

PIPE SUPPORT

FLEXIBLE COUPLINGS

Piping systems require that the support system accommodate the weight of all system components among which pipe, couplings, fluids, etc. In addition, reducing stresses, accommodation for thermal expansion or contraction, seismic movement, building settlement and others must be considered.

The tables below provide guidelines for steel piping systems with the use of grooved couplings and fittings without concentrated loads between pipe supports.

WHERE LINEAR MOVEMENT IS NEEDED

For pipe runs where linear movement is provided by the flexible couplings, the table below depicts the number of needed pipe supports per length of pipe.

Nominal Size (Inches / DN)	Pipe length in ft.							
	11	12	15	21	24	29	35	40
Up to 2" / 50	2	2	2	3	4	4	5	6
2½" / 65 up to 4" / 100	1	2	2	2	2	3	4	4
5" / 125 up to 16" / 400	1	1	2	2	2	3	3	3

WITHOUT LINEAR MOVEMENT

For pipe runs where linear movement provided by the flexible couplings is not needed, the table below depicts the maximum distance between pipe supports.

Nominal Size (Inches / DN)	Pipe length in ft.
Up to 1½" / 40	12
2" / 50 up to 8" / 200	15
10" / 250 up to 12" / 300	16
14" / 350 up to 16" / 400	18

PIPE SUPPORT RIGID COUPLINGS

For pipe runs with rigid couplings, the table below depicts the maximum distance between pipe supports.

Nominal Size (Inches / DN)	Water services in ft.			Air services in ft.		
	A	B	C	A	B	C
1¼" / 32	7	9	12	9	9	12
1½" / 40	7	11	12	9	11	12
2" / 50	10	13	15	13	15	15
2½" / 65	11	14	15	14	16	15
3" / 80	12	15	15	15	17	15
4" / 100	14	17	15	17	21	15
5" / 125	16	19	15	20	24	15
6" / 150	17	20	15	21	25	15
8" / 200	19	21	15	24	27	15
10" / 250	19	21	15	24	32	15
12" / 300	23	21	15	30	33	15
14" / 350	23	21	15	30	33	15
16" / 400	27	21	15	35	33	15

- A. Spacing by ANSI B31.1 - Power piping code
- B. Spacing by ANSI B39.1 - Building piping code
- C. Spacing by NFPA 13 - Sprinkler systems code

FRICTIONAL RESISTANCE DATA

The chart below expresses the frictional resistance of Quikcoup Grooved End Fittings as equivalent meter of straight pipe.

Fittings that are not listed can be interpolated from the data given.

For example: a Style 42 - 22½° elbow is approximately one-half resistance of a Style 64 - 45° elbow of the same size.

Nominal Size (Inches / DN)	Pipe Outside Diameter	Style 64 Elbow 45°	Style 04 Elbow 45°	Style 66 Elbow 45°	Style 06 Elbow 90°	Style 05 Tee		Style 65 Tee	
		ft.	ft.	ft.	ft.	Main line	Branch line	Main line	Branch line
		ft.	ft.	ft.	ft.	ft.	ft.		
1" / 25	1,315	-	-	1.9	1.9	1.6	4.3	1.6	4.3
1¼" / 32	1,660	1.0	1.0	1.9	1.9	1.9	4.8	1.9	4.8
1½" / 40	1,900	1.2	1.2	2.3	2.3	2.3	5.8	2.3	5.8
2" / 50	2,375	1.6	1.6	3.2	3.2	3.2	8.0	3.2	8.0
2½" / 65	2,875	2.0	2.0	3.9	3.9	3.9	9.8	3.9	9.8
3" OD	3,000	2.1	2.1	4.1	4.1	4.1	10.3	4.1	10.3
3" / 80	3,500	2.4	2.4	4.9	4.9	4.9	12.2	4.9	12.2
4" OD	4,250	3.3	3.3	6.5	6.5	6.5	16.3	6.5	16.3
4" / 100	4,500	3.3	3.3	6.5	6.5	6.5	16.3	6.5	16.3
5" OD	5,250	4.0	4.0	8.0	8.0	8.0	20.0	8.0	20.0
5" OD	5,500	4.1	4.1	8.0	8.0	8.0	20.0	8.0	20.0
5" / 125	5,563	4.1	4.1	8.2	8.2	8.2	20.5	8.2	20.5
6" OD	6,250	4.8	4.8	9.5	9.5	9.5	23.8	9.5	23.8
6" OD	6,500	4.8	4.8	9.5	9.5	9.5	23.8	9.5	23.8
6" / 150	6,625	5.0	5.0	9.9	9.9	9.9	24.8	9.9	24.8
8" / 200	8,625	6.6	6.6	13.1	13.1	13.1	32.8	13.1	32.8
10" / 250	10,750	8.3	8.3	16.5	16.5	16.5	41.3	16.5	41.3
12" / 300	12,750	9.9	9.9	23.0	23.0	19.9	49.7	19.9	49.7

