WINGROU

GROOVED PIPING SYSTEM

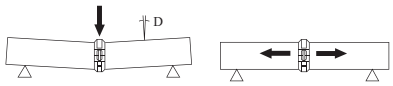
FIRE PROTECTION PIPING SOLUTIONS


FM APPROVED
Certificate of Compliance
This certificate is issued for the following:
Pipe Couplings and Fittings for Aboveground Fire Protection Systems
Model 1GS
Rigid Coupling
Model 1G
Grooved Mechanical Tee
Model 1N
Flexible Coupling
Model 1M
Threaded Mechanical Tee
Model 1NH
Flexible Coupling
Model 1L
U-Bolt Mechanical Tee
Model 1NR
Flexible Reducing Coupling
Model 1FI
Grooved Split Flange
Prepared for:
Wingrove Pipe Technologies Co.
No. 6, Stratton Way, Nuneaton CV10 7LR,
Warwickshire, United Kingdom
FM Approvals Class: 1920 – "Pipe Couplings and Fittings for Aboveground Fire Protection Systems"
Approval Identification: PR6490604
Approval Granted: May 2, 2018
To verify the availability of the Approved product, please refer to www.approvalguide.com
And Approval is subject to satisfactory field performance, continuing follow-up Facilities and Procedures Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.
Thomas H. Tullie
VP, Managing – Fire Protection
FM Approvals
1151 Boston-Providence Turnpike
Norwood, MA 02062 USA
FM Approvals
Member of the FM Global Group

Wingrou® grooved piping system is faster to install than welding, threading or flanging, resulting in lowest installed cost. It can be adopted to suit standard pipe with cut grooves or standard and light wall pipe with rolled grooves. Triple sealing of the C-shaped pressure responsive gasket is made from specially compounded rubbers with low compression set property. Coupling perform equally well under pressure and vacuum. Coupling with tri-seal gasket are highly suitable for higher vacuum service and dry systems subject to freezing. Coupling are available for flexible and rigid system.

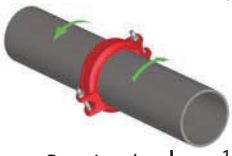
RIGID or FLEXIBLE?

WINGROU grooved couplings are classified into two types, flexible and rigid.
The following information is intended for system designers and installers to better understand the nature of the grooved piping systems. This will allow the designer and installer to make better use of the design features and advantages of grooved piping components and systems



Angular movement

Axial displacement



Rotational movement

MODEL
C'S
04
101

TYPE	ANGULAR MOVEMENT DEG.	AXIAL DISPLACEMENT	ROTATION AFTER INSTALLATION
Flexible Coupling	≥1°	1.6 - 3.2	Yes
Rigid Coupling	<1°	<1.6	No

Note: Angular movement of flexible coupling 8" and larger sizes should be 0.5°.
Axial displacement data based on roll-grooved pipe.

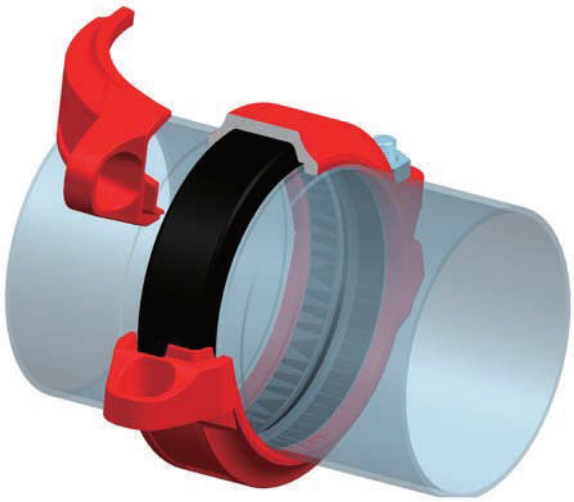
RIGID COUPLINGS

WINGROU rigid couplings can be used in application where you require a rigid joint similar to that of a traditional flanged, welded and or threaded connection. You need not worry about the snaking of the pipe on straight runs, as all WINGROU rigid couplings utilize both a mechanical and frictional interlock design to provide rigidity. Rigid couplings eliminate or reduce undesired angular movement, axial displacement and rotation after installation as is required under normal service conditions. Rigid couplings are some of the most popular and most widely used today.

ANGLE-PAD DESIGN

Angle-pad design: As the bolts are tightened, the angled bolt pads slide in opposite directions causing the couplings keys to tightly grip the pipe, while at the same time the pipe grooves are forced outward against the coupling keys.

T&G design: The T&G (tongue & groove) mechanism provides a mechanical and frictional interlock resulting in a rigid joint which reduces undesired angular movement. WINGROU precision casting techniques allow the coupling segments to meet metal-to-metal when installed on properly grooved pipe.



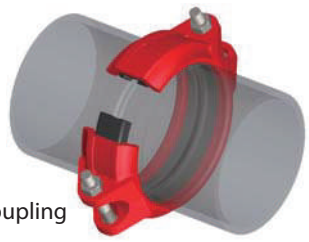
FLEXIBLE COUPLINGS

WINGROU flexible couplings allow for full design features in applications such as curved or deflected layouts and or when systems are exposed to outside forces beyond normal static conditions such as seismic events or where vibration and or noise attenuation are a concern. The ability to design in controlled flexibility is an advantageous feature when compared to traditional rigid joining methods such as threading, flanging and welding. When designing with flexible couplings you must allow for proper support to the system so as to eliminate undesired stress.
There are several published standards and codes covering grooved piping component. These codes or standards may vary as to the definition or standard for flexible couplings. System designers should confirm which standard(s) and or code(s) are required for the system being designed and they should select the applicable coupling for the application.

NFPA 13 defines a FLEXIBLE COUPLING as;
"a listed coupling or fitting that allows axial displacement, rotation, and at least 1 degree of angular movement of the pipe without inducing harm on the pipe. For pipe diameters of 8 in. and larger, the angular movement shall be permitted to be less than 1 degree but not less than 0.5 degrees."
(NFPA 13-2007 3.5.4)

For sprinkler systems, NFPA 13 specifies the use of flexible cou plings to protect the system against damage from earthquakes and sets some specific examples of how and where they should be used.

Designers and installers should design their fire protection systems in compliance with this standard.



Flexible Coupling

Axial Displacement & Angular Movement (Models IN & 1NH)

Size		Axial Displace -ment mm/in	Angular Movement (De flec tion)	
Nom.Size mm/in	Actual OD mm/in		Per coupling degrees	Per pipe mm/m, in/ ft
20	26.7	1.6	6°-46 ´	118
0.75	1.050	0.0625		1.42
25	33.4	1.6	5°-30 ´	96
1	1.315	0.0625		1.16
32	42.4	1.6	4°-20 ´	76
1.25	1.660	0.0625		0.91
40	48.3	1.6	3°-48 ´	66
1.5	1.900	0.0625		0.80
50	60.3	1.6	3°-01 ´	53
2	2.375	0.0625		0.63
65	73	1.6	2°-30 ´	44
2.5	2.875	0.0625		0.52
65	76.1	1.6	2°-24 ´	42
2.5	3.000	0.0625		0.50
80	88.9	1.6	2°-04 ´	36
3	3.500	0.0625		0.43
90	1016	1.6	1°-48 ´	31
3.5	4.000	0.0625		0.38
100	108.0	3.2	3°-24 ´	59.0
4	4.25	0.125		0.71
100	114.3	3.2	3°-12 ´	55
4	4.500	0.125		0.67
125	127.0	3.2	2°-53 ´	50.0
5	5.000	0.125		0.60
125	133	3.2	2°-46 ´	48
5	5.250	0.125		0.58
125	139.7	3.2	2°-37 ´	46
5	5.500	0.125		0.55
125	141.3	3.2	2°-36 ´	45
5	5.563	0.125		0.54

Size		Axial Displace -ment mm/in	Angular Movement (Deflection)	
Nom.Size mm/in	Actual OD mm/in		Per coupling degrees	Per pipe mm/m, in/ft
150	159.0	3.2	2°-18 ´	40
6	6.250	0.125		0.48
150	165.1	3.2	2°-14 ´	39
6	6.500	0.125		0.47
150	168.3	3.2	2°-10 ´	38
6	6.625	0.125		0.45
200 JIS	216.3	3.2	1°-42 ´	30
8	8.516	0.125		0.36
200	219.1	3.2	1°-40 ´	29
8	8.625	0.125		0.35
250 JIS	267.4	3.2	1°-22 ´	24
10	10.528	0.125		0.29
250	273.0	3.2	1°-20 ´	23
10	10.750	0.125		0.28
300 JIS	318.5	3.2	1°-10 ´	20
12	12.539	0.125		0.25
300	323.9	3.2	1°-08 ´	20
12	12.750	0.125		0.24
350	355.6	3.2	1°-02 ´	18
14	14.000	0.125		0.22
400	406.4	3.2	0°-54 ´	16
16	16.000	0.125		0.19
450	457.0	3.2	0°-48 ´	14
18	18.000	0.125		0.17
500	508.0	3.2	0°-44 ´	13
20	20.000	0.125		0.15
550	559.0	3.2	0°-38 ´	11
22	22.000	0.125		0.13
600	610.0	3.2	0°-36 ´	10
24	24.000	0.125		0.13

Note:Axial displacement is the maximum value when the system is pressurized to the maximum working pressure.
Angular movement is the maximum value that a coupling allows under no internal pressure.

MATERIALS

HOUSING

The housing segments not only provide significant strength to the joint but they also compress and protect the gasket from exposure, WINGROU coupling housings and components are cast in a variety of materials as shown below.

Ductile Iron: Standard coupling housing and fittings are made of ductile iron confirming to ASTM A536 Gr. 65-45-12. The properties of Grade 65-45-12 ductile iron are as follows; 65,000 psi (448 MPa) tensile Strength, 45,000 psi(310 MPa) yield strength and 12% elongation. As an option we also offer ductile iron made to ASTM A395 Gr. 60-40-18, for applications where required or where boiler codes may apply.

Stainless Steel: Wingrou offer a variety of stainless steel casting materials depending on your intended application. Standard coupling housing and fitting materials include CF8(304) CF8M(316) or CF3M (316L) per ASTM A743. Optional materials include 2205 Duplex, 2507 Super Duplex and ASTM CK-3MCuN (UNSJ93245), equivalent to 254SMO*. (* 254SMO is a registered trademark of Avesta Polarit AQB.)
Most of these materials are special order. Call your sales rep for details.

GASKETS

WINGROU gaskets are available in a variety of configurations and compounds to meet your specific requirements. These gaskets have excellent self sealing capabilities and are designed to provide a leak tight seal. During assembly the gasket is first stretched over the pipe ends which forms the inial seal. As the housing segments are installed and secured the pressure responsive gasket is slightly compressed to form a leak-tight joint. The strength of the seal is further enhanced by internal line pressure that creates downward pressure on the lips of the gasket. The gasket also seals well under vacuum conditions up to 10 inHg (254 mmHg) which may occur when a system is drained. Please refer to the WINGROU Gasket Selection Guide for additional details and gasket materials.

NUTS & BOLTS

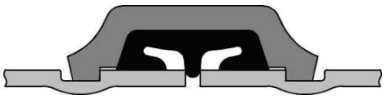
WINGROU products utilize oval neck track bolts and heavy duty hex nuts, available either in UNC threaded or ISO metric threaded. The oval neck track bolts mate into the oval holes in the housing segments to allow for easy tightening using only a single wrench/spanner. The UNC bolts and nuts are electro zinc plated in a silver chromate color and ISO bolts and nuts in a gold chromate color.
Hot-dip galvanized bolts and nuts are also available upon request. (M10 to M22 only)

Stainless steel track bolts and nuts, type 304 or 316, are supplied with WINGROU stainless steel couplings. Stainless steel track bolts and nuts are molybdenum disulfide (MoS_2) coated to inhibit galling.

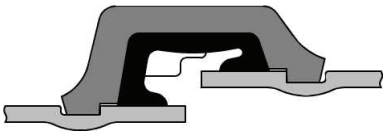
RUBBER GASKET

Wingrou gaskets are designed to provide life-of-the-system service in a wide variety of applications.
Gasket materials are available to meet most piping applications. For a list of service recommendations by gasket type see pg??

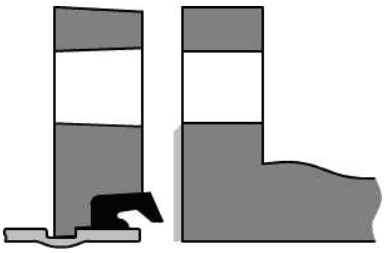
Standard C type:
Usually with grooved fittings. 1GS, 1X, 1N, 1NH, such as no special requirements are supporting this type of rubber seals



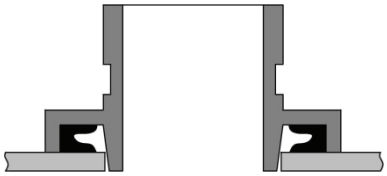
E type:
Usually with grooved fittings. 1GS, 1X, 1N, 1NH can be matched with this type of rubber seal



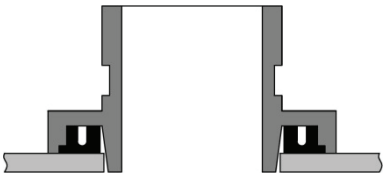
Reducing type :
Usually with grooved reducing fitting. 1NR supporting this type of rubber ring.



Flange type:
321-type slip flange are matched with this type of rubber ring



Opening reaction type:
3G, 3J are optional matching this type of rubber ring



Hole labyrinth type:
3G, 3J are optional matching this type of rubber ring

Rubber Gasket Materials

As elastomer technology advanced, superior gasket materials became available and were added to the Wingrou line. This allows Wingrou to presently offer a variety of synthetic rubber gaskets to provide the option of selecting Wingrou products for the widest variety of applications.
For most water system piping applications, Wingrou grade EPDM rubber is recommended. Wingrou E-grade rubber gasket material with excellent performance in anti-aging and heat resistance, the material at 125OC (257OF) temperature, the material for hot air aging test, the physical properties of the basic unchanged. When the rubber in a non-air environment, such as water piping system, its anti-aging properties will be further strengthened.
Since water has no deteriorating effect on the elastomer, temperature is the only limiting factor to be considered in determining the life expectancy of the elastomer in water service. The superior performance of the Grade "E" elastomer permits its use for hot water service up to +230°F/+110°C. The Grade "E" gasket is superior to previous gasket materials by all performance barometers, including high and low temperature limits, tensile strength, chemical resistance and shelf life.

Rubber Gasket Data

To assure the maximum life for the service intended, proper gasket selection and specification in ordering is essential. Many factors must be considered in determining the optimum gasket for a specific service. The foremost consideration is temperature, along with concentration of product, duration of service and continuity of service. Temperatures beyond the recommended limits have a degrading effect on the polymer. Therefore, there is a direct relationship between temperature, continuity of service and gasket life.
Services listed are General Service Recommendations only. It should be noted that there are services for which these gaskets are not recommended. For a list of application-specific and non-recommended application recommendations, reference should be made to the latest selection guide for seals.
The use of gasket only for the selection of rubber materials in the product, does not involve the selection of metal shell, fittings and bolts and nuts. For the housing, accessories and bolts and nuts selection, should be selected according to the actual application environment.

Grade	Temperature Range	Rubber Compound	Color Code	General Service Recommendations
E	-30°F to +230°F -34°C to +110°C	EPDM	Green Stripe	Recommended for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL classified in accordance with ANSI/NSF 61 for cold +86°F/+30°C and hot +180°F/+82°C potable water service. NOT RECOMMENDED FOR PETROLEUM SERVICES.
T	-20°F to +180°F -29°C to +82°C	Nitrile	Orange Stripe	Recommended for petroleum products, hydrocarbons, air with oil vapors, vegetable and mineral oils within the specified temperature range; except hot dry air over +140°F/+60°C and water over +150°F/+66°C. NOT RECOMMENDED FOR HOT WATER SERVICES.
O	-20°F to +300°F -29°C to +149°C	Fluoroelastomer	Blue Stripe	Recommended for many oxidizing acids, petroleum oils, halogenated hydrocarbons, lubricants, hydraulic fluids, organic liquids and air with hydrocarbons to +300°F/+149°C.
L	-30°F to +350°F -34°C to +177°C	Silicone	Body White	Recommended for dry heat, air without hydrocarbons to +350°F/+177°C and certain chemical services.
V	-30°F to +180°F -34°C to +82°C	Neoprene	Yellow Stripe	Recommended for hot lubricating oils and certain chemicals. Good oxidation

Rubber Gasket Selection Guide

Warning

To ensure that the rubber seal in the application of the longest life expectancy, the correct choice when ordering rubber seal material and specifications are the most basic requirements.
Failure to select the right rubber seal material can result in personal injury or property damage, joint leakage, or connection failure.

Nominal Size mm/in	Pipe O.D. mm/in	Max.Working Pressure Bar/PSI	Max.End Load kN/Lbs	Axial Displacement mm/in	Angular Movement		Dimensions			Bolt Size in	Bolt Torque N-m/Lbs-Ft
					Degree Per Coupling(°)	Pipe mm/m in/ft	X mm/in	Y mm/in	Z mm/in		
1	2	3	4	5	6		7			8	9

DATA CHART NOTES

Nominal Size: WINGROU couplings and fittings are identified by the nominal IPS pipe size in inches or nominal diameter of pipe (DN) in millimeters.

Pipe OD: Actual outside diameter of pipe in inches and millimeters.

Maximum Working Pressure: Maximum working pressures listed are CWP (cold water pressure) or maximum allowed working pressure within the service temperature range of the gasket used in the coupling, based on standard wall or sch. 7/10/40 steel pipe, cut or roll-grooved to ANSI/AWWA C606-04 specifications. These ranges may occasionally differ from maximum working pressures listed and/or approved by UL, ULC, and/or FM as testing conditions and test pipes differ. For performance data on other pipe schedules contact WINGROU
Note: For one time field test only the maximum joint working pressure may be increased 1.5 times the figures shown

Maximum End Load: Maximum end loads listed are total of internal and external forces to which the joint can be subjected, based on standard wall or sch. 7/10/40 steel pipe, cut or roll-grooved to ANSI/AWWA C606-04 specifications.

Axial Displacement: Designed range of the gap between pipe ends based on roll grooved pipe.

Angular Movement (Deflection): Maximum allowable deflection of pipe from centerline when the joint is used with cut or roll-grooved steel pipe under no internal pressure.

Dimensions: "X", "Y", "Z" and so on are external dimensions for reference purpose only in millimeters and inches

Bolt Size: UNC bolt size and length in inches and ISO metric bolt size and length in millimeters with numbers of bolts where applicable.

Bolt Torque: Recommended bolt fastening torque in Lbs-Ft and N-m.
Approximate weight: Weight of a Coupling complete with gasket,bolt and nuts or of a fittings in Kg / Lbs.

GENERAL NOTES

Service Fluid and Temperature: Service fluid and temperature limitations for WINGROU couplings are primarily governed by the gasket used within the coupling. Always refer to and consult the WINGROU Gasket Selection Guide.

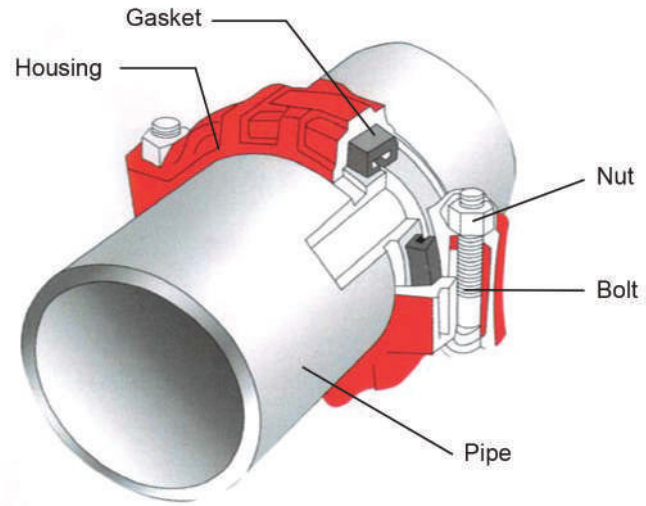
Working Pressure: WINGROU grooved couplings are generally engineered for use with standard or sch. 7/10/40 steel pipes (except for some high pressure models) and can be used within the rated working pressures as shown in the WINGROU literature. A one me only field test at 1.5 times the working pressure is allowed.

