 x 40	50.8	54.0	6.3	117.6	206.5	90.4	101.6	85.6	M16 x 121	3.5
	139.7mm/5 x 1–½	2.00	2.13	1417.6	4.63	8.13	3.56	4.00	3.37	⅝ x 4–¾	7.8
730mt5320✖	125 x 50	63.5	66.7	9.9	117.6	206.5	103.1	98.6	85.6	M16 x 121	3.5
	139.7mm/5 x 2	2.50	2.63	2215.1	4.63	8.13	4.06	3.88	3.37	⅝ x 4–¾	7.8
730mt5326✖	125 x 65	69.9	73.0	15.7	120.7	206.5	111.3	98.6	85.6	M16 x 121	4.0
	139.7mm/5 x 76.1mm	2.75	2.88	3534.3	4.75	8.13	4.38	3.88	3.37	–	8.9
730mt5330✖	125 x 80	88.9	92.1	21.4	127.0	206.5	130.3	103.1	85.6	M16 x 121	5.8
	139.7mm/5 x 3	3.50	3.63	4810.6	5.00	8.13	5.13	4.06	3.37	⅝ x 4–¾	12.7
730MT6212✖	150 x 32	50.8	54.0	4.8	130.3	235.0	90.4	108.0	99.1	M16 x 121	3.5
	165.1mm x 1–¼	2.00	2.13	1082.1	5.13	9.25	3.56	4.25	3.90	–	7.7
730at6215✖	150 x 40	50.8	54.0	6.3	130.3	235.0	90.4	102.6	99.1	M16 x 121	3.5
	165.1mm x 1–½	2.00	2.13	1417.6	5.13	9.25	3.56	4.04	3.90	–	7.7
730at6220✖	150 x 50	63.5	66.7	9.9	130.3	235.0	103.1	109.5	99.1	M16 x 121	3.7
	165.1mm x 2	2.50	2.63	2215.1	5.13	9.25	4.06	4.31	3.90	–	8.2

Figure 730
Mechanical Tees – Threaded

Tech Data Sheet: G210

10 YEAR LIMITED WARRANTY

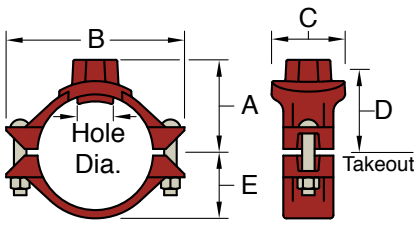


Figure 730 Branch Outlet with Female BSP Threaded Branch (Tee Configuration)

Part Number	Nominal Size Run x Branch DN In.	Hole Dia.†		Max.‡ Branch End Load kN Lbs.	Dimensions - mm In.					Bolt Size mm In.	Approx. Weight kg Lbs.
		Min. mm In.	Max. mm In.		A	B	C	D	E		
730at6226✖	150 x 65	69.9	73.0	15.7	130.3	235.0	111.3	106.2	99.1	M16 x 121	4.1
	165.1mm x 76.1mm	2.75	2.88	3584.3	5.13	9.25	4.38	4.18	3.90	–	9.0
730at6230✖	150 x 80	88.9	92.1	21.4	139.7	235.0	130.3	111.0	99.1	M16 x 121	4.8
	165.1mm x 3	3.50	3.63	4810.6	5.50	9.25	5.13	4.37	3.90	–	10.5
730mt6312✖	150 x 32	50.8	54.0	4.8	130.3	235.0	90.4	108.0	99.1	M16 x 121	3.4
	6 x 1- 1/4	2.00	2.13	1082.1	5.13	9.25	3.56	4.25	3.90	5/8 x 4- 3/4	7.5
730at6315✖	150 x 40	50.8	54.0	6.3	130.3	235.0	90.4	102.6	99.1	M16 x 121	3.4
	6 x 1- 1/2	2.00	2.13	1417.6	5.13	9.25	3.56	4.04	3.90	5/8 x 4- 3/4	7.5
730at6320✖	150 x 50	63.5	66.7	9.9	130.3	235.0	103.1	109.5	99.1	M16 x 121	3.5
	6 x 2	2.50	2.63	2215.1	5.13	9.25	4.06	4.31	3.90	5/8 x 4- 3/4	7.7
730at6326✖	150 x 65	69.9	73.0	14.4	130.3	235.0	111.3	106.2	99.1	M16 x 121	4.0
	6 x 76.1mm	2.75	2.88	3245.9	5.13	9.25	4.38	4.18	3.90	5/8 x 4- 3/4	8.9
730at6330✖	150 x 80	88.9	92.1	21.4	139.7	235.0	130.3	111.0	99.1	M16 x 121	4.7
	6 x 3	3.50	3.63	4810.6	5.50	9.25	5.13	4.37	3.90	5/8 x 4- 3/4	10.3
730at8020✖	200 x 50	63.5	66.7	14.4	158.8	317.5	103.1	130.0	124.5	M20 x 121	5.5
	8 x 2	2.50	2.63	3245.9	6.25	12.50	4.06	5.12	4.90	3/4 x 4- 3/4	12.1
730at8026✖	200 x 65	69.9	73.0	15.7	158.8	317.5	111.3	130.0	124.5	M20 x 121	5.7
	8 x 76.1mm	2.75	2.88	3534.3	6.25	12.50	4.38	5.12	4.90	–	12.6
730at8030✖	200 x 80	88.9	92.1	21.4	165.1	317.5	130.3	136.4	124.5	M20 x 121	6.1
	8 x 3	3.50	3.63	4810.6	6.50	12.50	5.13	5.37	4.90	3/4 x 4- 3/4	13.6

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish

† Proper hole preparation is required for effective sealing and performance. Check the pipe seal surface within 15.9mm (5/8") 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 a GRINNELL Sales Representative.

‡ 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 a GRINNELL Sales Representative for details.

Threads are BSP. Some size outlets are available with NPT threads. Contact a GRINNELL Sales Representative for details.

For information on alternative sizes, contact a GRINNELL Sales Representative.

See page 66 for mechanical tee specifications, and see pages 116 - 127 for gasket information.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 730
Mechanical Tees – Grooved

Tech Data Sheet: G210

10 YEAR LIMITED WARRANTY

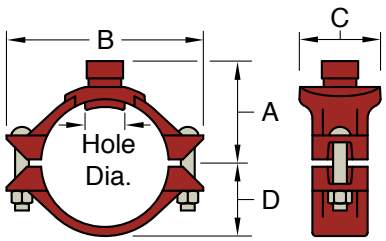


Figure 730 Branch Outlet with Grooved Branch (Tee Configuration)

Part Number	Nominal Size Run x Branch DN In.	Hole Dia.† Min. mm In.	Hole Dia.† Max. mm In.	Max.‡ End Load Branch kN Lbs.	Dimensions – mm In. A	B	C	D	Bolt Size mm In.	Approx. Weight kg Lbs.
730ag2012✖	50 x 32	44.5	47.6	4.8	70.6	124.0	84.3	40.4	M10 x 57	1.1
	2 x 1- 1/4	1.75	1.88	1082.1	2.78	4.88	3.32	1.59	3/8 x 2- 1/4	2.5
730ag2015✖	50 x 40	44.5	47.6	6.3	66.5	124.0	84.3	40.4	M10 x 57	1.1
	2 x 1- 1/2	1.75	1.88	1417.6	2.62	4.88	3.32	1.59	3/8 x 2- 1/4	2.4
730ag2512✖	65 x 32	50.8	54.0	4.8	76.2	133.4	90.4	46.0	M10 x 57	1.1
	2- 1/2 x 1- 1/4	2.00	2.13	1082.1	3.00	5.25	3.56	1.81	3/8 x 2- 1/4	2.5
730Mg2520✖	65 x 50	50.8	54.0	9.9	81.0	133.4	101.6	46.0	M10 x 57	1.1
	2- 1/2 x 2	2.00	2.13	2215.1	3.19	5.25	4.00	1.81	3/8 x 2- 1/4	2.5
730mg2612✖	65 x 32	50.8	54.0	4.8	77.7	142.7	90.4	47.5	M10 x 57	1.1
	76.1mm x 1- 1/4	2.00	2.13	1082.1	3.06	5.62	3.56	1.87	–	2.5
730mg2615✖	65 x 40	50.8	54.0	6.3	79.5	142.7	90.4	47.5	M10 x 57	1.1
	76.1mm x 1- 1/2	2.00	2.13	1417.6	3.13	5.62	3.56	1.87	–	2.5
730mg2620✖	65 x 50	50.8	54.0	9.9	82.6	142.7	101.6	47.5	M10 x 57	1.1
	76.1mm x 2	2.00	2.13	2215.1	3.25	5.62	4.00	1.87	–	2.5
730mg3012✖	80 x 32	44.5	47.6	4.8	84.8	155.7	84.3	56.1	M12 x 89	1.6
	3 x 1- 1/4	1.75	1.88	1082.1	3.34	6.13	3.32	2.21	1/2 x 3	3.5
730mg3015✖	80 x 40	50.8	54.0	6.3	85.9	155.7	90.4	56.1	M12 x 89	1.6
	3 x 1- 1/2	2.00	2.13	1417.6	3.38	6.13	3.56	2.21	1/2 x 3	3.6
730mg3020✖	80 x 50	63.5	66.7	9.9	88.9	155.7	103.9	56.1	M12 x 89	2.0
	3 x 2	2.50	2.63	2215.1	3.50	6.13	4.09	2.21	1/2 x 3	4.5
730ag4212✖	100 x 32	44.5	47.6	4.8	99.6	181.1	84.3	70.6	M12 x 89	2.2
	4 x 1- 1/4	1.75	1.88	1082.1	3.92	7.13	3.32	2.78	1/2 x 3	4.8
730ag4215✖	100 x 40	50.8	54.0	6.3	101.6	181.1	90.4	70.6	M12 x 89	2.3
	4 x 1- 1/2	2.00	2.13	1417.6	4.00	7.13	3.56	2.78	1/2 x 3	5.0
730mg4220✖	100 x 50	63.5	66.7	9.9	101.6	181.1	103.1	70.6	M12 x 89	2.4
	4 x 2	2.50	2.63	2215.1	4.00	7.13	4.06	2.78	1/2 x 3	5.3
730mg4225✖	100 x 65	69.9	73.0	14.4	101.6	181.1	111.3	70.6	M12 x 89	2.7
	4 x 2- 1/2	2.75	2.88	3245.9	4.00	7.13	4.38	2.78	1/2 x 3	5.9
730mg4226✖	100 x 65	69.9	73.0	15.7	101.6	181.1	111.3	70.6	M12 x 89	2.7
	4 x 76.1mm	2.75	2.88	3534.3	4.00	7.13	4.38	2.78	–	5.9
730mg4230✖	100 x 80	88.9	92.1	21.4	104.9	181.1	130.3	70.6	M12 x 89	3.4
	4 x 3	3.50	3.63	4810.6	4.13	7.13	5.13	2.78	1/2 x 3	7.4
730mg5315✖	125 x 40	50.8	54.0	6.3	117.6	206.5	90.4	85.6	M16 x 121	3.5
	139.7mm/5 x 1- 1/2	2.00	2.13	1417.6	4.63	8.13	3.56	3.37	5/8 x 4- 3/4	7.7
730mg5320✖	125 x 50	63.5	66.7	9.9	117.6	206.5	103.1	85.6	M16 x 121	3.4
	139.7mm/5 x 2	2.50	2.63	2215.1	4.63	8.13	4.06	3.37	5/8 x 4- 3/4	7.6

Figure 730
Mechanical Tees – Grooved

Tech Data Sheet: G210

10 YEAR LIMITED WARRANTY

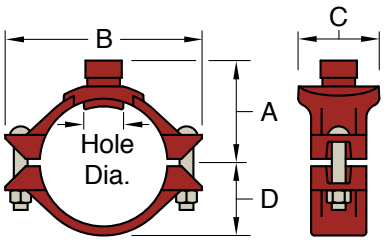


Figure 730 Branch Outlet with Grooved Branch (Tee Configuration)

Part Number	Nominal Size Run x Branch DN In.	Hole Dia.†		Max.‡ End Load Branch kN Lbs.	Dimensions – mm In.				Bolt Size mm In.	Approx. Weight kg Lbs.
		Min. mm In.	Max. mm In.		A	B	C	D		
730mg5325✖	125 x 65	69.9	73.0	14.4	120.7	206.5	111.3	85.6	M16 x 121	3.9
	139.7mm/5 x 2-1/2	2.75	2.88	3245.9	4.75	8.13	4.38	3.37	5/8 x 4-3/4	8.6
730mg5326✖	125 x 65	69.9	73.0	15.7	120.7	206.5	111.3	85.6	M16 x 121	3.9
	139.7mm/5 x 76.1mm	2.75	2.88	3534.3	4.75	8.13	4.38	3.37	–	8.6
730mg5330✖	125 x 80	88.9	92.1	21.4	127.0	206.5	130.3	85.6	M16 x 121	5.6
	139.7mm/5 x 3	3.50	3.63	4810.6	5.00	8.13	5.13	3.37	5/8 x 4-3/4	12.3
730MG6212✖	150 x 32	50.8	54.0	4.8	130.3	235.0	90.4	99.1	M16 x 121	3.5
	165.1mm x 1-1/4	2.00	2.13	1082.1	5.13	9.25	3.56	3.90	–	7.7
730MG6215✖	150 x 40	50.8	54.0	6.3	130.3	235.0	90.4	99.1	M16 x 121	3.4
	165.1mm x 1-1/2	2.00	2.13	1417.6	5.13	9.25	3.56	3.90	–	7.6
730ag6220✖	150 x 50	63.5	66.7	9.9	130.3	235.0	103.1	99.1	M16 x 121	3.6
	165.1mm x 2	2.50	2.63	2215.1	5.13	9.25	4.06	3.90	–	8.0
730ag6225✖	150 x 65	69.9	73.0	14.4	130.3	235.0	111.3	99.1	M16 x 121	4.0
	165.1mm x 2-1/2	2.75	2.88	3245.9	5.13	9.25	4.38	3.90	–	8.8
730ag6226✖	150 x 65	69.9	73.0	15.7	130.3	235.0	111.3	99.1	M16 x 121	4.0
	165.1mm x 76.1mm	2.75	2.88	3534.3	5.13	9.25	4.38	3.90	–	8.8
730ag6230✖	150 x 80	88.9	92.1	–	139.7	235.0	130.3	99.1	M16 x 121	4.6
	165.1mm x 3	3.50	3.63	–	5.50	9.25	5.13	3.90	–	10.1
730ag6242✖	150 x 100	114.3	117.5	35.4	136.7	235.0	155.7	99.1	M16 x 121	5.3
	165.1mm x 4	4.50	4.63	7952.2	5.38	9.25	6.13	3.90	–	11.6
730mg6312✖	150 x 32	50.8	54.0	4.8	130.3	235.0	90.4	99.1	M16 x 121	3.5
	6 x 1-1/4	2.00	2.13	1082.1	5.13	9.25	3.56	3.90	5/8 x 4-3/4	7.7
730ag6315✖	150 x 40	50.8	54.0	6.3	130.3	235.0	90.4	99.1	M16 x 121	3.4
	6 x 1-1/2	2.00	2.13	1417.6	5.13	9.25	3.56	3.90	5/8 x 4-3/4	7.6
730ag6320✖	150 x 50	63.5	66.7	9.9	130.3	235.0	103.1	99.1	M16 x 121	3.6
	6 x 2	2.50	2.63	2215.1	5.13	9.25	4.06	3.90	5/8 x 4-3/4	8.0
730ag6325✖	150 x 65	69.9	73.0	14.4	130.3	235.0	111.3	99.1	M16 x 121	4.0
	6 x 2-1/2	2.75	2.88	3245.9	5.13	9.25	4.38	3.90	5/8 x 4-3/4	8.8
730ag6326✖	150 x 65	69.9	73.0	14.4	130.3	235.0	111.3	99.1	M16 x 121	4.0
	6 x 76.1mm	2.75	2.88	3245.9	5.13	9.25	4.38	3.90	5/8 x 4-3/4	8.8
730ag6330✖	150 x 80	88.9	92.1	21.4	139.7	235.0	130.3	99.1	M16 x 121	4.6
	6 x 3	3.50	3.63	4810.6	5.50	9.25	5.13	3.90	5/8 x 4-3/4	10.1
730ag6342✖	150 x 100	114.3	117.5	35.4	136.7	235.0	155.7	99.1	M16 x 121	5.3
	6 x 4	4.50	4.63	7952.2	5.38	9.25	6.13	3.90	5/8 x 4-3/4	11.6
730AG8020✖	200 x 50	63.5	66.7	9.9	158.8	317.5	111.3	124.5	M20 x 121	5.5
	8 x 2	2.50	2.63	2215.1	6.25	12.50	4.38	4.90	3/4 x 4-3/4	12.1

Figure 730
Mechanical Tees – Grooved

Tech Data Sheet: G210

10 YEAR LIMITED WARRANTY

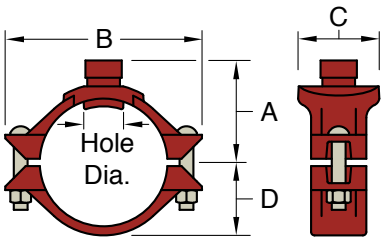


Figure 730 Branch Outlet with Grooved Branch (Tee Configuration)

Part Number	Nominal Size Run x Branch DN In.	Hole Dia.†		Max.‡ End Load Branch kN Lbs.	Dimensions – mm In.				Bolt Size mm In.	Approx. Weight kg Lbs.
		Min. mm In.	Max. mm In.		A	B	C	D		
730AG8025✖	200 x 65	69.9	73.0	14.4	158.8	317.5	111.3	124.5	M20 x 121	5.6
	8 x 2- 1/2	2.75	2.88	3245.9	6.25	12.50	4.38	4.90	3/4 x 4- 3/4	12.3
730ag8026✖	200 x 65	69.9	73.0	15.7	158.8	317.5	111.3	124.5	M20 x 121	5.6
	8 x 76.1mm	2.75	2.88	3534.3	6.25	12.50	4.38	4.90	–	12.3
730ag8030✖	200 x 80	88.9	92.1	21.4	165.1	317.5	130.3	124.5	M20 x 121	6.0
	8 x 3	3.50	3.63	4810.6	6.50	12.50	5.13	4.90	3/4 x 4- 3/4	13.2
730ag8042✖	200 x 100	114.3	117.5	35.4	162.1	317.5	155.7	124.5	M20 x 121	6.7
	8 x 4	4.50	4.63	7952.2	6.38	12.50	6.13	4.90	3/4 x 4- 3/4	14.7

✖ = 1 for red paint finish, 2 for hot dipped galvanised finish

× Contact a GRINNELL Sales Representative for dimension details.

† Proper hole preparation is required for effective sealing and performance. Check the pipe seal surface within 15.9mm (5/8") 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 a GRINNELL Sales Representative for details.

For information on alternative sizes, contact a GRINNELL Sales Representative.

See page 66 for mechanical tee specifications, and see pages 116 – 127 for gasket information.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Valves and Accessories

Valves & Accessories Table of Contents

General notes: Additional information is included in our data sheets and is available upon request. 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. Always read and understand the installation constructions. Never remove any piping components nor correct or modify any piping deficiencies without first depressurising and draining the system. Material and gasket selection should be verified with the gasket recommendation listing for the specific application.

Model B303 Grooved End Butterfly Valves Gear and Lever-Lock Operators

Tech Data Sheet: G315

The GRINNELL Model B303 Butterfly Valves provide for efficient control in piping systems of on/off or throttling/balancing service, fluid flow, and bubble-tight shut-off. The valves are furnished with grooved ends for use with grooved couplings and can be easily adapted to flanged components utilising GRINNELL Figure 71 Class 150 Flange Adapters.

Flow may be from either direction and the valve may be positioned in any orientation. 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 ranges. Contact your GRINNELL Representative for specific recommendations on seal and coating selections.

Lever-Lock Operator

Gear Operator

Approvals

- The Model B303 Butterfly Valves conform to MSS SP-67.

Maximum Working Pressure

- 50 to 200mm (2" to 8"): 20,7 bar (300 psi)
- 250 to 300mm (10" to 12"): 12 bar (175 psi)

Body:

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

Body Coating:

- Nylon: Rilson Pine Powder (PA11), Black

Disc:

- Ductile Iron conforming to ASTM A 395, Grade 60-40-18

Upper and Lower Stem:

- Type 410 Stainless Steel conforming to ASTM A479

Lever-Lock Operator:

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

Gear Operator:

- 50 to 200mm (2" to 8"): bronze travelling nut gearbox in ductile iron housing.
- 250 to 300mm (10" to 12"): segmented gearbox in ductile iron housing.

Encapsulated Disc Material & Temperature Rating:

See chart below

Butterfly Valve Torque

- Pressure drop, contact a GRINNELL Sales Representative.

Performance

- Pressure drop, contact a GRINNELL Sales Representative.

Grade "E" EPDM [a]	Grade "T" Nitrile [b]	Grade "O" Flouroelastomer [c]
-30°F to 230°F -34°C to 110°C	-20°F to 180°F -29°C to 82°C	-20°F to 200°F -29°C to 93°C

a. Recommended for hot water, dilute acids, alkalis, oil free air, and many chemical services not involving petroleum products. Not recommended for hydrocarbons or steam service.
b. Recommended for petroleum products, vegetable oils, mineral oils, and air with oils. High-end oil vapour temperature decreases to 150°F (66°C) Not recommended for hot water or hot dry air systems.
c. Recommended for oxidizing acids, petroleum products, hydraulic fluids, lubricants, halogenated hydrocarbons. Not recommended for hot water.

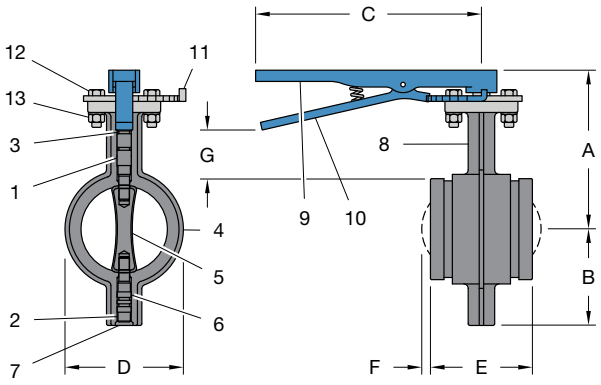
Model B303 Grooved End Butterfly Valves Lever-Lock Operator

Tech Data Sheet: G315

10 YEAR LIMITED WARRANTY

The 50 through 200mm (2" through 8") Model B303 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 to shut off service. The Lever may be pad-locked in any one of the positions, including opened or closed, by virtue of a locking hole located in the handle and lever.

Valve Material Specifications			
Item No.	Description	Material	Qty.
1		Stainless Steel	1
2		Polyacetal	4
3		EPDM, Nitrile, or Fluoroelastomer	4
4		Ductile Iron RILSAN Coated	1
5	Disc	Ductile Iron Encapsulation per Table on page 96	1
6	Lower Stem	Stainless Steel	1
7	Dust Plug	EPDM, Nitrile, or Fluoroelastomer	1
8	Nameplate	Aluminium	1
9	Handle	Ductile Iron	1
10	Lever	Zinc-Plated Steel	1
11	Throttle Plate	Zinc-Plated Steel	1
12	Hex. Bolt	Zinc-Plated Steel	2
13	Hex. Nut	Zinc-Plated Steel	2



Part Number		Pipe Size		Dimensions – mm Inches							Approx Weight Kg. Lbs.
EPDM	Nitrile	Nominal mm Inches	O.D. mm Inches	A	B	C	D	E	F	G	
B30320EL	B30320TL	50	60.3	131,0	72,5	284,0	70.0	96,4	0	50,8	1,8
		2	2.375	5.16	2.85	11.18	2.76	3.80		2.00	4.0
B30325EL	B30325TL	65	73.0	146,0	85,0	284,0	77,0	96,4	0	59,4	3,8
		2 1/2	2.875	5.76	3.35	11.18	3.03	3.80		2.34	8.4
B30326EL	B30326TL	65	76.1	146,0	85,0	284,0	77,0	96,4	0	57,9	3,8
		76,1mm	3.000	5.76	3.35	11.18	3.03	3.80		2.28	8.4
B30330EL	B30330TL	80	88.9	153,0	91,0	284,0	96.0	96,4	0	58,2	4,3
		3	3.500	6.02	3.58	11.18	3.78	3.80		2.29	9.5
B30340EL	B30340TL	100	114.3	178,0	109,0	284,0	124.0	115,4	0	70,6	6,0
		4	4.500	7.01	4.29	11.18	4.88	4.54		2.78	13.2
B30356EL	B30356TL	125	139.7	199,0	131,0	284,0	146,0	132,4	0	59,4	8,8
		139,7mm	5.500	7.83	4.16	11.18	5.75	5.21		2.34	19.4
B30350EL	B30350TL	125	141.3	199,0	131,0	284,0	146,0	132,4	0	58,7	8,8
		5	5.563	7.83	4.16	11.18	5.75	5.21		2.31	19.4
B30366EL	B30366TL	150	165.1	212,0	145,0	284,0	175,0	132,4	6,8	59,7	10,6
		165,1mm	6.500	8.35	5.71	11.18	6.89	5.21	0.27	2.35	23.4
B30360EL	B30360EL	150	168.3	212,0	145,0	284,0	175.0	132,4	6,8	58,2	10,6
		6	6.625	8.35	5.71	11.18	6.89	5.21	0.27	2.29	23.4
B30380EL	B30380TL	200	219.1	237,0	170,0	284,0	224.0	147,4	24,0	57,7	15,6
		8	8.625	9.33	6.69	11.18	8.82	5.80	0.94	2.27	34.4

Note: recommended for mounting with GRINNELL Rigid couplings
For information on alternative sizes, contact a GRINNELL Sales Representative.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

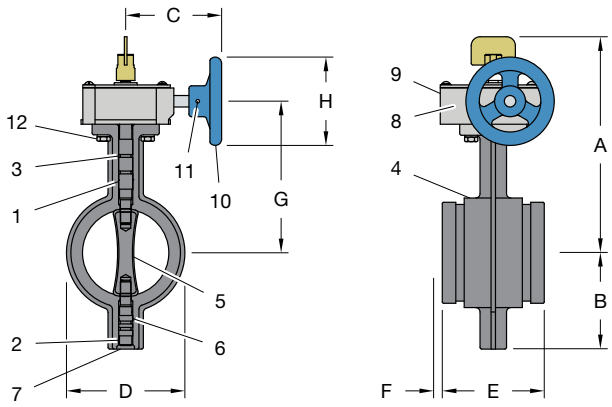
Model B303 Grooved End Butterfly Valves Gear Operator

Tech Data Sheet: G315

10 YEAR LIMITED WARRANTY

The 50 through 300mm (2" through 12") Model B303 Butterfly Valve with Gear Operator is a self-locking, travelling nut gear operator (50 through 200mm) and segmented gearbox (250 through 300mm) type. It is equipped with adjustable stop screws to lock the valve at the full open and shut positions.

Valve Material Specifications			
Item No.	Description	Material	Qty.
1	Upper Stem	Stainless Steel	1
2	Bearing	Polyacetal	4
3	O-ring	EPDM, Nitrile, or Fluoroelastomer	4
4	Body	Ductile Iron RILSAN Coated	1
5	Disc	Ductile Iron Encapsulation per Table on page 96	1
6	Lower Stem	Stainless Steel	1
7	Dust Plug	EPDM, Nitrile, or Fluoroelastomer	1
8	Nameplate	Aluminium	1
9	Gear Operator	Ductile Iron, Steel	1
10	Handwheel	Ductile Iron	1
11	Spring Pin	Steel	1
12	Hex. Bolt	Zinc-Plated Steel	2



Part Number		Pipe Size		Dimensions - mm Inches								Approx Weight Kg. Lbs.
EPDM	Nitrile	Nominal mm Inches	O.D. mm Inches	A	B	C	D	E	F	G	H	
B30320EG	B30320TG	50	60.3	214,0	72,5	108,6	70.0	96,4	0	124,5	125,0	7,2
		2	2.375	8.43	2.85	4.28	2.76	3.80		4.9	4.92	15.9
B30325EG	B30325TG	65	73.0	237,3	85,0	108,6	77,0	96,4	0	139,8	125,0	8,7
		2 1/2	2.875	9.34	3.35	4.28	3.03	3.80		5.50	4.92	19.2
B30326EG	B30326TG	65	76.1	237,3	85,0	108,6	77,0	96,4	0	139,8	125,0	8,7
		76,1mm	3.000	9.34	3.35	4.28	3.03	3.80		5.50	4.92	19.2
B30330EG	B30330TG	80	88.9	243,8	91,0	108,6	96.0	96,4	0	146,3	125,0	9,5
		3	3.500	9.60	3.58	4.28	3.78	3.80		5.76	4.92	21.0
B30340EG	B30340tG	100	114.3	269,0	109,0	108,6	124.0	115,4	0	171,5	125,0	11,0
		4	4.500	10.59	4.29	4.28	4.88	4.54		6.75	4.92	24.3
B30356EG	B30356TG	125	139.7	290,0	131,0	147,0	146,0	132,4	0	201,5	150,0	14,5
		139,7mm	5.500	11.42	4.16	5.79	5.75	5.21		7,93	5.91	32.0
B30350EG	B30350TG	125	141.3	290,0	131,0	147,0	146,0	132,4	0	201,5	150,0	14,5
		5	5.563	11.42	4.16	5.79	5.75	5.21		7,93	5.91	32.0
B30366EG	B30366TG	150	165.1	303,0	145,0	147,0	175,0	132,4	6,8	214,5	150,0	16,2
		165,1mm	6.500	11.93	5.71	5.79	6.89	5.21	0.27	8,44	5.91	35.7
B30360EG	B30360TG	150	168.3	303,0	145,0	147,0	175.0	132,4	6,8	214,5	150,0	16,2
		6	6.625	11.93	5.71	5.79	6.89	5.21	0.27	8,44	5.91	35.7
B30380EG	B30380TG	200	219.1	328,0	170,0	208,0	224.0	147,4	24,0	236,0	225,0	22,5
		8	8.625	12.91	6.69	8.19	8.82	5.80	0.94	9.29	8.86	49.6
B30310EG	B30310TG	250	273.0	374,0	195,0	208,0	275,0	159,0	41,8	282,0	225,0	33,0
		10	10.750	14.72	7.68	8.19	10.83	6.26	1.65	11.10	8.86	72.8
B30312EG	B30312TG	300	323.9	15.83	241,5	208,0	339,0	165,0	68,5	310,0	225,0	40.4
		12	12.750	402,0	9.51	8.19	13.15	6.50	2.70	12.20	8.86	89.3

Note: recommended for mounting with GRINNELL Rigid couplings
For information on alternative sizes, contact a GRINNELL Sales Representative.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.
Just for inside usage

Model CV-1 Grooved End Check Valves

Tech Data Sheet: G352

10 YEAR LIMITED WARRANTY

The GRINNELL Model CV-1 Grooved End Swing Check Valves are 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 and a nickel-plated seat.