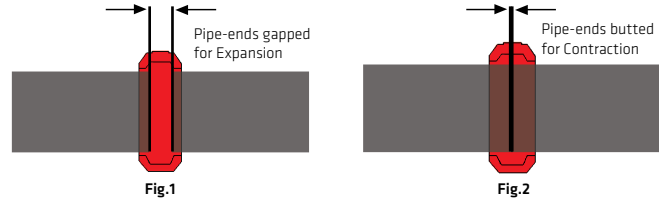
LINEAR MOVEMENT WITH FLEXIBLE QUIKCOUP COUPLINGS

In case thermal expansion is needed, the pipe ends at each joint should be fully gapped (fig. 1) to the maximum end gap. This can be achieved by pressurizing the system before anchoring the system.

In case of thermal contraction, the pipe ends at each joint should be fully butted (fig. 2). This system can be anchored in place to prevent the pipe ends from opening up to the maximum end gap when pressurized.

For design purposes, the maximum pipe end gap should be reduced to account for field practices as follows:

Nominal Size (Inches / DN)	Maximum pipe-end gap reduction
1¼" / 32 up to 3" / 80	50%
4" / 100 up to 16" / 400	25%



Therefore the following values should be used as available pipe end movements for Style 007, 75 and 07 flexible couplings:

Nominal Size (Inches / DN)	Pipe end movements	
	Cut grooves (inches)	Roll grooves* (inches)
1¼" / 32 up to 3" / 80	0 - 0.063	0 - 0.031
4" / 100 up to 16" / 400	0 - 0.189	0 - 0.945

* Roll groove joints provide half of the available movement of cut grooved joints.

THREE METHODS TO ACCOMODATE THERMAL EXPANSION/CONTRACTION

1. Design the system with rigid couplings and place expansion joints at the relevant locations. Expansion joints may be a series of flexible couplings of a sufficient quantity to accommodate the required movement.
2. Design the system with flexible and/or rigid couplings in such way that allows the pipes to move in desired directions, with the use of anchors and guides. It is important to ensure that movement at branch connections, changes of direction, equipment hookup, etc. will not cause damage or excessive stresses.
3. Design the system with flexible couplings utilizing the expansion/contraction capabilities of these couplings. The following example illustrates this method:

FLEXIBLE COUPLINGS CAN ACCOMODATE VIBRATION ABSORPTION

Vibration and noise in connected piping can be generated by equipment (e.g., pumps, chillers, etc.). Any vibrating, reciprocating, or rotating equipment should be mounted such that it does not transmit significant levels of vibration into the surrounding or supporting structure. Hence, it is important to provide vibration isolation for all attachments to a vibrating machine, including structural mounts and the connections to piping. Quikcoup flexible couplings can be used as a substitute for vibration compensators at device connections.

At least 3 pieces of Quikcoup style 75 or 007 flexible couplings should be installed consecutively at the source of vibration. Ensure proper installation of the flexible couplings and follow the Quikcoup installation instructions. Contact your engineering department or contact Modgal for questions.

OXIGEN DIFFUSION IN HYDRONIC SYSTEMS

Oxygen in a heating system can cause corrosion of piping, pumps, boilers and other components. Oxygen diffusion is the ability of oxygen molecules to pass through a material due to the material's molecular structure and a difference in the partial pressure of oxygen on each side of the material. Diffusion does not depend on system pressure, but on the partial pressure of the oxygen molecules across the permeable membrane. So under the right conditions atmospheric oxygen can enter a piping system filled with pressurized water.

Metal pipes and the housing of couplings and fittings (i.e. carbon steel, stainless steel, copper, aluminium and ductile iron) are not permeable. Testing by Modgal with Quikcoup couplings with standard EPDM gaskets has shown that Quikcoup couplings demonstrate oxygen diffusion characteristics equivalent to other metallic systems (i.e. welded). Quikcoup couplings do not contribute to oxygen concentrations in hydronic heating systems.

QUIKCOUP / Grooved Pipes Connection System