As there are limitations in service temperatures, the WINGROU couplings and fittings do not adopt the ANSI temperature- pressure ranges (Class 150, Class 300, etc.), ISO or JIS methods of pressure ranges (PN10, PN16, JIS 10K or 20K, etc.). All the published working pressures are CWP, non-shock cold water pressures, unless otherwise specified. Actual allowed working pressures for a specific coupling will vary depending on the coupling size, pipe material, pipe schedule (or thickness) and types of grooves used. Special attention is required when using thin wall stainless steel pipe such as sch. 5. For further details request the performance data for specific thin wall pipe.
The dimensions, weights, performance data, and other specifications shown in this catalog supersede all previous published data.

WINGROU reserves the right to change product designs and or specifications without notice and without obligation.
Illustrations shown within this catalogue are for illustrative purposes. They are not drawn to scale and may have been exaggerated for clarity. Any person who makes use of the information or materials contained herein shall do so at their own risk and shall be liable for any results arising from such use.

INSTALLATION INSTRUCTIONS:

Depressurize and drain the piping system before attempting to install, remove, or adjust any piping products.
Wear safety glasses, hardhat, and foot protection.



1. CHECK PIPE ENDS:
The outside surface of the pipe from the pipe end to the groove must be smooth and free from indentations, projections (including weld seams), and roll marks to ensure a leaktight seal for the gasket. All oil, grease, loose paint, and dirt must be removed.

2. CHECK GASKET AND LUBRICATE :
Check the gasket to make sure it is suitable for the intended service. Apply a thin coat of Tuf-Lube Gasket Grease Lubricant to the gasket lips and exterior.

3. POSITION GASKET:
Position the gasket over the pipe end. Make sure the gasket does not overhang the pipe end.

4. JOIN PIPE ENDS:
Align and bring the two pipe ends together. Slide the gasket into position, and make sure it is centered between the grooves in each pipe.
Make sure no portion of the gasket extends into the groove in either pipe.

5. ASSEMBLE HOUSINGS:
Insert one bolt into the housings, and thread the nut loosely onto the bolt (nut should be flush with end of bolt)

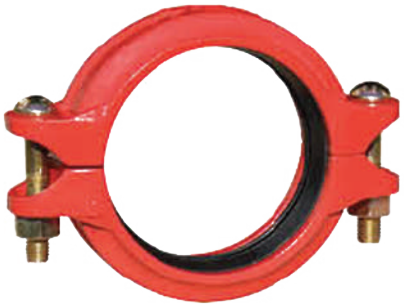
6. INSTALL HOUSINGS:
Install the housings over the gasket. Make sure the housings' keys engage the grooves properly on both pipes.

Torque Value
When a torque value is specified for coupling installation, this torque must be applied to the nuts in order to achieve proper installation, however torque beyond specified values will not improve sealing. Exceeding the specified torque by more than 25% may cause damage to the product, resulting in pipe-joint failure.

SPECIFIED TORQUE (LB/FT.)

SIZE	MIN	MAX
1"	30	45
1-1/4"	30	45
1-1/2"	30	45
2"	80	100
2-1/2"	80	100
3"	80	100
3-1/2"	100	130
4"	100	130

Using Impact Wrenches
When using an impact wrench, the speed of assembly may require extra care to ensure nuts are tightened evenly by alternating sides until proper assembly is complete. Impact wrenches do not provide the installer with direct "wrench feel" or torque to judge nut tightness. Since some impact wrenches are capable of high output, it is important to develop a familiarity with the impact wrench to avoid damaging or fracturing bolts or coupling bolt pads during installation. DO NOT continue to use an impact wrench after the visual installation guidelines for the coupling are achieved. Perform trial assemblies with the impact wrench and socket or torque wrenches to help determine the capability of the impact wrench. Using the same method, periodically check additional nuts throughout the system installation. In addition, verify that proper impact grade sockets are being used for coupling installation.



Available Sizes

• 1" to 12" / 25mm to 300mm

Pipe Material

• Carbon Steel, Schedule 10, Schedule 40.

For use with alternative materials and wall thickness please contact Wingrou

Maximum Working Pressure

Listed pressure is maximum working pressure, for Fire Protection application, approved pressure by related authorities should be used.

UL/ULC 300si 2065kPa/21bars FM 300Psi 2065kPa/21bars

Function

• Joins carbon steel pipe.

• Provides a rigid pipe joint designed to restrict axial or angular movement.

Certifications/Listing

Underwriters Laboratories, Under Laboratories Canada, Factory Mutual.

Specifications-Material

Housing Sections: Ductile Iron confirming to ASTM A 536, Grade 65-45-12.

Surface Finish:

Standard: RAL 3000 Red Paint Mat Finish/Epoxy powder coating

Available: Hot Dipped Galvanized/Zinc Plated, Dipped Painted

Gasket

Standard: Grade E EPDM (Type A)

Wingrou's products are listed by Underwriters Laboratories, Under Laboratories Canada and approved by Factory Mutual for wet and dry (oil free air) sprinkler services with the rated working pressure.

Bolts and Nuts

Ovel neck track bolt confirming to ASTM A183 with minimum tensile strength of 110,000 psi or square neck carriage bolt to ASTM A446 with 120,000 psi minimum tensile strength permits tightening of the nuts from one side with a single wrench. Nuts conform to ASTM A194, Bot and Nuts are electro galvanized.

User Responsibility for Product Selection and Suitability

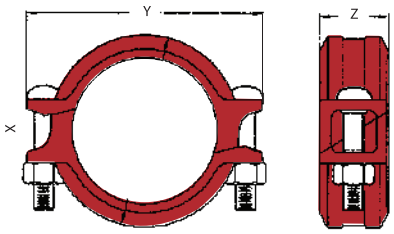
Each user bears final responsibility for making a determination as to the suitability of Wingrou products for a particular end-use application, in accordance with industry stan¬dards and project specifications, and the applicable building codes and related regulations as well as Wingrou performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Wingrou employee, shall be deemed to alter, vary, supersede, or waive any provision of Allied Rubber and Gasket Company's standard conditions of sale, installation guide, or this disclaimer

Note

All products to be installed in accordance with current WINGROU installation/assembly instructions. WINGROU reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation Reference should always be made to the WINGROU installation instructions of the product you are installing.

Model 1GS



WINGROU grooved coupling are suitable for fire protection systems, water systems and other process systems of higher working pressure.

FM APPROVED c UL us LISTED

Provides joint rigidity, of the support and hanging requirement of ANSI B31.1 power piping code ; ANSI B 31.9 Building Service Pipe code and NFPA 13 Sprinkler system.

Tongue and Grooved arrangements in housing do not permit expansion, contraction and defections are minimal.

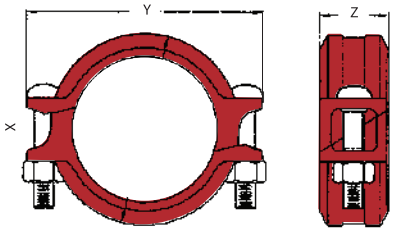
Size		Max. Work	Max. End	Allow. Pipe	Dimensions			Bolt/Nut	Approx.
Nominal Dia.	Actual O.D.	Pressure	Load	End Sep.	X	Y	Z	Size	Wgt. Each
DN	mm	KPa	N	mm	mm	mm	mm	mm	kg
Inches	Inches	PSI	Lbs.	Inches	Inches	Inches	Inches	Inches	Lbs.
25	33.4	5170	4530	2.3	54	98	44	M10X50	0.55
1	1.315	750	1020	0.091	2.126	3.858	1.732	3/8X2	1.21
32	42.4	5170	7300	2.3	63	109	44	M10X50	0.58
1 1/4	1.660	750	1620	0.091	2.480	4.291	1.732	3/8X2	1.28
40	48.3	5170	9470	2.3	69	115	44	M10X50	0.60
1 1/2	1.900	750	2130	0.091	2.717	4.528	1.732	3/8X2	1.32
50	60.3	4140	11820	2.3	83	128	45	M10X50	0.71
2	2.375	600	2660	0.091	3.268	5.039	1.772	3/8X2	1.56
65	73.0	3780	15820	2.3	97	142	46	M10X55	0.98
2 1/2	2.875	550	3570	0.091	3.819	5.591	1.811	3/8X2 1/4	2.16
65	76.1	3780	17190	2.3	100	145	46	M10X55	0.97
2 1/2	3.000	550	3890	0.091	3.937	5.709	1.811	3/8X2 1/4	2.13
80	88.9	3780	23460	2.7	113	159	47	M10X55	1.10
3	3.500	550	5290	0.106	4.449	6.260	1.850	3/8X2 1/4	2.42
100	108.0	3450	31610	2.7	136	192	49	M12X70	1.44
4	4.250	500	7090	0.106	5.354	7.559	1.929	1/2X2 3/4	3.17
100	114.3	3450	35400	2.7	142	198	49	M12X70	1.54
4	4.500	500	7950	0.106	5.591	7.795	1.929	1/2X2 3/4	3.39
125	133.0	3450	47930	2.7	163	224	50	M12X75	1.95
5	5.250	500	10820	0.106	6.417	8.819	1.969	1/2X3	4.30
125	139.7	3450	52880	2.7	169	230	50	M12X75	2.00
5	5.500	500	11880	0.106	6.654	9.055	1.969	1/2X3	4.41
125	141.3	3450	54100	2.7	171	232	50	M12X75	2.02
5	5.563	500	12150	0.106	6.732	9.134	1.969	1/2X3	4.45
150	159.0	3450	68500	2.7	190	249	51	M12X75	2.20
6	6.250	500	15340	0.106	7.480	9.803	2.008	1/2X3	4.85
150	165.1	3450	73860	2.7	196	254	51	M12X75	2.26
6	6.500	500	16590	0.106	7.717	10.000	2.008	1/2X3	4.98
150	168.3	3450	76750	2.7	199	257	51	M12X75	2.34
6	6.625	500	17240	0.106	7.835	10.118	2.008	1/2X3	5.15
200	219.1	2750	103680	4.9	256	328	58	M16X85	4.00
8	8.625	400	23370	0.193	10.079	12.913	2.283	5/8X3 3/8	8.81
250	273.0	2500	146340	4.9	311	397	59	M20X115	5.17
10	10.750	350	31770	0.193	12.244	15.630	2.323	3/4X4 1/2	11.39
300	323.9	2500	205990	4.9	365	451	60	M20X115	6.86
12	12.750	350	44690	0.193	14.370	17.756	2.362	3/4X4 1/2	15.11

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with WINGROU specifications.

The allowable pipe separation dimension show is for system layout purpose only . WINGROU couplings are considered rigid connections and will not accommodate expansion or contraction of the pipesystem.

When assembling WINGROU couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop.

Model 1N



FM APPROVED

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Provides joint flexibility required In some piping systems.

Confirms to the requirement of ANSI B31.1 power piping code ; ANSI B 31.9 Building Service Pipe code and NFPA 13 Sprinkler system.

Most Economical design for low pressure application.

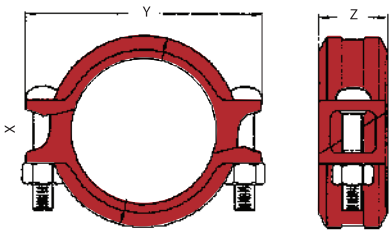
Size		Max. Work	Max. End	Allow. Pipe	Dimensions			Bolt/Nut	Approx.
Nominal Dia.	Actual O.D.	Pressure	Load	End Sep.	X	Y	Z	Size	Wgt. Each
DN	mm	KPa	N	mm	mm	mm	mm	mm	kg
Inches	Inches	PSI	Lbs.	Inches	Inches	Inches	Inches	Inches	Lbs.
25	33.4	5170	4530	2.2	53	98	44	M10X50	0.55
1	1.315	750	1020	0.087	2.087	3.858	1.732	$^{3}/_{8}$X2	1.21
32	42.4	5170	7300	2.2	62	110	44	M10X50	0.58
$1^{1}/_{4}$	1.660	750	1620	0.087	2.441	4.331	1.732	$^{3}/_{8}$X2	1.28
40	48.3	5170	9470	2.2	68	115	44	M10X50	0.60
$1^{1}/_{2}$	1.900	750	2130	0.087	2.677	4.528	1.732	$^{3}/_{8}$X2	1.32
50	60.3	4140	11820	2.2	83	130	45	M10X50	0.71
2	2.375	600	2660	0.087	3.268	5.118	1.772	$^{3}/_{8}$X2	1.56
65	73.0	3780	15820	2.4	97	144	46	M10X55	0.90
$2^{1}/_{2}$	2.875	550	3570	0.094	3.819	5.669	1.811	$^{3}/_{8}$X$2^{1}/_{4}$	1.98
65	76.1	3780	17190	2.4	100	147	46	M10X55	1.00
$2^{1}/_{2}$	3.000	550	3890	0.094	3.937	5.787	1.811	$^{3}/_{8}$X$2^{1}/_{4}$	2.20
80	88.9	3780	23460	2.8	113	172	47	M10X55	1.11
3	3.500	550	5290	0.110	4.449	6.772	1.850	$^{3}/_{8}$X$2^{1}/_{4}$	2.44
100	108.0	3450	31610	3.3	136	196	51	M12X70	1.62
4	4.250	500	7090	0.130	5.354	7.717	2.008	$^{1}/_{2}$X$2^{3}/_{4}$	3.57
100	114.3	3450	35400	3.3	142	202	51	M12X70	1.66
4	4.500	500	7950	0.130	5.591	7.953	2.008	$^{1}/_{2}$X$2^{3}/_{4}$	3.66
125	133.0	3450	47930	3.6	166	230	51	M16X85	2.37
5	5.250	500	10820	0.142	6.535	9.055	2.008	$^{5}/_{8}$X$3^{3}/_{8}$	5.22
125	139.7	3450	52880	3.6	172	236	51	M16X85	2.42
5	5.500	500	11880	0.142	6.772	9.291	2.008	$^{5}/_{8}$X$3^{3}/_{8}$	5.33
125	141.3	3450	54100	3.6	174	238	51	M16X85	2.44
5	5.563	500	12150	0.142	6.850	9.370	2.008	$^{5}/_{8}$X$3^{3}/_{8}$	5.37
150	159.0	3450	68500	3.9	190	266	52	M16X85	2.72
6	6.250	500	15340	0.154	7.480	10.472	2.047	$^{5}/_{8}$X$3^{3}/_{8}$	5.99
150	165.1	3450	73860	3.9	196	272	52	M16X85	2.78
6	6.500	500	16590	0.154	7.717	10.709	2.047	$^{5}/_{8}$X$3^{3}/_{8}$	6.12
150	168.3	3450	76750	3.9	199	275	52	M16X85	2.83
6	6.625	500	17240	0.154	7.835	10.827	2.047	$^{5}/_{8}$X$3^{3}/_{8}$	6.23
200	219.1	2750	103680	4.9	256	343	61	M20X115	5.06
8	8.625	400	23370	0.193	10.079	13.504	2.402	$^{3}/_{4}$X$4^{1}/_{2}$	11.15
250	273.0	2500	146340	4.9	311	397	61	M22X135	5.91
10	10.750	350	31770	0.193	12.244	15.630	2.402	$^{7}/_{8}$X$5^{1}/_{2}$	13.02
300	323.9	2500	205990	4.9	365	451	62	M22X135	7.39
12	12.750	350	44690	0.193	14.370	17.756	2.441	$^{7}/_{8}$X$5^{1}/_{2}$	16.28

Note : Allowable Axial displacement figures are for roll grooved standard steel pipe. Valve for cut grooved pipe will be double that of roll grooved. These valves are maximum for design and installation purpose these figures should be reduced by 50% for ¾″ – 31/2″ 25% for 4″ and larger to compensate for job site conditions.

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with WINGROU specifications.

When assembling WINGROU couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop

Model 1X



The WINGROU Model 1X is an angle –pad design standard rigid coupling for moderate pressure piping services including Fire mains, long straight run and valve connections.

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This angle pad rigid coupling allows for more accurate positioning of the tube end, forming a fixed tube end separation, which should be considered the design and installation.

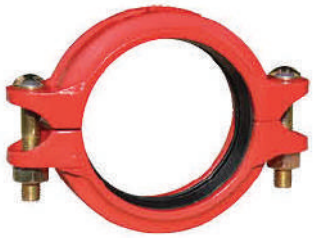
Size		Max. Work Pressure	Max. End Load	Allow. Pipe End Sep.	Dimensions			Bolt/Nut Size	Approx. Wgt. Each
Nominal Dia.	Actual O.D.				X	Y	Z		
DN Inches	mm Inches	KPa PSI	N Lbs.	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.
25 1	33.4 1.315	5170 750	4530 1020	2.2 0.086	55 2.165	98 3.858	45 1.772	M10X50 3/8X2	0.49 1.08
32 1 1/4	42.4 1.660	5170 750	7300 1620	2.2 0.086	64 2.520	110 4.331	45 1.772	M10X50 3/8X2	0.58 1.28
40 1 1/2	48.3 1.900	5170 750	9470 2130	2.2 0.086	70 2.756	115 4.528	45 1.772	M10X50 3/8X2	0.62 1.37
50 2	60.3 2.375	4140 600	11820 2660	2.2 0.086	85 3.346	130 5.118	47 1.850	M10X50 3/8X2	0.77 1.70
65 2 1/2	73.0 2.875	3780 550	15820 3570	2.7 0.106	100 3.937	148 5.827	49 1.929	M10X55 3/8X2 1/4	0.98 2.16
65 2 1/2	76.1 3.000	3780 550	17190 3890	2.7 0.106	103 4.055	151 5.945	49 1.929	M10X55 3/8X2 1/4	1.00 2.20
80 3	88.9 3.500	3780 550	23460 5290	2.7 0.106	116 4.567	164 6.457	49 1.929	M10X55 3/8X2 1/4	1.11 2.44
100 4	108.0 4.250	3450 500	31610 7090	3.3 0.130	138 5.433	188 7.402	51 2.008	M12X70 1/2X2 3/4	1.48 3.26
100 4	114.3 4.500	3450 500	35400 7950	3.3 0.130	144 5.669	194 7.638	51 2.008	M12X70 1/2X2 3/4	1.52 3.35
125 5	133.0 5.250	3450 500	47930 10820	3.3 0.130	165 6.496	226 8.898	51 2.008	M12X75 1/2X3	2.07 4.56
125 5	139.7 5.500	3450 500	52880 11880	3.3 0.130	172 6.772	232 9.134	51 2.008	M12X75 1/2X3	2.12 4.67
125 5	141.3 5.563	3450 500	54100 12150	3.3 0.130	173 6.811	234 9.213	51 2.008	M12X75 1/2X3	2.14 4.71
150 6	159.0 6.250	3450 500	68500 15340	3.3 0.130	192 7.559	252 9.921	52 2.047	M12X75 1/2X3	2.42 5.33
150 6	165.1 6.500	3450 500	73860 16590	3.3 0.130	198 7.795	258 10.157	52 2.047	M12X75 1/2X3	2.48 5.46
150 6	168.3 6.625	3450 500	76750 17240	3.3 0.130	201 7.913	261 10.276	52 2.047	M12X75 1/2X3	2.53 5.57
200 8	219.1 8.625	2750 400	103680 23370	4.9 0.193	260 10.236	325 12.795	61 2.402	M16X85 5/8X3 3/8	4.49 9.89
250 10	273.0 10.750	2500 350	146340 31770	4.9 0.193	314 12.362	397 15.630	61 2.402	M20X115 3/4X4 1/2	5.53 12.18
300 12	323.9 12.750	2500 350	205990 44690	4.9 0.193	368 14.488	451 17.756	62 2.441	M20X115 3/4X4 1/2	7.22 15.90

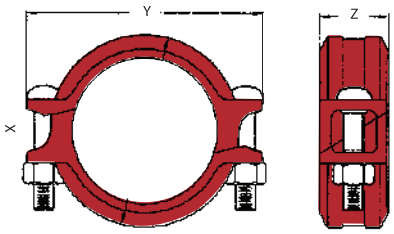
Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with WINGROU specifications.

The allowable pipe separation dimension show is for system layout purpose only . WINGROU couplings are considered rigid connections and will not accommodate expansion or contraction of the pipe system.

When assembling WINGROU couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop.

