Roll-On Insert Flanges & Expanding Tool

10. GENERAL INFORMATION

10.1 Roll-on Insert Flanges. The style of insert flange known as the Roll-on is the original insert flange, and has been an industry standard since the late 1940s.

Developed many years ago as a method of connecting pipe without welding, it is still the only commercially available pipe flange where welding is not required.

Though initially designed for roller expansion, today many weld and appreciate the flexibility to choose the method of fabrication.

10.2 Roller Expansion. Roller expansion is a strong, reliable and extremely cost effective method of joining insert flanges to pipe and fittings.

For many years roller expanding has been successfully used by other industries in hydraulic systems, tubular heat exchangers and other industrial applications, and is recognized by the major piping and pressure vessel codes.

A roller expanded joint is made by expanding a pipe into the bore of an insert flange. The insert contains grooves into which the pipe material is forced, creating a very strong and leak-tight joint. The insert expansion is accomplished with a tool (see expander tool next page) containing three or more rollers in a cage on tapered mandrel. As the mandrel is rotated, it moves longitudinally, forcing the rollers outward and expanding the pipe.

Nearly all metallic materials can be roller expanded. In most cases, if the pipe has been properly expanded, the joint will be stronger than a comparable welded joint. This is because the work hardening inherent in the process increases the material strength, while welding tends to reduce the strength of the pipe material in the heat affected zone adjacent to the weld. Furthermore, applications requiring the extra low carbon grades of austenitic stainless steels for welding purposes can often utilize the straight grades, which are stronger and less costly.

A roller expander and its auxiliary tools are very light and small compared to the welding equipment required to make the same attachment. Transportation is easier, and use in congested areas is facilitated. Since roller expansion uses no heat or flame, it can be safely used in explosive atmospheres where welding would be impossible.

10.3 SIFCO's Expander Tool. To best serve our customers, SIFCO has contracted with an expanding tool company to manufacture a pipe expanding tool specifically engineered for pipe expansion with SIFCO's roll-on insert flange. SIFCO stocks this expanding tool for schedule 10 pipe, but can obtain expanders for schedule 5 or 40 pipe.

With a minimum of operator skill, the SIFCO Roll-On Expander automatically positions and squares the flange on the pipe. Its rollers are match tapered with the mandrel, so the expansion is uniform throughout the joint thickness. The amount of material forced into the grooves is governed by a precisely controlled reduction of pipe wall thickness, rather than by operator feel of torque. This almost entirely eliminates the possibility of over expansion or under expansion.

10.4 Use with Tangential Fittings. To accommodate the expansion process, tangential or long radius fittings may be required.

SIFCO® 1-800-87-SIFCO • 610-494-1800 • FAX 610-494-1803

11. HOW TO ROLL-ON

11.1 Preparation. Experience has proven that expansion is best when seamless or full finished pipe is used. When expanding, the pipe must be squarely cut, free of surface projections or depressions, and must be round within commercial tolerances. Check to make sure the sizes of the pipe, mandrel, cage assembly and flanges are compatible. Make sure the I.D. of the pipe is clean of all foreign matter. The pipe should be firmly held in a suitable vise.

11.2 Setup for Expanding Operation. Start with a clean and well oiled expander. Slide the roller cage toward the small end of the tapered mandrel. After loosening the thumb screw on the adjustable collar, turn in the stop collar toward the rotating thrust collar up to the first thread on the mandrel. Tighten the thumb screw into the slot provided. Slide the bolting ring and insert over the pipe, approximately 1/32" from the end of the pipe, with the gasket face of the insert and the 45 degree chamfer of the flange toward the operator. Slide the roller cage into the end of the pipe as far as possible. (Figure 1)

11.3 Completing Expansion. Check the positioning of the rotating thrust collar by sighting vertically and horizontally so that it is parallel with the gasket face. Turn mandrel clockwise by hand until tight. Using a hand wrench, turn mandrel clockwise approximately 10 to 12 turns, or until insert is tight on pipe without any wobble. Loosen thumbscrew and turn stop collar clockwise until firm contact is made with the thrust collar. Tighten thumbscrew. This presets the adjustable stop collar so that subsequent roll-on flanges may be expanded quickly and easily with a power wrench. (Figure 2)

Remove the expander. If wobble is noted, back off stop collar 1 or 2 turns and repeat tightening procedure until a leak-proof joint is achieved. Flange is now ready for assembly into the line.

Figure 1. Setup for expansion.

