

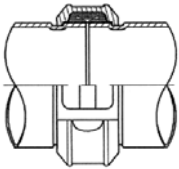

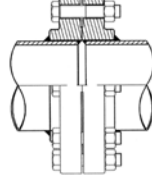
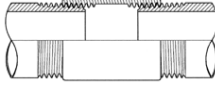




SHURJOINT GROOVED PIPING SYSTEM

The Shurjoint grooved piping system is one of the most advanced, versatile, economical and reliable systems available today. After the pipe ends are grooved a gasket is stretched over the pipe ends. The coupling segments are then placed over the gasket and the bolts and nuts are fastened resulting in a secure and leak free joint.

A coupling can be installed 3–4 times faster than a comparable welded or brazed joint and there is no need for a flame or welding torch on the job site. A coupling can be installed by fastening a pair of bolts and nuts while using only a wrench or spanner, whereas a comparable flanged joint requires the fastening of many bolts and nuts with a pair of wrenches. The grooved system allows for easy material take-offs and unlike a threaded system, there is no need to allow for added pipe length for thread engagement. With the removal of just a few bolts one can easily access the system for cleaning, maintenance, changes and or system expansion.

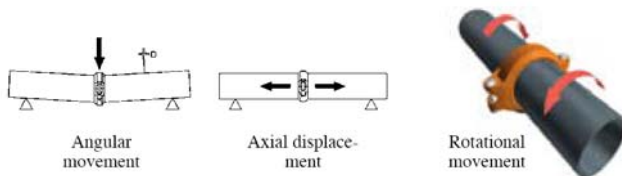


Major Pipe Joining Methods - Quick Comparison

System Type	Grooved	Welded	Flanged	Threaded
Joint Construction				
Pipe End Preparation	Roll-grooving. Fast and easy.	Beveled Ends	Welding of flanges by qualified welders.	Threading by skillful operators is required.
Equipment Required	Roll-grooving machine 	Welding equipment 	Welding equipment 	Pipe threading machine 
Installation	Easy fastening of bolts & nuts using only a wrench or spanner.	Welding tools and supplies required on the jobsite. A skillful and proper weld can be time consuming	A minimum of two wrenches or spanners required. Time consuming to tighten many bolts and nuts.	Pipe wrench required. As the pipe size increases so does the difficulty and force required for proper installation.
Allowance For Axial Displacement And Deflection	Yes – Couplings can allow for both.	No	No	No
Required Space For Installation	Can be installed in small spaces.	Adequate space is necessary for welding tools and welding around the entire O.D. of the pipe.	Adequate space is required as the flange adapter O.D. is large and the wrenches require ample working space.	Adequate space is required for turning the pipe wrench.
Ease of Prefabrication	Very Easy	Difficult	Difficult	Difficult
Surface Corrosion Resistance	Easy - Ant-corrosive paint	Difficult – Hard to paint inside of the pipe after welding.	Easy – Anti-corrosive paint	Easy to paint outside of the pipe after installation but inside threads are vulnerable to corrosion.
Quality Control	Product quality is easily controlled at the factory and or job site. Installation can be visually checked.	Quality of job site welding can be inconsistent. X-ray inspection may be required.	Quality of job site welding can be inconsistent.	Varies depending on skills of workers on the jobsite as all work is usually performed on site.
Maintenance and or Disassembly	Easy to dismantle and reinstall. System is flexible and forgiving.	Very difficult and rigid, cutting and flame is required.	Very difficult to dismantle and re-install due to limited space.	Difficult due to thread engagement, thread corrosion, limited space and need for a union.
Design & Cost Estimating	Easy take-offs and estimating. Most materials can be pre-fabricated.	Labor is difficult to estimate as the individual skill levels of welders is a determining factor.	Labor is difficult to estimate as the skill levels of welders and very accurate make-up is a determining factor.	Labor is difficult to estimate because prefabrication is not possible all work is performed on the job site.

RIGID OR FLEXIBLE?

Shurjoint grooved couplings are classified into two types, flexible and rigid. What are the differences? When and where should they be used? 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 advantages of grooved piping components and systems.