GROOVED COUPLINGS - HEAVY DUTY FLEXIBLE COUPLING
MODEL 1NH





The Wingrou Model 1NH heavy duty flexible coupling is designed for use in a variety of general piping applications of moderate or high pressure services.

FM APPROVED c UL us LISTED

Provides joint flexibility required In some piping systems.

Confirms to the requirement of ANSI B31.1 power piping code ; ANSI B 31.9 Building Service Pipe code and NFPA 13 Sprinkler system.

Heavy duty housing provide higher pressure rating.

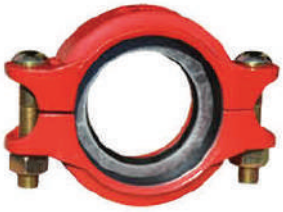
Size		Max. Work	Max. End	Allow. Pipe	Dimensions			Bolt/Nut	Approx.
Nominal Dia.	Actual O.D.	Pressure	Load	End Sep.	X	Y	Z	Size	Wgt. Each
DN	mm	KPa	N	mm	mm	mm	mm	mm	kg
Inches	Inches	PSI	Lbs.	Inches	Inches	Inches	Inches	Inches	Lbs.
25	33.4	10350	9068	2.2	57	101	44	M10X55	0.73
1	1.315	1500	2037	0.087	2.244	3.976	1.732	$^3/_8$X2$^1/_4$	1.61
32	42.4	860	1214	2.2	66	113	45	M12X60	0.91
1$^1/_4$	1.660	1250	2705	0.087	2.598	4.449	1.772	$^1/_2$X2$^3/_8$	2.00
40	48.3	860	1576	2.2	72	121	45	M12X60	0.97
1$^1/_2$	1.900	1250	3544	0.087	2.835	4.764	1.772	$^1/_2$X2$^3/_8$	2.14
50	60.3	860	2456	2.2	87	138	47	M12X60	1.20
2	2.375	1250	5538	0.087	3.425	5.433	1.850	$^1/_2$X2$^3/_8$	2.64
65	73.0	6900	28879	2.4	101	152	49	M12X75	1.52
2$^1/_2$	2.875	1000	6492	0.094	3.976	5.984	1.929	$^1/_2$X3	3.35
65	76.1	6900	31384	2.4	104	155	49	M12X75	1.54
2$^1/_2$	3.000	1000	7069	0.094	4.094	6.102	1.929	$^1/_2$X3	3.39
80	88.9	6900	42830	2.8	118	170	49	M12X75	1.71
3	3.500	1000	9621	0.110	4.646	6.693	1.929	$^1/_2$X3	3.77
100	108.0	6900	63210	3.3	142	206	51	M16X85	2.60
4	4.250	1000	14186	0.130	5.591	8.110	2.008	$^5/_8$X3$^3/_8$	5.73
100	114.3	6900	70800	3.3	148	212	51	M16X85	2.67
4	4.500	1000	15904	0.130	5.827	8.346	2.008	$^5/_8$X3$^3/_8$	5.88
125	133.0	6900	95861	3.6	169	243	51	M20X115	3.58
5	5.250	1000	21648	0.142	6.654	9.567	2.008	$^3/_4$X4$^1/_2$	7.89
125	139.7	6900	105763	3.6	176	249	51	M20X115	3.65
5	5.500	1000	23758	0.142	6.929	9.803	2.008	$^3/_4$X4$^1/_2$	8.04
125	141.3	6900	108199	3.6	177	251	51	M20X115	3.67
5	5.563	1000	24306	0.142	6.969	9.882	2.008	$^3/_4$X4$^1/_2$	8.08
150	159.0	6900	137004	3.9	197	271	51	M20X115	4.05
6	6.250	1000	30680	0.154	7.756	10.669	2.008	$^3/_4$X4$^1/_2$	8.92
150	165.1	6900	147718	3.9	203	277	51	M20X115	4.13
6	6.500	1000	33183	0.154	7.992	10.906	2.008	$^3/_4$X4$^1/_2$	9.10
150	168.3	6900	153500	3.9	206	279	51	M20X115	4.15
6	6.625	1000	34472	0.154	8.110	10.984	2.008	$^3/_4$X4$^1/_2$	9.14
200	219.1	5500	207366	4.9	267	357	63	M22X135	8.35
8	8.625	800	46741	0.193	10.512	14.055	2.480	$^7/_8$X5$^1/_2$	18.39
250	273.0	5500	321943	4.9	320	410	65	M24X135	10.70
10	10.750	800	72610	0.193	12.598	16.142	2.559	1X5$^1/_2$	23.57
300	323.9	5500	453185	4.9	370	460	65	M24X135	12.30
12	12.750	800	102141	0.193	14.567	18.110	2.559	1X5$^1/_2$	27.09

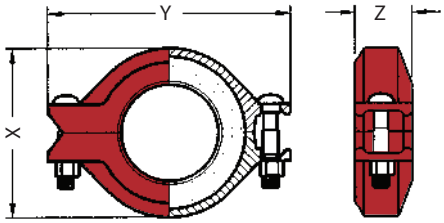
Note : Allowable Axial displacement figures are for roll grooved standard steel pipe. Valve for cut grooved pipe will be double that of roll grooved. These valves are maximum for design and installation purpose these figures should be reduced by 50% for ¾" – 31/2" 25% for 4" and larger to compensate for job site conditions.

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with
WINGROU specifications.

When assembling WINGROU couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop.

GROOVED COUPLINGS - Reducing Flexible Coupling
MODEL 1NR





The WINGROU model 1NR reducing coupling allows for direct reduction on a piping run and eliminate the need for a concentric reducer and coupling .
The Specially designed rubber gasket helps prevent small pipe from telescoping into larger pipe during vertical assembly.

FM APPROVED c UL us LISTED

Replaces two coupling and an in-line reducer (concentric or eccentric)

Comes standard with a metal insert to prevent Smaller pipe from slipping into larger pipe during vertical installation.

Size			Max. Work	Max. End	Allow. Pipe	Dimensions			Bolt/Nut	Approx.
Run Pipe	X	Branch Pipe	Pressure	Load	End Sep.	X	Y	Z	Size	Wgt. Each
mm Inches	X X	mm Inches	KPa PSI	N Lbs.	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.
48.3 1 1/2	X	42.4 1 1/4	3800 550	5365 1190	2.4 0.094	64 2.520	129 5.079	47 1.850	M10X50 3/8X2	0.66 1.45
60.3 2	X	42.4 1 1/4	3800 550	5365 1190	2.6 0.102	80 3.150	145 5.709	47 1.850	M10X50 3/8X2	0.86 1.89
		48.3 1 1/2	3800 550	6963 1559	2.6 0.102	80 3.150	145 5.709	47 1.850	M10X50 3/8X2	0.87 1.92
73.0 2 1/2	X	60.3 2	3800 550	10852 2437	2.9 0.114	95 3.740	160 6.299	49 1.929	M12X75 1/2X3	1.31 2.89
76.1 2 1/2	X	60.3 2	3800 550	10852 2437	2.9 0.114	98 3.858	164 6.457	49 1.929	M12X75 1/2X3	1.35 2.97
88.9 3	X	60.3 2	3450 500	9852 2215	3.1 0.122	115 4.528	178 7.008	49 1.929	M12X75 1/2X3	1.59 3.50
		73.0 2 1/2	3800 550	15905 3571	3.1 0.122	115 4.528	178 7.008	49 1.929	M12X75 1/2X3	1.54 3.39
		76.1 2 1/2	3800 550	17284 3888	3.1 0.122	115 4.528	178 7.008	49 1.929	M12X75 1/2X3	1.48 3.26
114.3 4	X	60.3 2	3450 500	9852 2215	3.5 0.138	141 5.551	208 8.189	51 2.008	M16X85 5/8X3 3/8	2.72 5.99
		73.0 2 1/2	3450 500	14440 3246	3.5 0.138	141 5.551	208 8.189	51 2.008	M16X85 5/8X3 3/8	2.55 5.62
		76.1 2 1/2	3450 500	15692 3534	3.5 0.138	141 5.551	208 8.189	51 2.008	M16X85 5/8X3 3/8	2.51 5.53
		88.9 3	3800 550	23587 5292	3.5 0.138	141 5.551	208 8.189	51 2.008	M16X85 5/8X3 3/8	2.33 5.13
139.7 5	X	88.9 3	2750 400	17070 3848	4.0 0.157	168 6.614	247 9.724	51 2.008	M20X115 3/4X4 1/2	3.68 8.11
		114.3 4	3100 450	31809 7157	4.0 0.157	168 6.614	247 9.724	51 2.008	M20X115 3/4X4 1/2	3.19 7.03
141.3 5	X	88.9 3	2750 400	17070 3848	4.0 0.157	169 6.654	249 9.803	51 2.008	M20X115 3/4X4 1/2	3.74 8.24
		114.3 4	3100 450	31809 7157	4.0 0.157	169 6.654	249 9.803	51 2.008	M20X115 3/4X4 1/2	3.45 7.60
165.1 6	X	114.3 4	2750 400	28217 6362	4.7 0.185	197 7.756	276 10.866	51 2.008	M20X115 3/4X4 1/2	4.25 9.36
		139.7 5	3100 450	47517 10691	4.7 0.185	197 7.756	276 10.866	51 2.008	M20X115 3/4X4 1/2	3.68 8.11
168.3 6	X	114.3 4	2750 400	28217 6362	4.7 0.185	199 7.835	276 10.866	51 2.008	M20X115 3/4X4 1/2	4.24 9.34
		141.3 5	3100 450	48611 10938	4.7 0.185	199 7.835	276 10.866	51 2.008	M20X115 3/4X4 1/2	3.82 8.41
219.1 8	X	165.1 6	2750 400	58873 13273	4.9 0.193	261 10.276	356 14.016	61 2.402	M22X135 7/8X5 1/2	8.45 18.61
		168.3 6	2750 400	61178 13789	4.9 0.193	261 10.276	356 14.016	61 2.402	M22X135 7/8X5 1/2	8.38 18.46

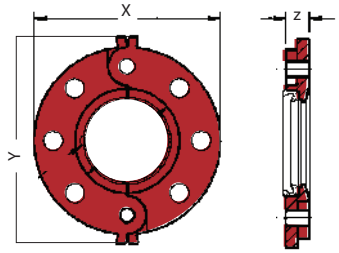
Deflection or angular movement is the maximum value that a coupling allows under no internal pressure. Assembly

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with WINGROU specifications.

The allowable pipe separation dimension show is for system layout purpose only . WINGROU couplings are considered rigid connections and will not accommodate expansion or contraction of the pipe system.

CAUTION Model 1N / INR coupling should not be used with an end cap, as the end maybe sucked into the pipe when draining the system.

GROOVED SPLIT FLANGE ADAPTER
MODEL 321



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Model 321 split flange mainly use for the flange connection with the valve, equipment or pipe conversion connection to solve the groove connection and flange connection conversion, installation is simple and fast.

Model 321 split flange's bolt holes designed into oval hole. ANSI Class 125 & 150 and PN16 grade flanges are universally available, with DN50 to DN80 (2 "to 3") for both PN10 and PN25 nominal flanges; DN100 to DN150 (4 "to 6") for both flanges PN10 nominal grade flange.

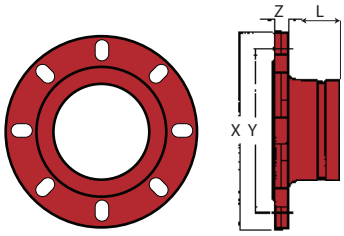
In addition to the standard flanges described above, it is also available to provide flanges under other standards such as JIS 10K and ANSI Class 300.

Size		Max. Work Pressure	PCD	Gasket Seat		Dimensions			Bolt/Nut Size	Approx. Wgt. Each
Nominal Dia.	Actual O.D.		c	A	B	X	Y	Z		
DN Inches	mm Inches	BAR PSI	mm inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.
50 2	60.3 2.375	20 300	120.5 4.75	64 2.520	78 3.071	165 6.496	218 8.583	20 0.787	M10X70 3/8X2 3/4	1.76 3.87
65 2 1/2	73.0 2.875	20 300	140 5.51	77 3.031	91 3.583	178 7.008	228 8.976	22 0.866	M10X70 3/8X2 3/4	2.04 4.50
65 2 1/2	76.1 3.000	20 300	140 5.51	80 3.150	94 3.701	185 7.283	238 9.370	22 0.866	M10X70 3/8X2 3/4	2.41 5.30
80 3	88.9 3.500	20 300	153 6.02	93 3.661	107 4.213	200 7.874	250 9.843	22 0.866	M10X70 3/8X2 3/4	2.55 5.62
100 4	114.3 4.500	20 300	191 7.52	119 4.685	133 5.236	229 9.016	280 11.02	24 0.945	M10X70 3/8X2 3/4	3.24 7.14
125 5	139.7 5.500	20 300	216 8.50	145 5.709	159 6.260	250 9.843	313 12.32	22 0.866	M12X70 1/2X2 3/4	3.49 7.68
125 5	141.3 5.563	20 300	216 8.50	146 5.748	160 6.299	254 10.00	321 12.64	26 1.024	M12X70 1/2X2 3/4	4.39 9.67
150 6	165.1 6.500	20 300	241 9.49	171 6.732	185 7.283	285 11.22	347 13.66	24 0.945	M12X70 1/2X2 3/4	4.55 10.02
150 6	168.3 6.625	20 300	241 9.49	174 6.850	188 7.402	285 11.22	345 13.58	26 1.024	M12X70 1/2X2 3/4	4.73 10.42
200 8	219.1 8.625	20 300	299 11.77	225 8.858	242 9.528	343 13.50	404 15.91	30 1.181	M12X70 1/2X2 3/4	6.95 15.31
250 10	273.0 10.750	20 300	362.0 14.25	275 10.83	297 11.69	407 16.02	472 18.58	28 1.101	M12 X 70 ½ X ¾	8.30 18.30
300 12	323.9 12.750	20 300	431.0 16.96	326 12.83	352 13.86	462 18.19	527 20.75	28 1.101	M12 X 70 ½ X ¾	9.80 21.60

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Wingrou products for a particular end-use application, in accordance with industry stan¬dards and project specifications, and the applicable building codes and related regulations as well as Wingrou performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Wingrou employee, shall be deemed to alter, vary, supersede, or waive any provision of Allied Rubber and Gasket Company's standard conditions of sale, installation guide, or this disclaimer

GROOVED FLANGE ADAPTER NIPPLE
MODEL 321A



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The Model 321A Flange Adapter Nipple provides a rigid transition from a flanged component to a grooved system.

Confirms to class ANSI 125 lb Flange and BS 4504 class PN 16 flange drilling

Made of ductile iron confirming ASTM A-536, Every lot is metallurgical examined to ensure compliance

Available with external or internal threaded ends as optional

Pressure ratings confirm to those of style 1N

Size		Max. Work Pressure	L	Gasket Seat		Dimensions			Bolt/Nut Size	Approx. Wgt. Each
Nominal Dia.	Actual O.D.			A	B	X	Y	Z		
DN Inches	mm Inches	BAR PSI	mm inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	Lbs. Kg.
50 2	60.3 2.375	20 300	2.50	64 2.520	78 3.071	165 6.50	125 4.92	16 0.63	M10X70 3/8X2 3/4	5.10 2.30
65 2 1/2	73.0 2.875	20 300	76 2.99	77 3.031	91 3.583	185 7.28	145 5.70	16 0.63	M10X70 3/8X2 3/4	6.53 2.96
65 2 1/2	76.1 3.000	20 300	76 2.99	80 3.150	94 3.701	185 7.28	145 5.70	16 0.63	M10X70 3/8X2 3/4	6.40 2.90
80 3	88.9 3.500	20 300	75 2.95	93 3.661	107 4.213	200 7.87	160 6.30	16 0.63	M10X70 3/8X2 3/4	4.79 3.39
100 4	114.3 4.500	20 300	75 2.95	119 4.685	133 5.236	225 8.86	180 7.09	16 0.63	M10X70 3/8X2 3/4	8.49 3.85
125 5	139.7 5.500	20 300	75 2.95	145 5.709	159 6.260	254 10.00	210 8.27	16 0.63	M12X70 1/2X2 3/4	14.33 6.50
125 5	141.3 5.563	20 300	75 2.95	146 5.748	160 6.299	254 10.00	210 8.27	16 0.63	M12X70 1/2X2 3/4	14.33 6.50
150 6	165.1 6.500	20 300	75 2.95	171 6.732	185 7.283	272 10.71	240 9.45	16 0.63	M12X70 1/2X2 3/4	13.86 6.30
150 6	168.3 6.625	20 300	75 2.95	174 6.850	188 7.402	272 10.71	240 9.45	16 0.63	M12X70 1/2X2 3/4	13.86 6.30
200 8	219.1 8.625	20 300	102 4.00	225 8.858	242 9.528	343 13.50	295 11.61	22 0.87	M12X70 1/2X2 3/4	30.99 13.65
250 10	273.0 10.750	20 300	102 4.00	275 10.83	297 11.69	405 15.94	355 13.97	24 0.945	M12 X 70 ½ X ¾	15.80 34.83
300 12	323.9 12.750	20 300	102 4.00	326 12.83	352 13.86	460 18.11	410 16.14	24 0.945	M12 X 70 ½ X ¾	40.34 18.30

Available Sizes

• 1" to 12" / 25mm to 300mm

Pipe Material

• Carbon Steel, Schedule 10, Schedule 40.

For use with alternative materials and wall thickness please contact Wingrou

Maximum Working Pressure

Listed pressure is maximum working pressure, for Fire Protection application, approved pressure by related authorities should be used.

UL/ULC 300si 2065kPa/21bars FM 300Psi 2065kPa/21bars

Function

• Joins carbon steel pipe.

• Provides a rigid pipe joint designed to restrict axial or angular movement.

Certifications/Listing

Underwriters Laboratories, Under Laboratories Canada, Factory Mutual.

Specifications-Material

Housing Sections: Ductile Iron confirming to ASTM A 536, Grade 65-45-12.

Surface Finish:

Standard: RAL 3000 Red Paint Mat Finish/Epoxy powder coating

Available: Hot Dipped Galvanized/Zinc Plated, Dipped Painted

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Wingrou products for a particular end-use application, in accordance with industry stan¬dards and project specifications, and the applicable building codes and related regulations as well as Wingrou performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Wingrou employee, shall be deemed to alter, vary, supersede, or waive any provision of Allied Rubber and Gasket Company's standard conditions of sale, installation guide, or this disclaimer

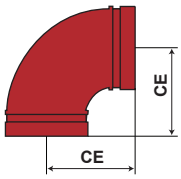
Note

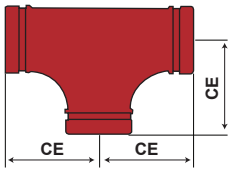
All products to be installed in accordance with current WINGROU installation/assembly instructions. WINGROU reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

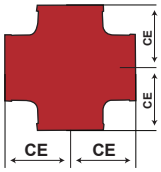
Installation Reference should always be made to the WINGROU installation instructions of the product you are installing.