- Sizes 50 to 200mm (2" to 8") have a stainless steel clapper assembly.
- Sizes 250 to 300mm (10" to 12") have a ductile iron clapper assembly.

A resilient elastomer seal facing on the spring-loaded clapper ensures a leaktight seal and a non-sticking operation.

The Model CV-1 Check Valves are designed to minimise water hammer caused by flow reversal. The Model CV-1 Check Valve is furnished with grooved ends and can be installed using GRINNELL Grooved Couplings or Flanged Adapters. The Model CV-1 Check Valves have been designed with a removable cover for ease of field maintenance. These valves can be installed horizontally (with cover in the upward position) or vertically with the flow in the upward direction.

Specifications

Valve Assembly Finish

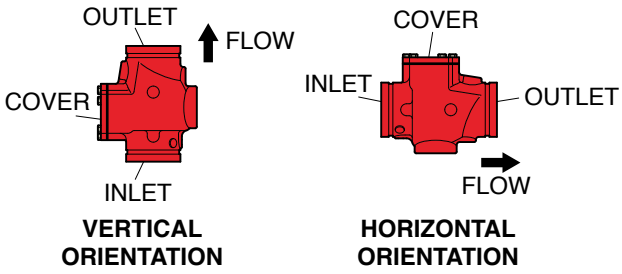
- Red, non-lead paint

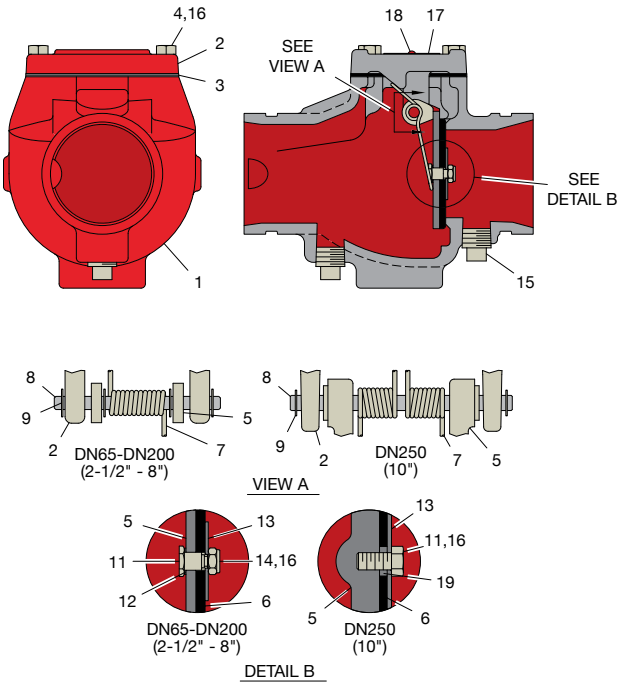
Max Working Pressure

- 0.7 Bar (300 psi)

Clapper

- 50 - 200mm (2" - 8") - Stainless Steel, 250mm (10") - Ductile iro



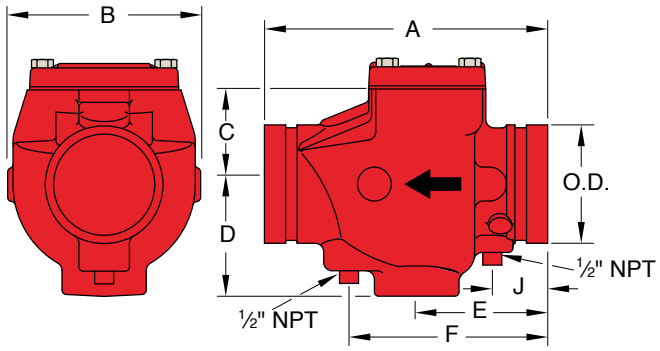


Valve Material Specifications			
Item No.	Description	Material	Qty.
1	Body	Ductile Iron	1
2	Cap	Ductile Iron	1
3	Gasket	Synthetic Fibre	1
4	Hex Cap Screw	Steel, Zinc Plated	AR
5	Clapper	Stainless Steel or Ductile Iron	1
6	Seal Facing	EPDM Grade "E"	1
7	Spring	Stainless Steel	1
8	Hinge Shaft	Stainless Steel	1
9	Retaining Ring	Stainless Steel	AR
10	Washer	Teflon	2
11	Retention Bolt	Stainless Steel	1
12	Seal Ring	Neoprene	1
13	Retaining Disc	Stainless Steel	1
14	Locknut	Stainless Steel	1
15	Plug- ½"-14 NPT	Cast Iron	2
16	Adhesive	Thread Sealer	AR
17	Nameplate	Aluminium	1
18	Rivet	Steel	2
19	Spacer	Stainless Steel	1

Model CV-1 Grooved End Check Valves

Tech Data Sheet: G35

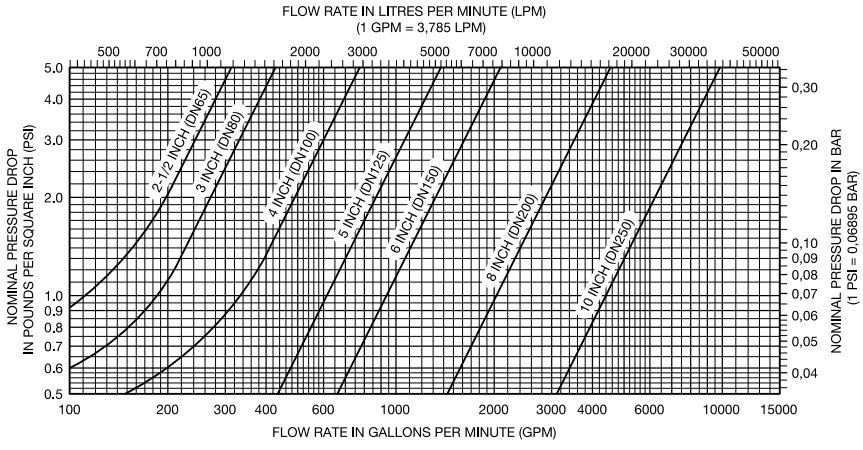
10 YEAR LIMITED WARRANTY



Part Number	Pipe Size		Dimensions mm In.							Approx. Weight kg Lbs
	Nominal DN In.	O.D. mm In.	A mm In.	B mm In.	C mm In.	D mm In.	E mm In.	F mm In.	J mm In.	
595900020	50	60.3	171.5	111.3	64.8	65.3	82.3	120.7	41.5	4.1
	2	2.375	6.75	4.38	2.55	2.57	3.25	4.75	1.62	9.0
595900025	65	73.0	203.2	147.3	86.6	86.4	98.6	152.4	43.2	4.5
	2-½	2.875	8.00	5.80	3.41	3.40	3.88	6.00	17.0	10.0
595900076	65	76.1	203.2	147.3	86.6	86.4	98.6	152.4	43.2	4.5
	76.1mm	3.000	8.00	5.80	3.41	3.40	3.88	6.00	1.70	10.0
595900030	80	88.9	212.6	146.3	91.4	86.4	98.6	152.4	43.2	5.0
	3	3.500	8.37	5.76	3.60	3.40	3.88	6.00	1.70	11.0
595900040	100	114.3	245.6	171.2	117.1	92.2	115.1	181.1	46.7	11.3
	4	4.500	9.63	6.74	4.61	3.63	4.56	7.13	1.84	25.0
595900139	125	139.7	266.7	190.5	134.4	106.7	124.5	193.0	48.3	13.2
	139.7mm	5.500	10.50	7.50	5.29	4.20	4.90	7.60	1.90	29.0
595900050	125	141.3	266.7	190.5	134.4	106.7	124.5	193.0	48.3	13.2
	5	5.563	10.50	7.50	5.29	4.20	4.90	7.60	1.90	29.0
595900165	150	165.1	292.1	204.4	146.1	114.3	127.0	193.0	37.6	21.3
	165.1mm	6.500	11.50	8.05	5.75	4.50	5.00	7.60	1.48	47.0
595900060	150	168.3	292.1	204.4	146.1	114.3	127.0	193.0	37.6	21.3
	6	6.625	11.50	8.05	5.75	4.50	5.00	7.60	1.48	47.0
595900080	200	219.1	355.6	260.4	196.9	142.7	138.4	213.4	58.9	29.9
	8	8.625	14.00	10.25	7.75	5.62	5.45	8.40	2.20	66.0
595900100	250	273.0	457.2	330.2	259.3	162.1	190.5	266.7	76.2	49.4
	10	10.750	18.00	13.00	10.21	6.38	7.50	10.50	3.00	109.7
595900120	300	323.9	533.4	362.7	287.2	184.4	193.5	269.7	69.9	68.0
	12	12.750	21.00	14.28	11.31	7.26	7.62	10.62	2.75	2.68

For information on alternative sizes, contact a GRINNELL Sales Representative.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Model CV-1 Pressure Loss Data



Notice: This information is current as of 2021 and is provided for historical reference only. Some products may now be discontinued or have modified specifications. Consult the current product data sheet for product specifications and information.

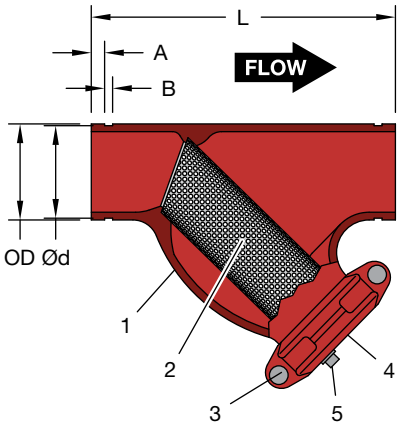
Figure 760P "Y" Strainer

Tech Data Sheet: G422

10 YEAR LIMITED WARRANTY

The Figure 760P "Y" Strainer provides economical strainer protection for piping equipment such as pumps, meters, valves, compressors, traps and similar equipment, from debris and foreign matter.

This Strainer features a 304 Stainless Steel screen that is secured with an end cap and a mechanical coupling. Cleaning and maintenance of the screen can be accomplished easily by removing the coupling. The Figure 760P Strainer is suitable for vertical and horizontal installation.



"Y" Strainer – Material Specifications		
Item No.	Description	Material
1	Valve Body	ASTM A536, 65-45-12
2	Screen	AISI 304
3	Rigid Coupling	ASTM A536, 65-45-12
4	Cap	ASTM A536, 65-45-12
5	Plug	Malleable Iron Galvanized or Bronze ASTM B564

Part Number	Pipe Size		Ød Bar psi	A mm Inches	B mm Inches	L mm Inches	Screen Perforation Detail (See Next Page)	Drain Plug Size Selection Inches NPT
	Nominal mm Inches	O.D. mm Inches						
760P000601	50	60.3	57.2	15.9	7.9	247.5	Fig. A	½"
	2	2.375	2.25	0.63	0.31	9.74		
760P000731	65	73.0	69.1	15.9	7.9	273.0		
	2-½	2.875	2.72	0.63	0.31	10.75		
760P000761	65	73.0	69.1	15.9	7.9	273.0		
	76,1mm	2.875	2.72	0.63	0.31	10.75		
760P000881	80	88.9	84.9	15.9	7.9	298.5	Fig. B	
	3	3.500	3.34	0.63	0.31	11.75		
760P001141	100	114.3	110.1	15.9	9.6	362.0		
	4	4.500	4.33	0.63	0.37	14.25		
760P001391	125	139.7	137.0	15.9	9.6	419.0	Fig. C	1"
	139,7mm	5.500	5.39	0.63	0.37	16.50		
760P001651	150	165.7	164.0	15.9	9.6	470.0	Fig. D	
	165,1mm	6.500	6.46	0.63	0.37	18.50		
760P001681	150	168.3	164.0	15.9	9.6	470.0		
	6	6.625	6.46	0.63	0.37	18.50		
760P002191	200	219.1	214.4	19.1	11.1	609.5		
	8	8.625	8.44	0.75	0.44	24.00		
760P002731	250	273.1	268.3	19.1	12.7	686.0		
	10	10.750	10.56	0.75	0.50	27.00		
760P003241	300	323.9	318.3	19.1	12.7	762.0		
	12	12.750	12.53	0.75	0.50	30.00		

Maximum working pressure is based upon the performance capability of the GRINNELL "Y"-Strainer.

Maximum system working pressure is dependant upon the rigid couplings used for installation and the pressure capacity of the system components. For information on alternative sizes, contact a GRINNELL Sales Representative.

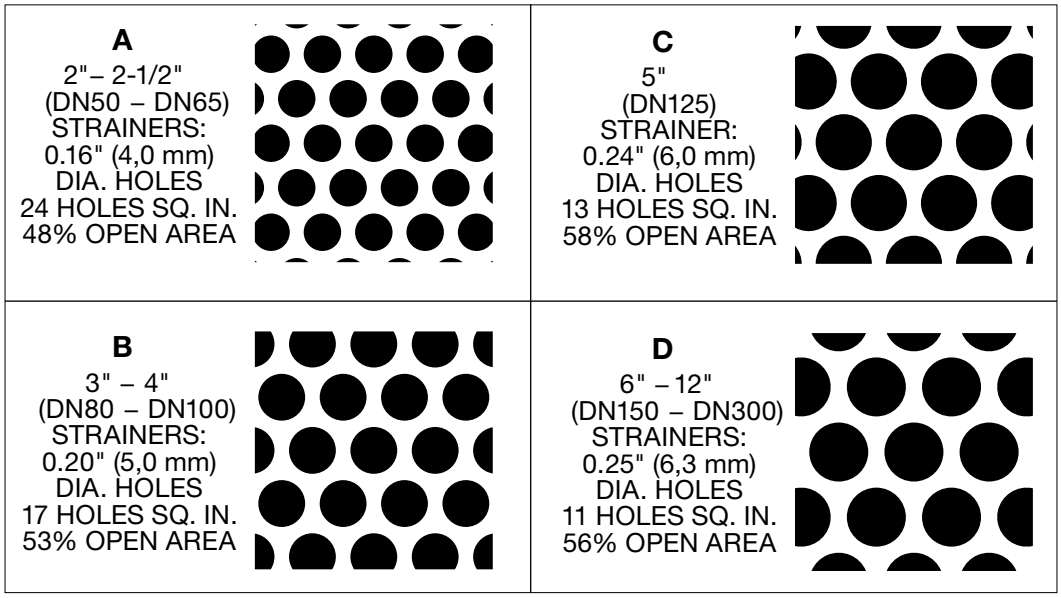
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 760P "Y" Strainer

Tech Data Sheet: G422

10 YEAR LIMITED WARRANTY

Figure 760P "Y" Strainer Screen Perforations



Specifications

Maximum Working Pressure
- 20 bar (300 psi)

Strainer Screen
- AISI 304

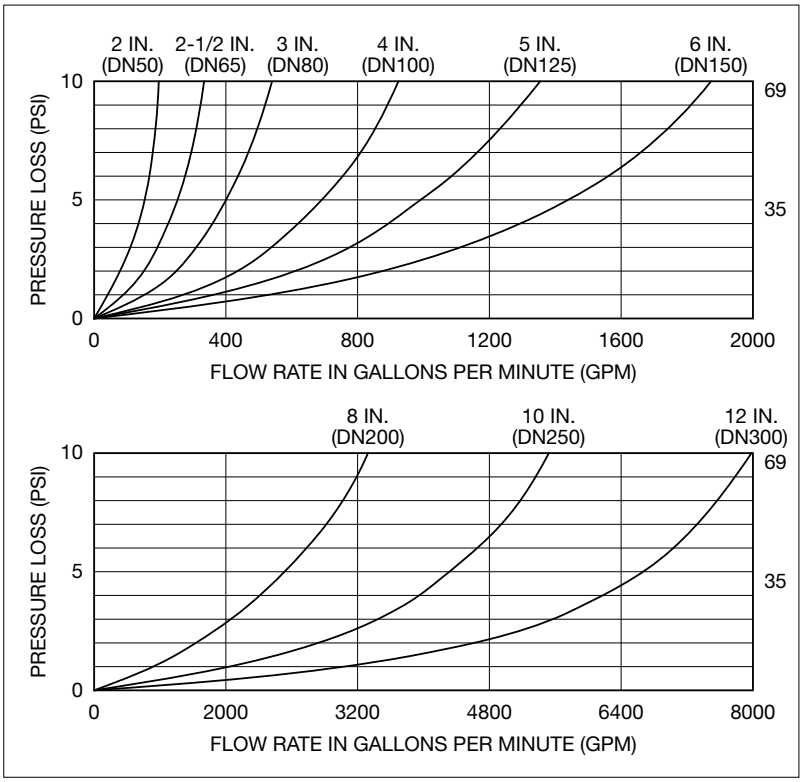
Temperature Range
- 0° to 100°C (32° to 200° F)

Body and Cover
- ASTM A-536, Grade 65-45-12

Coating
- Fusion bonded Epoxy Coating in accordance with ANSI/AWWA C550 or painting upon request

Performance
- See chart or contact a GRINNELL Sales Representative.

Figure 760P "Y" Strainer Performance



CB800 Circuit Balancing Valves

Tech Data Sheet: G450

10 YEAR LIMITED WARRANTY

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 20.7 Bar (300 psi) at 150°C (300°F). 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.

Material Specifications

Body

- Sizes 15 – 50mm (1/2" – 2") solder or BSP threaded connection: brass-resistant to dezincification (DZR)
- Sizes 65 – 300mm (2 1/2" – 12"), grooved or flanged connection: Cast Iron conforming to ASME ANSI B 16.5

Valve Stem and Disc

- Brass resistant to dezincification (DZR)

O-Ring

- EPDM E

Handwheel

- Thermoplastic

For accessories and replacement parts contact a GRINNELL Sales Representative 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 0.3 – 0.9m (1 – 3 ft.) of water. It is recommended that for improved accuracy, the valve is set to open 70%+.

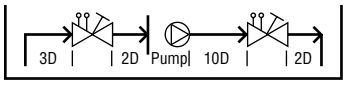
Size mm Inches	Flow Rate GPM LPM	Connection Type
15	0.687 - 1.110	Thread
1/2	2.6 - 4.2	
20	0.898 - 1.638	
3/4	3.4 - 6.2	
25	1.638 - 2.536	
1	6.2 - 9.6	
32	2.483 - 5.548	
1 1/4	9.4 - 21.0	
40	3.96 - 7.93	
1 1/2	15 - 30	
50	5.812 - 11.096	
2	22 - 42	
65	10.30 - 28.01	Grooved
2 1/2	39 - 106	
65	10.30 - 28.01	
76,1mm	39 - 106	
80	15.85 - 34.87	
3	60 - 132	
100	26.42 - 57.33	
4	100 - 217	
125	29.59 - 83.75	
139,7mm	112 - 317	
125	29.59 - 83.75	
5	112 - 317	
150	58.12 - 115.46	
165,1mm	220 - 437	
150	58.12 - 115.46	
6	220 - 437	
200	58.92 - 232.76	
8	223 - 881	
250	77.15 - 342.93	
10	292 - 1298	
300	162.75 - 457.33	
12	616 - 1731	

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 0.6m (2 ft.) water 0.06 Bar (0.8 psi) 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 normalise 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



Model CB800 Circuit Balancing Valves
Grooved Ends

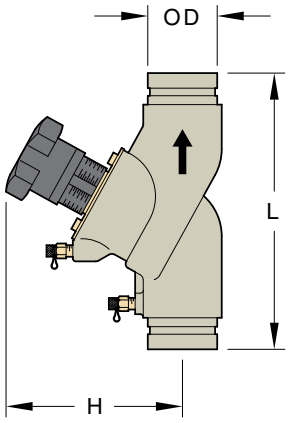
Tech Data Sheet: G450

10 YEAR LIMITED WARRANTY

The GRINNELL Model CB800 Balancing Valve provides features for achieving accurate and efficient balancing of hydronic heating or cooling systems. The GRINNELL Groove-by-Groove Model CB800 Valve, available sizes 65 to 300mm (2 ½" to 12"), is composed of cast iron.

The CB800 valve serves 5 functions:

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



Part Number	Pipe Size		Dimensions		Approx. Weight Kg. Lbs.	Limits PN/°C PSI/°F	Handwheel Turns
	Nominal mm Inches	O.D. mm Inches	L mm Inches	H mm Inches			
CB8002504	65	73.0	290.6	187.5	8.5	20.7/150	8
	2 ½	2.875	11.44	7.38	18.7	300/300	
CB8007604	65	76.1	290.6	187.5	8.5	20.7/150	8
	76,1mm	3.000	11.44	7.38	18.7	300/300	
CB8003004	80	88.9	311.2	203.2	12.5	20.7/150	8
	3	3.500	12.25	8.00	27.5	300/300	
CB8004004	100	114.3	349.3	239.8	20.5	20.7/150	8
	4	4.500	13.75	9.44	45.1	300/300	
CB8001394	125	139.7	400.0	282.7	32.0	20.7/150	8
	139,7mm	5.500	15.75	11.13	70.4	300/300	
CB8005004	125	141.3	400.0	282.7	32.0	20.7/150	8
	5	5.563	15.75	11.13	70.4	300/300	
CB8001654	150	165.1	479.6	285.8	43.5	20.7/150	8
	165,1mm	6.500	18.88	11.25	95.7	300/300	
CB8006004	150	168.3	479.6	285.8	43.5	20.7/150	8
	6	6.625	18.88	11.25	95.7	300/300	
CB8008004	200	219.1	600.2	468.4	116.0	20.7/150	12
	8	8.625	23.63	18.44	255.2	300/300	
CB8001104	250	273.1	730.3	479.6	171.0	20.7/150	12
	10	10.750	28.75	18.88	376.2	300/300	
CB8001204	300	323.9	849.4	514.4	136.0	20.7/150	12
	12	12.750	33.44	20.25	519.2	300/300	

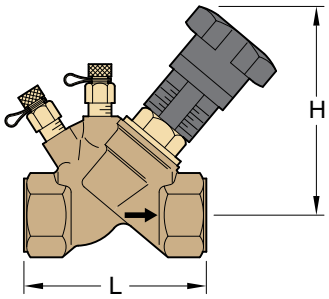
For information on alternative sizes, contact a GRINNELL Sales Representative.
See circuit balancing valve specifications on pages 83.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Model CB800 Circuit Balancing Valves
BSP 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 15 to 50mm (½" to 2"), is composed of zinc retaining brass.



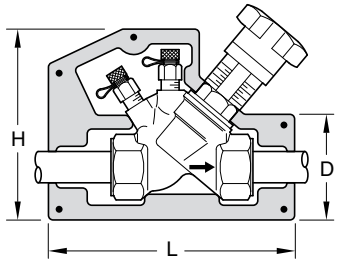
Part Number	Pipe Size		Dimensions		Approx. Weight Kg. Lbs.	Limits PN/°C PSI/°F	Handwheel Turns
	Nominal mm Inches	O.D. mm Inches	L mm Inches	H mm Inches			
CB8000505	15	21.3	79.5	104.9	0.6	16/150	7
	½	0.840	3.13	4.13	1.4	235/300	
CB8000755	20	26.9	84.1	115.8	0.6	16/150	7
	¾	1.050	3.31	4.56	1.4	235/300	
CB8001005	25	33.7	85.6	119.1	1.0	16/150	7
	1	1.315	3.38	4.69	2.2	235/300	
CB8001255	32	42.4	111.3	136.7	1.4	16/150	10
	1¼	1.660	4.38	5.38	3.0	235/300	
CB8001505	40	48.3	120.7	138.2	1.7	16/150	10
	1½	1.900	4.75	5.44	3.9	235/300	
CB8002005	50	60.3	150.9	147.6	2.6	16/150	10
	2	2.375	5.94	5.81	5.6	235/300	

For information on alternative sizes, contact a GRINNELL Sales Representative.
See circuit balancing valve specifications on pages 83.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

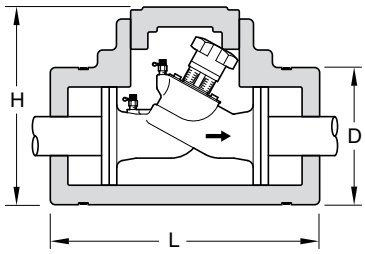
Model CB800 Circuit Balancing Valves Insulation Kits

Tech Data Sheet: G450

10 YEAR LIMITED WARRANTY



Sizes
15 – 50mm
(½" – 2")



Sizes
65 – 150mm
(2½" – 6")

The insulation shells have a CFC-free inner core made of polyurethane foam with a 1.5mm (0.06") plastic coat. It consists of two double shells which are tightened by two metal straps.

Available for sizes 15 – 150mm (½" – 6"). Specify size and end-connection type.

Pipe Size		Dimensions			Approx. Weight Kg. Lbs.
Nominal mm Inches	O.D. mm Inches	D mm Inches	H mm Inches	L mm Inches	
15	21.3	69	136	183	0.15
½	0.840	2.72	5.35	7.20	0.3
20	26.9	77	143	195	0.18
¾	1.050	3.31	5.63	7.68	0.4
25	33.7	85	151	243	0.22
1	1.315	3.35	5.94	9.57	0.5
32	42.4	97	172	254	0.20
1¼	1.660	3.82	6.77	10.00	0.4
40	48.3	105	185	250	0.33
1½	1.900	4.13	7.28	9.84	0.7
50	60.3	120	209	276	0.43
2	2.375	4.72	8.23	10.87	0.9
65	73.0	260	410	505	3.06
2½	2.875	10.2	16.1	19.9	6.7
80	88.9	280	415	530	3.25
3	3.500	11.0	16.3	20.9	7.2
100	114.3	320	520	580	5.16
4	4.500	12.6	20.5	22.8	11.4
125	141.3	360	560	620	5.24
5	5.563	14.2	22.1	24.4	11.6
150	168.3	400	600	730	5.97
6	6.625	15.7	23.6	28.7	13.2

For information on alternative sizes, contact a GRINNELL Sales Representative.
♦ Contact a GRINNELL Sales Representative for details.
See circuit balancing valve specifications on pages 83.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

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 15 – 300mm (½" – 12"). 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 pact. All parts of the hand-held computer are stored in a convenient carrying case.

Note: Only available in select regions, contact a GRINNELL Sales Representative.

Figure 70607
Groove Ended Metering Station

10 YEAR LIMITED WARRANTY

Description:

- Oventrop groove ended metering station PN16 complete with 2 extended pressure test points.

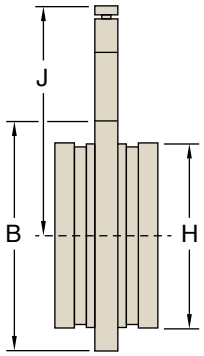
Application:

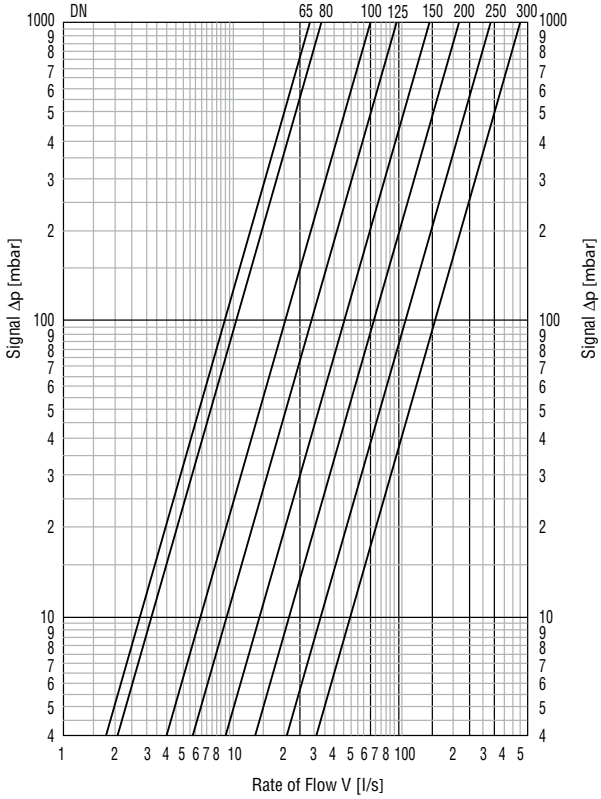
- Oventrop groove ended metering stations are installed in the pipework of hot water heating and chilled water systems to obtain flow measurements.
- Non-agressive fluids
- Maximum pressure: 16 bar (232 psi)
- Temperature range: -10°C to 150°C (14°F to 302°F)

Materials:

- Nickel plated steel body
- DZR test points

Note: To obtain an accuracy of +/- 5%, we recommended a minimum of 5 diameters of straight, valve sized, pipe on the inlet of the metering station and 3 diameters on the outlet.