Type	Angular Movement deg.	Axial Displacement mm	Rotation after installation	Model Nos.
Flexible Coupling	$\geq 1^\circ$	1.6 - 3.2	Yes	7705, 7706, 7707, SS-8, SS-8X
Rigid Coupling	Angle-pad design	< 1.6	No	Z05, Z07, C305
	T&G design	< 1.6	No	K9, 7771, SS-7, XH-70
	Butt-joint design	< 0.3°	< 0.8	R20

Note: 1) Angular movement of flexible couplings 8" and larger sizes should be $\geq 0.5^\circ$
 2) Axial displacement data based on roll-grooved pipe.

Rigid Couplings

The most popular and most widely used couplings today

Shurjoint rigid couplings can be used in applications 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 *Shurjoint* 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.

Shurjoint offers three different types of rigid couplings, the angle-pad design, the T&G (tongue and groove) design and the most recent innovation, the butt-joint design. The butt-joint design effectively eliminates the gap between pipe ends, offering increased rigidity.



#R20 Butt-joint Rigid Coupling

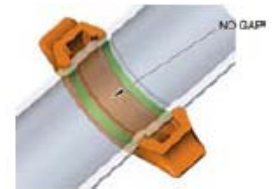
- **Angle-pad design:** As the bolts are tightened, the angled bolt pads slide in opposite directions causing the couplings keys to tightly grip the pipe, while at the same time the pipe grooves are forced outward against the coupling keys.



- **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. *Shurjoint* precision casting techniques allow the coupling segments to meet metal-to-metal when installed on properly grooved pipe.



- **Butt-joint design:** The unique butt-joint design eliminates the gap in between pipe ends, thus eliminating not only angular and rotational movement but also axial displacement under normal service conditions*. Fluid will not directly contact the gasket nor sit in the gasket pocket. The coupling segments will always come together forming metal-to-metal contact when properly installed. (*Pipes must be cut true and square to achieve a butt-joint.)



Flexible Couplings

Shurjoint flexible couplings allow for full design features in such applications 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 (**see Anchoring, hanging and supports on data sheet #B-20**).

There are several published standards and codes covering grooved piping components. 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. The 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 couplings 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. See Typical Applications of Flexible Couplings on Shurjoint Data Sheet #B-19).



Axial Displacement & Angular Movement (Models 7705 & 7707)

Size		Axial Displacement	Angular Movement (Deflection)	
Nom. Size	Actual OD		Per coupling	Per pipe
mm/in	mm/in	mm/in	degrees	mm/m, in/ft
20	26.7	1.6	6° - 46'	118
¾	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
1¼	1.660	0.0625		0.91
40	48.3	1.6	3° - 48'	66
1½	1.900	0.0625		0.80
50	60.3	1.6	3° - 01'	53
2	2.375	0.0625		0.63
65	73.0	1.6	2° - 30'	44
2½	2.875	0.0625		0.52
76.1mm	76.1	1.6	2° - 24'	42
	3.000	0.0625		0.50
80	88.9	1.6	2° - 04'	36
3	3.500	0.0625		0.43
101.6mm	101.6	1.6	1° - 48'	31
	4.000	0.0625		0.38
108.0mm	108.0	3.2	3° - 24'	59
	4.25	0.125		0.71
100	114.3	3.2	3° - 12'	55
4	4.500	0.125		0.67
127.0mm	127.0	3.2	2° - 53'	50
	5.000	0.125		0.60
133.0mm	133.0	3.2	2° - 46'	48
	5.250	0.125		0.58
139.7mm	139.7	3.2	2° - 37'	46
	5.500	0.125		0.55
125	141.3	3.2	2° - 36'	45
5	5.563	0.125		0.54

Size		Axial Displacement	Angular Movement (Deflection)	
Nom. Size	Actual OD		Per coupling	Per pipe
mm/in	mm/in	mm/in	degrees	mm/m, in/ft
159.0mm	159.0	3.2	2° - 18'	40
	6.250	0.125		0.48
165.1mm	165.1	3.2	2° - 14'	39
	6.500	0.125		0.47
150	168.3	3.2	2° - 10'	38
6	6.625	0.125		0.45
200JIS	216.3	3.2	1° - 42'	30
	8.516	0.125		0.36
200	219.1	3.2	1° - 40'	29
8	8.625	0.125		0.35
250JIS	267.4	3.2	1° - 22'	24
	10.528	0.125		0.29
250	273.0	3.2	1° - 20'	23
10	10.750	0.125		0.28
300JIS	318.5	3.2	1° - 10'	20
	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 with no internal pressure.