GROOVED 90° STD. ELBOW, STD. EQUAL TEE & STD. EQUAL CROSS

Models 90,130,180,







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Model 90 90°Standard Elbow

Model 130 Standard Equal Tee

Model 180 Standard Equal Cross

Size		Model 90 90° Std. Elbow		Model 130 Std. Equal Tee		Model 180 Short Equal Cross	
Nominal Dia.	Actual O.D.	CE	Approx.Wgt.	CE	Approx. Wgt.	CE	Approx. Wgt.
DN	mm	mm	kg	mm	kg	mm	kg
Inches	Inches	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.
25	33.4	57	0.3	57	0.5	57	0.6
1	1.315	2.25	0.66	2.25	1.10	2.25	1.32
32	42.4	70	0.5	70	0.7	70	1.0
1 1/4	1.660	2.75	1.10	2.75	1.54	2.75	2.20
40	48.3	70	0.5	70	0.9	70	1.1
1 1/2	1.900	2.75	1.10	2.75	1.98	2.75	2.42
50	60.3	83	0.8	83	1.4	83	1.7
2	2.375	3.25	1.76	3.25	3.08	3.25	3.74
65	73.0	95	1.5	95	2.2	95	2.7
2 1/2	2.875	3.75	3.30	3.75	4.85	3.75	5.95
65	76.1	95	1.7	95	2.4	95	2.8
2 1/2	3.000	3.75	3.74	3.75	5.29	3.75	6.17
80	88.9	108	2.0	108	3.0	108	4.8
3	3.500	4.25	4.41	4.25	6.61	4.25	10.57
100	108.0	127	3.0	127	5.2	127	7.1
4	4.250	5.00	6.61	5.00	11.45	5.00	15.64
100	114.3	127	3.2	127	5.4	127	7.2
4	4.500	5.00	7.05	5.00	11.89	5.00	15.86
125	133.0	140	5.3	140	8.0	140	9.0
5	5.250	5.50	11.67	5.50	17.62	5.50	19.82
125	139.7	140	5.3	140	8.1	140	9.1
5	5.500	5.50	11.67	5.50	17.84	5.50	20.04
125	141.3	140	5.3	140	8.1	140	9.2
5	5.563	5.50	11.67	5.50	17.84	5.50	20.26
150	159.0	165	7.8	165	10.1	165	12.6
6	6.250	6.50	17.18	6.50	22.25	6.50	27.75
150	165.1	165	7.8	165	10.3	165	12.7
6	6.500	6.50	17.18	6.50	22.69	6.50	27.97
150	168.3	165	7.8	165	10.4	165	12.7
6	6.625	6.50	17.18	6.50	22.91	6.50	27.97
200	219.1	197	13.6	197	21.6	197	24.8
8	8.625	7.75	29.96	7.75	47.58	7.75	54.62
250	273.0	229	28.7	229	44.9	229	55.1
10	10.750	9.00	63.21	9.00	98.90	9.00	121.36
300	323.9	254	33.6	254	60.3	254	72.9
12	12.750	10.00	74.01	10.00	132.82	10.00	160.57

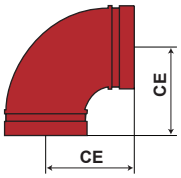
Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with WINGROU specifications.

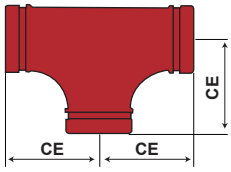
The allowable pipe separation dimension show is for system layout purpose only . WINGROU couplings are considered rigid connections and will not accommodate expansion or contraction of the pipe system.

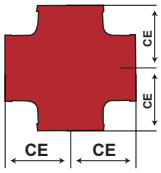
When assembling WINGROU couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop.

GROOVED SHORT PATTERN ELBOW 90°, EQUAL TEE & EQUAL CROSS
MODELS 90S,130S,180S,

WINGROU short radius fittings, while primarily designed for fire protection applications can also be used for general service requirements.







Model 90S 90°Short Pattern Elbow

Model 130S Short Pattern Equal Tee

Model 180S Short Pattern Equal Cross

Size		Model 90S 90° Short Elbow		Model 130S Short Equal Tee		Model 180S Short Equal Cross	
Nominal Dia.	Actual O.D.	CE	Approx. Wgt.	CE	Approx. Wgt.	CE	Approx. Wgt.
DN	mm	mm	kg	mm	kg	mm	kg
Inches	Inches	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.
50	60.3	70	0.6	70	0.9	70	1.1
2	2.375	2.75	1.32	2.75	1.98	2.75	2.42
65	73.0	76	0.8	76	1.2	76	1.5
2½	2.875	3.00	1.76	3.00	2.64	3.00	3.30
65	76.1	76	1.0	76	1.4	76	1.8
2½	3.000	3.00	2.20	3.00	3.08	3.00	3.96
80	88.9	86	1.3	86	1.7	86	2.3
3	3.500	3.40	2.86	3.40	3.74	3.40	5.07
100	108.0	102	2.0	102	2.6	102	3.3
4	4.250	4.00	4.41	4.00	5.73	4.00	7.27
100	114.3	102	2.1	102	2.8	102	3.6
4	4.500	4.00	4.63	4.00	6.17	4.00	7.93
125	133.0	124	3.4	124	4.3	124	5.8
5	5.250	4.88	7.49	4.88	9.47	4.88	12.78
125	139.7	124	3.5	124	4.4	124	6.0
5	5.500	4.88	7.71	4.88	9.69	4.88	13.22
125	141.3	124	3.6	124	4.5	124	6.1
5	5.563	4.88	7.93	4.88	9.91	4.88	13.44
150	159.0	140	5.2	140	6.7	140	8.7
6	6.250	5.50	11.45	5.50	14.76	5.50	19.16
150	165.1	140	5.4	140	7.0	140	9.0
6	6.500	5.50	11.89	5.50	15.42	5.50	19.82
150	168.3	140	5.6	140	7.2	140	9.2
6	6.625	5.50	12.33	5.50	15.86	5.50	20.26
200	219.1	173	10.5	173	14.0	173	16.5
8	8.625	6.80	23.13	6.80	30.84	6.80	36.34

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with WINGROU specifications.

GROOVED 45° ELBOW, 22.5° ELBOW & 11.25° ELBOW
Models 120,110,105

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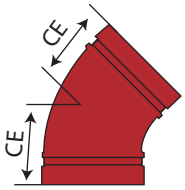
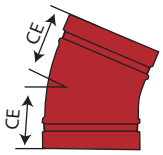
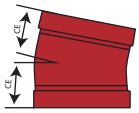






WINGROU short radius fittings, while primarily designed for fire protection applications can also be used for general service requirements.

Model 120 45° Elbow

Model 110 22.5°Elbow

Model 105 11.25°Elbow

Size		Model 120 45° Elbow		Model 110 22.5°Elbow		Model 105 11.25° Elbow	
Nominal Dia.	Actual O.D.	CE	Approx. Wgt.	CE	Approx. Wgt.	CE	Approx. Wgt.
DN Inches	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.	mm Inches	kg Lbs.
50 2	60.3 2.375	70 2.75	0.6 1.32	70 2.75	0.9 1.98	70 2.75	1.1 2.42
65 2 1/2	73.0 2.875	76 3.00	0.8 1.76	76 3.00	1.2 2.64	76 3.00	1.5 3.30
65 2 1/2	76.1 3.000	76 3.00	1.0 2.20	76 3.00	1.4 3.08	76 3.00	1.8 3.96
80 3	88.9 3.500	86 3.40	1.3 2.86	86 3.40	1.7 3.74	86 3.40	2.3 5.07
100 4	108.0 4.250	102 4.00	2.0 4.41	102 4.00	2.6 5.73	102 4.00	3.3 7.27
100 4	114.3 4.500	102 4.00	2.1 4.63	102 4.00	2.8 6.17	102 4.00	3.6 7.93
125 5	133.0 5.250	124 4.88	3.4 7.49	124 4.88	4.3 9.47	124 4.88	5.8 12.78
125 5	139.7 5.500	124 4.88	3.5 7.71	124 4.88	4.4 9.69	124 4.88	6.0 13.22
125 5	141.3 5.563	124 4.88	3.6 7.93	124 4.88	4.5 9.91	124 4.88	6.1 13.44
150 6	159.0 6.250	140 5.50	5.2 11.45	140 5.50	6.7 14.76	140 5.50	8.7 19.16
150 6	165.1 6.500	140 5.50	5.4 11.89	140 5.50	7.0 15.42	140 5.50	9.0 19.82
150 6	168.3 6.625	140 5.50	5.6 12.33	140 5.50	7.2 15.86	140 5.50	9.2 20.26
200 8	219.1 8.625	173 6.80	10.5 23.13	173 6.80	14.0 30.84	173 6.80	16.5 36.34

Working pressure and End load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with WINGROU specifications.

The allowable pipe separation dimension show is for system layout purpose only . WINGROU couplings are considered rigid connections and will not accommodate expansion or contraction of the pipe system.

When assembling WINGROU couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop.

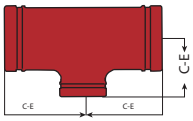
GROOVED REDUCING TEE
Models 131,131N

FM APPROVED

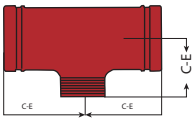
c UL US LISTED

Model 131 Grooved Reducing Tee

Model 131N Threaded Reducing Tee



Model 131 Grooved Reducing Tee



Model 131N Threaded Reducing Tee

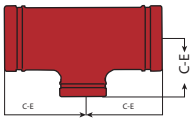
Size			Model 131 Reducing Tee		Model 131N Reducing Tee	
Run Pipe	X	Branch Pipe	CE	Approx. Wgt.	CE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
42.4 1¼	X	33.4 1	57 2.25	0.5 1.10	57 2.25	0.6 1.32
48.3 1½	X	33.4 1	70 2.75	0.6 1.32	70 2.75	0.6 1.32
		42.4 1¼	70 2.75	0.7 1.54	70 2.75	0.7 1.54
60.3 2	X	33.4 1	70 2.75	0.7 1.54	70 2.75	0.8 1.76
		42.4 1¼	70 2.75	0.8 1.76	70 2.75	0.8 1.76
		48.3 1½	70 2.75	0.8 1.76	70 2.75	0.8 1.76
73.0 2½	X	33.4 1	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		42.4 1¼	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		48.3 1½	76 3.00	1.2 2.64	76 3.00	1.2 2.64
		60.3 2	76 3.00	1.2 2.64	76 3.00	1.2 2.64
76.1 2½	X	33.4 1	76 3.00	1.2 2.64	76 3.00	1.2 2.64
		42.4 1¼	76 3.00	1.2 2.64	76 3.00	1.3 2.86
		48.3 1½	76 3.00	1.2 2.64	76 3.00	1.5 3.30
		60.3 2	76 3.00	1.2 2.64	76 3.00	1.6 3.52
88.9 3	X	33.4 1	86 3.40	1.4 3.08	86 3.40	1.4 3.08
		42.4 1¼	86 3.40	1.4 3.08	86 3.40	1.5 3.30
		48.3 1½	86 3.40	1.5 3.30	86 3.40	1.6 3.52
		73.0 2½	86 3.40	1.6 3.52	86 3.40	1.6 3.52
		76.1 2½	86 3.40	1.6 3.52	86 3.40	1.6 3.52
114.3 4	X	33.4 1	102 4.00	2.5 5.51	102 4.00	2.5 5.51

Size			Model 131 Reducing Tee		Model 131N Reducing Tee	
Run Pipe	X	Branch Pipe	CE	Approx. Wgt.	CE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
114.3 4	X	42.4 1¼	102 4.00	2.5 5.51	102 4.00	2.5 5.51
		48.3 1½	102 4.00	2.5 5.51	102 4.00	2.6 5.73
		60.3 2	102 4.00	2.6 5.73	102 4.00	2.6 5.73
		73.0 2½	102 4.00	2.6 5.73	102 4.00	2.7 5.95
		76.1 2½	102 4.00	2.6 5.73	102 4.00	2.7 5.95
		88.9 3	102 4.00	2.7 5.95	102 4.00	2.7 5.95
139.7 5	X	33.4 1	124 4.88	4.1 9.03	124 4.88	4.1 9.03
		42.4 1¼	124 4.88	4.1 9.03	124 4.88	4.2 9.25
		48.3 1½	124 4.88	4.2 9.25	124 4.88	4.3 9.47
		60.3 2	124 4.88	4.3 9.47	124 4.88	4.3 9.47
		76.1 2½	124 4.88	4.4 9.69	124 4.88	4.4 9.69
		88.9 3	124 4.88	4.5 9.91	124 4.88	4.6 10.13
		114.3 4	124 4.88	4.6 10.13	-- --	-- --
141.3 5	X	33.4 1	124 4.88	4.1 9.03	124 4.88	4.1 9.03
		42.4 1¼	124 4.88	4.1 9.03	124 4.88	4.2 9.25
		48.3 1½	124 4.88	4.2 9.25	124 4.88	4.3 9.47
		60.3 2	124 4.88	4.3 9.47	124 4.88	4.3 9.47
		73.0 2½	124 4.88	4.4 9.69	124 4.88	4.4 9.69
		88.9 3	124 4.88	4.5 9.91	124 4.88	4.6 10.13
		114.3 4	124 4.88	4.6 10.13	-- --	-- --

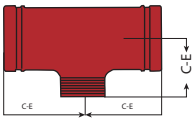
GROOVED REDUCING TEE
Models 131,131N

Model 131 Grooved Reducing Tee

Model 131N Threaded Reducing Tee



Model 131 Grooved Reducing Tee



Model 131N Threaded Reducing Tee

Size	Model 131 Reducing Tee		Model 131N Reducing Tee	
Run Pipe X Branch Pipe	CE	Approx. Wgt.	CE	Approx. Wgt.
mm X mm Inches X Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
165.1 X 33.4 6 1	140 5.50	6.3 13.88	140 5.50	6.3 13.88
42.4 1 1/4	140 5.50	6.3 13.88	140 5.50	6.4 14.10
48.3 1 1/2	140 5.50	6.3 13.88	140 5.50	6.4 14.10
60.3 2	140 5.50	6.4 14.10	140 5.50	6.4 14.10
76.1 2 1/2	140 5.50	6.4 14.10	140 5.50	6.5 14.32
88.9 3	140 5.50	6.5 14.32	140 5.50	6.5 14.32
114.3 4	140 5.50	6.7 14.76	-- --	-- --
139.7 5	140 5.50	6.9 15.20	-- --	-- --
168.3 X 33.4 6 1	140 5.50	6.3 13.88	140 5.50	6.3 13.88
42.4 1 1/4	140 5.50	6.3 13.88	140 5.50	6.4 14.10
48.3 1 1/2	140 5.50	6.3 13.88	140 5.50	6.4 14.10
60.3 2	140 5.50	6.4 14.10	140 5.50	6.4 14.10
73.0 2 1/2	140 5.50	6.4 14.10	140 5.50	6.5 14.32
88.9 3	140 5.50	6.5 14.32	140 5.50	6.5 14.32
114.3 4	140 5.50	6.7 14.76	-- --	-- --
141.3 5	140 5.50	6.9 15.20	-- --	-- --
219.1 X 33.4 8 1	173 6.80	11.1 24.45	173 6.80	11.1 24.45
42.4 1 1/4	173 6.80	11.3 24.89	173 6.80	11.4 25.11
48.3 1 1/2	173 6.80	11.5 25.33	173 6.80	11.6 25.55
60.3 2	173 6.80	11.9 26.21	173 6.80	12.0 26.43
73.0 2 1/2	173 6.80	12.0 26.43	173 6.80	12.1 26.65

Size	Model 131 Reducing Tee		Model 131N Reducing Tee	
Run Pipe X Branch Pipe	CE	Approx. Wgt.	CE	Approx. Wgt.
mm X mm Inches X Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
219.1 X 76.1 8 2 1/2	173 6.80	12.1 26.65	173 6.80	12.2 26.87
88.9 3	173 6.80	12.1 26.65	173 6.80	12.3 27.09
114.3 4	173 6.80	12.3 27.09	-- --	-- --
139.7 5	173 6.80	12.5 27.53	-- --	-- --
141.3 5	173 6.80	12.5 27.53	-- --	-- --
165.1 6	173 6.80	12.7 27.97	-- --	-- --
168.3 6	173 6.80	12.8 28.19	-- --	-- --
273.0 X 114.3 10 4	229 9.00	21.5 47.36	-- --	-- --
139.7 5	229 9.00	23.8 52.42	-- --	-- --
141.3 5	229 9.00	23.8 52.42	-- --	-- --
165.1 6	229 9.00	25.4 55.95	-- --	-- --
168.3 6	229 9.00	25.4 55.95	-- --	-- --
219.1 8	229 9.00	26.3 57.93	-- --	-- --
323.9 X 114.3 12 4	254 10.00	29.1 64.10	-- --	-- --
139.7 5	254 10.00	31.2 68.72	-- --	-- --
141.3 5	254 10.00	31.2 68.72	-- --	-- --
165.1 6	254 10.00	32.9 72.47	-- --	-- --
168.3 6	254 10.00	32.9 72.47	-- --	-- --
219.1 8	254 10.00	33.7 74.23	-- --	-- --
273.0 10	254 10.00	34.3 75.55	-- --	-- --

GROOVED CONCENTRIC REDUCER
Model 240,240N

Model 240 Concentric Reducer

Model 240N Concentric Reducer

Model 240 Concentric Reducer

Model 240N Threaded Concentric Reducer

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm X Inches	mm Inches	kg Lbs.	mm	kg Lbs.
42.4 1 1/4	X	33.4 1	64 2.50	0.2 0.44	64 2.50	0.3 0.66
48.3 1 1/2	X	33.4 1	64 2.50	0.3 0.66	64 2.50	0.3 0.66
		42.4 1 1/4	64 2.50	0.3 0.66	64 2.50	0.4 0.88
60.3 2	X	33.4 1	64 2.50	0.3 0.66	64 2.50	0.4 0.88
		42.4 1 1/4	64 2.50	0.4 0.88	64 2.50	0.4 0.88
		48.3 1 1/2	64 2.50	0.4 0.88	64 2.50	0.4 0.88
73.0 2 1/2	X	33.4 1	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		42.4 1 1/4	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		48.3 1 1/2	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		60.3 2	64 2.50	0.5 1.10	64 2.50	0.5 1.10
76.1 2 1/2	X	33.4 1	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		42.4 1 1/4	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		48.3 1 1/2	64 2.50	0.5 1.10	64 2.50	0.6 1.32
		60.3 2	64 2.50	0.6 1.32	64 2.50	0.6 1.32
88.9 3	X	33.4 1	64 2.50	0.6 1.32	64 2.50	0.6 1.32
		42.4 1 1/4	64 2.50	0.6 1.32	64 2.50	0.6 1.32
		48.3 1 1/2	64 2.50	0.6 1.32	64 2.50	0.7 1.54
		60.3 2	64 2.50	0.7 1.54	64 2.50	0.7 1.54
		73.0 2 1/2	64 2.50	0.7 1.54	64 2.50	0.7 1.54
		76.1 2 1/2	64 2.50	0.7 1.54	64 2.50	0.7 1.54
114.3 4	X	33.4 1	76 3.00	0.9 1.98	76 3.00	0.9 1.98

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm X Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
114.3 4	X	42.4 1 1/4	76 3.00	0.9 1.98	76 3.00	1.0 2.20
		48.3 1 1/2	76 3.00	1.0 2.20	76 3.00	1.0 2.20
		60.3 2	76 3.00	1.0 2.20	76 3.00	1.1 2.42
		73.0 2 1/2	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		76.1 2 1/2	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		88.9 3	76 3.00	1.1 2.42	76 3.00	1.1 2.42
139.7 5	X	33.4 1	89 3.50	1.4 3.08	89 3.50	1.4 3.08
		42.4 1 1/4	89 3.50	1.4 3.08	89 3.50	1.4 3.08
		48.3 1 1/2	89 3.50	1.4 3.08	89 3.50	1.5 3.30
		60.3 2	89 3.50	1.5 3.30	89 3.50	1.5 3.30
		76.1 2 1/2	89 3.50	1.5 3.30	89 3.50	1.6 3.52
		88.9 3	89 3.50	1.6 3.52	89 3.50	1.6 3.52
		114.3 4	89 3.50	1.7 3.74	-- --	-- --
141.3 5	X	33.4 1	89 3.50	1.4 3.08	89 3.50	1.4 3.08
		42.4 1 1/4	89 3.50	1.4 3.08	89 3.50	1.4 3.08
		48.3 1 1/2	89 3.50	1.4 3.08	89 3.50	1.5 3.30
		60.3 2	89 3.50	1.5 3.30	89 3.50	1.5 3.30
		73.0 2 1/2	89 3.50	1.5 3.30	89 3.50	1.6 3.52
		88.9 3	89 3.50	1.6 3.52	89 3.50	1.6 3.52
		114.3 4	89 3.50	1.7 3.74	-- --	-- --