Part Number	Pipe Size		Dimensions - mm Inches				Kv
	Nominal mm Inches	O.D. mm Inches	A	B	H	J	
7060751	65	76.1	80	108	76.1	195	102
	76.1mm	3.000	3.15	4.25	3.00	7.68	
7060752	80	88.9	80	125	88.9	212	120
	3	3.500	3.15	4.92	3.50	8.35	
7060753	100	114.3	80	147	114.3	234	234
	4	4.500	3.15	5.79	4.50	9.21	
7060754	125	139.7	80	175	139.7	262	335
	139.7mm	5.500	3.15	6.89	5.50	10.31	
7060755	150	165.1	80	202	165.1	289	522
	165.1mm	6.500	3.15	7.95	6.50	11.38	
7060756	200	219.1	100	251	219.1	338	780
	8	8.625	3.94	9.88	8.63	13.31	
7060757	250	273.1	100	300	273.1	387	1197
	10	10.750	3.94	11.81	10.75	15.24	
7060758	300	323.9	100	345	323.9	432	1810
	12	12.750	3.94	13.58	12.75	17.01	

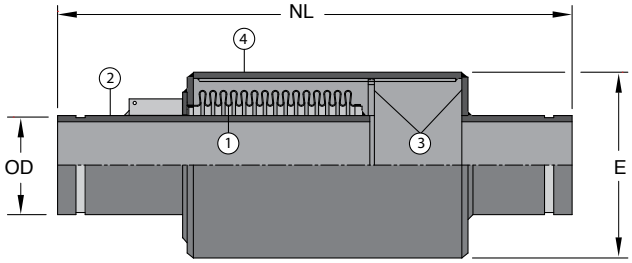
For information on alternative sizes, contact a GRINNELL Sale Representative. For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure RXAG Expansion Joint

10 YEAR LIMITED WARRANTY

An expansion joint with steel grooved ends for use within grooved end pipe systems. Using these couplings and fittings, combines a number of advantages. The ease and swiftness of installation reduces the actual time needed "on site". For applications in mainly heating systems, where a thermal expansion of the piping has to be absorbed. This type of expansion joint is basically meant for axial movements, and has an outer protection sleeve. The shown type is recommended for mounting with GRINNELL Rigid couplings.

RXAG – Material Specifications		
Item No.	Description	Material
1	Bellow	AISI 316Ti
2	Grooved Ends	Carbon Steel
3	End/Guide Ring	Carbon Steel
4	Outer Protection Sleeve	AISI 304



Part Number	Pipe Size		Max. Wk Pressure 20°C (68°F) Bar psi	Max. Wk Pressure 200°C (392°F) Bar psi	NL Neutral Length mm Inches	E mm Inches	Axial Compression mm Inches	Axial Extension mm Inches	Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches							
rxag034	25	33.7	16.0	10.0	525	88.9	-70	+10	4.8
	1	1.315	230	145	20.67	3.50	-2.76	+0.39	10.6
rxag042	32	42.4	16.0	10.0	525	101.6	-70	+10	6.0
	1 1/4	1.660	230	145	20.67	4.00	-2.76	+0.39	13.2
rxag048	40	48.3	16.0	10.0	525	114.3	-70	+10	7.3
	1 1/2	1.900	230	145	20.67	4.50	-2.76	+0.39	16.1
rxag060	50	60.3	16.0	10.0	525	115.0	-70	+10	7.8
	2	2.375	230	145	20.67	4.52	-2.76	+0.39	17.2
rxag076	65	76.1	16.0	10.0	525	127.0	-70	+10	10.3
	76,1mm	3.000	230	145	20.67	5.00	-2.76	+0.39	22.7
rxag089	80	88.9	16.0	10.0	525	166.0	-70	+10	14.6
	3	3.500	230	145	20.67	6.54	-2.76	+0.39	32.2
rxag114	100	114.3	16.0	10.0	525	178.0	-70	+10	16.3
	4	4.500	230	145	20.67	7.00	-2.76	+0.39	35.9
rxag139	125	139.7	16.0	10.0	525	219.0	-70	+10	22.3
	139,7mm	5.500	230	145	20.67	8.63	-2.76	+0.39	49.2
rxag168	150	168.3	16.0	10.0	525	273.0	-70	+10	30.6
	6	6.625	230	145	20.67	10.75	-2.76	+0.39	67.5
rxag219	200	219.1	16.0	10.0	525	324.0	-70	+10	44.4
	8	8.625	230	145	20.67	12.75	-2.76	+0.39	97.9
rxag273	250	273.0	16.0	10.0	525	400.0	-70	+10	-
	10	10.750	230	145	20.67	15.75	-2.76	+0.39	-
rxag300	300	323.9	16.0	10.0	525	457.0	-70	+10	-
	12	12.750	230	145	20.67	18.00	-2.76	+0.39	-

Note: recommended for mounting with GRINNELL Rigid couplings
For information on alternative sizes, contact a GRINNELL Sales Representative.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure ALG Expansion Joint

10 YEAR LIMITED WARRANTY

Material Specifications

Bellow

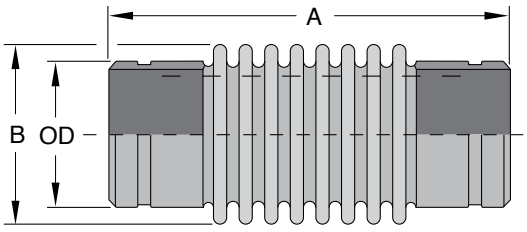
- Stainless steel AISI 321/Ws No 1.4541

Pipe Ends

- Carbon steel - ST 35.8

Internal Sleeves

- Stainless steel AISI 304/Ws No 1.4301



Part Number	Pipe Size		Max. Wk Pressure Bar psi	A mm Inches	B mm Inches	Rated Movement L mm Inches	Spring Rate N/mm Lbs/In.	Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches						
ALG0034	25	33.7	16.0	200	39	+20 / -20	14	0.4
	1	1.315	230	7.87	1.54	+0.79/-0.79	80	0.9
ALG0042	32	42.4	16.0	205	46	+20 / -20	16	0.5
	1 1/4	1.660	230	8.07	1.81	+0.79/-0.79	91	1.2
ALG0048	40	48.3	16.0	234	58	+25 / -25	26	0.8
	1 1/2	1.900	230	9.21	2.28	+0.98/-0.98	148	1.7
ALG0060	50	60.3	16.0	276	69	+30 / -30	22	1.3
	2	2.375	230	10.87	2.72	+1.18/-1.18	126	2.8
ALG0073	65	73.0	16.0	261	87	+30 / -30	24	1.6
	2 1/2	2.875	230	10.28	3.43	+1.18/-1.18	137	3.4
ALG0076	65	76.1	16.0	261	87	+30 / -30	24	1.6
	76,1mm	3.000	230	10.28	3.43	+1.18/-1.18	137	3.4

Note: recommended for mounting with GRINNELL Rigid couplings
For information on alternative sizes, contact a GRINNELL Sales Representative.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure ANS Expansion Joint

10 YEAR LIMITED WARRANTY

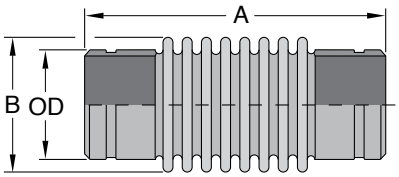
Material Specifications

Bellow

- Stainless steel AISI 321/Ws No 1.4541

Pipe Ends

- Carbon steel – ST 35.8



Part Number	Pipe Size		Max. Wk Pressure Bar psi	A mm Inches	B mm Inches	Rated Movement L mm Inches	Spring Rate N/mm Lbs/In	Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches						
ANS0089	80	88.9	16.0	205	104	+20 / -20	46	1.9
	3	3.500	230	8.07	4.09	+0.79/-0.79	263	4.1
ANS0114	100	114.3	16.0	200	127	+20 / -20	49	2.4
	4	4.500	230	7.87	5.00	+0.79/-0.79	280	5.3
ANS0139	125	139.7	16.0	210	155	+25 / -25	93	3.2
	139,7mm	5.500	230	8.27	6.10	+0.98/-0.98	531	7.1
ANS0141	125	141.3	16.0	210	155	+25 / -25	93	3.2
	5	5.563	230	8.27	6.10	+0.98/-0.98	531	7.1
ANS0165	150	165.1	16.0	245	184	+25 / -25	83	5.0
	165,1mm	6.500	230	9.65	7.24	+0.98/-0.98	474	11.0
ANS0168	150	168.3	16.0	245	184	+25 / -25	83	5.0
	6	6.625	230	9.65	7.24	+0.98/-0.98	474	11.0
ANS0219	200	219.1	16.0	275	235	+25 / -25	89	8.7
	8	8.625	230	10.83	9.25	+0.98/-0.98	508	19.1

Note: recommended for mounting with GRINNELL Rigid couplings
For information on alternative sizes, contact a GRINNELL Sales Representative.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure FSF Flanged Rubber Bellows

10 YEAR LIMITED WARRANTY

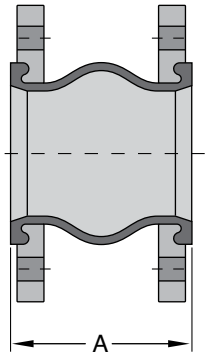
Material Specifications

Flange

- Galvanised carbon steel – ST 35.8, with hardened steel flange ring.

Bellow

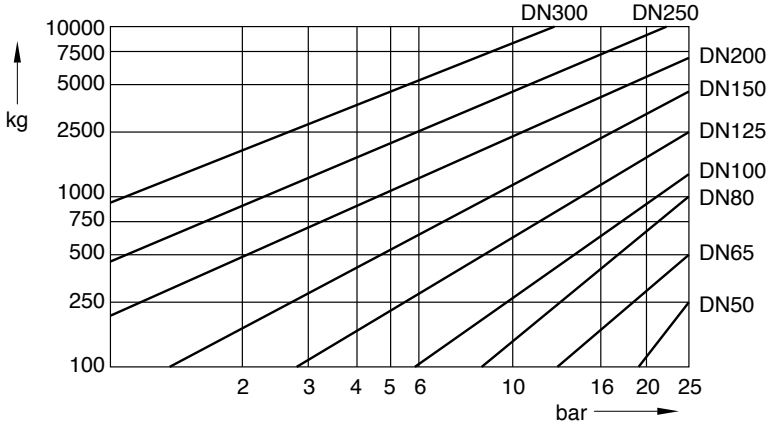
- EPDM, nylon reinforced.



Part Number	Pipe Size		Max. Wk Pressure Bar psi	Flange Dimension	A mm Inches	Axial Movement Δ L mm Inches	Lateral Movement mm Inches	Max. Deflection	Approx. Weight Kg. Lbs.
	Nominal mm Inches	O.D. mm Inches							
fsf0050E	50	60.3	16.0	PN10/16	130	+20 / -30	+20	35°	3.8
	2	2.375	230		5.12	+0.79 / -1.18	+0.79		8.4
fsf0065E	65	76.1	16.0	PN10/16	130	+20 / -30	+20	35°	4.7
	76,1mm	3.000	230		5.12	+0.79 / -1.18	+0.79		10.4
fsf0080E	80	88.9	16.0	PN10/16	130	+20 / -30	+20	35°	5.1
	3	3.500	230		5.12	+0.79 / -1.18	+0.79		11.2
fsf0100E	100	114.3	16.0	PN10/16	130	+20 / -30	+20	35°	7.0
	4	4.500	230		5.12	+0.79 / -1.18	+0.79		15.4
fsf0125E	125	139.7	16.0	PN10/16	130	+20 / -30	+20	35°	8.9
	139,7mm	5.500	230		5.12	+0.79 / -1.18	+0.79		19.6
fsf0150E	150	165.1	16.0	PN10/16	130	+20 / -30	+20	35°	10.6
	165,1mm	6.500	230		5.12	+0.79 / -1.18	+0.79		23.4
fsf0200E	200 8	219.1 8.625	10.0	PN10	130	+20 / -30	+20	35°	15.2
			150		5.12	+0.79 / -1.18	+0.79		33.5
FSF1200E			16.0	PN16	130	+20 / -30	+20	35°	15.2
			230		5.12	+0.79 / -1.18	+0.79		33.5
FSF0250E	250 10	273.0 10.750	10.0	PN10	130	+20 / -30	+20	35°	31.5
			150		5.12	+0.79 / -1.18	+0.79		69.4
FSF1250E			16.0	PN16	130	+20 / -30	+20	35°	31.5
			230		5.12	+0.79 / -1.18	+0.79		69.4
FSF0300E	300 12	323.9 12.750	10.0	PN10	130	+20 / -30	+20	35°	98.6
			150		5.12	+0.79 / -1.18	+0.79		217.4
fsf1300E			16.0	PN16	130	+20 / -30	+20	35°	98.6
			230		5.12	+0.79 / -1.18	+0.79		217.4

Note: Max. working temperature: 104° C (219.2°F) maximum Vacuum: 400 mm Hg
For information on alternative sizes, contact a GRINNELL Sales Representative.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Reaction Force FSF Rubber Expansion Joints



Figures 407GT & 407T Dielectric Waterways

Tech Data Sheet: G465

10 YEAR LIMITED WARRANTY

ure 407GT
electric Waterway

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 D 4140 for continuous use at temperatures up to 110°C (230°F).

Test data/results and listings by Pittsburgh Testing Laboratory can be provided upon request. Contact a GRINNELL Sales Representative.

Figure 407T
Dielectric Waterway

* Clearflow is a Registered Trademark of Perfection Corp.

Pipe Size		Figure 407GT Grooved x Male Thread			Figure 407T Male Thread x Male Thread		
Nominal mm Inches	O.D. mm Inches	Part Number	End to End mm Inches	Approx. Weight kg Lbs.	Part Number	End to End mm Inches	Approx. Weight kg Lbs.
15	21.3	–	–	–	407t000212	76.2	0.1
1/2	0.840		–	–		3.0	0.2
20	26.9	–	–	–	407t000262	76.2	0.1
3/4	1.050		–	–		3.0	0.2
25	33.7		101.6	0.1	407t000342	101.6	0.1
1	1.315		4.0	0.3		4.0	0.3
32	42.4	407gt00422	101.6	0.3	407t000422	101.6	0.3
1 1/4	1.660		4.0	0.6		4.0	0.6
40	48.3	407gt00482	101.6	0.4	407t000482	101.6	0.4
1 1/2	1.900		4.0	0.8		4.0	0.8
50	60.3	407gt00602	101.6	0.5	407t000602	101.6	0.5
2	2.375		4.0	1.0		4.0	1.0
65	73.0	407gt00732	152.4	0.7	407t000732	152.4	0.7
2 1/2	2.875		6.0	1.6		6.0	1.6
80	88.9	407gt00892	152.4	0.9	407t000892	152.4	0.9
3	3.500		6.0	2.0		6.0	2.0
100	114.3	407gt01142	152.4	2.0	407t001142	152.4	2.0
4	4.500		6.0	4.5		6.0	4.5

For information on alternative sizes, contact a GRINNELL Sales Representative.
See fitting specifications on page 39.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

UFBX and AFBX: Flexible Hoses

The hoses are annularly corrugated formed from butt weld rigid tube. Depending on the application, required working pressure and conditions of operation, a single or double layer of wire braid is applied externally to the hose to restrain it, increasing its ability to withstand the pressure, increasing hoop strength and protection from abrasion. The extent of braiding, gauge and angle of lay is calculated carefully to maximize performance.

UFBX

- Hose manufactured in 316 stainless steel | Braid manufactured in 304 and 316 stainless steel
- Directly braided on reels – Up to 80mm (3") UFBX is designed and certified to ISO 10380 specifications

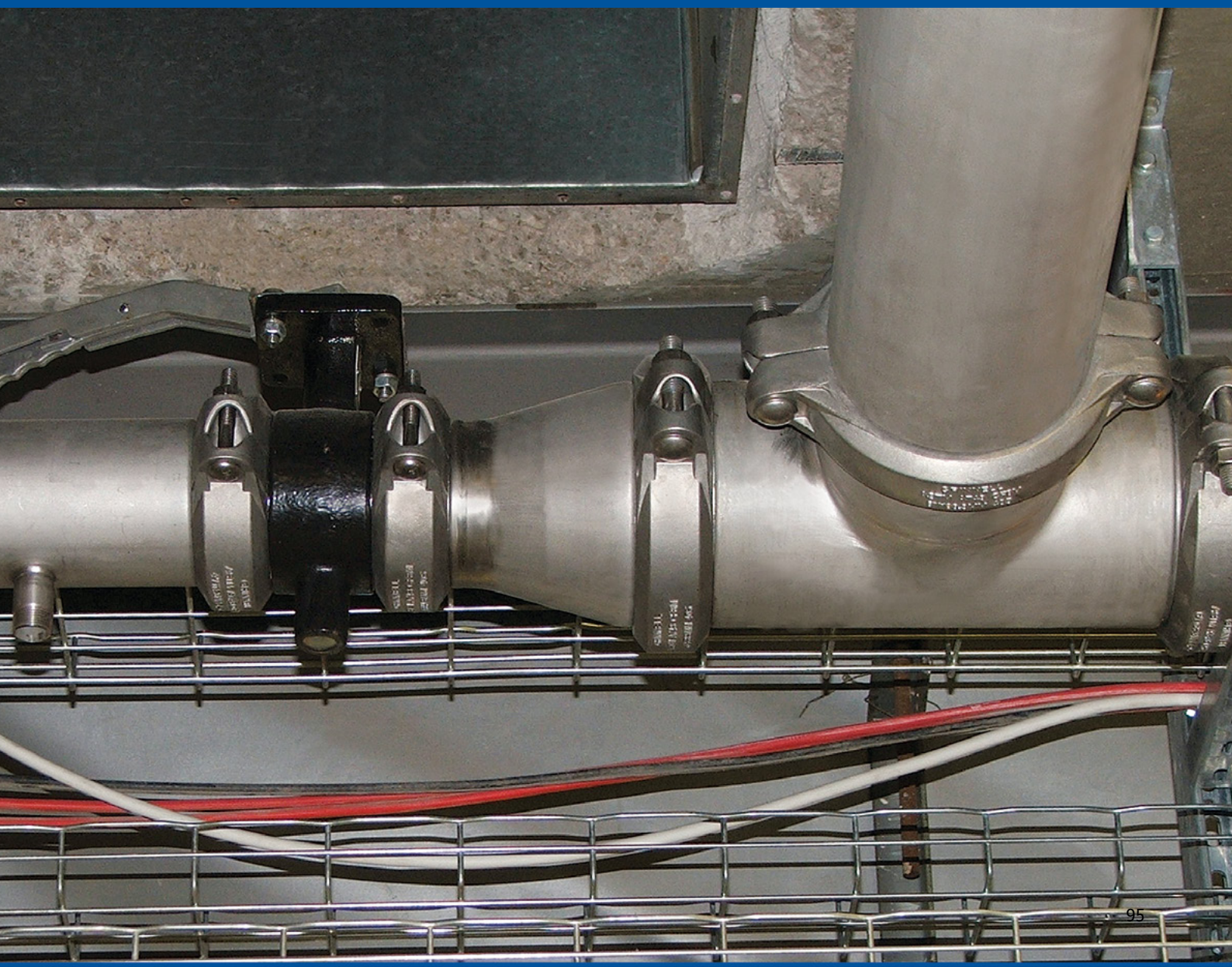
Size		Hose OD	Min bend rad in mm		Max. working pressure		Weight
in Inches	in DN	in mm	Static	Dynamic	Bar	psi	Kg/m
1"	35.8	35.8	85	200	76.2	0.1	0.88
1 1/4"	43.2	43.2	105	250	3.0	0.2	1.10
1 1/2"	50	50	127	250	76.2	0.1	1.40
2"	64.2	64.2	160	350	3.0	0.2	1.90
2 1/2"	78.6	78.6	200	410	101.6	0.1	2.80
3"	91.9	91.9	230	450	4.0	0.3	3.40
4"	129	129	230	560	101.6	0.3	4.90
5"	151	151	343	711	4.0	0.6	5.32
6"	180	180	406	864	101.6	0.4	7.78

AFBX

- Hose manufactured in 316 stainless steel
- Braid manufactured in 304 stainless steel

Size		Hose OD	Min bend rad in mm		Max. working pressure		Weight
in Inches	in DN	in mm	Static	Dynamic	Bar	psi	Kg/m
1"	DN25	33.5	85	190	50	725	0.63
1 1/4"	DN32	42.8	105	260	40	580	0.85
1 1/2"	DN40	51.2	130	300	35	508	1.17
2"	DN50	62	160	320	30	435	1.61
2 1/2"	DN65	83	180	410	24	348	2.64
3"	DN80	98	200	450	20	290	2.83
4"	DN100	119	290	560	18	261	3.80
5"	DN125	152.5	325	710	14	203	5.33
6"	DN150	178	380	815	12.5	181	6.77

Stainless Steel Systems



Stainless Steel Systems Table of Contents

Caution

Pressure performance values shown for GRINNELL couplings on light wall (Sch. 5 & Sch. 10 ISO Metric) stainless steel pipe are dependent on the use of required special rolls for roll grooving light-wall stainless steel pipe. Failure to utilize the required special rolls for roll grooving light-wall stainless steel pipe may result in equipment failure.

General notes: Additional information is included in our data sheets and is available upon request. It is the Designer's responsibilityto select products suitable for the intended service and to ensure that pressure ratings and performance data is not exceeded. Always read and understand the installation constructions. Never remove any piping components nor correct or modify any piping deficiencies without first depressurising and draining the system. Material and gasket selection should be verified with the gasket recommendation listing for the specific application.

Reference pages 142–144 will have recent pressure testing and ISO on ISO metric stainless steel pipe. Tech Data G815.

Coupling Specifications

Material Specifications

Stainless Steel Housing Specifications

- Type 316, 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 4826 Bar (70,000 psi)
- Yield strength, minimum 2068 Bar (30,000 psi)
- Elongation in 50mm (2") 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 colour code stripe identification and conform to ASTM D 2000 for service temperatures from -34°C to 110°C (-30°F to 230°F). They are recommended for hot water not to exceed 110°C (230°F) 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 colour code stripe identification and conform to ASTM D 2000 for service temperatures from -29°C to 82°C (-20°F to 180°F). They are recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapours.
- Grade "L" Silicone gaskets are Red colour code stripe and conform to ASTM D 2000 for service temperatures from -34°C to 177°C (-30°F to 350°F). They are recommended for air without hydrocarbons, or dry heat.
- Grade "O" Fluoroelastomer gaskets have a Blue colour code stripe 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: G571

Material Specifications

- Fabricated: 304/316 stainless steel conforming to ASTM A 312, Schedule 10 and Schedule 40
- Full-flow: 304/316 stainless steel conforming to ASTM A 403 WPW or A 403 CR
- Pipe wall thickness in groove area of standard stainless steel fittings are"
  2.0mm (0.08") for sizes 25 to 100mm (1" to 4");
  3.0mm (0.12") for 125 to 200mm (5" to 8"); and
  4.0mm (0.16") for 250 to 300mm (10" and 12"). Fittings are fabricated from SS316Ti / 1.4571

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

For pressure ratings of fittings, refer to data sheet G571.

UL FM APPROVED

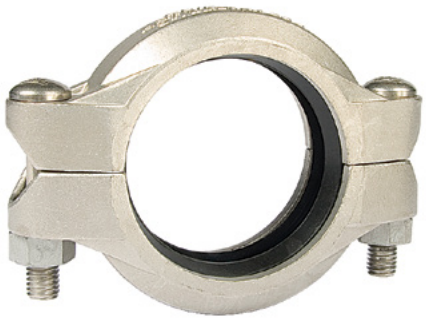
For detailed Listing / Approval information contact GRINNELL Mechanical Products

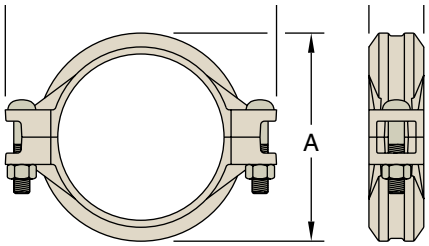
For local country potable water approvals, contact a GRINNELL Sales Representative.

Figure 472 Stainless Steel Rigid Couplings

Tech Data Sheet: G560

10 YEAR LIMITED WARRANTY





The GRINNELL Figure 472 Rigid Coupling is made of cast 316 stainless steel and is capable of pressure up to 41.4 Bar (600 psi).

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 32mm – 100mm (1 ¼" – 4") have gripping teeth to prevent rotation during installation.

Part Number	Pipe Size		Max.† Pressures Bar psi	Max.† End Load kN Lbs.	Max.*‡ End Gap Inches mm Inches	Dimensions			Coupling Bolts Size** mm Inches	Approx. Weight kg Lbs.
Standard Coupling	Nominal mm Inches	O.D. mm Inches				A mm Inches	B mm Inches	C mm Inches		
472MD00424	32	42.4	41.4	5.78	1.5	69.9	111.3	46.0	M10 x 57	0.9
	1 ¼	1.660	600	1,298.5	0.06	2.75	4.38	1.81	⅜ x 2 ¼	2.0
472MD00484	40	48.3	41.4	7.57	2.0	76.2	117.3	46.0	M10 x 57	1.0
	1 ½	1.900	600	1,701.1	0.08	3.00	4.62	1.81	⅜ x 2 ¼	2.1
472MD00604	50	60.3	41.4	11.82	3.3	86.6	130.0	47.8	M10 x 57	0.9
	2	2.375	600	2,658.0	0.13	3.41	5.12	1.88	⅜ x 2 ¼	1.9
472MD00734	65	73.0	41.4	17.32	3.3	99.3	143.0	47.8	M10 x 57	1.5
	2 ½	2.875	600	3,895.0	0.13	3.91	5.63	1.88	⅜ x 2 ¼	3.2
472MD00764	65	76.1	41.4	18.86	3.3	106.4	145.3	50.8	M10 x 57	1.6
	76,1mm	3.000	600	4,241.0	0.13	4.19	5.72	2.00	–	3.5
472MD00894	80	88.9	41.4	25.68	3.3	117.6	158.8	47.8	M12 x 89	1.6
	3	3.500	600	5,772.5	0.13	4.63	6.25	1.88	½ x 3	3.5
472MD01144	100	114.3	41.4	42.44	4.8	147.6	190.5	50.0	M12 x 89	2.5
	4	4.500	600	9,542.3	0.19	5.81	7.50	1.97	½ x 3	5.6
472MD01394	125	139.7	41.4	63.40	4.8	178.3	246.9	52.3	M16 x 83	3.9
	139,7mm	5.500	600	14,254.6	0.19	7.02	9.72	2.06	–	8.5
472MD01414	125	141.3	41.4	64.87	4.8	180.1	246.6	51.8	M16 x 83	3.9
	5	5.563	600	14,583.0	0.19	7.09	9.71	2.04	⅝ x 3 ¼	8.5
472MD01684	150	168.3	41.4	92.00	4.8	205.5	267.5	54.1	M16 x 83	4.3
	6	6.625	600	20,682.4	0.19	8.09	10.53	2.13	⅝ x 3 ¼	9.4
472MD02194	200	219.1	41.4	155.92	4.8	268.2	344.4	66.5	M20 x 121	8.8
	8	8.625	600	35,054.7	0.19	10.56	13.56	2.62	¾ x 4 ¾	19.4
472MD02734	250	273.0	41.4	242.22	3.3	326.1	416.8	66.5	–	14.5
	10	10.750	600	54,455.9	0.13	12.84	16.41	2.62	1 x 6 ½	32.0
472MD03244	300	323.9	41.4	340.73	3.3	391.4	478.5	66.5	–	19.5
	12	12.750	600	76,603.5	0.13	15.41	18.84	2.62	1 x 6 ½	43.0

Figure 472 Rigid Couplings have an Anti-Rotation Feature of "gripping teeth" along the coupling keys in sizes 1 ¼" - 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 a GRINNELL Sales Representative 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 a GRINNELL Sales Representative for availability of inch bolt sizes vs. metric bolt sizes.

For information on alternative sizes, contact a GRINNELL Sales Representative.

See page 95 for stainless steel coupling specifications and pages 116 - 127 for gasket information.

Note: The Fig. 472 Stainless Steel Heavy Duty Rigid Coupling does not provide compensation for pipe system expansion and/or contraction associated with pipe system temperature changes.

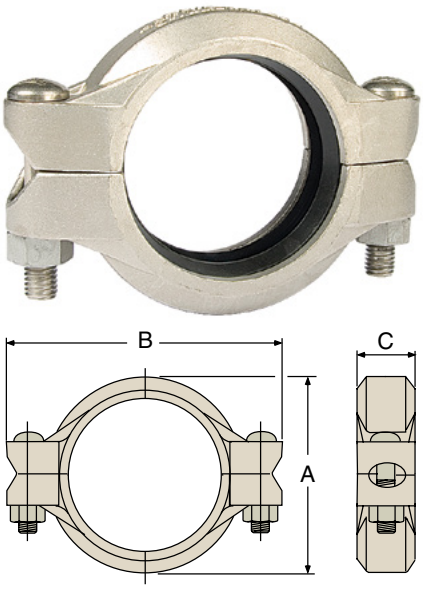
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 405 Stainless Steel Flexible Couplings

Tech Data Sheet: G565

10 YEAR LIMITED WARRANTY

The GRINNELL Figure 405 Flexible Coupling is made of 316 stainless steel and is capable of pressures up to 51.7 Bar (750 psi), depending on pipe size and wall thickness.



Compare pressure and load rates with the data sheet

Pipe Size		Max.† Pressures Bar psi	Max.† End Load Lbs. kN	Max.*‡ End Gap Inches mm	Deflectionc		Nominal Dimensions			Coupling Bolts		Approx. Weight Lbs Kg
Nominal ANSI Inches DN	O.D. Inches mm				Degrees per coupling	Inches/ Foot mm/m	A Inches mm	B Inches mm	C Inches mm	Qty.	Size Inches mm	
1 25	1.315 33,4	750 51,7	1,019 4,5	0.13 3,3	5° 26′	0.90 95,1	2.20 56,0	3.82 97,0	1.81 46,0	2	3/8 x 2-1/4 M10 x 57	1.5 0,6
1¼ 32	1.660 42,4	750 51,7	1,623 7,2	0.13 3,3	4° 19′	0.90 75,0	2.56 65,0	4.19 106,4	1.81 46,0	2	3/8 x 2-1/4 M10 x 57	1.5 0,7
1½ 40	1.900 48,3	750 51,7	2,127 9,5	0.13 3,3	3° 46′	0.79 65,8	2.75 69,9	4.44 112,8	1.81 46,0	2	3/8 x 2-1/4 M10 x 57	1.6 0,7
2 50	2.375 60,3	500 34,5	2,215 9,9	0.13 3,3	3° 1′	0.63 52,5	3.25 82,6	4.88 124,0	1.88 47,8	2	3/8 x 2-1/4 M10 x 57	1.7 0,8
2½ 65	2.875 73,0	500 34,5	3,246 14,4	0.13 3,3	2° 29′	0.52 43,3	3.69 93,7	5.50 139,7	1.88 47,8	2	3/8 x 2-1/4 M10 x 57	2.0 0,9
– 65	3.000 76,1	500 34,5	3,534 15,7	0.13 3,3	2° 23′	0.50 41,7	4.00 101,6	5.75 146,1	1.88 47,8	2	– M12 x 76	3.1 1,4
3 80	3.500 88,9	500 34,5	4,810 21,4	0.13 3,3	2° 3′	0.43 35,8	4.38 111,3	6.50 165,1	1.88 47,8	2	1/2 x 3 M12 x 76	3.1 1,4
4 100	4.500 114,3	500 34,5	7952 35,3	0.25 6,4	3° 11′	0.67 55,8	5.69 144,5	7.75 196,9	2.06 52,3	2	1/2 x 3 M12 x 76	4.0 1,8
– 125	5.500 139,7	450 31,0	10,691 47,6	0.25 6,4	2° 36′	0.55 45,5	6.81 173,0	9.75 247,7	2.06 52,3	2	– M16 x 83	7.2 3,3
5 125	5.563 141,3	450 31,0	10,933 48,7	0.25 6,4	2° 35′	0.54 45,0	6.88 174,8	9.75 247,7	2.06 52,3	2	5/8 x 3-1/4 M16 x 83	7.1 3,2
6 150	6.625 168,3	450 31,0	15,512 69,0	0.25 6,4	2° 10′	0.45 37,5	7.94 201,7	10.69 271,5	2.06 52,3	2	5/8 x 3-1/4 M16 x 83	7.1 3,2
8 200	8.625 219,1	450 31,0	29,261 117	0.25 6,4	1° 40′	0.35 29,2	10.19 258,8	13.56 344,4	2.50 63,5	2	3/4 x 4-3/4 M20 x 121	14.5 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 a GRINNELL Sales Representative for details.

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

** Contact a GRINNELL Sales Representative for availability of inch bolt sizes vs. metric bolt sizes.

For information on alternative sizes, contact a GRINNELL Sales Representative.

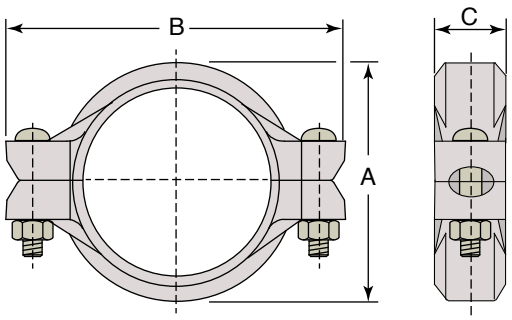
See page 95 for stainless steel coupling specifications and pages 116 - 127 for gasket information.

For fire protection equipment listing and approval pressure ratings contact Tyco FPP.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 705R
Rilsan Coated Flexible Coupling

10 YEAR LIMITED WARRANTY



Part Number	Pipe Size		Max. Wk Pressure † Bar Psi	Max. End Load † kN Lbs	Max. End Separation ‡ mm Inches	Deflection		Dimensions			Coupling Bolt Size (Qty 2) mm Inches	Approx Weight kg Lbs.
	Nominal mm Inches	O.D. mm Inches				Per Coupling Degrees	Pipe mm/m in/ft	A mm Inches	B mm Inches	C mm Inches		
705MES042r	32	42.4	16.0	2.21	3.3	4° 19'	75.0	65	106	46	M10x60	0.7
	1 1/4	1.660	230	496.8	0.13		0.90	2.56	4.17	1.81		1.5
705MES048r	40	48.3	16.0	2.90	3.3	3° 46'	65.8	70	113	46	M10x60	0.7
	1 1/2	1.900	230	651.9	0.13		0.79	2.76	4.45	1.81		1.5
705MES060r	50	60.3	16.0	4.53	3.3	3° 01'	52.5	83	124	48	M10x60	0.8
	2	2.375	230	1,018.4	0.13		0.63	3.27	4.88	1.89		1.8
705MES076r	65	76.1	16.0	7.23	3.3	2° 23'	41.7	102	146	48	M12x80	1.4
	76,1mm	3.000	230	1,625.4	0.13		0.50	4.02	5.75	1.89		3.1
705MES089r	80	88.9	16.0	9.84	3.3	2° 03'	35.8	111	165	48	M12x80	1.4
	3	3.500	230	2,212.1	0.13		0.43	4.37	6.50	1.89		3.1
705MES114r	100	114.3	16.0	16.27	6.4	3° 11'	55.8	145	197	52	M12x80	1.8
	4	4.500	230	3,657.6	0.25		0.67	5.71	7.76	2.05		4.0
705MES139r	125	139.7	16.0	24.31	6.4	2° 36'	45.0	173	248	52	M16x90	3.3
	139.7mm	5.500	230	5,465.1	0.25		0.54	6.81	9.76	2.05		7.3
705MES141r	125	141.3	16.0	24.87	6.4	2° 35'	45.0	175	248	52	M16x90	3.2
	5	5.563	230	5,591.0	0.25		0.54	6.89	9.76	2.05		7.1
705MES165r	150	165.1	16.0	33.95	6.4	2° 12'	38.3	197	272	52	M16x90	3.2
	165.1mm	6.500	230	7,632.3	0.25		0.46	7.76	10.71	2.05		7.1
705MES168r	150	168.3	16.0	35.27	6.4	2° 10'	37.5	202	272	52	M16x90	3.2
	6	6.625	230	7,929.0	0.25		0.45	7.95	10.71	2.05		7.1
705MES219r	200	219.1	16.0	59.78	6.4	1° 40'	29.2	259	344	64	M20x120	6.6
	8	8.625	230	13,439.1	0.25		0.35	10.20	13.54	2.52		14.6

†: Maximum pressure and end load are total from all loads based on standard weight steel pipe. Pressure ratings and end loads may differ on pipe materials and/or wall thickness. Contact a GRINNELL Sales Representative for details. For fire protection equipment listing and approval pressure ratings contact a GRINNELL Sales Representative..

‡: Maximum pipe end separation is for cut grooved standard weight pipe. Values for roll grooved will be 1/2 that of cut grooved. Standard Stainless Steel 316 Bolt, Nuts and Washer.

Standard Stainless Steel 316 Bolt, Nuts and Washer.

Always use washers in combination with Fig 705R Rilsan Coated Couplings

Because of the Rilsan coating FM/UL/VDS/LPC approvals do not apply.

Also available with zinc plated bolts and nuts. Part code: 705ME...R (e.g. 705ME114R)

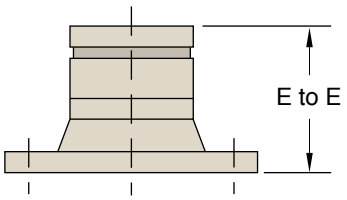
See page 95 for stainless steel coupling specifications and pages 116 – 127 for gasket information.

For information on alternative sizes, contact a GRINNELL Sales Representative.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 443 & 444 Flange Adapters
(PN16/PN10 BS 4504)

10 YEAR LIMITED WARRANTY



Pipe Size		Figure 443 – PN16					Figure 444 – PN10 BS 4504				
Nominal mm Inches	O.D. mm Inches	Part Number	E to E mm Inches	Mating Flange Bolt		Approx. Weight kg Lbs.	Part Number	E to E mm Inches	Mating Flange Bolt		Approx. Weight kg Lbs.
				Qty.	Size *				Qty.	Size *	
32	42.4	443H000424	90	4	M16 x 65	1.8	–	–	–	–	–
1 1/4	1.660		3.54			4.0					
40	48.3	443H000484	92	4	M16 x 65	2.0	–	–	–	–	–
1 1/2	1.900		3.62			4.4					
50	60.3	443H000604	95	4	M16 x 65	2.7	–	–	–	–	–
2	2.375		3.74			6.0					
65	76.1	443H000764	95	4	M16 x 65	3.3	–	–	–	–	–
76,1mm	3.000		3.74			7.3					
80	88.9	443H000894	100	8	M16 x 70	4.0	–	–	–	–	–
3	3.500		3.94			8.8					
100	114.3	443H001144	102	8	M16 x 70	4.6	–	–	–	–	–
4	4.500		4.02			10.1					
125	139.7	443H001394	105	8	M16 x 75	6.0	–	–	–	–	–
139.7mm	5.500		4.13			13.2					
150	168.3	443H001684	105	8	M20 x 80	7.2	–	–	–	–	–
6	6.625		4.13			15.9					
200	219.1	–	–	–	–	–	444H002194	112.0	8	M20 x 80	10.2
8	8.625							4.41			22.5
250	273.0	–	–	–	–	–	444h002734	128.0	12	M20 x 90	18.0
10	10.750							5.04			39.7
300	323.9	–	–	–	–	–	444h003244	117.0	12	M20 x 90	22.4
12	12.750							4.61			49.4

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

For information on alternative sizes, contact a GRINNELL Sales Representative.

Schedule 40 fittings available upon request, contact a GRINNELL Sales Representative.

See page 32 for flange washer Adaptor and page 144 Flange Drilling Specifications

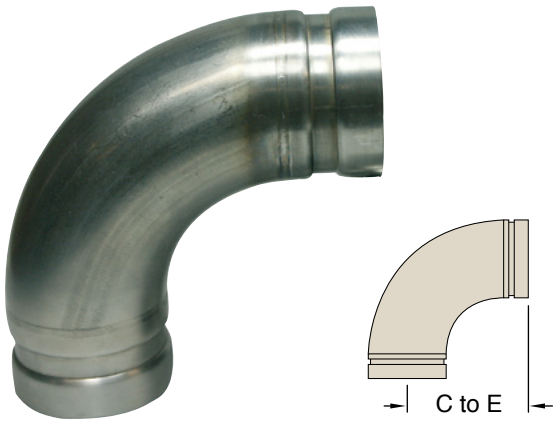
See page 95 for stainless steel specifications.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 410 90° Stainless Steel Elbows

Tech Data Sheet: G571

10 YEAR LIMITED WARRANTY



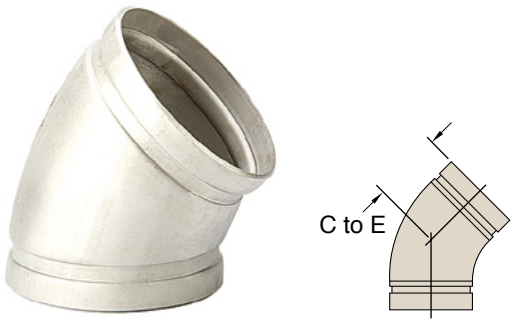
Part Number	Pipe Size		C to E	Approx. Weight
	Nominal mm Inches	O.D. mm Inches	mm Inches	kg Lbs.
410H000344	25	33.7	73.0	0.5
	1	1.315	2.87	1.1
410H000424	32	42.4	82.0	0.5
	1 1/4	1.660	3.23	1.1
410H000484	40	48.3	92.0	0.5
	1 1/2	1.900	3.62	1.1
410H000604	50	60.3	111.0	0.9
	2	2.375	4.37	2.0
410H000764	65	76.1	130.0	1.4
	76,1mm	3.000	5.12	3.1
410H000894	80	88.9	149.0	2.0
	3	3.500	5.87	4.4
410H001144	100	114.3	187.0	3.9
	4	4.500	7.36	8.6
410H001394	125	139.7	225.0	6.1
	139.7mm	5.500	8.86	13.4
410H001684	150	168.3	263.0	8.4
	6	6.625	10.35	18.5
410H002194	200	219.1	345.0	16.6
	8	8.625	13.58	36.6
410H002734	250	273.0	440.0	27.2
	10	10.750	17.32	60.0
410H003244	300	323.9	517.0	30.4
	12	12.750	20.35	67.0

For information on alternative sizes, contact a GRINNELL Sales Representative.
Schedule 40 fittings available upon request, contact a GRINNELL Sales Representative.
See page 95 for stainless steel fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 401 45° Stainless Steel Elbows

Tech Data Sheet: G571

10 YEAR LIMITED WARRANTY



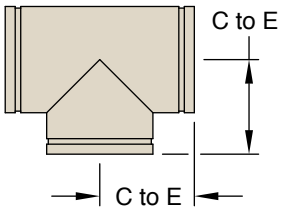
Part Number	Pipe Size		C to E	Approx. Weight
	Nominal mm Inches	O.D. mm Inches	mm Inches	kg Lbs.
401H000344	25	33.7	50.0	0.5
	1	1.315	1.97	1.1
401H000424	32	42.4	54.0	0.5
	1 1/4	1.660	2.13	1.1
401H000484	40	48.3	58.0	0.5
	1 1/2	1.900	2.28	1.1
401H000604	50	60.3	65.0	0.9
	2	2.375	2.56	2.0
401H000764	65	76.1	73.0	1.4
	76,1mm	3.000	2.87	3.1
401H000894	80	88.9	80.0	2.0
	3	3.500	3.15	4.4
401H001144	100	114.3	95.0	3.9
	4	4.500	3.74	8.6
401H001394	125	139.7	110.0	6.1
	139.7mm	5.500	4.33	13.4
401H001684	150	168.3	125.0	8.4
	6	6.625	4.92	18.5
401H002194	200	219.1	166.0	16.6
	8	8.625	6.54	36.6
401H002734	250	273.0	210.0	27.2
	10	10.750	8.27	60.0
401H003244	300	323.9	349.0	30.4
	12	12.750	13.74	67.0

For information on alternative sizes, contact a GRINNELL Sales Representative.
Schedule 40 fittings available upon request, contact a GRINNELL Sales Representative.
See page 95 for stainless steel fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 419 Tees

Tech Data Sheet: G571

10 YEAR LIMITED WARRANTY



Part Number	Pipe Size		C to E mm Inches	Approx. Weight kg Lbs.
	Nominal mm Inches	O.D. mm Inches		
419H000344	25	33.7	73.0	0.5
	1	1.315	2.87	1.1
419H000424	32	42.4	60.0	0.5
	1 1/4	1.660	2.36	1.1
419H000484	40	48.3	62.0	0.5
	1 1/2	1.900	2.44	1.1
419H000604	50	60.3	68.0	0.9
	2	2.375	2.68	2.0
419H000764	65	76.1	76.0	1.4
	76,1mm	3.000	2.99	3.1
419H000894	80	88.9	86.0	2.0
	3	3.500	3.39	4.4
419H001144	100	114.3	105.0	3.9
	4	4.500	4.13	8.6
419H001394	125	139.7	160.0	6.1
	139.7mm	5.500	6.30	13.4
419H001684	150	168.3	178.0	8.4
	6	6.625	7.01	18.5
419H002194	200	219.1	178.0	16.6
	8	8.625	7.01	36.6
419H002734	250	273.0	250.0	27.2
	10	10.750	9.84	60.0
419H003244	300	323.9	255.0	30.4
	12	12.750	10.04	67.0

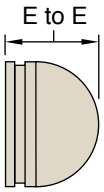
For information on alternative sizes, contact a GRINNELL Sales Representative.
Schedule 40 fittings available upon request, contact a GRINNELL Sales Representative.
See page 95 for stainless steel fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 460 End Caps

Tech Data Sheet: G571

10 YEAR LIMITED WARRANTY

Part Number	Pipe Size		Nominal E to E	Approx. Weight
	Nominal mm Inches	O.D. mm Inches	mm Inches	kg Lbs.
460H000344	25	33.7	50.0	0.5
	1	1.315	1.97	1.1
460H000424	32	42.4	51.0	0.5
	1 1/4	1.660	2.01	1.1
460H000484	40	48.3	54.0	0.5
	1 1/2	1.900	2.13	1.1
460H000604	50	60.3	57.0	0.9
	2	2.375	2.24	2.0
460H000764	65	76.1	62.0	1.4
	76,1mm	3.000	2.44	3.1
460H000894	80	88.9	62.0	2.0
	3	3.500	2.44	4.4
460H001144	100	114.3	64.0	3.9
	4	4.500	2.52	8.6
460H001394	125	139.7	74.0	6.1
	139.7mm	5.500	2.91	13.4
460H001684	150 *	168.3	86.0	8.4
	6	6.625	3.39	18.5
460H002194	200 *	219.1	98.0	16.6
	8	8.625	3.86	36.6
460H002734	250 *	273.0	114.0	27.2
	10	10.750	4.49	60.0
460H003244	300 *	323.9	150.0	30.4
	12	12.750	5.91	67.0



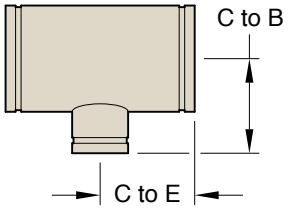
* Dished Cap
For information on alternative sizes, contact a GRINNELL Sales Representative.
Schedule 40 fittings available upon request, contact a GRINNELL Sales Representative.
See page 95 for stainless steel fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 421 Reducing Tees

Tech Data Sheet: G571

10 YEAR LIMITED WARRANTY

Part Number	Pipe Size		C to E mm Inches	C to B mm Inches	Approx. Weight kg Lbs.
	Nominal mm Inches	O.D. mm Inches			
421H020104	50 x 50 x 25	60.3 x 60.3 x 33.7	68.0	68.0	1.0
	2 x 2 x 1	2.375 x 2.375 x 1.315	2.68	2.68	2.2
421H020124	50 x 50 x 32	60.3 x 60.3 x 42.4	100.0	83.0	1.1
	2 x 2 x 1 1/4	2.375 x 2.375 x 1.660	3.94	3.27	2.4
421H020154	50 x 50 x 40	60.3 x 60.3 x 48.3	68.0	68.0	1.1
	2 x 2 x 1 1/2	2.375 x 2.375 x 1.900	2.68	2.68	2.4
421H026154	50 x 50 x 40	76.1 x 76.1 x 48.3	76.0	76.0	1.2
	76.1 x 76.1mm x 1 1/2	3.000 x 3.000 x 1.900	2.99	2.99	2.6
421H026204	50 x 50 x 50	76.1 x 76.1 x 60.3	76.0	76.0	2.0
	76.1 x 76.1mm x 2	3.000 x 3.000 x 2.375	2.99	2.99	4.4
421H030204	80 x 80 x 50	88.9 x 88.9 x 60.3	86.0	83.0	2.5
	3 x 3 x 2	3.500 x 3.500 x 2.375	3.39	3.27	5.5
421H030264	80 x 80 x 65	88.9 x 88.9 x 76.1	86.0	83.0	2.6
	3 x 3 x 76.1mm	3.500 x 3.500 x 3.000	3.39	3.27	5.7
421H042204	100 x 100 x 50	114.3 x 114.3 x 60.3	105.0	95.0	4.6
	4 x 4 x 2	4.500 x 4.500 x 2.375	4.13	3.74	10.1
421H042264	100 x 100 x 65	114.3 x 114.3 x 76.1	105.0	95.0	5.1
	4 x 4 x 76.1mm	4.500 x 4.500 x 3.000	4.13	3.74	11.2
421H042304	100 x 100 x 80	114.3 x 114.3 x 88.9	105.0	95.0	5.2
	4 x 4 x 3	4.500 x 4.500 x 3.500	4.13	3.74	11.5
421h052304	125 x 125 x 80	139.7 x 139.7 x 88.9	160.0	160.0	6.7
	139.7 x 139.7mm x 3	5.000 x 5.000 x 3.500	6.30	6.30	14.8
421H052424	125 x 125 x 100	139.7 x 139.7 x 114.3	160.0	160.0	6.7
	139.7 x 139.7mm x 3	5.000 x 5.000 x 4.500	6.30	6.30	14.8
421H063204	150 x 150 x 50	168.3 x 168.3 x 88.9	143.0	122.0	11.8
	6 x 6 x 2	6.625 x 6.625 x 2.375	5.63	4.80	26.0
421h063264	150 x 150 x 65	168.3 x 168.3 x 76.1	143.0	122.0	12.0
	6 x 6 x 76.1mm	6.625 x 6.625 x 3.000	5.63	4.80	26.5
421h063304	150 x 150 x 80	168.3 x 168.3 x 60.3	143.0	122.0	12.1
	6 x 6 x 3	6.625 x 6.625 x 3.500	5.63	4.80	26.7
421h063424	150 x 150 x 100	168.3 x 168.3 x 114.3	143.0	122.0	12.2
	6 x 6 x 4	6.625 x 6.625 x 4.500	5.63	4.80	26.9
421h063524	150 x 150 x 125	168.3 x 168.3 x 139.7	178.0	178.0	17.5
	6 x 6 x 139.7	6.625 x 6.625 x 5.000	7.01	7.01	38.6
421h080424	200 x 200 x 100	219.1 x 219.1 x 114.1	178.0	148.0	18.0
	8 x 8 x 4	8.625 x 8.625 x 4.500	7.01	5.83	39.7
421h080524	200 x 200 x 125	219.1 x 219.1 x 139.7	178.0	178.0	23.5
	8 x 8 x 139.7	8.625 x 8.625 x 5.000	7.01	7.01	51.8
421h080634	200 x 200 x 150	219.1 x 219.1 x 168.3	218.0	203.0	24.2
	8 x 8 x 6	8.625 x 8.625 x 6.625	8.58	7.99	53.4
421h011634	250 x 250 x 150	273.0 x 273.0 x 168.3	250.0	216.0	25.0
	10 x 10 x 6	10.750 x 10.750 x 6.625	9.84	8.50	55.1
421h011804	250 x 250 x 200	273.0 x 273.0 x 219.1	250.0	216.0	30.0
	10 x 10 x 8	10.750 x 10.750 x 8.625	9.84	8.50	66.1
421h013804	300 x 300 x 200	323.9 x 323.9 x 219.1	255.0	230.0	34.0
	12 x 12 x 8	12.750 x 12.750 x 8.625	10.04	9.06	75.0
421h013114	300 x 300 x 250	323.9 x 323.9 x 273.0	255.0	230.0	35.0
	12 x 12 x 10	12.750 x 12.750 x 10.750	10.04	9.06	77.2

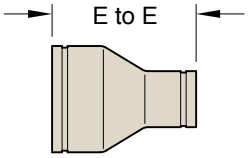


For information on alternative sizes, contact a GRINNELL Sales Representative.
Schedule 40 fittings available upon request, contact a GRINNELL Sales Representative.
See page 95 for stainless steel fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 450 Concentric Reducers

Tech Data Sheet: G571

10 YEAR LIMITED WARRANTY



Part Number	Pipe Size		E to E mm Inches	Approx. Weight kg Lbs.
	Nominal mm Inches	O.D. mm Inches		
450H012104	32 x 25	42.4 x 33.7	85.0	0.7
	1 1/4 x 1	1.660 x 1.315	3.35	1.5
450H015104	40 x 25	48.3 x 33.7	134.0	0.5
	1 1/2 x 1	1.900 x 1.315	5.28	1.1
450H015124	40 x 32	48.3 x 42.4	135.0	0.9
	1 1/2 x 1 1/4	1.900 x 1.660	5.31	2.0
450H020154	50 x 40	60.3 x 48.3	111.0	1.0
	2 x 1 1/2	2.375 x 1.900	4.37	2.2
450h026154	65 x 40	76.1 x 48.3	125.0	1.0
	76.1mm x 1 1/2	3.000 x 1.900	4.92	2.2
450H026204	65 x 50	76.1 x 60.3	125.0	1.1
	76.1mm x 2	3.000 x 2.375	4.92	2.4
450h030154	80 x 40	88.9 x 48.3	125.0	1.1
	3 x 1 1/2	3.500 x 1.900	4.92	2.4
450h030204	80 x 50	88.9 x 60.3	125.0	1.1
	3 x 2	3.500 x 2.375	4.92	2.4
450h030264	80 x 65	88.9 x 76.1	125.0	1.1
	3 x 76.1mm	3.500 x 3.000	4.92	2.4
450h042204	100 x 50	114.3 x 60.3	135.0	1.1
	4 x 2	4.500 x 2.375	5.31	2.4
450h042264	100 x 65	114.3 x 76.1	135.0	1.3
	4 x 76.1mm	4.500 x 3.000	5.31	2.9
450h042304	100 x 80	114.3 x 88.9	135.0	1.3
	4 x 3	4.500 x 3.500	5.31	2.9
450h052304	125 x 80	139.7 x 88.9	162.0	1.3
	139.7mm x 3	5.500 x 3.500	6.38	2.9
450h052424	125 x 100	139.7 x 114.3	162.0	1.6
	139.7mm x 4	5.500 x 4.500	6.38	3.5
450h063424	150 x 100	168.3 x 114.3	175.0	1.6
	6 x 4	6.625 x 4.500	6.89	3.5

Part Number	Pipe Size		E to E mm Inches	Approx. Weight kg Lbs.
	Nominal mm Inches	O.D. mm Inches		
450H063524	150 x 125	168.3 x 139.7	210.0	1.7
	6 x 139.7mm	6.625 x 5.500	8.27	3.7
450H080424	200 x 100	219.1 x 114.3	227.0	1.7
	8 x 4	8.625 x 4.500	8.94	3.7
450H080524	200 x 125	219.1 x 139.7	227.0	2.5
	8 x 139.7mm	8.625 x 5.500	8.94	5.5
450H080634	200 x 150	219.1 x 168.3	227.0	2.5
	8 x 6	8.625 x 6.625	8.94	5.5
450H011634	250 x 150	273.0 x 168.3	278.0	2.5
	10 x 6	10.750 x 6.625	10.94	5.5
450H011804	250 x 200	273.0 x 219.1	278.0	3.4
	10 x 8	10.750 x 8.625	10.94	7.5
450H013804	300 x 200	323.9 x 219.1	300.0	4.7
	12 x 8	12.750 x 8.625	11.81	10.4
450H013114	300 x 250	323.9 x 273.0	300.0	5.2
	12 x 10	12.750 x 10.750	11.81	11.5

For information on alternative sizes, contact a GRINNELL Sales Representative.
Schedule 40 fittings available upon request, contact a GRINNELL Sales Representative.
See page 95 for stainless steel fitting specifications.
For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Preparation Equipment

Preparation Equipment Table of Contents

General notes: Additional information is included in our data sheets and is available upon request. 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. Always read and understand the installation constructions. Never remove any piping components nor correct or modify any piping deficiencies without first depressurising and draining the system. Material and gasket selection should be verified with the gasket recommendation listing for the specific application.