GROOVED CONCENTRIC REDUCER
Model 240,240N

Model 240 Concentric Reducer

Model 240N Concentric Reducer

Model 240 Concentric Reducer

Model 240N Threaded Concentric Reducer

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
165.1 6	X	33.4 1	102 4.00	2.1 4.66	102 4.00	2.1 4.66
		42.4 $1^1/_4$	102 4.00	2.1 4.66	102 4.00	2.2 4.85
		48.3 $1^1/_2$	102 4.00	2.2 4.85	102 4.00	2.2 4.85
		60.3 2	102 4.00	2.2 4.85	102 4.00	2.3 5.07
		76.1 $2^1/_2$	102 4.00	2.3 5.07	102 4.00	2.3 5.07
		88.9 3	102 4.00	2.3 5.07	102 4.00	2.4 5.29
		114.3 4	102 4.00	2.4 5.29	-- --	-- --
		139.7 5	102 4.00	2.7 5.99	-- --	-- --
168.3 6	X	33.4 1	102 4.00	2.1 4.66	102 4.00	2.2 4.85
		42.4 $1^1/_4$	102 4.00	2.1 4.66	102 4.00	2.2 4.85
		48.3 $1^1/_2$	102 4.00	2.2 4.85	102 4.00	2.2 4.85
		60.3 2	102 4.00	2.2 4.85	102 4.00	2.3 5.07
		73.0 $2^1/_2$	102 4.00	2.3 5.07	102 4.00	2.3 5.07
		88.9 3	102 4.00	2.3 5.07	102 4.00	2.4 5.29
		114.3 4	102 4.00	2.4 5.29	-- --	-- --
		141.3 5	102 4.00	2.7 5.99	-- --	-- --
219.1 8	X	33.4 1	127 5.00	4.1 9.03	127 5.00	4.2 9.25
		42.4 $1^1/_4$	127 5.00	4.2 9.25	127 5.00	4.3 9.47
		48.3 $1^1/_2$	127 5.00	4.2 9.25	127 5.00	4.3 9.47
		60.3 2	127 5.00	4.3 9.47	127 5.00	4.4 9.69
		73.0 $2^1/_2$	127 5.00	4.3 9.47	127 5.00	4.4 9.69

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Branch Pipe			EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
219.1 8	X	76.1 $2^1/_2$	127 5.00	4.3 9.47	127 5.00	4.5 9.91
		88.9 3	127 5.00	4.5 9.91	127 5.00	4.5 9.91
		114.3 4	127 5.00	4.6 10.13	-- --	-- --
		139.7 5	127 5.00	4.8 10.57	-- --	-- --
		141.3 5	127 5.00	4.8 10.57	-- --	-- --
		165.1 6	127 5.00	5.0 11.00	-- --	-- --
		168.3 6	127 5.00	5.0 11.00	-- --	-- --
273.0 10	X	114.3 4	152 6.00	7.5 16.52	-- --	-- --
		139.7 5	152 6.00	7.6 16.74	-- --	-- --
		141.3 5	152 6.00	7.6 16.74	-- --	-- --
		165.1 6	152 6.00	7.8 17.18	-- --	-- --
		168.3 6	152 6.00	7.8 17.18	-- --	-- --
		219.1 8	152 6.00	8.8 19.38	-- --	-- --
323.9 12	X	114.3 4	178 7.00	9.9 21.81	-- --	-- --
		139.7 5	178 7.00	10.0 22.03	-- --	-- --
		141.3 5	178 7.00	10.0 22.03	-- --	-- --
		165.1 6	178 7.00	10.2 22.47	-- --	-- --
		168.3 6	178 7.00	10.3 22.69	-- --	-- --
		219.1 8	178 7.00	11.2 24.67	-- --	-- --
		273.0 10	178 7.00	13.8 30.40	-- --	-- --

GROOVED ECCENTRIC REDUCER

Model 230,230N

Model 230 Eccentric Reducer Model 230N Threaded Concentric Reducer

Model 230 Eccentric Reducer

Model 230N Threaded Concentric Reducer

Size			Model 230 Eccentric Reducer		Model 230N Eccentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
42.4 $1^1/_4$	X	33.4 1	64 2.50	0.2 0.44	64 2.50	0.3 0.66
48.3 $1^1/_2$	X	33.4 1	64 2.50	0.3 0.66	64 2.50	0.3 0.66
		42.4 $1^1/_4$	64 2.50	0.3 0.66	64 2.50	0.4 0.88
60.3 2	X	33.4 1	64 2.50	0.3 0.66	64 2.50	0.4 0.88
		42.4 $1^1/_4$	64 2.50	0.4 0.88	64 2.50	0.4 0.88
		48.3 $1^1/_2$	64 2.50	0.4 0.88	64 2.50	0.4 0.88
73.0 $2^1/_2$	X	33.4 1	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		42.4 $1^1/_4$	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		48.3 $1^1/_2$	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		60.3 2	64 2.50	0.5 1.10	64 2.50	0.5 1.10
76.1 $2^1/_2$	X	33.4 1	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		42.4 $1^1/_4$	64 2.50	0.5 1.10	64 2.50	0.5 1.10
		48.3 $1^1/_2$	64 2.50	0.5 1.10	64 2.50	0.6 1.32
		60.3 2	64 2.50	0.6 1.32	64 2.50	0.6 1.32
88.9 3	X	33.4 1	64 2.50	0.6 1.32	64 2.50	0.6 1.32
		42.4 $1^1/_4$	64 2.50	0.6 1.32	64 2.50	0.6 1.32
		48.3 $1^1/_2$	64 2.50	0.6 1.32	64 2.50	0.7 1.54
		60.3 2	64 2.50	0.7 1.54	64 2.50	0.7 1.54
108.0 4	X	33.4 1	76 3.00	0.9 1.98	76 3.00	0.9 1.98
		42.4 $1^1/_4$	76 3.00	0.9 1.98	76 3.00	1.0 2.20
		48.3 $1^1/_2$	76 3.00	1.0 2.20	76 3.00	1.0 2.20

Size			Model 230 Eccentric Reducer		Model 230N Eccentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
108.0 4	X	33.4 1	76 3.00	0.9 1.98	76 3.00	0.9 1.98
		42.4 $1^1/_4$	76 3.00	0.9 1.98	76 3.00	1.0 2.20
		48.3 $1^1/_2$	76 3.00	1.0 2.20	76 3.00	1.0 2.20
		60.3 2	76 3.00	1.0 2.20	76 3.00	1.1 2.42
		76.1 $2^1/_2$	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		88.9 3	76 3.00	1.1 2.42	76 3.00	1.1 2.42
114.3 4	X	33.4 1	76 3.00	0.9 1.98	76 3.00	0.9 1.98
		42.4 $1^1/_4$	76 3.00	0.9 1.98	76 3.00	1.0 2.20
		48.3 $1^1/_2$	76 3.00	1.0 2.20	76 3.00	1.0 2.20
		60.3 2	76 3.00	1.0 2.20	76 3.00	1.1 2.42
		73.0 $2^1/_2$	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		76.1 $2^1/_2$	76 3.00	1.1 2.42	76 3.00	1.1 2.42
		88.9 3	76 3.00	1.1 2.42	76 3.00	1.1 2.42
139.7 5	X	60.3 2	89 3.50	1.5 3.30	89 3.50	1.5 3.30
		76.1 $2^1/_2$	89 3.50	1.5 3.30	89 3.50	1.5 3.30
		88.9 3	89 3.50	1.6 3.52	89 3.50	1.6 3.52
		108.0 4	89 3.50	1.7 3.74	-- --	-- --
		114.3 4	89 3.50	1.7 3.74	-- --	-- --
141.3 5	X	60.3 2	89 3.50	1.5 3.30	89 3.50	1.5 3.30
		73.0 $2^1/_2$	89 3.50	1.5 3.30	89 3.50	1.6 3.52
		88.9 3	89 3.50	1.6 3.52	89 3.50	1.6 3.52
		114.3 4	89 3.50	1.7 3.74	-- --	-- --

GROOVED ECCENTRIC REDUCER
Model 230,230N

Model 230 Eccentric Reducer Model 230N Threaded Concentric Reducer

Model 230 Eccentric Reducer

Model 230N Threaded Concentric Reducer

Size			Model 240 Concentric Reducer		Model 240N Concentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
165.1 6	X	60.3 2	102 4.00	2.2 4.85	102 4.00	2.3 5.07
		76.1 $2^1/_2$	102 4.00	2.3 5.07	102 4.00	2.3 5.07
		88.9 3	102 4.00	2.3 5.07	102 4.00	2.4 5.29
		114.3 4	102 4.00	2.4 5.29	-- --	-- --
		139.7 5	102 4.00	2.7 5.99	-- --	-- --
168.3 6	X	60.3 2	102 4.00	2.2 4.85	102 4.00	2.3 5.07
		73.0 $2^1/_2$	102 4.00	2.3 5.07	102 4.00	2.3 5.07
		88.9 3	102 4.00	2.3 5.07	102 4.00	2.4 5.29
		114.3 4	102 4.00	2.4 5.29	-- --	-- --
		141.3 5	102 4.00	2.7 5.99	-- --	-- --
219.1 8	X	60.3 2	127 5.00	4.3 9.47	127 5.00	4.4 9.69
		73.0 $2^1/_2$	127 5.00	4.3 9.47	127 5.00	4.4 9.69
		88.9 3	127 5.00	4.5 9.91	127 5.00	4.5 9.91
		108.0 4	127 5.00	4.6 10.13	-- --	-- --
		133.0 5	127 5.00	4.8 10.57	-- --	-- --
		139.7 5	127 5.00	4.8 10.57	-- --	-- --
		141.3 5	127 5.00	4.8 10.57	-- --	-- --
		159.0 6	127 5.00	5.0 11.00	-- --	-- --
		165.1 6	127 5.00	5.0 11.00	-- --	-- --
		168.3 6	127 5.00	5.0 11.00	-- --	-- --

Size			Model 230 Eccentric Reducer		Model 230N Eccentric Reducer	
Run Pipe	X	Branch Pipe	EE	Approx. Wgt.	EE	Approx. Wgt.
mm Inches	X	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.
273.0 10	X	108.0 4	152 6.00	7.5 16.52	-- --	-- --
		114.3 4	152 6.00	7.5 16.52	-- --	-- --
		133.0 5	152 6.00	7.6 16.74	-- --	-- --
		139.7 5	152 6.00	7.6 16.74	-- --	-- --
		141.3 5	152 6.00	7.6 16.74	-- --	-- --
		159.0 6	152 6.00	7.8 17.18	-- --	-- --
		165.1 6	152 6.00	7.8 17.18	-- --	-- --
		168.3 6	152 6.00	7.8 17.18	-- --	-- --
		219.1 8	152 6.00	8.8 19.38	-- --	-- --
323.9 12	X	108.0 4	178 7.00	9.9 21.81	-- --	-- --
		114.3 4	178 7.00	9.9 21.81	-- --	-- --
		133.0 5	178 7.00	10.0 22.03	-- --	-- --
		139.7 5	178 7.00	10.0 22.03	-- --	-- --
		141.3 5	178 7.00	10.0 22.03	-- --	-- --
		159.0 6	178 7.00	10.2 22.47	-- --	-- --
		165.1 6	178 7.00	10.2 22.47	-- --	-- --
		168.3 6	178 7.00	10.3 22.69	-- --	-- --
		219.1 8	178 7.00	11.2 24.67	-- --	-- --
		273.0 10	178 7.00	13.8 30.40	-- --	-- --

The Mechanical Tee provides a fast and easy mid-pipe threaded branch outlet. It eliminates the need for welding or mulple fittings. The mechanical tee utilizes ductile iron housings, a grade E moulded gasket and heat-treated carbon steel track bolts and nuts. Pressure rated to 300 psi (20 bar).

Pipe Material

• Carbon Steel, Schedule 10, Schedule 40.

For use with alternative materials and wall thickness please contact Wingrou

Maximum Working Pressure

Listed pressure is maximum working pressure, for Fire Protection application, approved pressure by related authorities should be used.

UL/ULC 300si 2065kPa/21bars FM 300Psi 2065kPa/21bars

Function

• Joins carbon steel pipe.

• Provides a rigid pipe joint designed to restrict axial or angular movement.

Certifications/Listing

Underwriters Laboratories, Under Laboratories Canada, Factory Mutual.

Specifications-Material

Housing Sections: Ductile Iron confirming to ASTM A 536, Grade 65-45-12.

Surface Finish:

Standard: RAL 3000 Red Paint Mat Finish/Epoxy powder coating

Available: Hot Dipped Galvanized/Zinc Plated, Dipped Painted

Gasket

Standard: Grade E EPDM (Type A)

Wingrou's products are listed by Underwriters Laboratories, Under Laboratories Canada and approved by Factory Mutual for wet and dry (oil free air) sprinkler services with the rated working pressure.

Bolts and Nuts

Ovel neck track bolt confirming to ASTM A183 with minimum tensile strength of 110,000 psi or square neck carriage bolt to ASTM A446 with 120,000 psi minimum tensile strength permits tightening of the nuts from one side with a single wrench. Nuts conform to ASTM A194, Bot and Nuts are electro galvanized.

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Wingrou products for a particular end-use application, in accordance with industry stan¬dards and project specifications, and the applicable building codes and related regulations as well as Wingrou performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Wingrou employee, shall be deemed to alter, vary, supersede, or waive any provision of Allied Rubber and Gasket Company's standard conditions of sale, installation guide, or this disclaimer

Note

All products to be installed in accordance with current WINGROU installation/assembly instructions. WINGROU reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation Reference should always be made to the WINGROU installation instructions of the product you are installing.

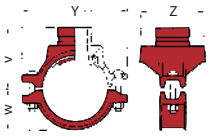
BOLTED BRANCH OUTLET MECHANICAL TEES
Models 3G, 3J

WINGROU®

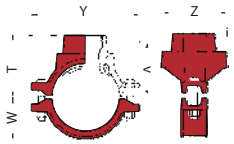
FM APPROVED c UL us LISTED

Model 3G Grooved Outlet Mechanical Tee

Model 3JThreaded Mechanical Tee



Model 3G Grooved Outlet Mechanical Tee



Model 3JThreaded Mechanical Tee

The Model 3G & 3J Mechanical Tee provides a fast and easy mid-pipe threaded branch outlet. It eliminates the need for welding or mulple fittings. The mechanical tee utilizes ductile iron housings, a grade E moulded gasket and heat-treated carbon steel track bolts and nuts. Pressure rated to 300 psi (20 bar).

Size			Max. Work Pressure	Hole Size	Dimensions						Bolt/Nut Size	Approx. Wgt.	
Run Pipe	X	Branch Pipe			W	Y	Z	3G V	3J V	3J T		3G	3J
mm Inches	X X	mm Inches	KPa PSI	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.	kg Lbs.
60.3 2	X	33.4 1	3450 500	38 1.50	37 1.46	134 5.28	70 2.76	64 2.52	62 2.44	46 1.81	M12X65 $^1/_2$X$2^1/_2$	0.85 1.87	0.81 1.78
		42.4 $1^1/_4$	3450 500	44.5 1.75	37 1.46	134 5.28	77 3.03	65 2.56	65 2.56	46 1.81	M12X65 $^1/_2$X$2^1/_2$	0.89 1.96	0.92 2..03
		48.3 $1^1/_2$	3450 500	44.5 1.75	37 1.46	134 5.28	77 3.03	65 2.56	65 2.56	46 1.81	M12X65 $^1/_2$X$2^1/_2$	0.91 2.00	0.98 2.16
73.0 $2^1/_2$	X	33.4 1	3450 500	38 1.50	43 1.69	148 5.83	68 2.68	74 2.91	64 2.52	46 1.81	M12X75 $^1/_2$X3	1.25 2.75	1.16 2.56
		42.4 $1^1/_4$	3450 500	44.5 1.75	43 1.69	148 5.83	76 2.99	74 2.91	67 2.64	46 1.81	M12X75 $^1/_2$X3	1.28 2.82	1.33 2.93
		48.3 $1^1/_2$	3450 500	51 2.00	43 1.69	148 5.83	83 3.27	74 2.91	67 2.64	46 1.81	M12X75 $^1/_2$X3	1.39 3.06	1.52 3.35
76.1 $2^1/_2$	X	33.4 1	3450 500	38 1.50	45 1.77	151 5.94	68 2.68	76 2.99	66 2.60	47 1.85	M12X75 $^1/_2$X3	1.19 2.62	1.17 2.58
		42.4 $1^1/_4$	3450 500	44.5 1.75	45 1.77	151 5.94	76 2.99	76 2.99	68 2.68	47 1.85	M12X75 $^1/_2$X3	1.22 2.69	1.27 2.80
		48.3 $1^1/_2$	3450 500	51 2.00	45 1.77	151 5.94	83 3.27	76 2.99	69 2.72	47 1.85	M12X75 $^1/_2$X3	1.27 2.80	1.33 2.93
88.9 3	X	33.4 1	3450 500	38 1.50	52 2.05	161 6.34	68 2.68	82 3.23	72 2.83	54 2.13	M12X75 $^1/_2$X3	1.28 2.82	1.25 2.75
		42.4 $1^1/_4$	3450 500	44.5 1.75	52 2.05	161 6.34	75 2.95	82 3.23	74 2.91	54 2.13	M12X75 $^1/_2$X3	1.31 2.89	1.36 3.00
		48.3 $1^1/_2$	3450 500	51 2.00	52 2.05	161 6.34	82 3.23	82 3.23	75 2.95	54 2.13	M12X75 $^1/_2$X3	1.37 3.02	1.43 3.15
		60.3 2	3450 500	64 2.50	52 2.05	161 6.34	95 3.74	82 3.23	79 3.11	54 2.13	M12X75 $^1/_2$X3	1.44 3.17	1.56 3.44
108.0 4	X	33.4 1	3450 500	38 1.50	62 2.44	182 7.17	69 2.72	93 3.66	84 3.31	65 2.56	M12X75 $^1/_2$X3	1.48 3.26	1.44 3.17
		42.4 $1^1/_4$	3450 500	44.5 1.75	62 2.44	182 7.17	75 2.95	93 3.66	86 3.39	65 2.56	M12X75 $^1/_2$X3	1.52 3.35	1.56 3.44
		48.3 $1^1/_2$	3450 500	51 2.00	62 2.44	182 7.17	83 3.27	93 3.66	86 3.39	65 2.56	M12X75 $^1/_2$X3	1.59 3.50	1.64 3.61
		60.3 2	3450 500	64 2.50	62 2.44	182 7.17	95 3.74	93 3.66	90 3.54	65 2.56	M12X75 $^1/_2$X3	1.7 3.74	1.81 3.99
		76.1 $2^1/_2$	3450 500	70 2.75	62 2.44	182 7.17	101 3.98	94 3.70	94 3.70	65 2.56	M12X75 $^1/_2$X3	1.91 4.21	2.13 4.69
114.3 4	X	33.4 1	3450 500	38 1.50	65 2.56	188 7.40	69 2.72	96 3.78	87 3.43	68 2.68	M12X75 $^1/_2$X3	1.52 3.35	1.45 3.19
		42.4 $1^1/_4$	3450 500	44.5 1.75	65 2.56	188 7.40	75 2.95	96 3.78	89 3.50	68 2.68	M12X75 $^1/_2$X3	1.55 3.41	1.58 3.48
		48.3 $1^1/_2$	3450 500	51 2.00	65 2.56	188 7.40	83 3.27	96 3.78	89 3.50	68 2.68	M12X75 $^1/_2$X3	1.62 3.57	1.67 3.68
		60.3 2	3450 500	64 2.50	65 2.56	188 7.40	95 3.74	96 3.78	93 3.66	68 2.68	M12X75 $^1/_2$X3	1.75 3.85	1.86 4.10
		73.0 $2^1/_2$	3450 500	70 2.75	65 2.56	188 7.40	101 3.98	97 3.82	97 3.82	68 2.68	M12X75 $^1/_2$X3	1.91 4.21	2.02 4.45
		76.1 $2^1/_2$	3450 500	70 2.75	65 2.56	188 7.40	101 3.98	97 3.82	97 3.82	68 2.68	M12X75 $^1/_2$X3	1.93 4.25	2.05 4.52
		88.9 3	3450 500	89 3.50	65 2.56	188 7.40	122 4.80	97 3.82	100 3.94	68 2.68	M12X75 $^1/_2$X3	2.07 4.56	2.31 5.09