Pipe Preparation Tools

Figure GROOVER 01

Figure GROOVER 02

Figure GROOVER 10A

Part Number	Nominal Size mm In.	Power Supply*	Description	Approx. Weight kg Lbs
Groover 01	32mm thru 450mm	400VAC 50Hz	Portable Groover with Pipestand	225
	1 1/4" thru 18"			496
	Supplied with standard roll sizes until 300mm (12"). For larger sizes, contact a GRINNELL Sales Representative to purchase spare bottom and top rollers. Stainless steel bottom and top rollers are available in sizes 25 - 600mm (1" – 24"). GRINNELL can supply the tool as a standard tools to include stainless steel rollers. Contact a GRINNELL Sales Representative for more information.			
Groover 02	32mm thru 450mm	400VAC 50Hz	Automatic Groover with Pipestand	425
	1 1/4" thru 18"			936
	Supplied with standard roll sizes until 300mm (12"). For larger sizes, contact a GRINNELL Sales Representative to purchase spare bottom and top rollers. Stainless steel bottom and top rollers are available in sizes 25 - 600mm (1" – 24"). GRINNELL can supply the tool as a standard tools to include stainless steel rollers. Contact a GRINNELL Sales Representative for more information.			
Groover 10a	25mm thru 200mm	230VAC 50Hz	Portable Groover with Pipestand	125
	1" thru 8"			275
	Stainless steel bottom rollers are available in sizes 50 - 150mm (2" – 6"). GRINNELL can supply the tool as a standard tool to include stainless steel bottom rollers. Contact a GRINNELL Sales Representative for more information.			
Groover 10a-uk	25mm thru 200mm	110VAC 50Hz	Portable Groover with Pipestand	125
	1" thru 8"			275

*Note: Other voltages on request.

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Pipe Stands

Part Number	Description	Size Range mm In.	Approx. Weight kg Lbs
STAND	Pipe stand for pipes	33.7mm thru 219.1mm	15
		1" thru 8"	33.1
RJ-624	Pipe stand for pipes	168.3mm thru 609.6mm	40
		6" thru 24"	88.2

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure STAND

Figure RJ-624

Figure HCTOOL Hole Cutting Tool

Figure HCTOOL
(Drill not included)

Part Number	Pipe Size mm In.	Max. Hole Ø Supply mm In.	Description	Approx Weight Kg
hctool	21.0-273.0	125	Hole cutting Tool	8.0
	½-10	5		17.6

Note: The HCT Hole Cutting Tool is a great help when drilling holes in pipe. Almost any standard hole saw machine [i.e. electric drill] can be mounted on the HCT. With the HCT the hole saw can be fixed, secured and used as a leveling tool to ensure accurate hole alignment. For pipes of 12mm thru 250mm (½"thru 12"). With the optional base and beam adapter, the support can also be attached to standard steel beams.

Contact a GRINNELL Sales Representative for missing part numbers and ordering information.

Hole Cutting Tool Spare Parts

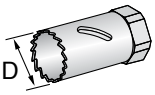


Figure HOLESAW
(Available sizes
show in table)

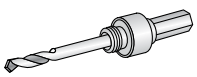


Figure HOLESAWCP
(For dia. 14.3mm
thru 30.2mm)
(0.56" thru 1.19")

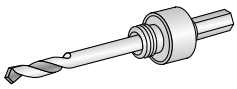


Figure HOLESAWCP5
(For dia. 31.8mm
thru 152.4mm)
(1.25" thru 6.00")

Figure HOLESAWDP
(Drive plate for
dia. 76.2mm
thru 152.4mm)
(3.00" thru 6.00")

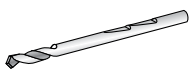


Figure HOLESAWCD
(Spare drill for
HOLESAWCP &
HOLESAWCP5)

Part Number	D mm In.	Use with Hole Drill	Use with Drive Plate
Holesaw22	22.2	HolesawCp	–
	0.87		
Holesaw24	23.8	HolesawCp	–
	0.94		
Holesaw25	25.4	holesawcp	–
	1.00		
holesaw35	34.9	HolesawCp5	–
	1.37		
Holesaw38	38.1	HolesawCp5	–
	1.50		
HOLESAW44	44.5	holesawcp5	–
	1.75		
Holesaw50	50.8	HolesawCp5	–
	2.00		
Holesaw63	63.5	HolesawCp5	–
	2.50		
Holesaw70	69.9	HolesawCp5	–
	2.75		
Holesaw89	88.9	HolesawCp5	Holesawdp
	3.50		
Holesaw114	114.3	HolesawCp5	Holesawdp
	4.50		

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

GRINNELL Groove Measurement Tapes

This dimensional measurement tape has been developed to check the groove diameter (C-size) of grooved pipe from 33.7mm up to 609.6mm (1" up to 24").

The loop extending from the metal housing consist of a clear-view plastic window with an indicator line and a metal measuring tape. Through the window one can see the various markings (groove tolerance areas) on the tape.

First, verify which size pipe is to be checked. As shown on the drawing, the metal tape will show the diameter of a particular steel pipe size. Slide the loop over the grooved end of the pipe and place the tape in the groove.

Please note: Check whether the tape is placed in the groove over the entire circumference of the pipe!

Pull the tape tightly on the pipe. Through the clear view window one should see the indicator line and a small 'block' showing the tolerance area for the groove. The indicator line in the window must fall within the dark coloured block or groove tolerance area.

If the indicator line is not within the groove tolerance area, first check if the tape is pulled back tightly, and whether the tape is correctly placed in the groove. If the tape is placed properly, this particular groove is not correct. Make sure that the settings on the GRINNELL grooving tool are corrected to obtain the correct groove dimensions.

Please note:

This tape is not a calibrated tool and is to be used for reference only. To ensure accuracy, always check grooved end pipe with calibrated gauges or calibers.

For Roll Groove Standard Specifications for Steel Pipe and Other IPS Pipe, refer to Data Sheet G710.

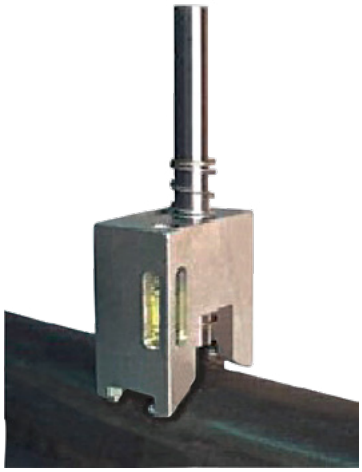
Part Number	Pipe Size mm In.	Description Hole Drill	Use with Drive Plate
GRINTAPE	33.7 – 323.9	Pipe Measuring Tape	0.100
	1 – 12		
zklm024	33.7 – 609.6	Pipe Measuring Tape	0.100
	1 – 24		

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure PUNCH Centre Punch

Part Number
PUNCH

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.



GRINNELL Gauges

This dimensional gauge is developed to check the A dimension (gasket seat) and B dimension (groove width) of grooved pipe.

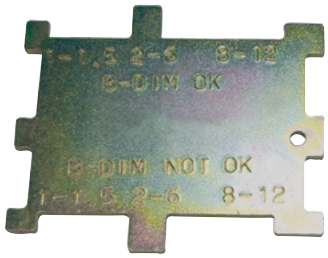
A Dimension - Gasket seat

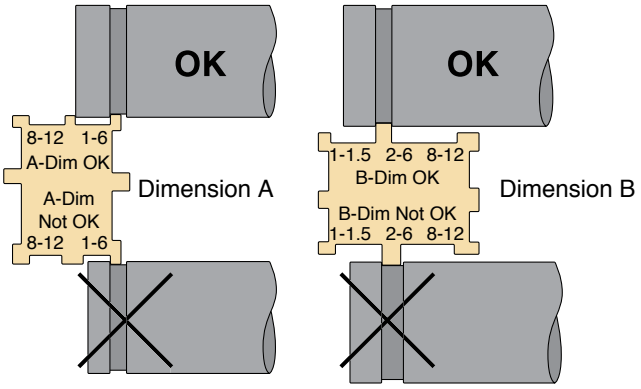
Select the proper size of pipe on the gauge. Place the gauge with the DIM A OK side on the grooved end of the pipe as shown on the drawing. If the gauge fits the groove should be acceptable. If the DIM A NOT OK side fits the grooved end, this groove is not made in accordance with GRINNELL specifications.

B Dimension - Groove width

Select the proper size of the pipe on the gauge. Place the gauge with the DIM B OK side in the groove of the pipe as shown on the drawing. If the gauge fits, the groove should be acceptable. If the DIM B NOT OK side fits the groove, this groove is not made in accordance with GRINNELL specifications.

Please note: This gauge is not a calibrated tool and is to be used for reference only. To ensure accuracy, always check grooved end pipe with calibrated gauges or calibers.





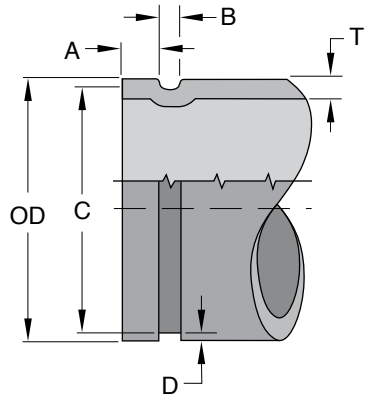
PART NUMBER	PIPE SIZE MM IN.	DESCRIPTION HOLE DRILL	USE WITH DRIVE PLATE
GAUGE	33.7 – 323.9 1 – 12	Gauge	0.250

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Roll Groove Standard Specification for Steel & Other IPS Pipe

Tech Data Sheet: G710

GRINNELL Roll Grooves conform to AWWA C-606 specification.



Nominal Pipe Size mm Inches	Pipe O.D. mm Inches			A ±0,76mm ±0.030" mm Inches	B ±0,76mm ±0.030" mm Inches	C Groove Diameter mm Inches		D Groove Depth (ref. only) mm Inches	T Minimum Wall mm Inches	Maximum Allow Flare Diameter mm Inches
	O.D.	Tolerance				Actual	Tol. +0.000			
		+	-							
32	42.4	0.41	0.41	15.88	7.14	38.99	-0.38	1.60	1.65	44.96
1 1/4	1.660	0.016	0.016	0.625	0.281	1.535	-0.015	0.062	0.065	1.77
40	48.3	0.48	0.48	15.88	7.14	45.09	-0.38	1.60	1.65	51.05
1 1/2	1.900	0.019	0.019	0.625	0.281	1.775	-0.015	0.062	0.065	2.01
50	60.3	0.61	0.61	15.88	8.74	57.15	-0.38	1.60	1.65	62.99
2	2.375	0.024	0.024	0.625	0.344	2.250	-0.015	0.062	0.065	2.48
65	73.0	0.74	0.74	15.88	8.74	69.09	-0.46	1.98	2.11	75.69
2 1/2	2.875	0.029	0.029	0.625	0.344	2.720	-0.018	0.078	0.083	2.98
65	76.1	0.76	0.76	15.88	8.74	72.26	-0.46	1.93	2.11	78.74
76.1mm	3.000	0.030	0.030	0.625	0.344	2.845	-0.018	0.076	0.083	3.10
80	88.9	0.89	0.79	15.88	8.74	84.94	-0.46	1.98	2.11	91.44
3	3.500	0.035	0.031	0.625	0.344	3.344	-0.018	0.078	0.083	3.60
100	108.0	1.09	0.79	15.88	8.74	103.73	-0.51	2.11	2.11	110.49
108.0mm	4.252	0.043	0.031	0.625	0.344	4.084	-0.020	0.083	0.083	4.35
100	114.3	1.14	0.79	15.88	8.74	110.08	-0.51	2.11	2.11	116.84
4	4.500	0.045	0.031	0.625	0.344	4.334	-0.020	0.083	0.083	4.60
125	133.0	1.35	0.79	15.88	8.74	129.13	-0.56	2.11	2.77	135.89
133.0mm	5.236	0.053	0.031	0.625	0.344	5.084	-0.022	0.083	0.109	5.35
125	139.7	1.42	0.79	15.88	8.74	135.48	-0.56	2.11	2.77	142.24
139.7mm	5.500	0.056	0.031	0.625	0.344	5.334	-0.022	0.083	0.109	5.60
125	141.3	1.42	0.79	15.88	8.74	137.03	-0.56	2.13	2.77	143.76
5	5.563	0.056	0.031	0.625	0.344	5.395	-0.022	0.084	0.109	5.66
150	159.0	1.60	0.79	15.88	8.74	154.53	-0.76	2.11	2.77	161.29
159.0mm	6.260	0.063	0.031	0.625	0.344	6.084	-0.030	0.083	0.109	6.35
150	165.1	1.60	0.79	15.88	8.74	160.78	-0.56	2.16	2.77	167.64
165.1mm	6.500	0.063	0.031	0.625	0.344	6.330	-0.022	0.085	0.109	6.60

(1) The maximum allowable tolerances for IPS Pipe from square cut ends is:
0.76mm (0.030") for sizes 32mm – 80mm (1¼" thru 3");
1.14mm (0.045") for sizes 100mm – 150mm (4" – 6"); and
1.52mm (0.060") for sizes 200mm (8") and above.

(2) 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.

(3) Groove Diameter "C" must be of uniform depth around the circumference of the pipe.

(4) Groove Depth "D" is a reference dimension only. The Groove Diameter "C" must be maintained.

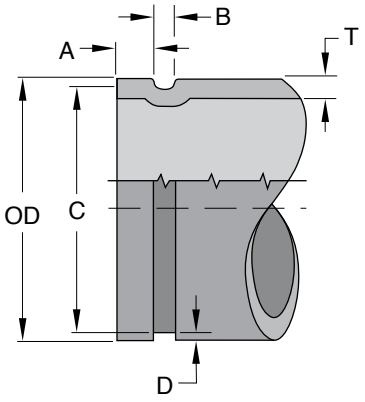
(5) Minimum Wall Thickness "T" is the minimum wall thickness that should be roll grooved.

(6) Maximum allowable pipe end flare diameter is measured at the pipe end diameter.

Caution: Pressure performance values shown for GRINNELL couplings on light wall (Sch. 5 & Sch. 10 ISO Metric) stainless steel pipe are dependent on the use of required special rolls for roll grooving light-wall stainless steel pipe. Failure to utilize the required special rolls for roll grooving light-wall stainless steel pipe may result in equipment failure.

Roll Groove Standard Specification for Steel & Other IPS Pipe

Tech Data Sheet: G710



Nominal Pipe Size mm Inches	Pipe O.D. mm Inches			A ±0,76mm ±0.030" mm Inches	B ±0,76mm ±0.030" mm Inches	C Groove Diameter mm Inches		D Groove Depth (ref. only) mm Inches	T Minimum Wall mm Inches	Maximum Allow Flare Diameter mm Inches
	O.D.	Tolerance				Actual	Tol. +0.000			
		+	-							
150	168.3	1.60	0.79	15.88	8.74	163.96	-0.56	2.16	2.77	170.94
6	6.625	0.063	0.031	0.625	0.344	6.455	-0.022	0.085	0.109	6.73
200	219.1	1.60	0.79	19.05	11.91	214.40	-0.64	2.34	2.77	223.52
8	8.625	0.063	0.031	0.750	0.469	8.441	-0.025	0.092	0.109	8.80
250	273.0	1.60	0.79	19.05	11.91	268.27	-0.69	2.39	3.40	277.37
10	10.750	0.063	0.031	0.750	0.469	10.562	-0.027	0.094	0.134	10.92
300	323.9	1.60	0.79	19.05	11.91	318.19	-0.76	2.77	3.96	328.17
12	12.750	0.063	0.031	0.750	0.469	12.531	-0.030	0.109	0.156	12.92
350	355.6	1.60	0.79	23.83	11.91	350.04	-0.76	2.77	3.96	358.14
14	14.000	0.063	0.031	0.938	0.469	13.781	-0.030	0.109	0.156	14.10
400	406.4	1.60	0.79	23.83	11.91	400.84	-0.76	2.77	4.19	408.94
16	16.000	0.063	0.031	0.938	0.469	157.81	-0.030	0.109	0.165	16.10
450	457.2	1.60	0.79	25.40	11.91	451.64	-0.76	2.77	4.19	461.26
18	18.000	0.063	0.031	1.000	0.469	17.781	-0.030	0.109	0.165	18.16
500	508.0	1.60	0.79	25.40	11.91	502.44	-0.76	2.77	4.78	512.06
20	20.000	0.063	0.031	1.000	0.469	19.781	-0.030	0.109	0.188	20.16
600	609.6	1.60	0.79	25.40	12.70	600.86	-0.76	4.37	5.54	614.68
24	24.000	0.063	0.031	1.000	0.500	23.656	-0.030	0.172	0.218	24.20

(1) The maximum allowable tolerances for IPS Pipe from square cut ends is:
0.76mm (0.030") for sizes 32mm – 80mm (1¼" thru 3");
1.14mm (0.045") for sizes 100mm – 150mm (4" – 6"); and
1.52mm (0.060") for sizes 200mm (8") and above.

(2) 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.

(3) Groove Diameter "C" must be of uniform depth around the circumference of the pipe.

(4) Groove Depth "D" is a reference dimension only. The Groove Diameter "C" must be maintained.

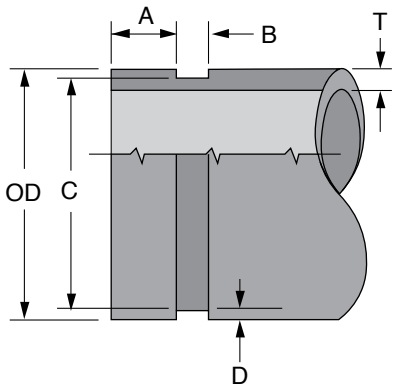
(5) Minimum Wall Thickness "T" is the minimum wall thickness that should be roll grooved.

(6) Maximum allowable pipe end flare diameter is measured at the pipe end diameter.

Caution: Pressure performance values shown for GRINNELL couplings on light wall (Sch. 5 & Sch. 10 ISO Metric) stainless steel pipe are dependent on the use of required special rolls for roll grooving light-wall stainless steel pipe. Failure to utilize the required special rolls for roll grooving light-wall stainless steel pipe may result in equipment failure.

Cut Groove Standard Specification for Steel & Other IPS Pipe

Tech Data Sheet: G710



Nominal Pipe Size mm Inches	Pipe O.D. mm Inches			A ±0,76mm ±0.030" mm Inches	B ±0,76mm ±0.030" mm Inches	C Groove Diameter mm Inches		D Groove Depth (ref. only) mm Inches	T Minimum Wall mm Inches
	O.D.	Tolerance							
		+	-			Actual	Tol. +0.000		
32	42.4	0.41	0.41	15.88	7.95	38.99	-0.38	1.60	3.56
1 1/4	1.660	0.016	0.016	0.625	0.313	1.535	-0.015	0.062	0.140
40	48.3	0.48	0.48	15.88	7.95	45.09	-0.38	1.60	3.68
1 1/2	1.900	0.019	0.019	0.625	0.313	1.775	-0.015	0.062	0.145
50	60.3	0.61	0.61	15.88	7.95	57.15	-0.38	1.60	3.91
2	2.375	0.024	0.024	0.625	0.313	2.250	-0.015	0.062	0.154
65	73.0	0.74	0.74	15.88	7.95	69.09	-0.46	1.98	4.78
2 1/2	2.875	0.029	0.029	0.625	0.313	2.720	-0.018	0.078	0.188
65	76.1	0.76	0.76	15.88	7.95	72.26	-0.46	1.93	4.78
76.1mm	3.000	0.030	0.030	0.625	0.313	2.845	-0.018	0.076	0.188
80	88.9	0.89	0.79	15.88	7.95	84.94	-0.46	1.98	4.78
3	3.500	0.035	0.031	0.625	0.313	3.344	-0.018	0.078	0.188
100	108.0	1.07	0.79	15.88	9.53	103.73	-0.51	2.11	5.16
108.0mm	4.252	0.042	0.031	0.625	0.375	4.084	-0.020	0.083	0.203
100	114.3	1.14	0.79	15.88	9.53	110.08	-0.51	2.11	5.16
4	4.500	0.045	0.031	0.625	0.375	4.334	-0.020	0.083	0.203
125	133.0	1.35	0.79	15.88	9.53	129.13	-0.51	2.11	5.16
133.0mm	5.236	0.052	0.031	0.625	0.375	5.084	-0.020	0.083	0.203
125	139.7	1.42	0.79	15.88	9.53	135.48	-0.51	2.11	5.16
139.7mm	5.500	0.056	0.031	0.625	0.375	5.334	-0.020	0.083	0.203
125	141.3	1.42	0.79	15.88	9.53	137.03	-0.56	2.13	5.16

(1) The maximum allowable tolerances for IPS Pipe from square cut ends is:
0.76mm (0.030") for sizes 32mm – 80mm (1¼" thru 3");
1.14mm (0.045") for sizes 100mm – 150mm (4" – 6"); and
1.52mm (0.060") for sizes 200mm (8") and above.

(2) 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.

(3) Groove Diameter "C" must be of uniform depth around the circumference of the pipe.

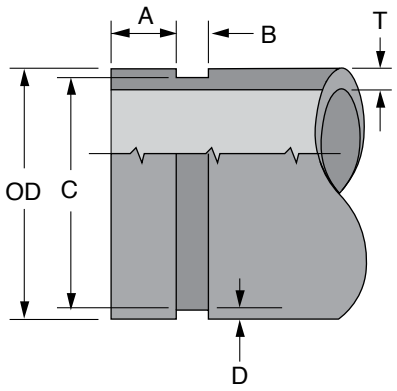
(4) Groove Depth "D" is a reference dimension only. The Groove Diameter "C" must be maintained.

(5) Minimum Wall Thickness "T" is the minimum wall thickness that should be cut grooved.

Caution: Pressure performance values shown for GRINNELL couplings on light wall (Sch. 5 & Sch. 10 ISO Metric) stainless steel pipe are dependent on the use of required special rolls for roll grooving light-wall stainless steel pipe. Failure to utilize the required special rolls for roll grooving light-wall stainless steel pipe may result in equipment failure.

Cut Groove Standard Specification for Steel & Other IPS Pipe

Tech Data Sheet: G710



Nominal Pipe Size mm Inches	Pipe O.D. mm Inches			A ±0,76mm ±0.030" mm Inches	B ±0,76mm ±0.030" mm Inches	C Groove Diameter mm Inches		D Groove Depth (ref. only) mm Inches	T Minimum Wall mm Inches
	O.D.	Tolerance							
		+	-			Actual	Tol. +0.000		
5	5.563	0.056	0.031	0.625	0.375	5.395	-0.022	0.084	0.203
150	159.0	1.60	0.79	15.88	9.53	154.53	-0.56	2.11	5.56
159.0mm	6.260	0.063	0.031	0.625	0.375	6.084	-0.022	0.083	0.219
150	165.1	1.60	0.79	15.88	9.53	160.78	-0.56	2.16	5.56
165.1mm	6.500	0.063	0.031	0.625	0.375	6.330	-0.022	0.085	0.219
150	168.3	1.60	0.79	15.88	9.53	163.96	-0.56	2.16	5.56
6	6.625	0.063	0.031	0.625	0.375	6.455	-0.022	0.085	0.219
200	219.1	1.60	0.79	19.05	11.13	214.40	-0.64	2.34	6.05
8	8.625	0.063	0.031	0.750	0.438	8.441	-0.025	0.092	0.238
250	273.0	1.60	0.79	19.05	12.70	268.27	-0.69	2.39	6.35
10	10.750	0.063	0.031	0.750	0.500	10.562	-0.027	0.094	0.250
300	323.9	1.60	0.79	19.05	12.70	318.19	-0.76	2.77	7.09
12	12.750	0.063	0.031	0.750	0.500	12.531	-0.030	0.109	0.279
350	355.6	1.60	0.79	23.83	12.70	350.04	-0.76	2.77	7.14
14	14.000	0.063	0.031	0.938	0.500	13.781	-0.030	0.109	0.281
400	406.4	1.60	0.79	23.83	12.70	400.84	-0.76	2.77	7.92
16	16.000	0.063	0.031	0.938	0.500	157.81	-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
18	18.000	0.063	0.031	1.000	0.500	17.781	-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
20	20.000	0.063	0.031	1.000	0.500	19.781	-0.030	0.109	0.312
600	609.6	1.60	0.79	25.40	14.27	600.86	-0.76	4.37	9.53
24	24.000	0.063	0.031	1.000	0.562	23.656	-0.030	0.172	0.375

(1) The maximum allowable tolerances for IPS Pipe from square cut ends is:
0.76mm (0.030") for sizes 32mm – 80mm (1¼" thru 3");
1.14mm (0.045") for sizes 100mm – 150mm (4" – 6"); and
1.52mm (0.060") for sizes 200mm (8") and above.

(2) 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.

(3) Groove Diameter "C" must be of uniform depth around the circumference of the pipe.

(4) Groove Depth "D" is a reference dimension only. The Groove Diameter "C" must be maintained.

(5) Minimum Wall Thickness "T" is the minimum wall thickness that should be cut grooved.

Caution: Pressure performance values shown for GRINNELL couplings on light wall (Sch. 5 & Sch. 10 ISO Metric) stainless steel pipe are dependent on the use of required special rolls for roll grooving light-wall stainless steel pipe. Failure to utilize the required special rolls for roll grooving light-wall stainless steel pipe may result in equipment failure.

Gaskets

GRINNELL Gasket Seal

Tech Data Sheet: G610

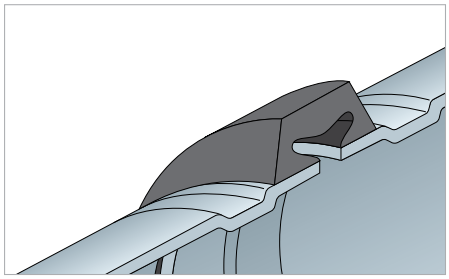
Pressure responsive gaskets are offered in a variety of types. Although they each serve a specific function they all utilise the same sealing design.

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.

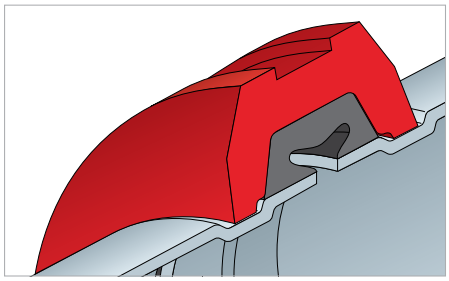
(2) The installation of the housing segments around the gasket and into the pipe groove properly positions the gasket. Tightening of the housing segments forms the gasket to the inside of the housing and compresses it around the pipe-sealing surface thus increasing the gasket's sealing against the pipe.

(3) The introduction of the system pressure energises the pressure responsive seal of the gasket and further enhances the sealing action.



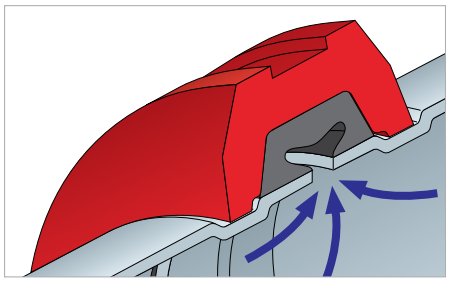
First Seal

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 maximise the leak-tight seal.

UL FM APPROVED

For detailed Listing / Approval information contact GRINNELL Mechanical Products

GRINNELL 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, 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 centre "rib" of the gasket over the gap between the pipes. The tri-seal gasket has two tapered sealing edges in addition to the centre rib for additional strength and sealing.

The Tri-Seal gasket can be used with the Figure 705, 707, 772, 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.

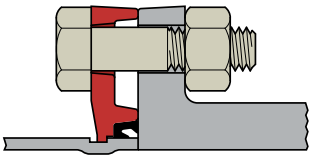
Note: Rigid couplings are recommended for vacuum and low temperature applications.

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.

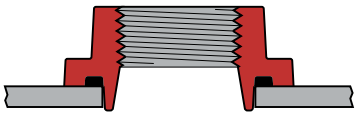
Reducing couplings are not recommended for low temperature applications.

Flange Adapter



This gasket is specifically designed for use with the Figure 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.

Outlet Fittings



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 the Figure 730 Mechanical Tee (threaded and grooved). 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.

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

Tech Data Sheet: G610

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 21°C (70°F) unless otherwise noted.

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

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Contact a GRINNELL Sales Representative for recommendations for services not listed.

Gasket recommendations apply to GRINNELL gaskets and valves only.

Grade	Temperature Range	Compound	Colour Code	General Service Application
"E"	**-34°C to 110°C** *(-30°F to 230°F)*	EPDM	*Green Stripe*	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	**-34°C to 110°C** *(-30°F to 230°F)*	EPDM	*Green Stripe*	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 82°C (180°F)*	EPDM	*Green/Yellow Stripe*	IPS Sizes Only, Approved for Potable Water Applications, contact a GRINNELL Sales Representative for details **Not recommended for hydrocarbons.**
"T" and "T" Tri- Seal	**-29°C to 82°C** *(-20°F to 180°F)*	Nitrile	*Orange Stripe*	Compressed air, petroleum products, vegetable oils, mineral oils, and air with oils. High-End oil vapour temperature, decrease to 66°C (150°F). **Not recommended for hot water systems. Not recommended for hot dry air systems.**
"O" and "O" Tri- Seal	**-7°C to 149°C** *(+20°F to 300°F)*	Fluoroelastomer	*Blue Stripe*	Oxidizing acids, petroleum products, hydraulic fluids, lubricants, halogenated hydrocarbons.
"L"	**-34°C to 177°C** *(-30°F to 350°F)*	Silicone *	*Red Stripe*	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 a GRINNELL Sales Representative.