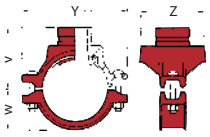
WG

BOLTED BRANCH OUTLET MECHANICAL TEES

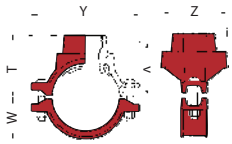
Models 3G, 3J

Model 3G Grooved Outlet Mechanical Tee

Model 3JThreaded Mechanical Tee



Model 3G Grooved Outlet Mechanical Tee



Model 3JThreaded Mechanical Tee

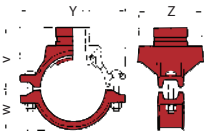
Size		Max. Work Pressure	Hole Size	Dimensions						Bolt/Nut Size	Approx. Wgt.	
Run Pipe	X Branch Pipe			W	Y	Z	3G V	3J V	3J T		3C	3R
mm Inches	X mm X Inches	KPa PSI	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.	kg Lbs.
133.0 5	X 33.4 1	3450 500	38 1.50	75 2.95	239 9.41	68 2.68	107 4.21	97 3.82	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.1 4.63	2.03 4.47
	42.4 1$^1/_4$	3450 500	44.5 1.75	75 2.95	239 9.41	75 2.95	107 4.21	100 3.94	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.13 4.69	2.17 4.78
	48.3 1$^1/_2$	3450 500	51 2.00	75 2.95	239 9.41	81 3.19	107 4.21	100 3.94	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.21 4.87	2.26 4.98
	60.3 2	3450 500	64 2.50	75 2.95	239 9.41	95 3.74	107 4.21	104 4.09	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.36 5.20	2.47 5.44
	76.1 2$^1/_2$	3450 500	70 2.75	75 2.95	239 9.41	103 4.06	107 4.21	107 4.21	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.58 5.68	2.79 6.15
	88.9 3	3450 500	89 3.50	75 2.95	239 9.41	120 4.72	107 4.21	111 4.37	79 3.11	M16X85 $^5/_8$X3$^3/_8$	2.71 5.97	3.04 6.70
139.7 5	X 33.4 1	3450 500	38 1.50	78 3.07	232 9.13	68 2.68	110 4.33	100 3.94	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.15 4.74	2.08 4.58
	42.4 1$^1/_4$	3450 500	44.5 1.75	78 3.07	232 9.13	75 2.95	110 4.33	103 4.06	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.19 4.82	2.23 4.91
	48.3 1$^1/_2$	3450 500	51 2.00	78 3.07	232 9.13	81 3.19	110 4.33	103 4.06	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.26 4.98	2.31 5.09
	60.3 2	3450 500	64 2.50	78 3.07	232 9.13	95 3.74	110 4.33	107 4.21	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.42 5.33	2.53 5.57
	76.1 2$^1/_2$	3450 500	70 2.75	78 3.07	232 9.13	103 4.06	110 4.33	110 4.33	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.65 5.84	2.86 6.30
	88.9 3	3450 500	89 3.50	78 3.07	232 9.13	120 4.72	110 4.33	114 4.49	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.77 6.10	3.1 6.83
141.3 5	X 33.4 1	3450 500	38 1.50	79 3.11	234 9.21	68 2.68	111 4.37	99 3.90	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.14 4.71	2.07 4.56
	42.4 1$^1/_4$	3450 500	44.5 1.75	79 3.11	234 9.21	75 2.95	111 4.37	102 4.02	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.18 4.80	2.22 4.89
	48.3 1$^1/_2$	3450 500	51 2.00	79 3.11	234 9.21	81 3.19	111 4.37	102 4.02	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.26 4.98	2.31 5.09
	60.3 2	3450 500	64 2.50	79 3.11	234 9.21	95 3.74	111 4.37	106 4.17	82 3.23	M16X85 $^5/_8$X3$^3/_8$	2.42 5.33	2.52 5.55
	73.0 2$^1/_2$	3450 500	70 2.75	79 3.11	234 9.21	103 4.06	112 4.41	109 4.29	83 3.27	M16X85 $^5/_8$X3$^3/_8$	2.63 5.79	2.83 6.23
	88.9 3	3450 500	89 3.50	79 3.11	234 9.21	120 4.72	112 4.41	113 4.45	83 3.27	M16X85 $^5/_8$X3$^3/_8$	2.77 6.10	3.1 6.83
159.0 6	X 33.4 1	3450 500	38 1.50	89 3.50	251 9.88	68 2.68	121 4.76	111 4.37	92 3.62	M16X85 $^5/_8$X3$^3/_8$	2.4 5.29	2.3 5.07
	42.4 1$^1/_4$	3450 500	44.5 1.75	89 3.50	251 9.88	74 2.91	121 4.76	113 4.45	92 3.62	M16X85 $^5/_8$X3$^3/_8$	2.44 5.37	2.47 5.44
	48.3 1$^1/_2$	3450 500	51 2.00	89 3.50	251 9.88	80 3.15	121 4.76	114 4.49	92 3.62	M16X85 $^5/_8$X3$^3/_8$	2.51 5.53	2.56 5.64
	60.3 2	3450 500	64 2.50	89 3.50	251 9.88	94 3.70	121 4.76	117 4.61	92 3.62	M16X85 $^5/_8$X3$^3/_8$	2.72 5.99	2.82 6.21
	76.1 2$^1/_2$	3450 500	70 2.75	89 3.50	251 9.88	103 4.06	121 4.76	121 4.76	92 3.62	M16X85 $^5/_8$X3$^3/_8$	3.09 6.81	3.29 7.25
	88.9 3	3450 500	89 3.50	89 3.50	251 9.88	120 4.72	121 4.76	124 4.88	92 3.62	M16X85 $^5/_8$X3$^3/_8$	3.09 6.81	3.42 7.53
	108.0 4	3450 500	114 4.50	89 3.50	251 9.88	146 5.75	123 4.84	-- --	92 3.62	M16X85 $^5/_8$X3$^3/_8$	3.44 7.58	-- --
	114.3 4	3450 500	114 4.50	89 3.50	251 9.88	146 5.75	123 4.84	-- --	92 3.62	M16X85 $^5/_8$X3$^3/_8$	3.49 7.69	-- --

BOLTED BRANCH OUTLET MECHANICAL TEES

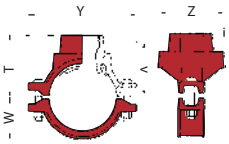
Models 3G, 3J

Model 3G Grooved Outlet Mechanical Tee

Model 3JThreaded Mechanical Tee



Model 3G Grooved Outlet Mechanical Tee

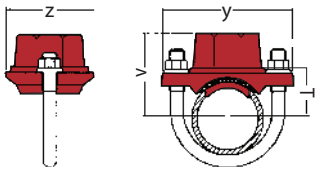


Model 3JThreaded Mechanical Tee

Size		Max. Work Pressure	Hole Size	Dimensions						Bolt/Nut Size	Approx. Wgt.	
Run Pipe	X Branch Pipe			W	Y	Z	3G V	3J V	3J T		3C	3R
mm Inches	X mm X Inches	KPa PSI	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	mm Inches	kg Lbs.	kg Lbs.
165.1 6	X 33.4 1	3450 500	38 1.50	95 3.74	124 4.88	114 4.49	92 3.62	257 10.12	68 2.68	M16X85 $^5/_8$X3$^3/_8$	2.42 5.33	2.31 5.09
	42.4 1$^1/_4$	3450 500	44.5 1.75	95 3.74	124 4.88	116 4.57	92 3.62	257 10.12	74 2.91	M16X85 $^5/_8$X3$^3/_8$	2.46 5.42	2.5 5.51
	48.3 1$^1/_2$	3450 500	51 2.00	95 3.74	124 4.88	117 4.61	92 3.62	257 10.12	80 3.15	M16X85 $^5/_8$X3$^3/_8$	2.53 5.57	2.58 5.68
	60.3 2	3450 500	64 2.50	95 3.74	124 4.88	120 4.72	92 3.62	257 10.12	94 3.70	M16X85 $^5/_8$X3$^3/_8$	2.73 6.01	2.83 6.23
	76.1 2$^1/_2$	3450 500	70 2.75	95 3.74	124 4.88	124 4.88	92 3.62	257 10.12	103 4.06	M16X85 $^5/_8$X3$^3/_8$	2.99 6.59	3.1 6.83
	88.9 3	3450 500	89 3.50	95 3.74	124 4.88	127 5.00	92 3.62	257 10.12	120 4.72	M16X85 $^5/_8$X3$^3/_8$	3.12 6.87	3.44 7.58
	108.0 4	3450 500	114 4.50	95 3.74	126 4.96	-- --	92 3.62	257 10.12	146 5.75	M16X85 $^5/_8$X3$^3/_8$	3.38 7.44	-- --
	114.3 4	3450 500	114 4.50	95 3.74	126 4.96	-- --	92 3.62	257 10.12	146 5.75	M16X85 $^5/_8$X3$^3/_8$	3.44 7.58	-- --
168.3 6	X 33.4 1	3450 500	38 1.50	97 3.82	126 4.96	116 4.57	94 3.70	260 10.24	68 2.68	M16X85 $^5/_8$X3$^3/_8$	2.43 5.35	2.34 5.15
	42.4 1$^1/_4$	3450 500	44.5 1.75	97 3.82	126 4.96	118 4.65	94 3.70	260 10.24	74 2.91	M16X85 $^5/_8$X3$^3/_8$	2.47 5.44	2.51 5.53
	48.3 1$^1/_2$	3450 500	51 2.00	97 3.82	126 4.96	119 4.69	94 3.70	260 10.24	80 3.15	M16X85 $^5/_8$X3$^3/_8$	2.53 5.57	2.58 5.68
	60.3 2	3450 500	64 2.50	97 3.82	126 4.96	122 4.80	94 3.70	260 10.24	94 3.70	M16X85 $^5/_8$X3$^3/_8$	2.74 6.04	2.85 6.28
	73.0 2$^1/_2$	3450 500	70 2.75	97 3.82	126 4.96	124 4.88	94 3.70	260 10.24	103 4.06	M16X85 $^5/_8$X3$^3/_8$	2.96 6.52	3.15 6.94
	88.9 3	3450 500	89 3.50	97 3.82	126 4.96	129 5.08	94 3.70	260 10.24	120 4.72	M16X85 $^5/_8$X3$^3/_8$	3.13 6.89	3.44 7.58
	114.3 4	3450 500	114 4.50	97 3.82	128 5.04	-- --	94 3.70	260 10.24	146 5.75	M16X85 $^5/_8$X3$^3/_8$	3.52 7.75	-- --
219.1 8	X 33.4 1	3450 500	38 1.50	123 4.84	152 5.98	142 5.59	121 4.76	328 12.91	68 2.68	M20X115 $^3/_4$X4$^1/_2$	3.95 8.70	3.82 8.41
	42.4 1$^1/_4$	3450 500	44.5 1.75	123 4.84	152 5.98	144 5.67	121 4.76	328 12.91	74 2.91	M20X115 $^3/_4$X4$^1/_2$	3.98 8.77	4.02 8.85
	48.3 1$^1/_2$	3450 500	51 2.00	123 4.84	152 5.98	145 5.71	121 4.76	328 12.91	81 3.19	M20X115 $^3/_4$X4$^1/_2$	4.11 9.05	4.16 9.16
	60.3 2	3450 500	64 2.50	123 4.84	152 5.98	148 5.83	121 4.76	328 12.91	94 3.70	M20X115 $^3/_4$X4$^1/_2$	4.37 9.63	4.47 9.85
	73.0 2$^1/_2$	3450 500	70 2.75	123 4.84	152 5.98	152 5.98	121 4.76	328 12.91	103 4.06	M20X115 $^3/_4$X4$^1/_2$	4.56 10.04	4.74 10.44
	76.1 2$^1/_2$	3450 500	70 2.75	123 4.84	152 5.98	152 5.98	121 4.76	328 12.91	103 4.06	M20X115 $^3/_4$X4$^1/_2$	4.58 10.09	4.78 10.53
	88.9 3	3450 500	89 3.50	123 4.84	152 5.98	155 6.10	121 4.76	328 12.91	120 4.72	M20X115 $^3/_4$X4$^1/_2$	4.83 10.64	5.13 11.30
	108.0 4	3450 500	114 4.50	123 4.84	154 6.06	-- --	121 4.76	328 12.91	145 5.71	M20X115 $^3/_4$X4$^1/_2$	5.26 11.59	-- --
	114.3 4	3450 500	114 4.50	123 4.84	154 6.06	-- --	121 4.76	328 12.91	145 5.71	M20X115 $^3/_4$X4$^1/_2$	5.31 11.70	-- --

U-BOLT MECHANICAL TEE (SADDLE-LET)

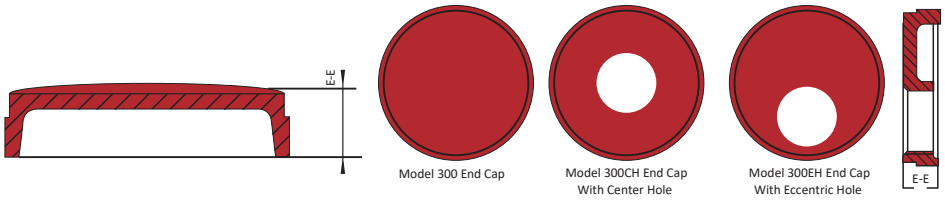
Models 3L



The Model 300U Saddle-Lets is the ideal outlet fitting for direct connecons to sprinkler heads, drop nipples and or gauges. No need for welding, just cut or drill a hole at the desired outlet location. Posion the Saddle-Let so that the locating collar fits within the hole and secure with the U-bolt and nuts. The Saddle-Let allows full bore flow and is pressure rates to 300 psi (20 bar).

Size			Max. Work Pressure	Hole Size	Dimensions				Bolt/Nut Size	Approx. Wgt.
Run Pipe	X	Branch Pipe			Y	Z	V	T		
mm	X	mm	KPa	mm	mm	mm	mm	mm	mm	kg
Inches	X	Inches	PSI	Inches	Inches	Inches	Inches	Inches	Inches	Lbs.
42.4	X	21.3	2500	30.5	88	57	46	28	M10 X 68 X 38	0.32
$1^1/_4$		$^1/_2$	350	1.20	3.46	2.25	1.81	1.10	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.70
		26.9	2500	30.5	88	57	46	30	M10 X 68 X 38	0.34
		$^3/_4$	350	1.20	3.46	2.25	1.81	1.81	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.75
		33.4	2500	30.5	88	57	52	34	M10 X 68 X 38	0.40
		1	350	1.20	3.46	2.25	2.05	1.34	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.88
48.3	X	21.3	2500	30.5	88	57	45	31	M10 X 68 X 38	0.32
$1^1/_2$		$^1/_2$	350	1.20	3.46	2.25	1.77	1.22	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.70
		26.9	2500	30.5	88	57	48	33	M10 X 68 X 38	0.34
		$^3/_4$	350	1.20	3.46	2.25	1.89	1.30	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.75
		33.4	2500	30.5	88	57	55	37	M10 X 68 X 38	0.40
		1	350	1.20	3.46	2.25	2.17	1.46	$^3/_8$ X $2^{11}/_{16}$ X $1^1/_2$	0.88
60.3	X	21.3	2500	30.5	94	57	51	37	M10 X 74 X 47	0.33
2		$^1/_2$	350	1.20	3.70	2.25	2.00	1.46	$^3/_8$ X $2^{15}/_{16}$ X $1^7/_8$	0.73
		26.9	2500	30.5	94	57	54	39	M10 X 74 X 47	0.35
		$^3/_4$	350	1.20	3.70	2.25	2.13	1.54	$^3/_8$ X $2^{15}/_{16}$ X $1^7/_8$	0.77
		33.4	2500	30.5	94	57	61	43	M10 X 74 X 47	0.41
		1	350	1.20	3.70	2.25	2.40	1.69	$^3/_8$ X $2^{15}/_{16}$ X $1^7/_8$	0.90
73	X	21.3	2500	30.5	108	57	57	43	M10 X 89X 57	0.49
$2^1/_2$		$^1/_2$	350	1.20	4.25	2.25	2.25	1.69	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.08
		26.9	2500	30.5	108	57	60	45	M10 X 89X 57	0.51
		$^3/_4$	350	1.20	4.25	2.25	2.36	1.77	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.12
		33.4	2500	30.5	108	57	67	49	M10 X 89X 57	0.57
		1	350	1.20	4.25	2.25	2.64	1.93	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.26
76.1	X	21.3	2500	30.5	108	57	59	45	M10 X 89X 57	0.49
$2^1/_2$		$^1/_2$	350	1.20	4.25	2.25	2.32	1.77	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.08
		26.9	2500	30.5	108	57	62	47	M10 X 89X 57	0.51
		$^3/_4$	350	1.20	4.25	2.25	2.44	1.85	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.12
		33.4	2500	30.5	108	57	69	51	M10 X 89X 57	0.57
		1	350	1.20	4.25	2.25	2.72	2.00	$^3/_8$ X $3^1/_2$ X $2^1/_4$	1.26

GROOVED END CAP & END CAP WITH HOLE
Models 300,300CH,300EH



Wingrou Model 300 End Cap with hole is an ideal transition fittings when a large reduction is required such as 6” x 1”, 4” x 1” Etc.
The model 300 can be used as an alternative to expensive swaged nipple

Model 300 End Cap

Model 300EH End Cap With Eccentric Hole

Model 300CH End Cap With Center Hole

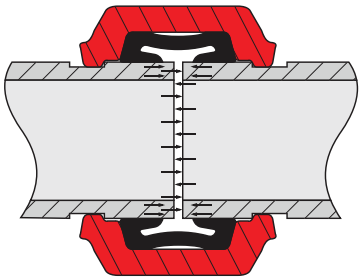
Size		Model 300 End Cap		Model 300CH End Cap With Center Hole		Model 300EH End Cap With Eccentric Hole	
Nominal Dia.	Actual O.D.	T	Approx. Wgt.	T	Approx. Wgt.	T	Approx. Wgt.
DN Inches	mm Inches	mm Inches	kg Lbs.	mm Inches	kg Lbs.	mm Inches	kg Lbs.
25 1	33.4 1.315	28 1.10	0.1 0.22	--- ---	--- ---	--- ---	--- ---
32 $1^1/_4$	424. 1.660	28 1.10	0.13 0.29	--- ---	--- ---	--- ---	--- ---
40 $1^1/_2$	48.3 1.900	28 1.10	0.15 0.33	--- ---	--- ---	--- ---	--- ---
50 2	60.3 2.375	37 1.46	0.22 0.48	25 1.00	0.31 0.68	25 1.00	0.25 0.55
65 $2^1/_2$	73.0 2.875	37 1.46	0.3 0.66	25 1.00	0.36 0.79	25 1.00	0.36 0.79
65 $2^1/_2$	76.1 3.000	37 1.46	0.32 0.7	25 1.00	0.38 0.84	25 1.00	0.38 0.84
80 3	88.9 3.500	41 1.61	0.41 0.9	25 1.00	0.52 1.15	25 1.00	0.52 1.15
100 4	108.0 4.250	51 2.00	0.69 1.52	25 1.00	0.8 1.76	25 1.00	0.8 1.76
100 4	114.3 4.500	51 2.00	0.71 1.56	25 1.00	0.82 1.81	25 1.00	0.82 1.81
125 5	133.0 5.250	51 2.00	1.04 2.29	25 1.00	1.15 2.53	25 1.00	1.15 2.53
125 5	139.7 5.500	51 2.00	1.11 2.44	25 1.00	1.23 2.71	25 1.00	1.23 2.71
125 5	141.3 5.563	51 2.00	1.12 2.47	25 1.00	1.24 2.73	25 1.00	1.24 2.73
150 6	159.0 6.250	55 2.17	1.38 3.04	25 1.00	1.56 3.44	25 1.00	1.56 3.44
150 6	165.1 6.500	55 2.17	1.45 3.19	25 1.00	1.68 3.7	25 1.00	1.68 3.7
150 6	168.3 6.625	55 2.17	1.51 3.33	25 1.00	1.72 3.79	25 1.00	1.72 3.79
200 8	219.1 8.625	68 13.00	3.13 6.89	30 1.18	3.71 8.17	30 1.18	3.71 8.17
250 10	273.0 10.750	75 2.95	5.52 12.16	32 1.25	6.17 13.59	32 1.25	6.17 13.59
300 12	323.9 12.750	81 3.20	8.44 18.59	32 1.25	9.73 21.43	32 1.25	9.73 21.43

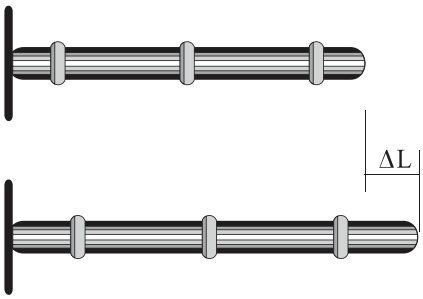
SELF-CENTERING

The flanges of the couplings fit into the grooves in the fittings/ tubes, completely enclosing the diameter and thus avoiding their separation as a result of pressure and other external forces across the full working pressure range of the coupling.

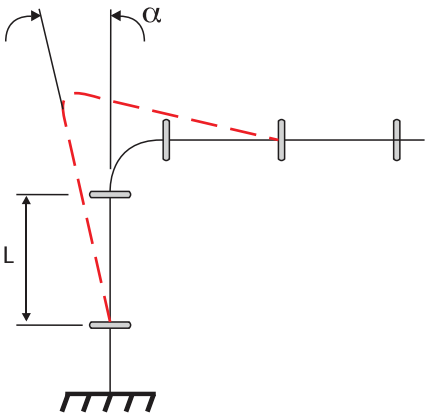
The relative position between the coupling and the groove can vary until the circulating fluid has steadied, at which time the joint will be centred.

In the case of anticipated pressure surges, it will be necessary to make adequate arrangements in the system (accommodation of linear and angular movements).





Example: provision for the increase in length of the system



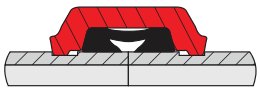
Example: provision for the movement in a bent joint.

RIGIDITY OR FLEXIBILITY

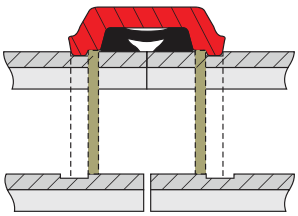
Depending on the requirements, two designs types are available.
The rigid couplings have a series of teeth in the flange that "grip" the tube and fix the joint in a determined position. Flexible couplings allow linear and angular movement between the joined tubes so that: - The use of expansion joints are limited.

The existence of free spaces between the elements to be joined (fittings/couplings/tubes) is allowed, enabling linear movements – expansion and contraction – in the tubing resulting from temperature changes or other forces inherent in the system (pressure surges….) whose scale depends on the type of groove, the dimension of the tube in question and the tolerances of the grooves in the make-up of the elements involved in the joint.

EXPANSION

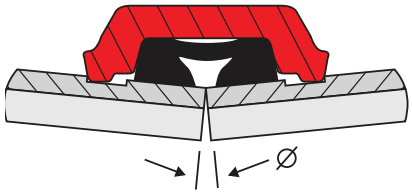


CONTRACTION

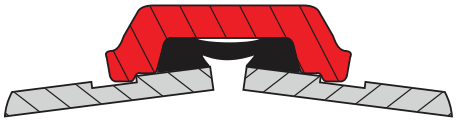


Angular displacements of the tubing are possible as a result of the space which exists between the coupling/fitting flange and the geometry of the groove, allowing the alignment of the tubing to adapt itself to situations in which certain changes of direction are required (walls, broken ground etc.) the angle permitted varies according to the size and type of coupling and needs to take into account the tolerances of the grooves when assembling the various constituents of the joint.

The stresses caused by the surfaces on which the tubing is located are absorbed and eliminated.



Angular movement (angle Ø)



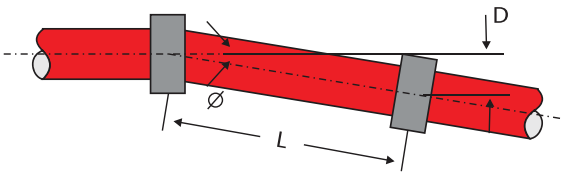
The design also permits a limited capacity for mixed movement (the maximum values for linear and angular movement can never be reached simultaneously).

The design allows the partial adaptation of certain rotational movements caused by thermal expansion, vibration etc. but does not allow any form of constant pivotal articulation.

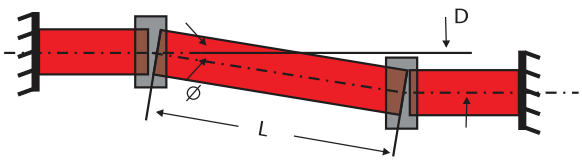
MISALIGNMENT

The capacity for angular movement allows the assembly of joints between non-aligned tubes (sinuous layouts) so that it will be possible to install curved alignments using straight tubing subject to prior calculation of the bend radius and the suitable lengths.

The curves in the tubing (whether this is linear on the same plane or lateral on different planes) can be adequately adjusted (always subject to the angle of deviation not exceeding the maximum value foreseen for the coupling) by means of the location of the number of necessary fittings.



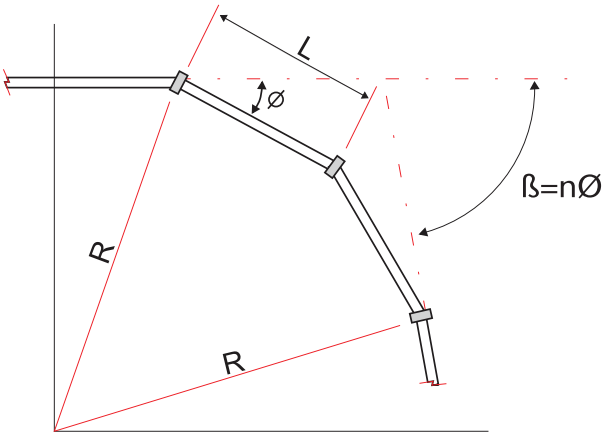
The tubing, subject to the stresses or deformation of the pressure or the temperature of the fluid, will tend, without securing to prevent it, to straighten itself. Therefore, if the curve is to be maintained, the tubes must be anchored at necessary points in order to resist the lateral forces and thus to maintain the joint.



Thus, the length of misalignment (D), expressed in mm., can be calculated as follows

D = L Sen Ø

With :
L = Length of the tube in question, expressed in mm.
Ø = maximum angle, expressed in degrees, between the axes of the tubes in question



CURVED ALIGNMENT

The alignment of curved runs using straight tubing and couplings is achievable owing to the possibility of the aforementioned misalignment.

Thus, taking into account the factors which determine the alignment of a curve are:

-the length of the tubing runs to be joined: L (mm)

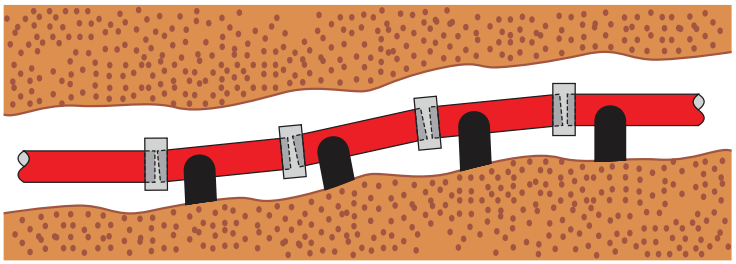
-the angular deviation required with respect to a central line of reference : Ø (º)

angular deviation resulting from the assembly : ß (º)

-the radius of the curve of the run : R (m)

-the number of couplings in the run : n the equation resulting from these is :

This possibility of curved runs means that the couplings make a very useful tool for special installations such as trunking which has to be placed underground and must therefore adapt itself to the irregularities of the terrain.



THERMAL EXPANSION

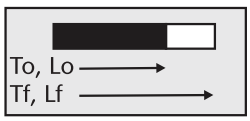
As a result of the interchange of heat between the interior and the exterior of the system (owing to their different temperatures), the joint can be subject to expansion or contraction making it necessary to determine the number of joints necessary in any given run length in order to compensate this phenomenon.

Linear Expansion

The change in length ***(ΔL= Lf - Lo)*** is proportional to the temperature change ***(ΔT = Tf - To)*** and to the initial (Lo) length of the tubing. The coefficient of proportionality, also known as coefficient of **linear expansion** (specific for each material), is named α.

$$\Delta L = (Lf - Lo) = \alpha . Lo . \Delta T$$

ΔL = increase in the length of the tubing (mm)
Lf = final length of the tubing (m)
Lo = initial length of the tubing (m)
ΔT = increase in temperature (ºC)
α = coefficient of linear expansion (ºC $^{-1}$)
α for steel = 1,2 x 10^{-5} (between 0 and 100ºC)
α copper = 1,7 x 10^{-5} (between 0 and 100ºC)



Example:

Initial tube length= 6m
Increase in T= 30ºC
Decrease in T= 20ºC

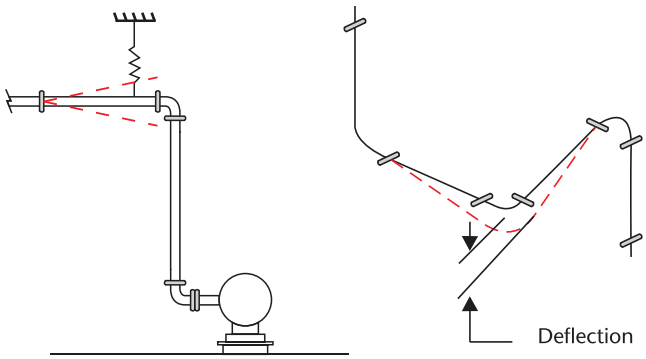
} increase in length= 2,16 mm
decrease in length = 1,44 mm

SECURING THE TUBES

The design of a grooved joint installation must take the following into account:
The weight of the components (tubes, couplings, fittings, fluid content).
Adequate protection against the existing stresses on the joints.
Dynamic factors of the system, both internal (pressure surges, temperature changes) and external (earth move- ments etc.).
Characteristics of the brackets and fixings (the use of those which allow the movement on various planes) The space to leave between two brackets will be, as a general approximation:

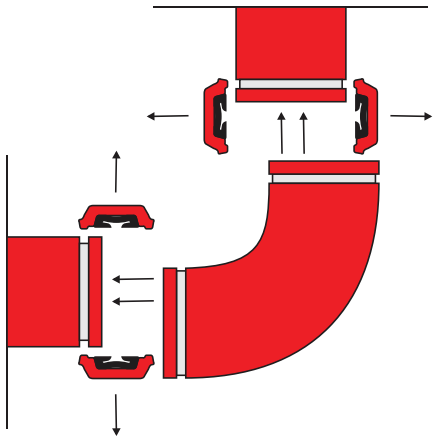
Tube	Space (m)
Up to 1″	2.0
1 1/4″ to 2 1/2″	3.0
2 1/2″ to 4″	3.5
5″ to 8″	4.0
10″ to 12″	4.5

The spacing of the brackets will depend on the particular characteristics of each installation. Nevertheless, one must establish the way in which deflections (arising from, for example, the weight of the fluid) can be avoid- ed and adequate absorption of vibration and cyclic variation (for example in pumping installations), etc. can be performed.



SUBSTITUTION OF TUBES

The couplings can be easily disassembled for mainte- nance purpose (repair and substitution of tubing, periodic rotation of tubes with the aim of spreading the internal wear and tear arising from residual liquids and other abrasive materials and thus increasing the life-span of the tubing….) Clearly, in order to avoid injuring people and damaging installations, prior to handling the joints, the system must be turned off and internal pressure discharged.



Substitution of tubing component

NOISE, VIBRATION AND INSULATION

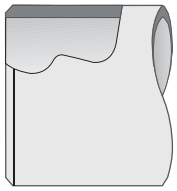
The elastomer gaskets and the scheduled separation between tubes help to insulate and absorb noise and vibration as well as minimizing their transmission. The tubes must be insulated using traditional methods

Throughout their lifetime, grooved Joint systems have demonstrated proven efficiency in countless applications, some of which are:

Fire prevention systems.
-Heating and air-conditioning systems.
-Industrial Installations (compressed air, hot and cold water supply, steam, storage installations , various piping networks, etc.).
-Civil engineering projects.
- Pumping Installations.
- Construction.
-Petroleum Industry.
-Processing Plants.

In order to obtain a joint with guaranteed sealing, the assembly must be in accordance with the following guidelines:

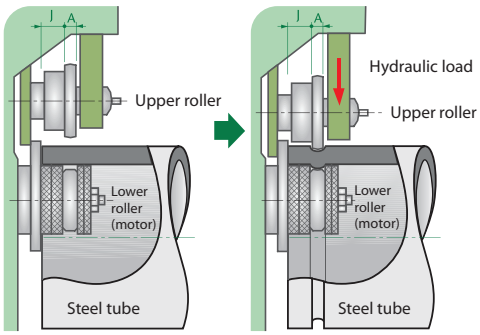
1.Correctly cut the tubes perpendicularly to their axes. Check the tubes with the object of ensuring that they contain no dirt, oil, burr, etc. the maximum length of the chamber must not exceed 1.5mm. Note: In soldered pipes the weld of the soldering at the ends must be removed in order to prevent the soldering machine from jumping (rolled).



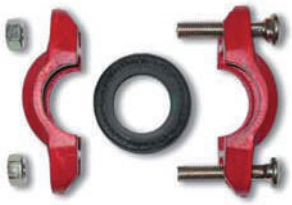
2. Using a suitable machine, make the appropriate grooves at the end of the tubes to be joined. The geometry of the resulting groove must comply with the dimensions specified in tables 6.1 and 6.2 whether it is cut or rolled.. If this is not done, the joint will not be safe. The grooves produced must be kept perfectly clean and free of any irregularity which might produce leakage.

Groove machine

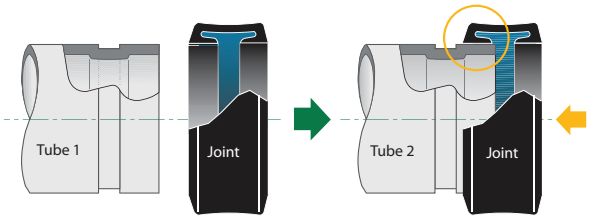
Rolled Groove



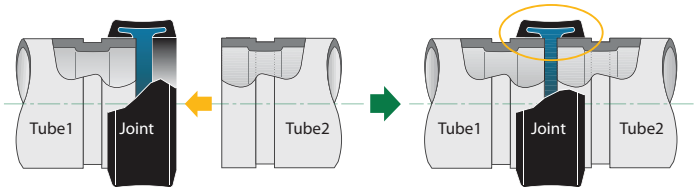
3. Unscrew the screws of the coupling and remove the sealing gasket. For some couplings it is enough to unscrew only one of the ends.



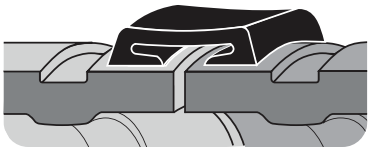
4. Position the gasket in one of the tubing ends ensuring that It does not enter the groove.
Note: in tubes with big diameters it might be advisable to totally introduce the gasket in the 1st tube, pass it into the 2nd tube and then push it along the 2nd tube in such a way that it is equally divided between both tubes



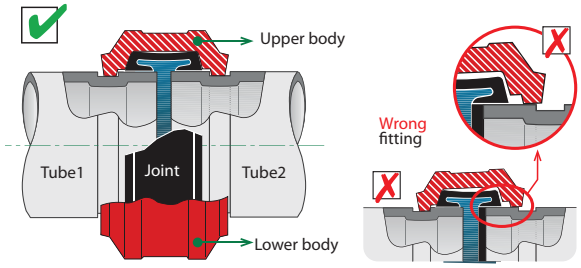
5.Bring the two tubes together, line them up and assemble the sealing gasket at the other end of the tube.



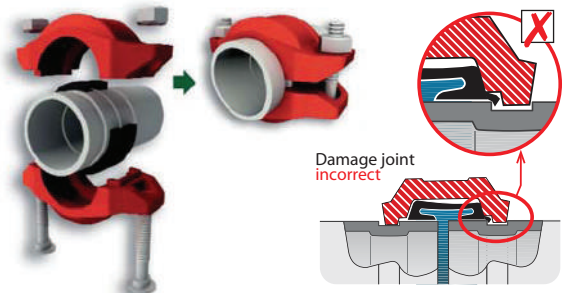
6. Reposition the gasket so that it is centred between the two tubes. It must sit on the surface of both tubes and under no circumstances, even partially, must it touch the grooved area.



7. Next, mount the bodies of the couplings. To do so, place the lower body on the gasket and then locate the upper body on top of it.



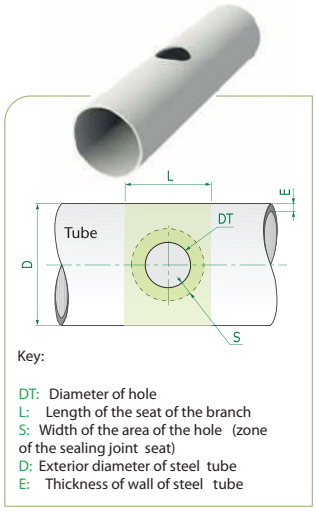
8. Once placed symmetrically, with a suitable tool start to tighten the nuts alternatively. Bear in mind that if the tightening is not done uniformly, There is a chance that the gasket will be nipped



9. Recommended torque values:

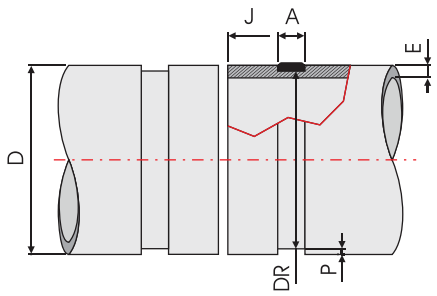
- Up to 2": 40 - 60 Nm
- Between 2" y 4": 105 - 135 Nm
- Between 4" y 6": 135 - 175 Nm
- Between 6" y 8": 175 - 245 Nm
- Between 8" y 12": 245 - 345 Nm

Note: it is advisable to reach metal on metal contact between the bodies of the flexible couplings.



Care should be taken to maintain the area of around 16mm outside the hole (quota s), along with the section of the tube of length L, free of burr, grease, dirt etc., with the aim of achieving total sealing. The coupling should sit perfectly

CUT GROOVE



The diameters of the grooves must have exact dimensions

o	D			J	A	DR		P	E
(DN/")	(mm/")			(mm/")	(mm/")	(mm/")		(mm/")	(mm/")
Designation of the tube	Exterior diameter of the tube			POSITION of the union (start of the groove)	WIDTH of the groove	Exterior diameter of the groove		Depth of the groove	Minimum thickness of the tube
	Valor Nominal	Tolerances				Nominal value	Tolerances		
		positive	negative				+0.000 / + 0.000		
25	33.7	0.33	-0.33	15.88	7.95	30.23	-0.38	1.6	3.38
1"	1.327	0.013	-0.013	0.625	0.313	1.190	-0.015	0.063	0.133
32	42.4	0.41	-0.41	15.88	7.95	38.99	-0.38	1.6	3.56
1 1/4"	1.669	0.016	-0.016	0.625	0.313	1.535	-0.015	0.063	0.14
40	48.3	0.48	-0.48	15.88	7.95	45.09	-0.38	1.6	3.68
1 1/2"	1.900	0.019	-0.019	0.625	0.323	1.779	-0.015	0.063	0.145
50	60.3	0.61	-0.61	15.88	7.95	57.15	-0.38	1.6	3.91
2"	2.375	0.024	-0.024	0.625	0.313	2.250	-0.015	0.063	0.154
65	76.1	0.76	-0.76	15.88	7.95	72.26	-0.46	1.98	4.78
21/2"	3.000	0.030	-0.030	0.625	0.313	2.845	-0.018	0.078	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	0.323	3.344	-0.018	0.078	0.188
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	139.7	1.42	-0.79	15.88	9.53	135.48	-0.51	2.11	5.16
5"	5.500	0.056	-0.031	0.625	0.375	5.334	-0.020	0.083	0.203
150	165.1	1.6	-0.79	15.88	9.53	150.78	-0.56	2.16	5.56
61/2"OD	6.500	0.063	-0.031	0.625	0.375	6.330	-0.022	0.085	0.219
150	168.3	1.6	-0.79	15.88	9.53	163.96	-0.56	2.16	5.56
6"	6.625	0.063	-0.032	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	1.6	-0.79	19.05	12.7	268.28	-0.69	2.39	6.35
10"	10.750	0.063	-0.031	0.750	0.500	10.562	-0.027	0.094	0.25
300	323.9	1.60	-0.79	19.05	12.7	318.29	-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

Φ Diameter of the tubing: designated in terms of Nominal Diameter (DN) and inches.

D Exterior diameter of the tubing:
maximum ovulation of 1%.
A square cut end tube without bevel is recommended.
In order not to damage the rollers of the grooves any dirt on the surface must be removed.