Tri-Seal Freezer Gasket

The Tri-Seal Grade E freezer gasket is used primarily for dry pipe fire protection systems, vacuum service, and freezer applications. The Tri-Seal freezer gasket differs from standard gaskets by closing off the gap of gasket cavity. This is accomplished by positioning the centre "rib" of the gasket over the gap between the pipes. The Tri-Seal freezer gasket has two tapered sealing edges in addition to the centre rib for additional strength and sealing.

The Tri-Seal freezer gasket is available in sizes 32mm to 300mm (1¼" to 12") and is designed for use with GRINNELL Figure 705, 705R, 707, 774, 772, 405 and 472 Couplings. A petroleum-free silicone based lubricant is recommended for all dry pipe systems.

They are intended primarily for low-temperature, dry systems in cold storage, freezer applications and vacuum applications greater than 10 inches of mercury.

Note: Rigid couplings are preferred for vacuum, dry pipe and freezer applications.

GRINNELL Gasket Air, Water & Chemical Recommendations

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- Contact a GRINNELL Sales Representative 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.
- Check gasket colour code to be certain it is recommended for the service intended.
- Unless otherwise noted, all gasket listings are based upon a temperature of 21°C (70°F).
- For services not listed, contact a GRINNELL Sales Representative for recommendation.
- Where more than one gasket is shown, the preferred gasket grade is listed first.

Water & Air

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

Petroleum Products

Service	Gasket Grade
Crude Oil - Sour	T
Diesel Oil	T
Fuel Oil	T
Gasoline, Leaded	T
Hydraulic Oil	T
Kerosene	T
Lube Oil, to 66°C (150°F)	T
Motor Oil	T
Tar and Tar Oil	T

Chemical Composition	Gasket Grade
ASTM #3 Oil	T
Acetaldehyde	E
Acetamide	T
Acetic Acid up to 10% 38°C (100°F)	E
Acetic Acid up to 10-50% 38°C (100°F)	L
Acetic Acid, Glacial 38°C (100°F)	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
Aluminium Chloride	E/T
Aluminium Fluoride	E/T
Aluminium Hydroxide	E
Aluminium Nitrate	E/T
Aluminium Oxychloride	T
Aluminium Phosphate	E
Aluminium Salts	T
Aluminium Sulphate	E/T
Ammonia Gas, Cold	E
Ammonia, Liquid	E
Ammonium Bifluoride	T
Ammonium Carbonate	E
Ammonium Chloride	E/T

Chemical Composition	Gasket Grade
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 Sulphate	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
Barium Chloride	E/T

Chemical Composition	Gasket Grade
Barium Hydroxide	E/T
Barium Sulfide	T
Benzaldehyde	E
Benzene	O
Benzine (see Petroleum Ether)	O
Benzoic Acid	E
Benzol	O
Benzyl Alcohol	E
Benzyl Benzoate	E
Black Sulphate 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

Chemical Composition	Gasket Grade
Calcium Hydroxide	E/T
Calcium Hypochlorite	E
Calcium Hypochloride	E
Calcium Nitrate	E/T
Calcium Sulphate	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 (Chlorocosane)	T

GRINNELL Gasket Air, Water & Chemical Recommendations

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Chemical Composition	Gasket Grade
Chloroacetic Acid	E
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 Sulphate	E/T
Creosol, Cresylic Acid	O
Creosote, Coal Tar	O
Creosote, Wood	O
Cupric Fluoride	T
Cupric Sulphate	T
Cyclohexane (Alicyclic Hydrocarbon)	O
Cyclohexanone	E
Deionised Water	E
Dextrim	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
Dioctyl 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
Ethyl Ether	T

Chemical Composition	Gasket Grade
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 Sulphate	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, 54°C (130°F)	T
Freon 12, 54°C (130°F)	T
Freon 113 54°C (130°F)	T
Freon 114, 54°C (130°F)	T
Freon 134a, 80°C (176°F)	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 Sulphate Liquor	T
Halon 1301	E
Heptane	T
Hexaldehyde	E
Hexane	T
Hexanol Tertiary	T
Hexyl Alcohol	T
Hexylene Glycol	T
Hydrobromic Acid, to 40%	E
Hydrochloric Acid, to 36%, 24°C (75°F)	E
Hydrochloric Acid, to 36%, 70°C (158°F)	O

Chemical Composition	Gasket Grade
Hydrocyanic Acid	E
Hydrofluoric Acid, to 75%, 24°C (75°F)	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 Sulphate	E
Hypochlorous Acid, Dilute	E
Iso Octane, 38°C (100°F)	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 Sulphate	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 66°C (150°F)	T
Magnesium Chloride	E/T
Magnesium Hydroxide	E/T
Magnesium Sulphate	E/T
Maleic Acid	T
Malic Acid	T
Mercuric Chloride	E/T
Mercuric Cyanide	T
Mercurous Nitrate	E/T
Mercury	T
Methane	T
Methyl Alcohol, Methanol	E/T

Chemical Composition	Gasket Grade
Methyl Chloride	O
Methyl Ethyl Ketone	E
Methyl Isobutyl Carbinol	E
Methylene Chloride	O
Methylene Dichloride 38°C (100°F)	O
MIL-L7808	O
MIL-05606	O
MIL-08515	O
Mineral Oils	T
Naptha, 71°C (160°F)	O
Napthenic Acid	T
Natural Gas	T
Nevoil	E
Nickel Chloride	E/T
Nickel Plating Solution 52°C (125°F)	E/T
Nickel Sulphate	E/T
Nitric Acid to 10%, 24°C (75°F)	E
Nitric Acid, 10-50%, 24°C (75°F)	O
Nitric Acid, 50-86%, 24°C (75°F)	O
Nitric Acid, Red Fuming	O
Nitromethane	E
Nitrous Oxide	E
NOVEC 1230 FK-5-1-12	E
Ogisogiric Acid, to 75%, 66°C (150°F)	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
Petroleum Ether (see Benzene)	O
Petroleum Oils	T
Phenol (Carbolic Acid)	O
Phenylhydrazine	E

GRINNELL Gasket Air, Water & Chemical Recommendations

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Chemical Composition	Gasket Grade
Phenylhydrazine Hydrochloride	E
Phosphate Ester	E
Phosphoric Acid, to 75% and 21°C (70°F)	E/T
Phosphoric Acid, to 85% and 93°C (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_2O)	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 Permaganate Saturate 10-25%	E
Potassium Persulfate	T
Potassium Silicate	E/T
Potassium Sulphate	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

Chemical Composition	Gasket Grade
Pyroguard "D"	T
Pyroguard 55	E
Pyrrole	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 Sulphate	E
Skydrol, 93°C (200°F)	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
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 Sulphate	E/T
Sodium Sulfide	T

Chemical Composition	Gasket Grade
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%, 66°C (150°F)	E
Sulfuric Acid, 25-50%, 93°C (200°F)	O
Sulfuric Acid, 50-95%, 66°C (150°F)	O
Sulfuric Acid, Fuming	O
Sulfuric Acid, Oleum	O
Sulfurous Acid	O
Tall Oil	T
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 93°C (200°F)	O
Tricresyl Phosphate	E
Triethanolamine	E/T

Chemical Composition	Gasket Grade
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 66°C (150°F)	E/T
Water, to 93°C (200°F)	E
Water, to 110°C (230°F)	E
Water, Acid Mine	E/T
Water, Chlorine	E
Water, Deionised	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 Sulphate	E/T

Note:
Contact GRINNELL for an Engineering evaluation and recommendation where the gasket grade is shown in parenthesis. For dry pipe systems or freezer systems, use Tri-Seal freezer gasket and petroleum free silicone lubricant. Check gasket colour code to be certain it is recommended for the service intended. Unless otherwise noted, all gasket listings are based upon a temperature of 21°C (70°F). For services not listed contact GRINNELL for recommendation. Where more than one gasket is shown, the preferred gasket grade is listed first.

GRINNELL Gasket Lubricants

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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.

GRINNELL Mechanical Piping Products recommends two kinds of lubricant:

- La-Co Industries Lubri-Joint
- Klüber VR6717002 (Silikon)

Check lubricant chart to be certain the proper lubricant is recommended for the service intended. For information on health safety, contact a GRINNELL Sales Representative for Material Safety Data Sheets (MSDS).

Part Number	Lubricant	Approx. Weight kg Lbs.
32005	Multi-lingual Label	1
		2.2

Part Number	GETL (GRINNELL Extreme Temperature Lubricant)	Approx. Weight kg Lbs.
8000B	English Label	0.5
		1.1

Part Number	Lubricant	Approx. Weight kg Lbs.
VR6717002	Multi-lingual Label	1.0
		2.2

Part Number	Lubricant for Potable Water	Approx. Weight kg Lbs.
VR69-252	With KTW Certificate	1.0
		2.2

GRINNELL Replacement Gaskets for Figure 705, 774, 707 and 772

10 YEAR LIMITED WARRANTY

Standard "C" Style Gaskets

Tri-Seal Style Gaskets

Pipe Size		EPDM		
Nominal mm Inches	O.D. mm Inches	Grade E C-Style	Grade E Tri-Seal	EPDM Grade EN* C-Style
25	33.7	10EPDM	–	10EPDM-PW
1	1.315			
32	42.4	12EPDM	12EPDM-TRI	12EPDM-PW
1 1/4	1.660			
40	48.3	15EPDM	15EPDM-TRI	15EPDM-PW
1 1/2	1.900			
50	60.3	20EPDM	20EPDM-TRI	20EPDM-PW
2	2.375			
65	73.0	25EPDM	25EPDM-TRI	25EPDM-PW
2 1/2	2.875			
65	76.1	26EPDM	26EPDM-TRI	26EPDM-PW
76.1mm	3.000			
80	88.9	30EPDM	30EPDM-TRI	30EPDM-PW
3	3.500			
100	108.0	41EPDM	–	–
108.0mm	4.252			
100	114.3	42EPDM	42EPDM-TRI	42EPDM-PW
4	4.500			
125	133.0	51EPDM	–	–
133.0mm	5.236			
125	139.7	52EPDM	52EPDM-TRI	52EPDM-PW
139.7mm	5.500			
125	141.3	52EPDM	52EPDM-TRI	52EPDM-PW
5	5.563			
150	159.0	61EPDM	–	–
159.0mm	6.260			
150	165.1	62EPDM	62EPDM-TRI	62EPDM-PW
165.1mm	6.500			
150	168.3	63EPDM	63EPDM-TRI	63EPDM-PW
6	6.625			
200	219.1	80EPDM	80EPDM-TRI	80EPDM-PW
8	8.625			
250	273.0	11EPDM	11EPDM-TRI	11EPDM-PW
10	10.750			
300	323.9	13EPDM	13EPDM-TRI	13EPDM-PW
12	12.750			
350	355.6	14EPDM	–	–
14	14.000			
400	406.4	16EPDM	–	–
16	16.000			
450	457.2	18EPDM	–	–
18	18.000			
500	508.0	21EPDM	–	–
20	20.000			
600	609.6	24EPDM	–	–
24	24.000			

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

GRINNELL Replacement Gaskets for Figure 705, 774, 707 and 772

10 YEAR LIMITED WARRANTY

Standard "C" Style Gaskets

Tri-Seal Style Gaskets

Pipe Size		Nitrile		Fluoro Elastomer		Silicone
Nominal mm Inches	O.D. mm Inches	Grade T C-Style	Grade T Tri-Seal	Grade O C-Style	Grade O Tri-Seal	Grade L C-Style
25	33.7	10BUNA	–	10VITON	–	10SILICONE
1	1.315					
32	42.4	12BUNA	–	12VITON	–	12SILICONE
1 1/4	1.660					
40	48.3	15BUNA	–	15VITON	–	15SILICONE
1 1/2	1.900					
50	60.3	20BUNA	–	20VITON	–	20SILICONE
2	2.375					
65	73.0	25BUNA	–	25VITON	–	25SILICONE
2 1/2	2.875					
65	76.1	26BUNA	–	26VITON	–	26SILICONE
76.1mm	3.000					
80	88.9	30BUNA	–	30VITON	–	30SILICONE
3	3.500					
100	108.0	41BUNA	–	–	–	–
108.0mm	4.252					
100	114.3	42BUNA	–	42VITON	–	42SILICONE
4	4.500					
125	133.0	51BUNA	–	–	–	–
133.0mm	5.236					
125	139.7	52BUNA	–	52VITON	–	52SILICONE
139.7mm	5.500					
125	141.3	52BUNA	–	52VITON	–	52SILICONE
5	5.563					
150	159.0	61BUNA	–	–	–	–
159.0mm	6.260					
150	165.1	62BUNA	–	62VITON	–	62SILICONE
165.1mm	6.500					
150	168.3	63BUNA	–	63VITON	–	63SILICONE
6	6.625					
200	219.1	80BUNA	–	80VITON	–	80SILICONE
8	8.625					
250	273.0	11BUNA	–	11VITON	–	11SILICONE
10	10.750					
300	323.9	13BUNA	–	13VITON	–	13SILICONE
12	12.750					
350	355.6	–	–	14VITON	–	14SILICONE
14	14.000					
400	406.4	–	–	16VITON	–	16SILICONE
16	16.000					
450	457.2	–	–	18VITON	–	–
18	18.000					
500	508.0	–	–	21VITON	–	–
20	20.000					
600	609.6	–	–	24VITON	–	–
24	24.000					

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

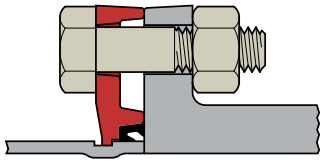
GRINNELL Replacement Gaskets for Figure 71

10 YEAR LIMITED WARRANTY

Pipe Size		Figure 71 Flange Adapter	
Nominal mm Inches	O.D. mm Inches	EPDM Grade E	Nitrile Grade T
50	60.3	20EPDM71	20BUNA71
2	2.375		
65	73.0	25EPDM71	25BUNA71
2 1/2	2.875		
65	76.1	26EPDM71	26BUNA71
76.1mm	3.000		
80	88.9	30EPDM71	30BUNA71
3	3.500		
100	114.3	42EPDM71	42BUNA71
4	4.500		
125	139.7	52EPDM71	52BUNA71
139.7mm	5.500		
125	141.3	53EPDM71	53BUNA71
5	5.563		
150	165.1	62EPDM71	62BUNA71
165.1mm	6.500		
150	168.3	63EPDM71	63BUNA71
6	6.625		
200	219.1	80EPDM71	80BUNA71
8	8.625		
250	273.0	11EPDM71	11BUNA71
10	10.750		
300	323.9	13EPDM71	13BUNA71
12	12.750		

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Figure 71 Gaskets



GRINNELL Replacement Gaskets for Figure 716

10 YEAR LIMITED WARRANTY

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.

Pipe Size		EPDM Grade E 716-Style	Nitrile Grade T 716-Style
Nominal mm Inches	O.D. mm Inches		
50 x 40	60.3 x 48.3	EPDM2015	BUNA2015
2 x 1 1/2	2.375 x 1.900		
65 x 50	73.0 x 60.3	EPDM2520	BUNA2520
2 1/2 x 2	2.875 x 2.375		
65 x 50	76.1 x 60.3	EPDM2620	BUNA2620
76.1 x 2	3.000 x 2.375		
80 x 50	88.9 x 60.3	EPDM3020	BUNA3020
3 x 2	3.500 x 2.375		
80 x 65	88.9 x 73.0	EPDM3025	BUNA3025
3 x 2 1/2	3.500 x 2.875		
80 x 65	88.9 x 76.1	EPDM3026	BUNA3026
3 x 76.1mm	3.500 x 3.000		
100 x 60	114.3 x 60.3	EPDM4220	BUNA4220
4 x 2	4.500 x 2.375		
100 x 65	114.3 x 73.0	EPDM4225	BUNA4225
4 x 2 1/2	4.500 x 2.875		
100 x 65	114.3 x 76.1	EPDM4226	BUNA4226
114.3 x 76.1mm	4.500 x 3.000		
100 x 80	114.3 x 88.9	EPDM4230	BUNA4230
4 x 3	4.500 x 3.500		
125 x 100	139.7 x 114.3	EPDM5242	BUNA5242
139.7mm x 4	5.500 x 4.500		
125 x 100	141.3 x 114.3	EPDM5342	BUNA5342
5 x 4	5.563 x 4.500		
150 x 100	165.1 x 114.3	EPDM6242	BUNA6242
165mm x 4	6.500 x 4.500		
150 x 100	168.3 x 114.3	EPDM6342	BUNA6342
6 x 4	6.625 x 4.500		
150 x 125	168.3 x 141.3	EPDM6353	BUNA6353
6 x 5	6.625 x 5.563		
200 x 150	219.1 x 168.3	EPDM8063	BUNA8063
8 x 6	8.625 x 6.625		

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

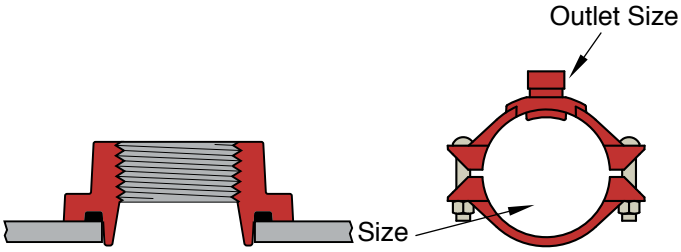
GRINNELL Replacement Gaskets for Figure 730

10 YEAR LIMITED WARRANTY

Outlet Fittings

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 the Figure 730 Mechanical Tee (threaded and grooved).

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



Run Size mm Inches	Outlet Size mm Inches	EPDM Grade E 730-Style	Nitrile Grade T 730-Style
50. 65. 80. 100	15. 20. 25	1EPDM730	1BUNA730
2, 2 ½, 3, 4	½, ¾, 1		
50. 80. 100	32	2EPDM730	2BUNA730
2, 3, 4	1 ¼		
50	40	2EPDM730	2BUNA730
2	1 ½		
65. 80. 100. 150	40	3EPDM730	3BUNA730
2 ½, 3, 4, 5, 6	1 ½		
65	32	3EPDM730	3BUNA730
2 ½	1 ¼		
150	32	3EPDM730	3BUNA730
6	1 ¼		
65	50	3EPDM730	3BUNA730
2 ½	2		
80. 100. 125. 150. 200	50	4EPDM730	4BUNA730
3, 4, 5, 6, 8	2		
100. 125	65	5EPDM730	5BUNA730
4, 5	2 ½		
150. 200	65	6EPDM730	6BUNA730
6, 8	2 ½		
100. 125	80	7EPDM730	7BUNA730
4, 5	3		
150. 200	80	8EPDM730	8BUNA730
6, 8	3		
150. 200	100	9EPDM730	9BUNA730
6, 8	4		

For instructions on part numbers, ordering information, and availability, refer to page 13 or contact a GRINNELL Sales Representative.

Notes

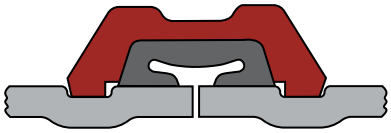
Pressure and Design Data

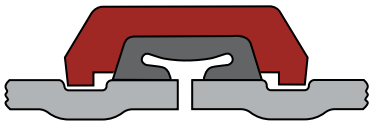
Design

Tech Data Sheets: G810, G820, G830

Rigid Joints

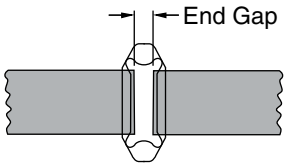
GRINNELL Rigid Couplings provide rigid gripping of the pipe. They are designed to bring the pipe ends close together and to ensure the coupling clamps firmly onto the pipe OD and the bottom of the grooves. Because rigid couplings clamp around the entire pipe surface, they provide resistance to flexural 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.

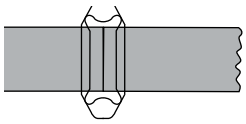


Pipe Ends Gapped for Expansion

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 pressurising the system and then anchoring the system.

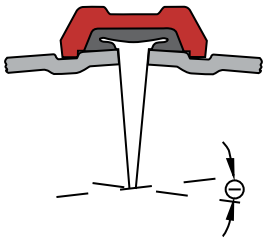
For thermal contraction with flexible couplings, the pipe ends at each joint should be fully butted. The system can then be anchored in place to prevent the pipe ends from opening up to the maximum end gap when pressurised.



Pipe Ends Butted for Contraction

Angular Deflection

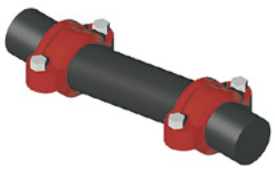
GRINNELL Flexible Couplings are capable of accommodating angular deflection.

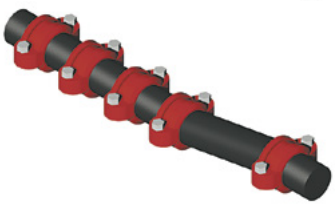


Expansion/Contraction

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 practises as follows:

End Gap Reduction	
Pipe Size mm Inches	Maximum Pipe End Gap
42.4 – 88.9	50%
1 1/4 – 3	
114.3 – 610.0	25%
4 – 24	

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 mm Inches	Cut Grooved mm Inches	Roll Grooved mm Inches
42.4 – 88.9	0 – 1.6	0 – 0.8
1 1/4 – 3	0 – 0.063	0 – 0.031
114.3 – 610.0	0 – 2.4	0 – 2.4
4 – 24	0 – 0.188	0 – 0.094
* 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 practises as shown:

Deflection	
Pipe Size mm Inches	Maximum Pipe Deflection Reduction
42.4 – 88.9	50%
1 1/4 – 3	
114.3 – 610.0	25%
4 – 24	

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.

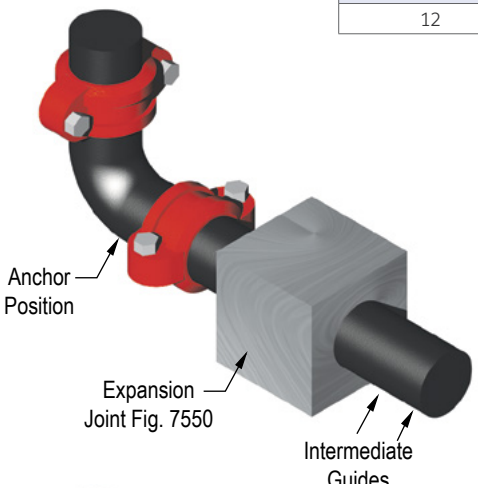
(2) Design the system with flexible and/or rigid couplings and allow the pipe to move in directions desired, with the use of anchors and guides if so required. With this method, it is important to ensure that movement at branch connections, changes of direction, equipment hookup, etc., will not cause damage or harmful stresses.

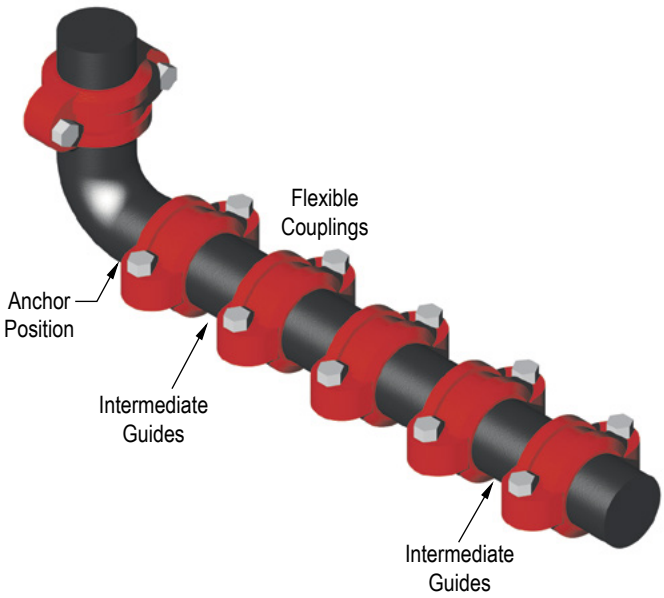
(3) Design the system with flexible couplings utilising the expansion/contraction capabilities of these products.

The following example illustrates this method:

- 150mm (6") Schedule 40 steel pipe, roll grooved, 45.7m (150') long, anchored at each end
- Maximum Temperature = 93.3°C (200°F)
- Minimum Temperature = 4.4°C (40°F)
- Install Temperature = 26.6°C (80°F)

Activation Force	
Pipe Size mm Inches	Activation Force N Lbs.
42.4	156
1 1/4	35
48.3	200
1 1/2	45
60.3	311
2	70
73.0	645
2 1/2	100
76.1	489
76,1mm	110
88.9	645
3	145
114.3	1068
4	240
141.3	1668
5	375
165.1	2224
165,1mm	500
168.3	2313
6	520
219.1	3914
8	880
273.0	6072
10	1365
323.9	8518
12	1915





Thermal Movement

Tech Data Sheets: G810, G820, G8

Directions to calculate the number of couplings required to compensate for the thermal expansion and contraction of pipe (by example):

(1) Thermal Contraction

Utilise the Thermal Expansion Table. Allowance for the minimum installation temperature, in this case 26.6°C to 4.4°C (80°F to 40°F), is calculated as:

26.6°C = 15,5mm per 30,5m
4.4°C = 7,6mm per 30,5m
Difference = 7,9mm per 30,5m
For 45,7m of pipe = 7,9mm x 1.5 = 11,9mm per 45,7m

(80°F = 0.61" per 100'
40°F = 0.30" per 100'
Difference = 0.31" per 100'
For 150' of pipe = 0.31" x 1.5 = 0.47" per 150')

(2) Thermal Expansion

Utilise 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:

93.3°C = 38,6mm per 30,5m
26.6°C = 15,5mm per 30,5m
Difference = 23,1mm per 30,5m
For 45,7m of pipe = 23,1mm x 1.5 = 34,5mm per 45,7m

(200°F = 1.52" per 100'
80°F = 0.61" per 100'
Difference = 0.91" per 100'
For 150' of pipe = 0.91 x 1.5 = 1.36" per 150')

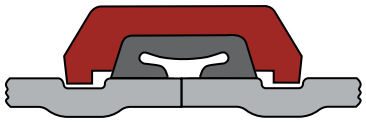
(3) Couplings Required

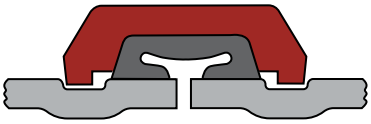
Available linear movement for a 150mm (6") Figure 707 Flexible Coupling on roll grooved pipe = 2.4mm (0.094") per coupling.

- Fully butted together for contraction only. Therefore the number of Figure 707 Flexible Couplings required:
- 11.9mm / 2.4mm per coupling = 4.96
  (0.47" / 0.094" per coupling = 5.0)
- Use 5 Figure 707 couplings for pipe contraction
- (b) Fully gapped apart for expansion only. Therefore the number of Figure 707 Flexible Couplings required:
- 34.5mm / 2.4mm per coupling = 14.38
  (1.36" / 0.094" per coupling = 14.47)
- · Use 15 Figure 707 Flexible Couplings for pipe expansion

Thermal Expansion of Carbon Steel in millimetres per Metres Between 0°C (-32°F) and Indicated Temperature

Temperature C° F°	Thermal Expansion mm/30.5m
-40	-0.500
-40	
-30	-0.375
-22	
-20	-0.250
-4	
-10	-0.125
14	
0	0.000
32	
10	0.125
50	
20	0.250
68	
30	0.375
86	
40	0.500
104	
50	0.625
122	
60	0.750
140	
70	0.875
158	
80	1.000
176	
90	1.125
194	
100	1.250
212	
120	1.500
248	
Based on coifiecient of thermal expansion = 0.0000125 mm/mm/°C carbon steel	



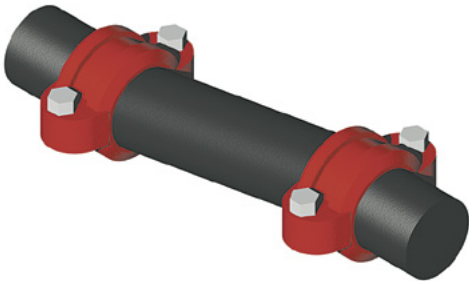


Misalignment and Deflection

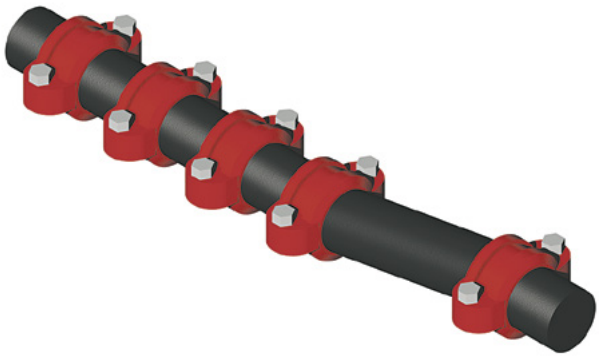
Tech Data Sheets: G810, G820, G830

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.

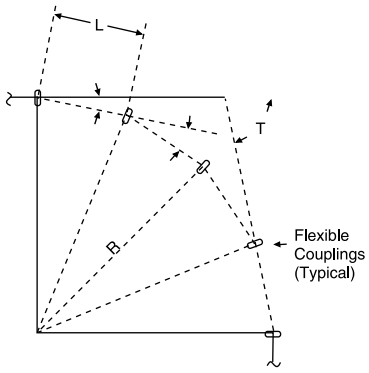


Flexible couplings are also useful in laying out curved piping systems.

$$R = \frac{L}{(2)\ (\text{Sin}\frac{\theta}{2})}$$

$$L = (2)\ (R)\ (\text{Sin}\frac{\theta}{2})$$

$$N = \frac{T}{\theta}$$



R = Radius of curve

L = Pipe length

θ = Deflection from centre line, 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 O (Roll Grooved Pipe)	
Pipe Size mm Inches	Figures 705 & 707
42.4	1.08°
1 1/4	
48.3	0.94°
1 1/2	
60.3	0.75°
2	
73.0	0.62°
2 1/2	
76.1	0.60°
76,1mm	
88.9	0.51°
3	
114.3	1.19°
4	
141.3	0.97°
5	
165.1	0.83°
165,1mm	
168.3	0.81°
6	
219.1	0.63°
8	
273.0	0.50°
10	
323.9	0.42°
12	
Incorporates the recommended safety factor reduction for field practises (50% for sizes 32mm – 80mm (1 1/4" – 3") and 25% for sizes 100mm – 300mm (4" – 12")).	

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.

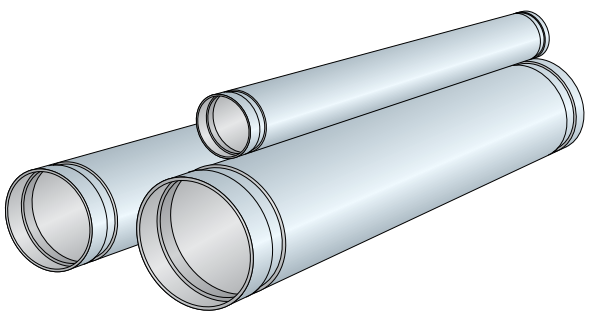
Flexible Joints

For pipe runs when linear movement is accommodated by the flexible coupling:

Number of Hangers Per Pipe Length								
Pipe Size mm Inches	Pipe Length in Metres Feet							
	10	12	15	22	25	30	35	40
	3.3	3.7	4.6	6.7	7.6	9.1	10.7	12.2
	Average Number of Hangers Per Pipe Length							
42.4 – 60.3	2	2	2	3	4	4	5	6
1¼ - 2								
73.0 – 114.3	1	2	2	2	2	3	4	4
2½ - 4								
141.3 – 609.6	1	1	2	2	2	3	3	3
5 - 24								

For pipe runs when linear movement is not required:

Distance Between Supports	
Nominal Size mm Inches	Maximum Distance Between Supports Metres Feet
42.4 - 48.3	3.7
1¼ - 1½	12
60.3 - 219.1	4.6
2 - 8	15
273.0 - 323.9	4.9
10 - 12	16
355.6 - 406.4	5.5
14 - 16	18
457.2 - 609.6	6.1
18 - 24	20
Note: The requirements of ANSI, ASME or other code groups may require additional supports.	



Rigid Joints

For pipe runs with rigid couplings:

Pipe Size		Suggested Maximum Span Between Supports – Metres Feet					
Nominal DN In.	O.D. mm In.	Water Service			Air Service		
		I	II	III	I	II	III
25	33.4	2.1	2.7	3.7	2.7	9	3.7
1	1.315	7	9	12	9	2.7	12
32	42.4	2.1	3.4	3.7	2.7	11	3.7
1¼	1.660	7	11	12	9	3.4	12
40	48.3	2.1	3.7	4.6	2.7	13	4.6
1½	1.900	7	12	15	9	4.0	15
50	60.3	3.0	4.0	4.6	4.0	15	4.6
2	2.375	10	13	15	13	4.6	15
65	73.0	3.4	4.3	4.6	4.3	16	4.6
2½	2.875	11	14	15	14	4.9	15
65	76.1	3.4	4.3	4.6	4.3	16	4.6
76.1mm	3.000	11	14	15	14	4.9	15
80	88.9	3.7	4.6	4.6	4.6	17	4.6
3	3.500	12	15	15	15	5.2	15
100	114.3	4.3	5.2	4.6	5.2	21	4.6
4	4.500	14	17	15	17	6.4	15
125	133.0	4.9	5.8	4.6	6.1	24	4.6
133.0mm	5.236	16	19	15	20	7.3	15
125	139.7	4.6	5.5	4.6	5.2	23	4.6
139.7mm	5.500	15	18	15	19	7	15
125	141.3	4.9	5.8	4.6	6.1	24	4.6
5	5.563	16	19	15	20	7.3	15
150	165.1	5.2	6.1	4.6	6.4	25	4.6
165.1mm	6.500	17	20	15	21	7.6	15
150	168.3	5.2	6.1	4.6	6.4	25	4.6
6	6.625	17	20	15	21	7.6	15
200	219.1	5.8	6.4	4.6	7.3	28	4.6
8	8.625	19	21	15	24	8.5	15
250	273.0	5.8	6.4	4.6	7.3	31	4.6
10	10.750	19	21	15	24	9.4	15
300	323.9	7	6.4	4.6	9.1	33	4.6
12	12.750	23	21	15	30	10.1	15
350	355.6	7	6.4	4.6	9.1	33	4.6
14	14.000	23	21	15	30	10.1	15
400	406.4	8.2	6.4	4.6	10.7	33	4.6
16	16.000	27	21	15	35	10.1	15
450	457.2	8.2	6.4	4.6	10.7	33	4.6
18	18.000	27	21	15	35	10.1	15
500	508.0	9.1	6.4	4.6	11.9	33	4.6
20	20.000	30	21	15	39	10.1	15
600	609.6	9.8	6.4	4.6	12.8	33	4.6
24	24.000	32	21	15	42	10.1	15

I – Spacing by ANSI B31.1 Power Piping Code
II – Spacing by ANSI B39.1 Building Piping Code
III – Spacing by NFPA 13 Sprinkler Systems (Steel Pipe except Threaded Lightwall)

Pipe Support

Tech Data Sheets: G810, G820, G830

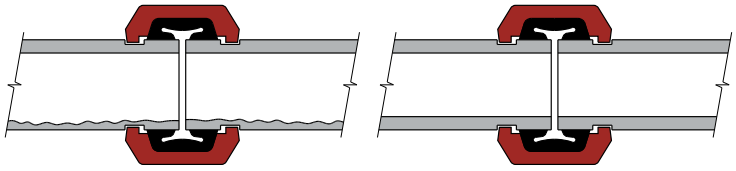
Rotational Movement

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 depressurised. 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.

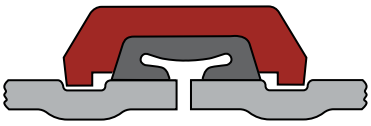


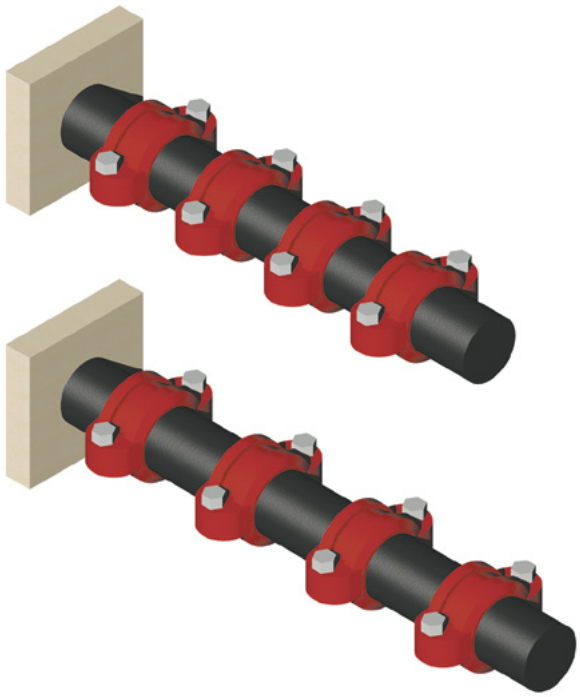
Linear Movement

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.





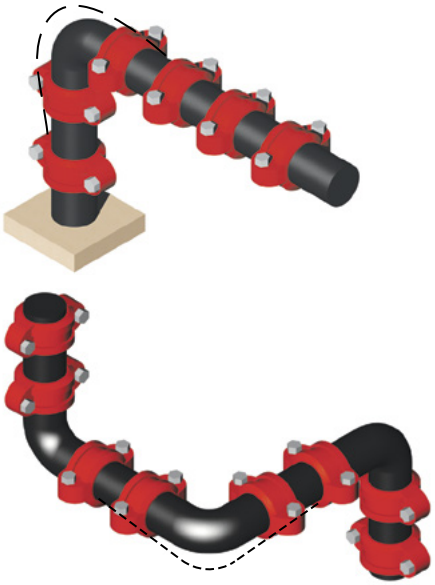
Pipe Support

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.

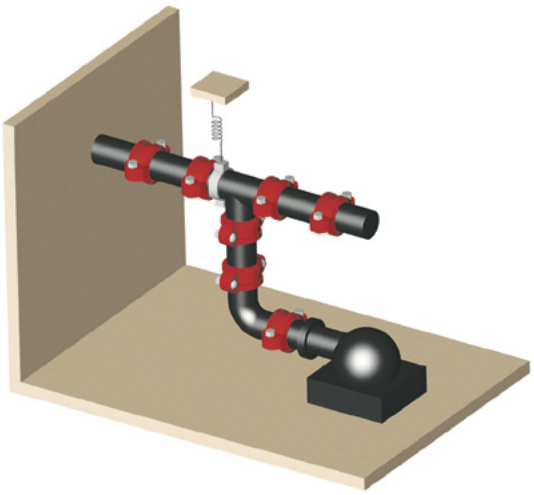


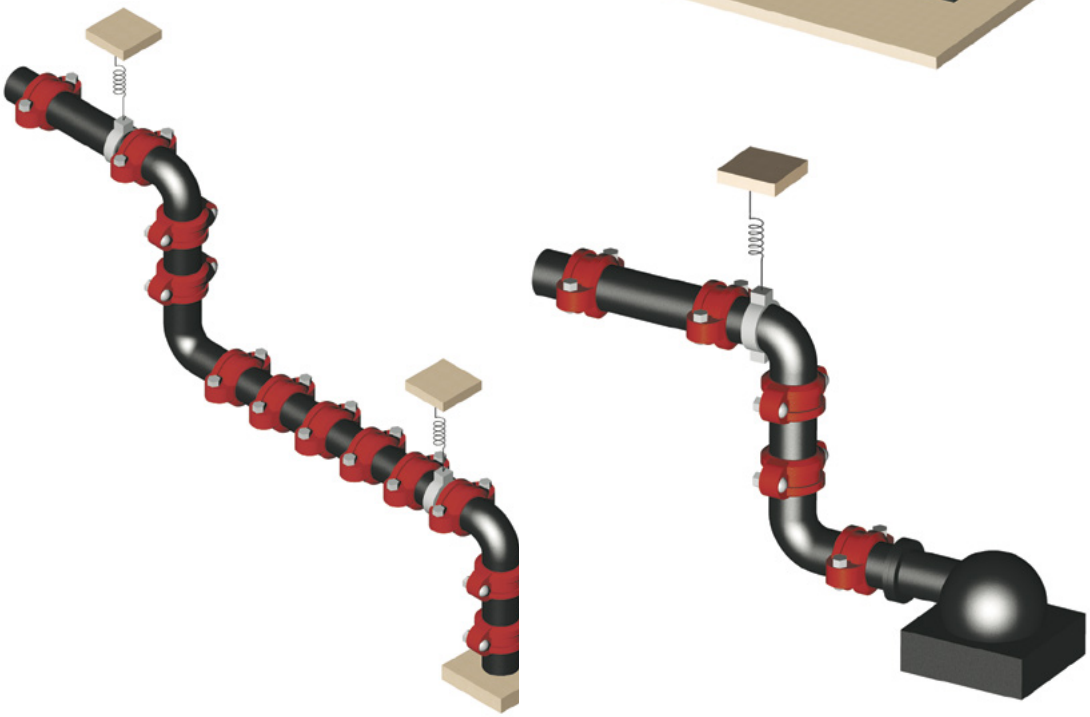
Pipe Support

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.

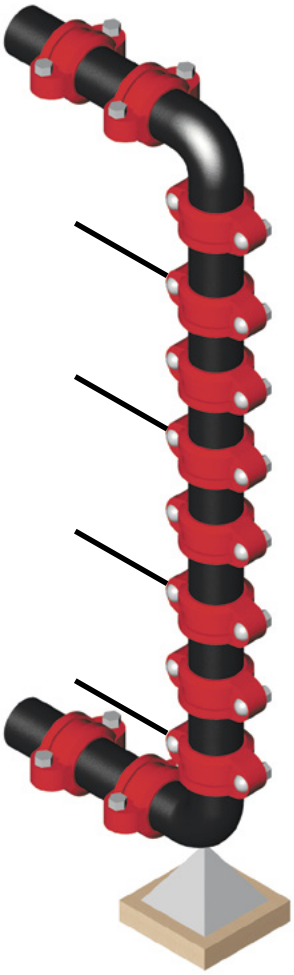




Vertical Piping

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.



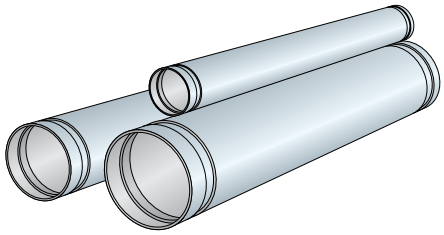
When using flexible couplings, the movement that occurs in long lengths of piping needs to be considered. Each joint can move up to the maximum pipe end separation published. This movement can accumulate and result in the growth of the piping system, for example at the top. Offsets may be necessary.

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 practise 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 depressurising and draining the system. Material and gasket selection should be verified to be compatible for the specific application.

Pipe Data



Pipe Size		Conversion Table Wall Thickness – mm inches								
Nominal DN In.	O.D. mm In.	Pipe ANSI B36.10						Pipe DIN Norm		
		Sch. 5	Sch. 10	Sch. 20	Sch. 30	Sch. 40	Sch. 80	DIN 2440	DIN 2448	DIN 2458
20	26.9	1.65	2.77	–	–	2.87	3.91	2.65	2.3	2
¾	1.050	0.06	0.11	–	–	0.11	0.15	0.10	0.09	0.08
25	33.4	1.65	2.77	–	–	3.38	4.55	3.25	2.6	2
1	1.315	0.06	0.11	–	–	0.13	0.18	0.13	0.10	0.08
32	42.4	1.65	2.77	–	–	3.56	4.83	3.25	2.6	2.3
1¼	1.660	0.06	0.11	–	–	0.14	0.19	0.13	0.10	0.09
40	48.3	1.65	2.77	–	–	3.68	5.08	3.25	2.6	2.3
1½	1.900	0.06	0.11	–	–	0.14	0.20	0.13	0.10	0.09
50	60.3	1.65	2.77	–	–	3.91	5.54	3.65	2.9	2.6
2	2.375	0.06	0.11	–	–	0.15	0.22	0.14	0.11	0.10
65	73.0	2.11	3.05	–	–	5.16	7.01	–	–	–
2½	2.875	0.08	0.12	–	–	0.20	0.28	–	–	–
65	76.1	–	–	–	–	–	–	3.65	2.9	2.6
76.1mm	3.000	–	–	–	–	–	–	0.14	0.11	0.10
80	88.9	2.11	3.05			5.49	7.61	4.05	3.2	2.9
3	3.500	0.08	0.12			0.22	0.30	0.16	0.13	0.11
100	108.0	–	–	–	–	–	–	–	3.6	2.9
108.0mm	4.252	–	–	–	–	–	–	–	0.14	0.11
100	114.3	2.11	3.05	–	–	6.02	8.56	4.5	3.6	3.2
4	4.500	0.08	0.12	–	–	0.24	0.34	0.18	0.14	0.13
125	133.0	–	–	–	–	–	–	–	4	3.6
133.0mm	5.236	–	–	–	–	–	–	–	0.16	0.14
125	139.7	–	–	–	–	–	–	4.85	–	–
139.7mm	5.500	–	–	–	–	–	–	0.19	–	–
125	141.3	2.77	3.4	–	–	6.55	9.53	–	–	–
5	5.563	0.11	0.13	–	–	0.26	0.38	–	–	–
150	159.0	–	–	–	–	–	–	–	4.5	4
159.0mm	6.260	–	–	–	–	–	–	–	0.18	0.16
150	165.1	–	–	–	–	–	–	4.85	4.5	4
165.1mm	6.500	–	–	–	–	–	–	0.19	0.18	0.16
150	168.3	2.77	3.4	–	–	7.11	10.97	–	–	4.5
6	6.625	0.11	0.13	–	–	0.28	0.43	–	–	0.18
200	219.1	2.77	3.76	6.35	7.04	8.18	12.7	–	6.3	4.5
8	8.625	0.11	0.15	0.25	0.28	0.32	0.50	–	0.25	0.18
250	273.0	3.4	4.19	6.35	7.8	9.27	15.06	–	6.3	5
10	10.750	0.13	0.16	0.25	0.31	0.36	0.59	–	0.25	0.20
300	323.9	3.96	4.57	6.35	8.38	10.31	17.45	–	7.1	5.6
12	12.750	0.16	0.18	0.25	0.33	0.41	0.69	–	0.28	0.22
350	355.6	4.19	6.35	7.94	9.53	11.1	19.05	–	8	5.6
14	14.000	0.16	0.25	0.31	0.38	0.44	0.75	–	0.31	0.22
400	406.4	–	6.35	7.94	9.53	12.7	21.41	–	8.8	6.3
16	16.000	–	0.25	0.31	0.38	0.50	0.84	–	0.35	0.25
450	457.2	–	6.35	7.94	11.13	14.28	23.8	–	10	6.3
18	18.000	–	0.25	0.31	0.44	0.56	0.94	–	0.39	0.25
500	508.0	–	6.35	9.53	12.7	15.06	26.19	–	11	6.3
20	20.000	–	0.25	0.38	0.50	0.59	1.03	–	0.43	0.25
600	609.6	–	6.35	9.53	14.28	17.45	30.94	–	12.5	6.3
24	24.000	–	0.25	0.38	0.56	0.69	1.22	–	0.49	0.25

Working Pressure Ratings (psi) on Light Wall Roll Grooved Steel Pipe

Tech Data Sheets: G810

Nominal Pipe Size ANSI Inches DN	Pipe Schedule	Pipe Wall Thickness Inches	Fig. 705 Flexible Coupling Max.	Fig. 707 Heavy Duty Flexible Coupling	Fig. 772 Rigid Coupling	Fig. 774 Grooved Rigid Coupling	Fig. 716a Flexible Reducing Coupling	Fig. 71 Flange
1 25	5	0.065	500	500	N/A	500	N/A	N/A
	10	0.109	500	750		500		
	40	0.133	500	1000		500		
1-1/4 32	5	0.065	500	500	750	500	N/A	N/A
	10	0.109	500	750	750	500		
	40	0.140	500	1000	750	500		
1-1/2 40	5	0.065	500	500	500	500	N/A	N/A
	10	0.109	500	750	750	500		
	40	0.145	500	1000	750	500		
2 50	5	0.065	500	500	500	500	N/A	300
	10	0.109	500	750	750	500		300
	40	0.154	500	1000	750	500		300
2-1/2 65	5	0.083	500	500	500	500	500	300
	10	0.120	500	600	600	500	500	300
	40	0.203	500	1000	750	500	500	300
3 80	5	0.083	500	500	500	500	500	250
	10	0.120	500	600	600	500	500	300
	40	0.216	500	1000	750	500	500	300
4 100	5	0.083	400	400	400	400	400	200
	10	0.120	500	600	600	500	500	300
	40	0.237	500	1000	750	500	500	300
5 125	5	0.109	350	350	350	350	350	200
	10	0.134	450	500	500	450	500	300
	40	0.258	450	1000	750	500	500	300
6 150	5	0.109	350	350	350	350	350	200
	10	0.134	450	450	500	450	500	300
	40	0.280	450	1000	700	500	500	300
8 200	5	0.109	250	250	250	250	250	200
	10	0.148	300	300	300	300	400	250
	40	0.322	450	800	600	400	400	300
10 250	5	0.134	150	250	250	150	N/A	200
	10	0.165	300	300	300	233		200
	40	0.365	350	800	500	233		300
12 300	5	0.156	150	200	125	125	N/A	200
	10	0.180	300	300	300	175		200
	40	0.375	350	800	400	175		300
14 350	10	0.250	N/A	300	300	N/A	N/A	200
	20	0.312		300	300			250
	Std	0.375		350	350			300
16 400	10	0.250	N/A	300	300	N/A	N/A	200
	20	0.312		300	300			250
	Std	0.375		350	350			250
18 450	10	0.250	N/A	200	200	N/A	N/A	200
	20	0.312		300	350			250
	Std	0.375		300	350			300
20 500	10	0.250	N/A	200	200	N/A	N/A	200
	Std (20)	0.375		300	350			300
24 600	10	0.250	N/A	200	200	N/A	N/A	200
	Std (20)	0.375		350	350			250

a. Figure 716 Maximum Working Pressure based on larger pipe connection nominal pipe size.
* Maximum line pressure including surge to which a joint should be subjected on pipe roll groove to standard roll grooving specification with coupling properly assembled.

Working Pressure Ratings (Bar) on ISO Size Steel Pipe

Tech Data Sheets: G810

Nominal Pipe Size ANSI Inches DN	Pipe O.D. mm	Pipe Wall Thickness mm	Fig. 705 Flexible Coupling	Fig. 707 Heavy Duty Flexible Coupling	Fig. 772 Rigid Coupling	Fig. 774 Grooved Rigid Coupling	Fig. 716a Flexible Reducing Coupling	Fig. 71 Flange
1 25	33,7	2,0	34	34	N/A	34	N/A	N/A
		2,8	34	52		34		
		3,4	34	69		34		
1-1/4 32	42,4	2,0	34	34	52	34	N/A	N/A
		2,8	34	52	52	34		
		3,6	34	69	52	34		
1-1/2 40	48,3	2,0	34	34	34	34	N/A	N/A
		2,8	34	52	52	34		
		3,7	34	69	52	34		
2 50	60,3	2,0	34	34	34	34	N/A	21
		2,8	34	52	52	34		21
		3,9	34	69	52	34		21
2-1/2 65	73	2,0	34	34	34	34	34	21
		3,0	34	41	41	34	34	21
		5,2	34	69	52	34	34	21
65	76,1	2,0	34	22	34	34	34	12
		3,0	34	34	41	34	34	19
		5,2	34	52	52	34	34	19
3 80	88,9	2,0	34	34	34	34	34	17
		3,0	34	41	41	34	34	21
		5,5	34	69	52	34	34	21
4 100	114,3	2,0	28	28	28	28	28	14
		3,0	34	41	41	34	34	21
		6,0	34	69	52	34	34	21
5 125	139,7	2,8	24	24	24	24	24	14
		3,4	31	34	34	31	34	21
		6,4	31	69	52	34	34	21
5 125	141,3	2,8	24	24	24	24	24	14
		3,4	31	34	34	31	34	21
		6,6	31	69	52	34	34	21
6 150	165,1	2,8	24	24	24	24	24	14
		3,4	31	31	34	31	34	21
		7,1	31	69	48	34	34	21
6 150	168,3	2,8	24	24	24	24	24	14
		3,4	31	31	34	31	34	21
		7,1	31	69	48	34	34	21

a. Figure 716 Maximum Working Pressure based on larger pipe connection nominal pipe size.
* Maximum line pressure including surge to which a joint should be subjected on pipe roll groove to standard roll grooving specification with coupling properly assembled.

Working Pressure Ratings (Bar) on ISO Size Steel Pipe

Tech Data Sheets: G810

Nominal Pipe Size ANSI Inches DN	Pipe O.D. mm	Pipe Wall Thickness mm	Fig. 705 Flexible Coupling	Fig. 707 Heavy Duty Flexible Coupling	Fig. 772 Rigid Coupling	Fig. 774 Grooved Rigid Coupling	Fig. 716a Flexible Reducing Coupling	Fig. 71 Flange
8 200	219,1	2,8	17	17	17	17	17	14
		3,8	21	21	21	21	28	17
		8,2	31	55	41	28	28	21
10 250	273	3,4	10	17	17	10	N/A	14
		4,2	21	21	21	16		14
		9,3	24	55	34	16		21
12 300	323,9	4,0	10	14	9	9	N/A	14
		4,6	21	21	21	12		14
		9,5	24	55	28	12		21
14 350	355,6	6,4	N/A	21	21	N/A	N/A	14
		7,9		21	20			17
		9,5		24	24			21
16 400	406,4	6,4	N/A	21	21	N/A	N/A	14
		7,9		21	21			17
		9,5		24	24			17
18 450	457,2	6,4	N/A	14	14	N/A	N/A	14
		7,9		21	24			17
		9,5		21	24			21
20 500	508,0	6,4	N/A	14	14	N/A	N/A	14
		9,5		21	24			21
24 600	609,6	6,4	N/A	14	14	N/A	N/A	14
		9,5		24	24			17

a. Figure 716 Maximum Working Pressure based on larger pipe connection nominal pipe size.

* Maximum line pressure including surge to which a joint should be subjected on pipe roll groove to standard roll grooving specification with coupling properly assembled.

GRINNELL Mechanical Products

Stainless Steel Pipe per EN20217-7 316 Ti and EN10217-7 304L Design Data Pressure Rating

Tech Data Sheets: G815

Nominal Pipe Size ANSI Inches DN	Pipe O.D. mm	Pipe Wall Thickness mm	Fig. 705 Flexible Coupling	Fig. 707 Heavy Duty Flexible Coupling	Fig. 716[a] Flexible Reducing Coupling	Fig. 71 Flange	Fig. 772 Rigid Coupling	Fig. 774[b] Grooved Rigid Coupling	Fig. 405 Flexible Coupling	Fig. 472 Rigid Coupling
1 25	33,7	2,0	34	52	N/A	N/A	N/A	34	52	N/A
		2,8	34	52				34	52	
		3,4	34	52				34	52	
1-1/4 32	42,4	2,0	34	52	N/A	N/A	52	34	52	52
		2,8	34	52			52	34	52	52
		3,6	34	52			52	34	52	52
1-1/2 40	48,3	2,0	34	45	N/A	N/A	45	34	45	45
		2,8	34	45			52	34	45	52
		3,7	34	52			52	34	52	52
2 50	60,3	2,0	28	28	N/A	21	28	28	28	28
		2,8	34	34		21	52	34	34	52
		3,9	34	52		21	52	34	34	52
65	76,1	2,0	28	28	28	21	28	28	28	28
		3,0	28	34	28	21	34	28	34	34
		5,2	34	52	34	21	52	34	34	41
3 80	88,9	2,0	28	28	28	21	28	28	28	28
		3,0	28	34	28	21	34	28	34	34
		5,5	34	52	34	21	52	34	34	41
4 100	114,3	2,0	25	25	25	21	25	25	25	25
		3,0	28	34	28	21	34	28	28	28
		6,0	34	52	34	21	52	34	34	41
5 125	139,7	2,8	21	21	21	21	21	21	21	21
		3,4	24	34	24	21	34	24	24	24
		6,4	31	45	31	21	45	31	31	41
6 150	165,1	2,8	21	34	21	21	34	21	21	34
		3,4	21	34	21	21	34	21	21	34
		7,1	21	34	21	21	34	21	31	41
6 150	168,3	2,8	21	34	21	21	34	21	21	34
		3,4	21	34	21	21	34	21	21	34
		7,1	21	34	21	21	34	34	31	41
8 200	219,1	2,8	10	10	10	10	20	10	10	20
		3,8	14	21	14	14	21	14	14	21
		8,2	21	28	21	21	21	21	31	41
10 250	273	3,8	N/A	N/A	N/A	N/A	20	N/A	N/A	20
		4,2	5	9		5	21	5		21
		9,3	21	21		21	21	16		41
12 300	323,9	3.8	N/A	N/A	N/A	N/A	20	N/A	N/A	20
		4,6					20			20
		9,5	17	21		17	28	12		41

a. Figure 716 Maximum Working Pressure based on larger pipe connection nominal pipe size. Use only grooving machine rollers designed for stainless steel pipe.
b. Figure 774 is available in Europe, Middle East, and Africa only. Use only grooving machine rollers designed for stainless steel pipe.

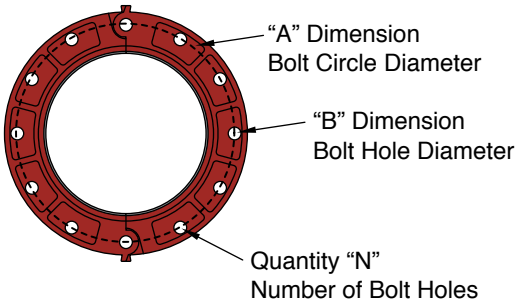
Global Pipe Size Designations

GRINNELL Mechanical Products product data is utilised 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.