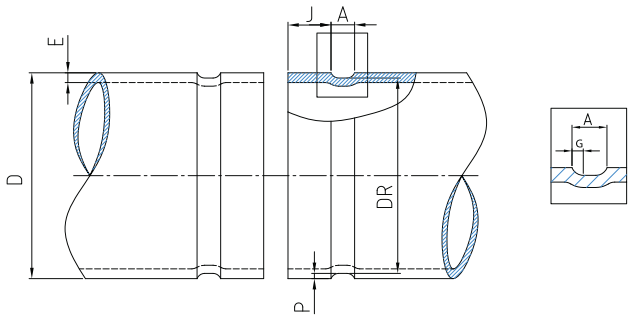
J Distance from the end of the tube to the beginning of the groove:
This is the surface where the half of the sealing gasket is gong to sit.
This surface should be perfectly clean and without obstruction. If otherwise, the gasket might not sit perfectly and this could give rise to a **risk of leakage**.

A Width of the Groove:
Its value is fundamental for correct expansion, contraction and angular deviation of the couplings. At the deep end of the groove the maximum radius must not exceed 3.75 mm.

DR Groove Diameter:
This must be perfectly concentric with the outside diameter of the tube and uniform in all its circumvallation.

Note 1: all the measurements are in millimetres (mm) and inches (")
Nota 2: the tolerance for the measurements J and A are :
from 1" a 3" : ± 0.76 mm / ± 0.03"
from 4" a 6" : ± 1.14 mm / ± 0.045"
from 8" a 12" : ± 1.52 mm / ± 0.06"

ROLLED GROOVE



The diameters of the grooves must have exact dimensions

0	D			J	A	DR		P	E	F	G
(DN / ")	(mm / ")			(mm / ")	(mm / ")	(mm / ")		(mm / ")	(mm / ")	(mm / ")	(mm / ")
Designation of the tube	Exterior diameter of the tube			POSITION of the union (start of the groove)	WIDTH of the groove	Exterior diameter of the groove		Depth of the groove	Minimum thickness of the tube	Maximum expansion "flare"	Maximum curve
	Valor Nominal	Tolerances				Nominal value	Tolerances				
		positive	negative				+ 0.000 / + 0.000				
25	33.7	0.33	-0.33	11.88	7.14	30.23	-0.38	1.6	1.65	36.3	2,0
1"	1.327	0.013	-0.013	0.625	0.281	1.190	-0.015	0.063	0.065	1.43	0,079
32	42.4	0.41	-0.41	11.88	7.14	38.99	-0.38	1.6	1.65	45	2,0
1 1/4"	1.669	0.016	-0.016	0.625	0.281	1.535	-0.015	0.063	0.065	1.77	0,079
40	48.3	0.48	-0.48	11.88	7.14	41.09	-0.38	1.6	1.65	51.1	2,0
1 1/2"	1.900	0.019	-0.019	0.625	0.281	1.779	-0.015	0.063	0.065	2.01	0,079
50	60.3	0.61	-0.61	11.88	8.74	57.15	-0.38	1.6	1.65	63	2,0
2"	2.375	0.024	-0.024	0.625	0.344	2.250	-0.015	0.063	0.065	2.48	0,079
65	76.1	0.76	-0.76	11.88	8.74	72.26	-0.46	1.99	2.11	78.7	2,0
2 1/2"	3.000	0.030	-0.030	0.625	0.344	2.841	-0.018	0.078	0.083	3.1	0,079
80	88.9	0.89	-0.79	11.88	8.74	84.94	-0.46	1.98	2.11	91.4	2,0
3"	3.500	0.035	-0.031	0.625	0.344	3.344	0.018	0.078	0.083	3.6	0,079
100	114.3	1.14	-0.79	11.88	8.74	110.08	-0.51	2.11	2.11	116.8	2,0
4"	4.500	0.045	-0.031	0.625	0.344	4.334	-0.020	0.083	0.083	4.6	0,079
125	139.7	1.42	-0.79	11.88	8.74	131.48	-0.51	2.11	2.77	142.2	2,0
5"	5.500	0.056	-0.031	0.625	0.344	5.334	-0.020	0.083	0.109	5.6	0,079
150	165.1	1.6	-0.79	11.88	8.74	160.78	-0.56	2.16	2.77	167.6	2,0
6 1/2" OD	6.500	0.063	-0.031	0.625	0.344	6.330	-0.022	0.081	0.109	6.6	0,079
150	168.3	1.6	-0.79	11.88	8.74	163.96	-0.56	2.16	2.77	170.9	2,0
6"	6.625	0.063	-0.031	0.625	0.344	6.455	-0.022	0.081	0.109	6.73	0,079
200	219.1	1.60	-0.79	19.01	11.91	214.40	-0.64	2.34	2.77	223.5	1,5
8"	8.621	0.063	-0.031	0.750	0.469	8.441	-0.025	0.092	0.109	8.8	0,019
250	273.0	1.6	-0.79	19.01	11.91	268.28	-0.69	2.39	3.4	277.4	1,5
10"	10.750	0.063	-0.031	0.750	0.469	10.562	-0.027	0.094	0.134	10.92	0,019
300	323.9	1.60	-0.79	19.01	11.91	318.29	-0.76	2.77	3.96	328.2	1,5
12"	12.750	0.063	-0.031	0.750	0.469	12.531	-0.030	0.109	0.156	12.92	0,019

Φ Diameter of the tubing: designated in terms of Nominal Diameter (DN) and inches.

D Exterior diameter of the tubing:
maximum ovulation of 1%.
A square cut end tube without bevel is recommended.
In order not to damage the rollers of the grooves any dirt on the surface must be removed.

J Distance from the end of the tube to the beginning of the groove:
This is the surface where the half of the sealing gasket is gong to sit.
This surface should be perfectly clean and without obstruction. If otherwise, the gasket might not sit perfectly and this could give rise to a **risk of leakage**.

A Width of the Groove:
Its value is fundamental for correct expansion, contraction and angular deviation of the couplings. At the deep end of the groove the maximum radius must not exceed 3.75 mm.

DR Groove Diameter:
Debe ser perfectamente concéntrico con el diámetro exterior del tubo y uniforme en toda su circunvalación.

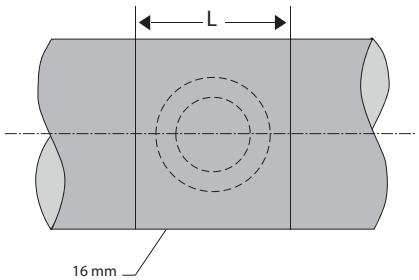
F maximum expansion:
Maximum diameter of the average flare at the end of the tube ("flare Diameter").

Note 1: all the measurements are in millimetres (mm)and inches (**"**).

Note 2: the tolerance for the measurements J and A are :
from 1" to 3" : ± 0.76 mm / ± 0.03"
from 4" to 6" : ± 1.14 mm / ± 0.045"
from 8" to 12" : ± 1.52 mm / ± 0.06"

When it is necessary to perform a deviation, the hole produced should comply with the tolerances specified below and be correctly situated on the central line of the tube.

In the section of length L and in an area of 16mm around the hole, the surface must be perfectly clean and smooth so that the gasket is perfectly seated. Never flame drill.



3L (Branch for sprinkler)

Main tube	Required branch	Hole to execute		Length L (mm)
		Nominal diameter (mm - Inches)	Maximum diameter (mm - Inches)	
DN32 (1 1/4") (Φ ext = 42,4 mm)	DN15 (1/2" - 21,3 mm)	30.5 - 1.20	31.6 - 1.24	89
	DN.20 (3/4" - 26,9 MM)	30.5 - 1.20	31.6 - 1.24	89
	DN25 (1" - 33,4 mm)	30.5 - 1.20	31.6 - 1.24	89
DN40 (1 1/2") (Φ ext = 48,3 mm)	DN15 (1/2" - 21,3 mm)	30.5 - 1.20	31.6 - 1.24	89
	DN20 (3/4" - 26,9 MM)	30.5 - 1.20	31.6 - 1.24	89
	DN25 (1" - 33,4 mm)	30.5 - 1.20	31.6 - 1.24	89
DN50 (2") (Φ ext = 60,3 mm)	DN15 (1/2" - 21,3 mm)	30.5 - 1.20	31.6 - 1.24	89
	DN20 (3/4" - 26,9 MM)	30.5 - 1.20	31.6 - 1.24	89
	DN25 (1" - 33,4 mm)	30.5 - 1.20	31.6 - 1.24	89
DN65 (2 1/2") (Φ ext = 76,1 mm)	DN15 (1/2" - 21,3 mm)	30.5 - 1.20	31.6 - 1.24	89
	DN20 (3/4" - 26,9 MM)	30.5 - 1.20	31.6 - 1.24	89
	DN25 (1" - 33,4 mm)	30.5 - 1.20	31.6 - 1.24	89

3J and 3G (Mechanical tee threaded and grooved)

Main tube	Required branch	Hole to execute		Length L (mm)
		Nominal diameter (mm - Inches)	Maximum diameter (mm - Inches)	
DN50 (2") (Φ ext = 60,3 mm)	DN15 (1/2" - 21,3 mm)	38.0 -1.50	39.6 -1.l6	89
	DN.20 (3/4" - 26,9 MM)	38.0 -1.50	39.6 -1.l6	89
	DN25 (1" - 33,4 mm)	38.0 -1.50	39.6 -1.l6	89
	DN32 (11/4" - 42,4 mm)	44.5 -1.75	46.6 -1.83	102
	DN40 (11/2" - 48,3 MM)	44.5 -1.75	46.6 -1.83	102
DN65 (2 1/2") (Φ ext = 76,1 mm)	DN15 (1/2" - 21,3 mm)	38.0 -1.50	39.6 -1.l6	89
	DN20 (3/4" - 26,9 MM)	38.0 -1.50	39.6 -1.l6	89
	DN25 (1" - 33,4 mm)	38.0 -1.50	39.6 -1.l6	89
	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
DN80 (3") (Φ ext = 88,9 mm)	DN15 (1/2" - 21,3 mm)	38.0 -1.50	39.6 -1.l6	89
	DN20 (3/4" - 26,9 MM)	38.0 -1.50	39.6 -1.l6	89
	DN25 (1" - 33,4 mm)	38.0 -1.50	39.6 -1.l6	89
	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
DN100 (4") (Φ ext = 114,3 mm)	DN15 (1/2" - 21,3 mm)	38.0 -1.50	39.6 -1.l6	89
	DN20 (3/4" - 26,9 MM)	38.0 -1.50	39.6 -1.l6	89
	DN25 (1" - 33,4 mm)	38.0 -1.50	39.6 -1.l6	89
	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
	DN65 (21/2" - 76,1mm)	70.0 -2.75	71.6 -2.82	120
	DN80 (3" - 88,9 MM)	89.0 -3.50	90.6 -3.l7	140
DN125 (5") (Φ ext = 139,7 mm)	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
	DN65 (21/2" - 76,1mm)	70.0 -2.75	71.6 -2.82	120
DN150 (61/2" OD) (Φ ext = 165,1 mm)	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
	DN65 (21/2" - 76,1mm)	70.0 -2.75	71.6 -2.82	120
DN150 (6") (Φ ext = 168,3 mm)	DN32 (11/4" - 42,4 mm)	51.0 -2.00	52.6 -2.07	102
	DN40 (11/2" - 48,3 MM)	51.0 -2.00	52.6 -2.07	102
	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114
	DN65 (21/2" - 76,1mm)	70.0 -2.75	71.6 -2.82	120
	DN80 (3" - 88,9 MM)	89.0 -3.50	90.6 -3.l7	140
	DN100 (4" - 114,3 mm)	114.0 -4.50	115.6 -4.55	165
DN200 (8") (Φ ext = 219,1 mm)	DN50 (2" - 60,3 mm)	64.0 -2.50	6l.6 -2.l8	114

Pipe Preparation Tools

Field Fabrication

WINGROOVER 2 - 12 ''

Advance electro-hydraulic rolling groover for steel pipes Ø 2-12 (60-325 mm) for rolling of grooves on thin-walled and standard steel pipes

Product Profile

APPLICATION AREA

Sprinkler systems, installations, larger heading units, industrial use and mining

KEY FEATURES

- Designed for field roll grooving of 2-12 (60-325mm pipe
- Sturdy hydraulic-pump with precisely formed grips for ideal handling
- Compact and very stable machine design
- Powerful yet quiet motor
- Fine adjustment for groove depth and regulation

TECHNICAL DATA

Working range	:	2 - 12" (60 - 325 mm)
Pipe wall-thickness	:	3 - 10 mm
Weight	:	128 kg
Dimensions	:	880 x 620 x880 mm
Current	:	110 -240 v, 50 /60 Hz
Power	:	1, 100 W
Speed	:	23 U/min
Max. working pressure	:	8,000 kg

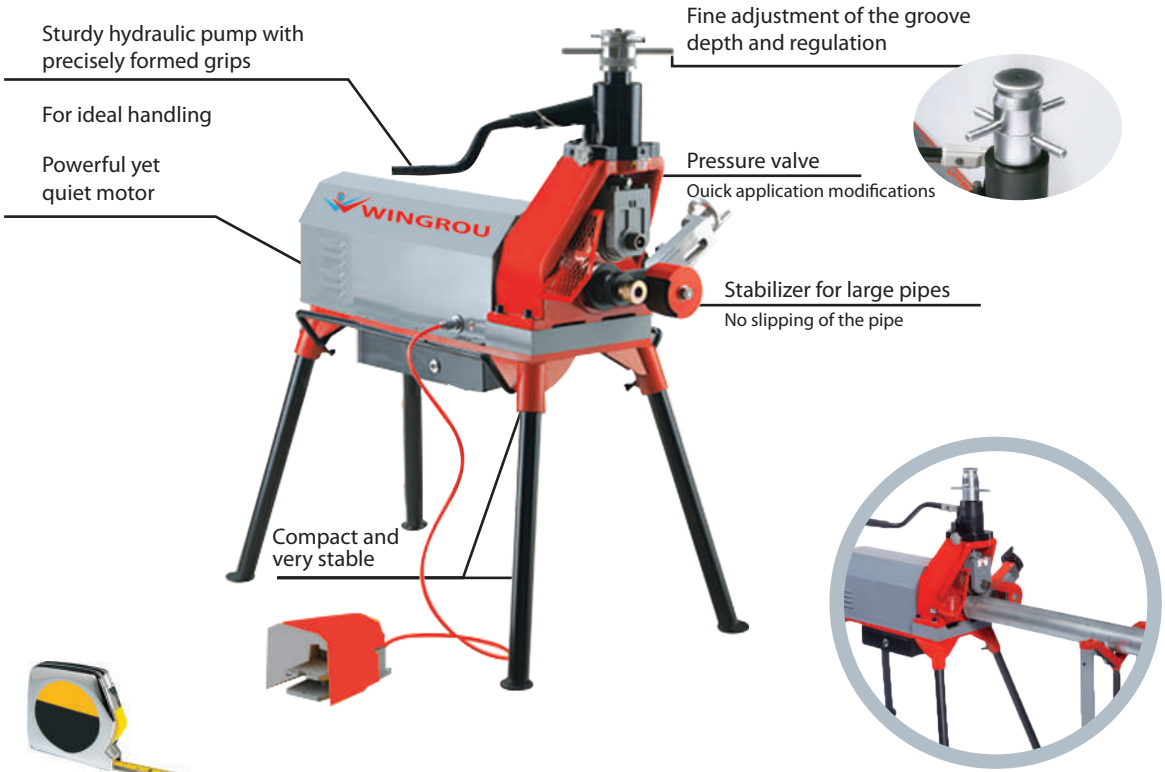
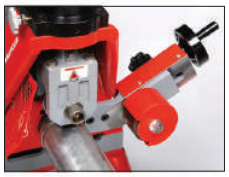


Fig. Diameter measuring tape



Scope of delivery: WINGROOVER machine 2 - 12", roll groove set 2-1/2roll groove set 3-6", roll groove set 8-12", pipe support stand, tools for installation, diameter measuring tape, installation and instructional CD

Model	kg	
WINGROOVER 2-12"	128.0	1
Roll Groove set 2 - 21/2"	1.5	1
Roll Groove set 3 - 6"	2.2	1
Roll Groove set 8 - 12"	2.4	1

Model	kg	
Top Roll Groove set 2 - 6"	1.5	1
Top Roll Groove set 8 -12	2.2	1
Pipe Support Stand	29	1
Diameter measuring tape	0.05	1

Pipe Preparation Tools
Field Fabrication

WINGROOVER 8 - 24 ''

Advance electro-hydraulic rolling groover for steel pipes Ø 8-24 (219-630 mm) for rolling of grooves on thin-walled and standard steel pipes

Product Profile

APPLICATION AREA

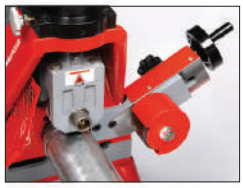
Sprinkler systems, installations, larger heading units, industrial use and mining

KEY FEATURES

- Designed for field roll grooving of 8-24 (219-630 mm) pipe
- Sturdy hydraulic-pump with precisely formed grips for ideal handling
- Compact and very stable machine design
- Powerful yet quiet motor
- Fine adjustment for groove depth and regulation

TECHNICAL DATA

Working range	:	8 - 24" (219-630 mm)
Pipe wall-thickness	:	13 mm
Weight	:	340 kg
Dimensions	:	102x75x47 (cm)
Current	:	Three phase Hz(220/380/415/440V
Frequency	:	50/60HZ
Speed	:	14 rpm



Scope of delivery: WINGROOVER machine 8-24 roll groove set 8-14 roll groove set 16-18", roll groove set 20-24", pipe support stand, tools for installation, diameter measuring tape, installation and instructional CD

Model	kg	
WINGROOVER 8-24"	300	1
Roll Groove set 8-14"	9	1
Roll Groove set 16-18"	8.675	1
Roll Groove set 20-24"	8.515	1

Model	kg	
Top Roll Groove set 8-22"	1.27	1
Top Roll Groove set 24	1.32	1
Pipe Support Stand	55	1

General

These terms and conditions shall control with respect to any purchase order or sale of seller's products. No waiver, alteration or modification of these terms and conditions whether on Buyers' purchase order or otherwise shall be valid unless the waiver, alteration or modification is specifically accepted in writing and singed by an authorized representative of seller.

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Seller will make every effort to complete delivery of products as indicated on seller's acceptance of an order, but seller assumes no responsibility or liability, and will accept no back charge, for loss or damage due to delay or inability to deliver caused by acts of God, war labor difficulties, accident, delays, or carriers, by contractors or suppliers, inability to obtain materials, shortages of fuel and energy, or any other causes of any kind whatsoever beyond the control of seller. Seller may terminate any contract of sale of its Products without liability of any nature, by written notice to buyer, in the event that the delay in the delivery or performance resulting from any of the aforesaid cause shall continue for a period of sixty (60) days. Under no circumstances shall Seller be liable for any special or consequential damage or for loss, damage, or expense (whether or not based on negligence) directly or indirectly arising from delays or failure to give notice of delay.

Warranty

We warrant all products to be free from defects in materials and workmanship under normal conditions of use and service.
Our obligation under this warranty is limited to repairing or replacing at our option at our factory any product which shall within one year after delivery to original buyer, be returned with transportation charges prepaid, and which our examination shall show to our satisfaction to have been defective.

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Seller neither assumes nor authorizes any person to assume for it any other liability In connection with the sales of such products.
This warranty shall not apply to any product which has been subject to misuse, negligence or accident, which has been repaired or altered in any manner outside of the factory or which has been used in a manner contrary to Seller instructions or recommendations. Seller shall not be responsible for delivery errr and design error due to inaccurate or incomplete information supplied by Buyer or its representatives.

Liability

Seller will not be liable for any loss, damage, cost of repairs, incidental or consequential damages of any kind, whether based upon warranty (except for the obligation accepted by Seller under "warranty" above), contract or negligence arising in connection with the design, manufacture, sale, use or repair of the products or of the engineering designs supplied to buyer.

Returns

Seller cannot accept return of any products unless its written permission has been first obtained, in which case same be credited subject to the following (a) All materials returned must, on its arrival at Seller's plant, be found to be in first-class condition; if not, cost of putting in saleable condition will be deducted from credit memoranda; (b) A handling charge deduction of twenty five (25%) will be made from all credit memoranda issued for material returned; (c) Transportation charges, if not prepaid will be deducted from credit memoranda.

Shipments

All products sent out will be carefully examined, counted and packed. The cost any special packing or special handling caused by Buyer's requirements or request shall be added to the amount of the order. No claim for shortages will be allowed unless made in writing within ten (10) days of receipt of a shipment. Claims for products damaged or lost in transit should be made on the carrier, Seller's responsibility ceases, and title passes, on delivery to the carrier.

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