Flange Drilling Specifications



Valve Size		ANSI B16.1 (Class 125#) [1]			ISO 2084 (PN10) [2]			ISO 2084 (PN16) [3]		
		Dimensions – mm Inches								
Nominal mm Inches	O.D. mm Inches	A	B	Qty. N	A	B	Qty. N	A	B	Qty. N
50	60.3	120.6	19.0	4	125.0	18.0	4	125.0	18.0	4
2	2.375	4.75	0.75		4.92	0.71		4.92	0.71	
65	73.0	139.7	19.0	4	145.0	18.0	4	145.0	18.0	4
2 1/2	2.875	5.50	0.75		5.71	0.71		5.71	0.71	
80	88.9	152.4	19.0	4	160.0	18.0	8	160.0	18.0	8
3	3.500	6.00	0.75		6.30	0.71		6.30	0.71	
100	114.3	190.5	19.1	8	180.0	18.0	8	180.0	18.0	8
4	4.500	7.50	0.75		7.09	0.71		7.09	0.71	
125	141.3	215.9	22.4	8	210.0	18.0	8	210.0	18.0	8
5	5.563	8.50	0.88		8.27	0.71		8.27	0.71	
150	168.3	241.3	22.4	8	240.0	22.0	8	240.0	22.0	8
6	6.625	9.50	0.88		9.45	0.87		9.45	0.87	
200	219.1	298.5	22.2	8	295.0	22.0	8	295.0	22.0	12
8	8.625	11.75	0.88		11.61	0.87		11.61	0.87	
250	273.0	362.0	25.4	12	350.0	22.0	12	355.0	26.0	12
10	10.750	14.25	1.00		13.78	0.87		13.98	1.02	
300	323.9	431.8	25.4	12	400.0	22.0	12	410.0	26.0	12
12	12.750	17.00	1.00		15.75	0.87		16.14	1.02	
350	355.6	476.5	28.4	12	460.0	22.0	16	470.0	26.0	16
14	14.000	18.76	1.12		18.11	0.87		18.50	1.02	
400	406.4	539.8	28.4	16	515.0	26.0	16	525.0	30.0	16
16	16.000	21.25	1.12		20.28	1.02		20.67	1.18	
450	457.2	577.9	31.8	16	565.0	26.0	20	585.0	30.0	20
18	18.000	22.75	1.25		22.24	1.02		23.03	1.18	
500	508.0	635.0	31.8	20	620.0	26.0	20	650.0	33.0	20
20	20.000	25.00	1.25		24.41	1.02		25.59	1.30	
600	609.6	749.3	35.1	20	725.0	30.0	20	770.0	36.0	20
24	24.000	29.50	1.38		28.54	1.18		30.31	1.42	

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 a GRINNELL Sales Representative.

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		
Millimetres (mm)	X	0.03937		Inches (in)	X	25.4
Metres (m)	X	3.281		Feet (ft)	X	0.3048
Kilogrammes (kg)	X	2.205		Pounds (lb)	X	0.4536
Grammes (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 Metres (N·m)	X	0.738		Torque (lbft)	X	1.356
Celsius (°C)		(C + 17.78) × 1.8		Temp. (°F)		(F − 32) ÷ 1.8
Watts (w)	X	1.341 × 10-3		Horsepower (hp)	X	745.7
Litres per min. (L/M)	X	0.2642		Gal. per Min. (gpm)	X	3.785
Cubic Metres per min. (m3/m)	X	264.2		10^{-3} Gal. per Min. (gpm)	X	3.7865

Typical General Specification

(CSI – Div. 15, Section A Info., Methods, & Instructions)

Section 1 – Grooved Piping Method

GRINNELL grooved pipe couplings, grooved end fittings, grooved end butterfly and check valves, and other system components as manufactured or supplied by GRINNELL Mechanical Products shall be used to install piping systems and make mechanical equipment connections in systems within specified operating conditions and working pressures as shown in the coupling manufacturer's product specification. GRINNELL grooved pipe couplings shall be used for the following systems (subject to applicable local code approval).

Heating / Air Conditioning

Chilled Water
Hot Water
Condenser
Water Heating
Cooling Tower
Dual Temperature
Machinery Room
Utility Water

Plumbing

Domestic Hot Water
Domestic Cold Water
Roof Drains/Storm Drains

Other

Vacuum
Lubrication
Air
Pneumatic Conveyor
Elevator Hydraulic
Low Temperature

Typical Guide Specification

Basic Materials & Methods (CSI - Div. 15 Section 15050)

Section 1 - Materials - Pipe & Pipe Fittings

1.1 Pipe - Pipe shall conform to GRINNELL published tolerance specifications. Steel pipe shall be black or galvanised, conforming to ASTM A-135, A-795 or A-53.

1.2 Couplings - Couplings shall be GRINNELL Figures 705, 707, 772 and 716 cast in ductile iron as specified in ASTM A-536. Couplings shall have nuts and bolts. Couplings shall be coated with a lead free paint as standard, or hot-dipped galvanised in accordance with ASTM A-153 as an option. Couplings shall be GRINNELL Figures 405 and 472 cast in Stainless Steel as specified in ASTM A-743/A-743M. Couplings shall have nuts and bolts.

1.2.1 Gaskets - Gaskets shall be a pressure responsive design, moulded of synthetic elastomer as designated by ASTM D-2000, and shall conform to the coupling housing and pipe outside diameter. Reference shall be made to the latest published GRINNELL gasket selection guide for proper gasket selection for the intended service.

1.2.1.1 Water Service - Gasket shall be Grade "E" EPDM with green colour code identification, for service temperatures from - 34°C to 110°C (-30°F to 230°F). Recommended for hot water not to exceed 110°C (230°F), plus a variety of dilute acids, oil free air and many chemical services. Not recommended for petroleum services or steam.

1.2.1.2 Oil Service - Gasket shall be grade "T" Nitrile with orange colour code identification, for service temperatures from -29°C to 82°C (-20°F to 180°F). Recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapours.

1.2.1.3 Other Services - Refer to the latest published GRINNELL gasket selection guide for other service recommendations.

1.2.2 Bolts and Nuts - Shall be heat treated carbon steel, ovalneck track head bolts and heavy hex nuts, conforming to the physical properties of ASTM A-183 with a minimum tensile strength of 7584 Bar (110,000 psi). Bolts and nuts shall be zinc electroplated.

1.3 Flanges - Shall be GRINNELL Figure 71 Flange, casting in ductile iron in accordance with ASTM A-536. Flange shall conform to ANSI Class 125 and 150 bolt patterns and shall be coated with a lead-free paint as standard, or hot dipped galvanised in accordance to ASTM A-153.

1.4 Fittings - Shall be ASTM A-536 ductile iron or fabricated from steel pipe, 32mm - 600mm (1 ¼" - 24"). All fittings shall be coated with a lead-free paint as standard, or hot-dipped galvanised as an option in accordance to ASTM A-153.

1.5 Branch Outlets - Shall be GRINNELL Figure 730 mechanical tees or crosses with integral gasket. Figure 730 shall be coated with a lead-free paint as standard, or hot-dipped galvanised as an option.

1.6 Butterfly Valves - Shall be with grooved ends. Valves shall have encapsulated Grade "E" EPDM or Grade "T" Nitrile disc and rated at 20.7 Bar (300 psi) bubble-tight-shut-off. Reference shall be ma1100de to the latest published GRINNELL gasket selection guide for proper disc seal selection for the intended service. Valve bodies shall be ductile iron, and upper stems shall be stainless steel.

1.7 Check Valves - Shall be with grooved ends. Valves shall have a resilient elastomer seal Grade "E" EPDM or Grade "T" Nitrile and rated at 20.7 Bar (300 psi). Reference shall be made to the latest published GRINNELL gasket selection guide for proper seal selection for the intended service. Valve bodies shall be ductile iron with a nickel seat. The caps shall be ductile iron with an attached stainless steel clapper assembly for 60.3mm - 219.1mm (2" - 8") and a ductile iron clapper assembly for 273.0mm - 323.9mm (10" - 12"). All bodies and caps shall be coated with a lead-free paint as standard.

Section 2 - Materials - Pipe Preparation

Pipe shall be prepared according to GRINNELL published specifications, ANSI/AWWA C-606, or other applicable standards.

2.1 Pipe Ends - Shall be clean and free from indentations, projections, burrs, rust or roll marks in the area from pipe end to groove.

2.1.1 Standard Weight Pipe - Shall be roll grooved without removing metal, or cut grooved in accordance with GRINNELL published standard roll groove or standard cut groove specifications.

2.1.2 Lightwall Pipe - Shall be roll grooved without metal removal in accordance with GRINNELL published standard roll groove specifications.

Section 3 - Assembly

3.1 GRINNELL couplings, fittings, flanges and valves shall be assembled in accordance with instructions published by GRINNELL Mechanical Products.

3.1.1 Pipe - Ends shall be clean and free from indentations, projections, burrs, roll marks, etc., in the area from pipe end to groove. Pipe ends shall be square cut and prepared in accordance with standard GRINNELL specifications.

3.1.2 Gasket - Shall be of pressure responsive design verified as proper style and grade suitable for the intended service as published in the latest GRINNELL gasket recommendation technical literature.

3.1.3 Lubrication - A thin, uniform coat of GRINNELL lubricant shall be applied to the entire exterior of the gasket, including the gasket lips. Complete lubrication is essential to prevent gasket pinching and to ease installation and alignment. Petroleum-free silicone gasket lubricant is recommended when gaskets are subject to low temperature conditions. Petroleum lubricants shall not be used for EPDM gaskets.

Section 4 - Support

4.1 Horizontal Piping: (Contact GRINNELL Mechanical Products for support recommendations)

4.1.1 Flexible Connections - No pipe length shall be left unsupported between any two couplings, nor shall any pipe be left unsupported whenever a change in direction of line flow takes place. Supports shall meet the requirements stated above, but in no case shall the distance between supports exceed the following for systems where linear movement is not required:

4.1.2 Rigid Connections - Pipe connections formed with the Figure 772 shall be supported in accordance with applicable ANSI B31.1, Power Piping Code; ANSI B31.9, Building Service Pipe Code.

Distance Between Supports	
Nominal Size mm Inches	Span Metres Feet
42.4 - 48.3	3.7
1 ¼ - 1 ½	12
60.3 - 219.1	4.6
2 - 8	15
273.0 - 323.9	4.9
10 - 12	16
355.6 - 406.4	5.5
14 - 16	18
457.2 - 609.6	6.1
18 - 24	20
Note: The requirements of ANSI, ASME or other code groups may require additional supports.	

Typical Specifications

Building Service Systems - Plumbing

Plumbing Specifications (CSI - Div. 15 Section 15-E Plumbing)

Section 1 - Domestic Water Systems

(CSI - Div. 15, Section 15-E Water Supply Systems) GRINNELL Mechanical Grooved Pipe couplings, fittings and butterfly valves as manufactured or supplied by GRINNELL Mechanical Products shall be used for all water supply systems under operating conditions not to exceed 110°C (230°F) temperature. The coupling gasket and encapsulated disc on butterfly valves shall be Grade "E" EPDM.

1.1 Materials:

1.1.1 Pipe - Pipe shall be galvanised steel pipe, conforming to ASTM A-135, A-795 or A-53. All pipe shall be prepared according to GRINNELL published specifications, or to ANSI/AWWA C-606 grooved end pipe. Pipe ends shall be prepared as detailed in Basic Materials and Methods and to the latest GRINNELL published specifications.

1.1.2 Couplings - All GRINNELL grooved couplings and fittings shall be painted or galvanised Figure 705, 707, 772 or 716 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.

1.1.3 Branch Connections - Shall be made with Figure 730 and/or Figure 522.

1.1.4 Flange Connections - Flange connections shall be GRINNELL Figure 71 Flanges incorporating Grade "E" EPDM gasket.

1.1.5 Fittings - Fittings shall be painted or galvanised GRINNELL standard ductile iron or segmentally welded steel fittings, with grooved ends.

1.1.6 Butterfly Valves - Shall be of grooved end design with a Grade "E" EPDM encapsulated disc. Upper stem shall be stainless steel. Valves shall have pressure assisted double seal and be capable of 300 psi, bubble-tight-shutoff. Butterfly valves shall be with gear actuator or hand lever. Operating conditions not to exceed -34°C to 110°C (-30°F to 230°F).

1.1.7 Check Valves - Shall be of grooved end design with a clapper seal of Grade "E" EPDM. Valves shall be capable of pressures of 300 psi. The valves shall have a spring loaded clapper to ensure a leak tight seal and a nonsticking operation. The clapper seat in the valve body shall be nickel. Operating conditions not to exceed -34°C to 110°C (-30°F to 230°F).

Section 2 - Storm Drains / Roof Drains

GRINNELL mechanical grooved pipe couplings and fittings as manufactured by GRINNELL Mechanical Products shall be used for all storm and roof drainage systems.

2.1 Materials:

2.1.1 Pipe - Pipe shall be galvanised steel pipe, conforming to ASTM A-135, A-795 or A-53. All pipe shall be prepared according to GRINNELL published specifications, or to ANSI/AWWA grooved end pipe. Pipe ends shall be prepared as detailed in Basic Materials and Methods and to the latest GRINNELL published specifications.

2.1.2 Couplings - Couplings shall be galvanised Figure 705, 707, 772 or 716 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.

2.1.3 Flange Connections - Flange connections shall be galvanised GRINNELL Figure 71 Flanges incorporating Grade "E" EPDM gasket.

2.1.4 Fittings - Fittings shall be galvanised GRINNELL standard ductile iron or segmentally welded steel fittings, with grooved ends.

2.2 Plastic Pipe Systems

2.2.1 Pipe - Pipe with material and dimensions conforming to ASTM D-1785 Type 1, Grade 1 with cut grooves and joint pressure ratings conforming to grooved manufacturer's specifications or recommendations; or Type 2, Grade 1 with rolled or radius cut grooves and joint ratings conforming to grooved manufacturer's specifications and recommendations.

2.2.2 Couplings - Flexible type couplings shall be used.

2.2.3 Flange Connections - Same as in 2.1.3

2.2.4 Fittings - Same as in 2.1.4

Section 3 - Vent Piping

(Same as in Section 2 - Storm Drains / Roof Drains)

Typical Specifications

Building Service Systems - Cooling

Cooling System Specifications (CSI - Div. 15 Section 15-N Refrigeration Systems)

Section 1 - Chilled Water - Supply & Return

GRINNELL Mechanical Grooved Pipe couplings, fittings and butterfly and check valves as manufactured or supplied by GRINNELL Mechanical Products shall be used for cooling system chilled water piping, including risers, mains, equipment connection, branches, supply and return lines under operating conditions not to exceed -34°C to 110°C (-30°F to 230°F) temperature. Calculations shall be made based on coupling manufacturers latest literature to determine expansion/contraction allowance available, enabling elimination of special movement compensators, swing joints, flexible connections and vibration isolators where possible.

1.1 Materials:

1.1.1 Pipe - Shall be steel pipe, conforming to ASTM A-135, A-795 or A-53. All pipe shall be prepared according to GRINNELL published specifications, or to ANSI/AWWA C-606 grooved end pipe. Pipe ends shall be prepared as detailed in Basic Materials and Methods.

1.1.2 Couplings - All flexible couplings shall be GRINNELL Figure 705 and 707 with Grade "E" EPDM gaskets and zinc plated bolts and nuts. All rigid couplings shall be GRINNELL Figure 772 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.

1.1.3 Branch Connections - Branch stub-in connections shall be made with Figure 730 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.

1.1.4 Flange Connections - Shall be GRINNELL Figure 71 Flange incorporating Grade "E" EPDM gasket.

1.1.5 Fittings - Shall be GRINNELL ductile iron or segmentally welded steel fittings, with grooved ends.

1.1.6 Butterfly Valves - Shall be of grooved end design with EPDM encapsulated disc. Neck design shall readily accommodate insulation. Valves shall have pressure assisted double seal and stainless steel upper stems, and be capable of 20.7 Bar (300 psi), bubble-tight-shut-off, with an actuator or hand lever.

1.1.7 Check Valves - Shall be of grooved end design with a clapper seal of EPDM. The valves shall have a spring loaded clapper to ensure a leak tight seal and a non-sticking operation. The clapper seat in the valve body shall be nickel. Valves shall be capable of pressures of 20.7 Bar (300 psi).

Section 2 - Cooling Tower Piping

Same as Section 1, except pipe, couplings and fittings shall be galvanised.

Section 3 - Dual Temperature Systems Piping

Same as Section 1.

Section 4 - Condenser Water Piping

Same as Section 1.

Typical Specifications

Building Service Systems - Heating

Heating System Specifications (CSI - Div. 15 Section 15-L Water Piping)

Section 1 - Hot Water Heating Systems - Supply & Return

GRINNELL Mechanical Grooved Pipe couplings, fittings and butterfly and check valves as manufactured or supplied by GRINNELL Mechanical Products shall be used for hot water systems , including boiler manifolds, mains, risers, branches, supply and return lines, under operating conditions not to exceed 110°C (230°F). Calculations shall be based on coupling manufacturers latest literature to determine expansion allowance available, enabling elimination of special expansion compensators, swing joints, flexible connections and vibration isolators where possible.

1.1 Materials:

1.1.1 Pipe - Shall be steel pipe, conforming to ASTM A-135, A-795 or A-53. All pipe shall be prepared according to GRINNELL published specifications, or to ANSI/AWWA C-606 grooved end pipe. Pipe ends shall be prepared as detailed in Basic Materials and Methods.

1.1.2 Couplings - All flexible couplings shall be GRINNELL Figure 705 and 707 with Grade "E" EPDM gaskets and zinc plated bolts and nuts. All rigid couplings shall be GRINNELL Figure 772 with Grade "E" EPDM gaskets and zinc plated bolts and nuts. All reducing couplings shall be GRINNELL Figure 716 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.

1.1.3 Branch Connections - Branch stub-in connections shall be made with GRINNELL Figure 730 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.

1.1.4 Flange Connections - Flange connections shall be GRINNELL Figure 71 Flange incorporating Grade "E" EPDM gasket.

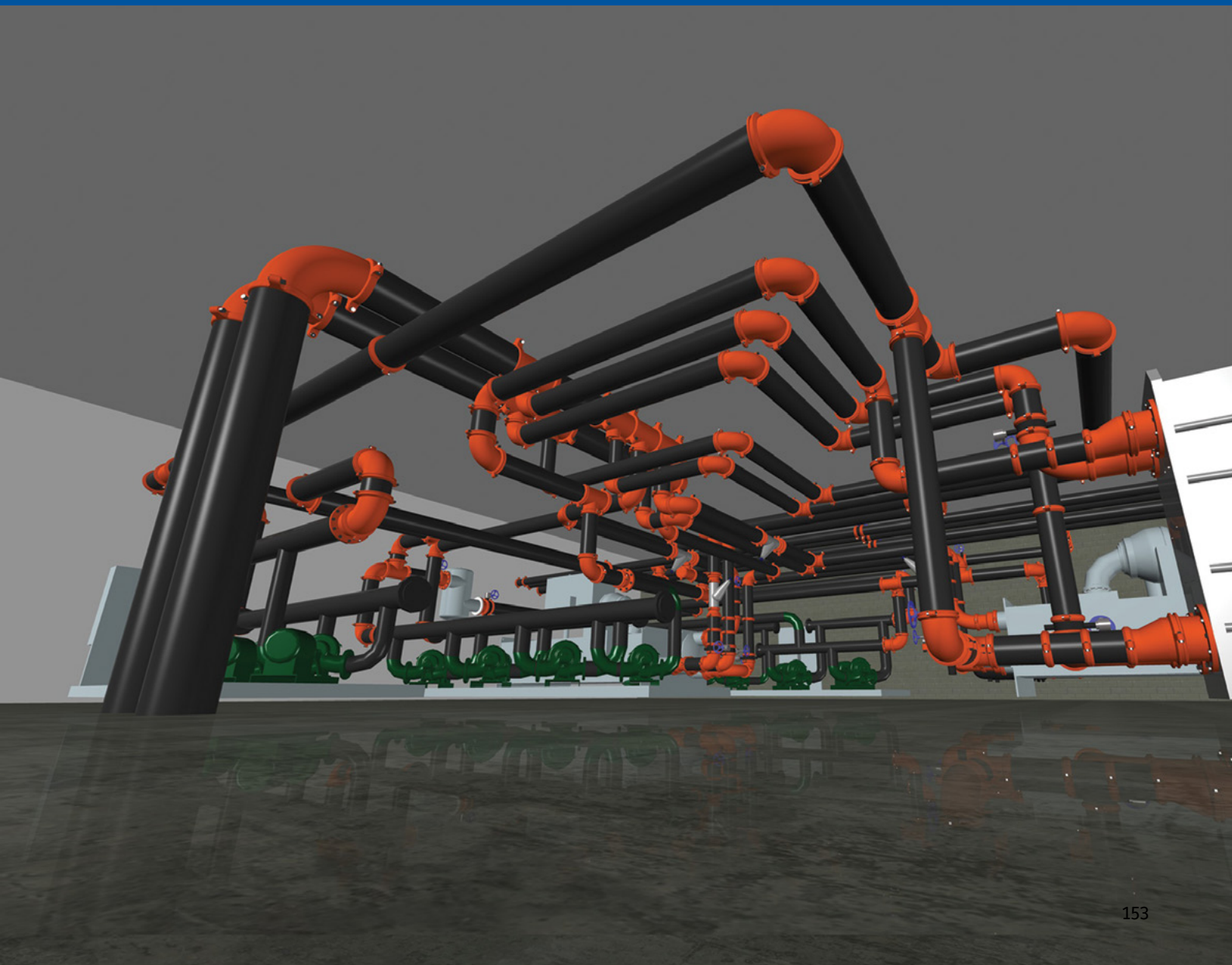
1.1.5 Fittings - Fittings shall be GRINNELL ductile iron or segmentally welded steel fittings, with grooved ends.

1.1.6 Butterfly Valves - Shall be of grooved end design with EPDM encapsulated disc. Neck design shall readily accommodate insulation. Valves shall have pressure assisted double seal and stainless steel upper stems, and be capable of 20.7 Bar (300 psi), bubble-tight-shut-off, with an actuator or hand lever.

1.1.7 Check Valves - Shall be of grooved end design with a clapper seal of EPDM. The valves shall have a spring loaded clapper to ensure a leak tight seal and a nonsticking operation. Valves shall be capable of pressures of 20.7 Bar (300 psi).

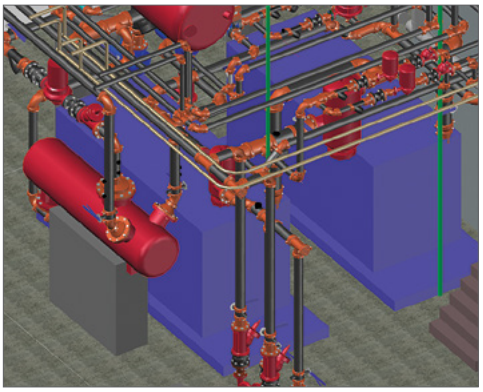
Notes

Technical Services



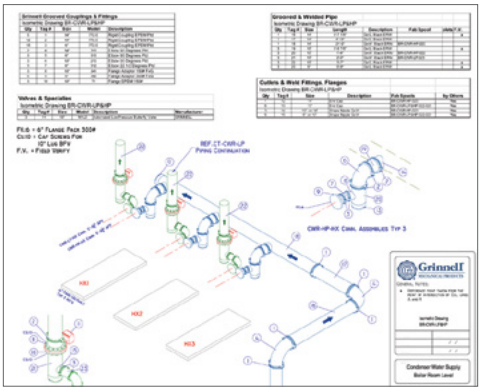
Your Partner from Design to Build

Our Technical Services team partner seamlessly with your designers, engineers and contractors to help ensure your project runs efficiently. From design to build our team of product specialists can provide your business with technical expertise, drawing services and cost saving solutions to overcome common project challenges.



Common Challenges You Face

- High Material Handling Costs
- Material Backorders
- High Installation Costs
- Excessive Material Leftovers
- Piping Interferences and Clashes
- Space Constraints
- Lack of Skilled Labor
- Compressed Delivery Schedules



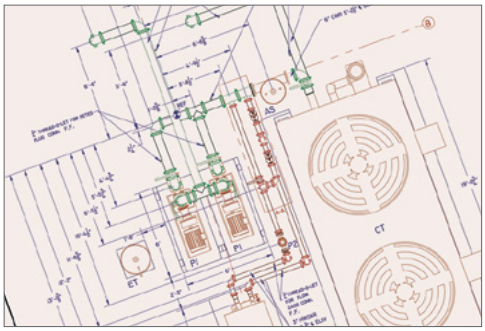
Services We Provide

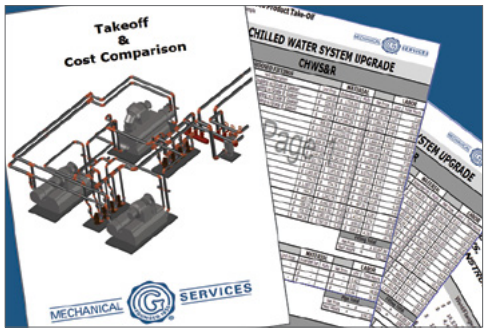
Technical Expertise – Our product specialists are available to assist with your enquiries and provide accurate recommendations to help you find the best grooved mechanical solution to fit your project needs and requirements.

Project Planning and Development

We offer a range of services during the project planning phase including;

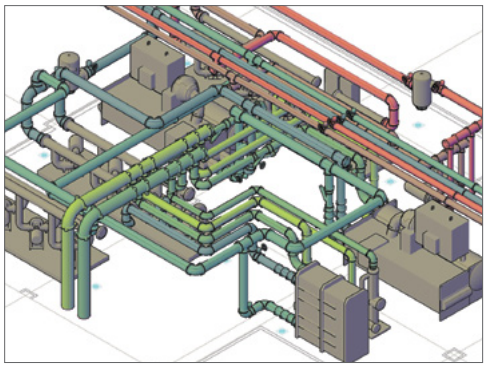
- Analysis of thermic expansion and development of expansion concepts - We assist specifiers and installers on the proper use of grooved couplings for thermal expansion and compensation in piping systems. Our assessments of your systems aim to provide cost-effective design solutions, reduce error and help you meet Key Performance Indicators (KPI's)
- 2D and 3D AutoCAD® blocks – We offer traditional AutoCAD® blocks and STEP-files
- Expansion and Contraction Calculations – Our technical project team are also adept at providing accurate riser calculations and anchor load and movement calculations
- Material take offs (MTO) with full Bill of Material (BOM) provision
- 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 techniques.

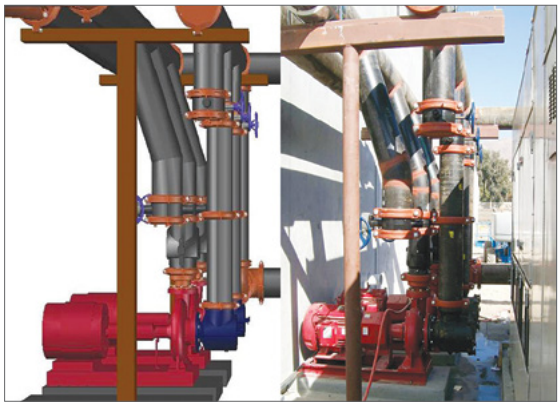


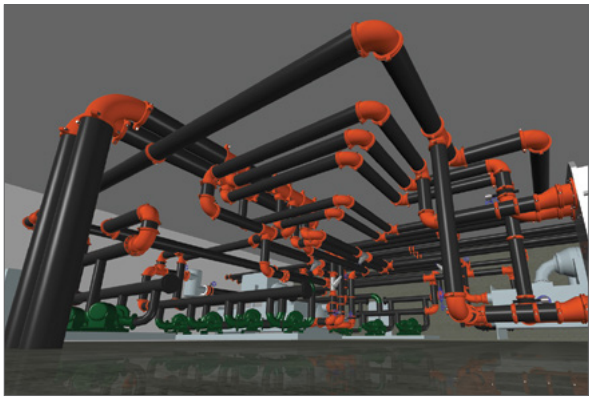


Training

Our Product Specialists can provide training demonstrations on the manual grooving process to help upskill your employees. Demonstrations may be given on site at your convenience or in our custom built technical training facilities. Advanced product training is also available to provide wider education on grooved mechanical systems.







* AutoCAD is a registered trademark of Autodesk, Inc.

* Revit is a registered trademark of Autodesk, Inc.

Notes

Indices

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Keyword Index

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10-Year Limited Warranty

Limited Warranty

Products manufactured by Johnson Controls International Plc. ("JCI") under the GRINNELL brand are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service, against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by JCI. No warranty is given for products or components manufactured by companies not affiliated by ownership with JCI or for products and components which have been subject to misuse, improper installation or maintenance, corrosion, or other external sources of damage. Materials found by JCI to be defective shall be either repaired or replaced, at JCI's sole option. JCI neither assumes, nor authorises any person to assume for it, any other obligation in connection with the sale of products or parts of products. JCI shall not be responsible for system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall JCI be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labour charges, regardless of whether JCI was informed about the possibility of such damages, and in no event shall JCI's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This Limited Warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Notes

Notes

Grinnell

About Johnson Controls:
At Johnson Controls (NYSE:JCI), we transform the environments where people live, work, learn and play. As the global leader in smart, healthy and sustainable buildings, our mission is to reimagine the performance of buildings to serve people, places and the planet.

Building on a proud history of nearly 140 years of innovation, we deliver the blueprint of the future for industries such as healthcare, schools, data centers, airports, stadiums, manufacturing and beyond through OpenBlue, our comprehensive digital offering.

Today, with a global team of 100,000 experts in more than 150 countries, Johnson Controls offers the world`s largest portfolio of building technology and software as well as service solutions from some of the most trusted names in the industry.

For more information, contact your regional GRINNELL product representative or visit www.grinnell.com

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