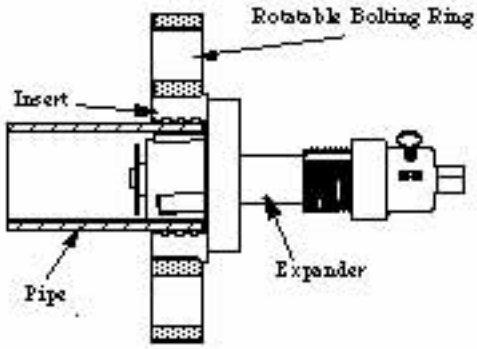
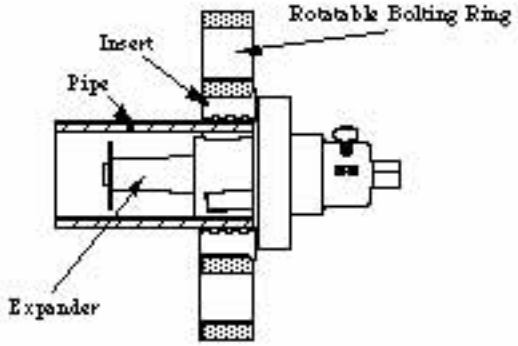
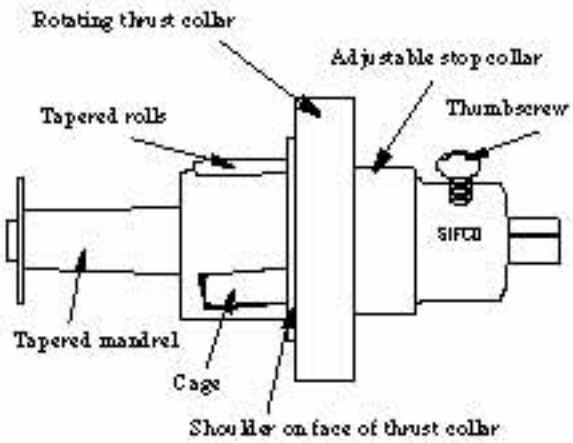


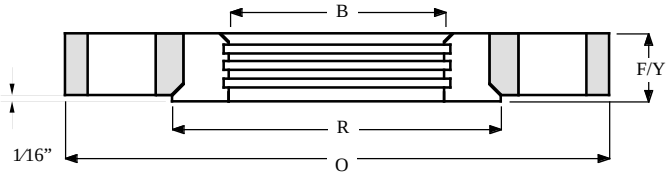
Figure 2. Expansion completed.



Expander Tool



Standard Piping Insert Flanges
Roll-On



150 LB

Series 1000

SIFCO Part Number	Flange Size	O	F/Y	R	B	No. of Holes	Diam. of Holes	Bolt Circle	Weight
1005	1/2"	3.50	0.44	1.38	0.85	4	0.63	2.38	1.0
1010	3/4"	3.88	0.50	1.69	1.06	4	0.63	2.75	1.5
1015	1"	4.25	0.56	2.00	1.32	4	0.63	3.13	2.0
1020	1-1/4"	4.63	0.63	2.50	1.67	4	0.63	3.50	2.5
1025	1-1/2"	5.00	0.69	2.88	1.91	4	0.63	3.88	3.0
1030	2"	6.00	0.75	3.63	2.38	4	0.75	4.75	4.5
1035	2-1/2"	7.00	0.88	4.13	2.89	4	0.75	5.50	7.5
1040	3"	7.50	0.94	5.00	3.52	4	0.75	6.00	8.5
1045	4"	9.00	0.94	6.19	4.52	8	0.75	7.50	11.5
1050	5"	10.00	0.94	7.31	5.58	8	0.88	8.50	13.0
1055	6"	11.00	1.00	8.50	6.66	8	0.88	9.50	16.0
1060	8"	13.50	1.13	10.63	8.66	8	0.88	11.75	26.0
1065	10"	16.00	1.19	12.75	10.79	12	1.00	14.25	34.0
1070	12"	19.00	1.25	15.00	12.79	12	1.00	17.00	55.0

300 LB

Series 3000

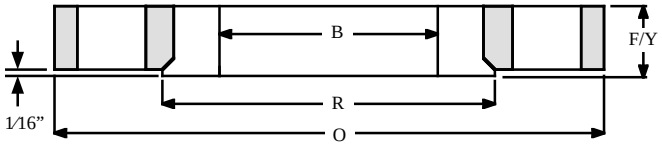
SIFCO Part Number	Flange Size	O	F/Y	R	B	No. of Holes	Diam. of Holes	Bolt Circle	Weight
3005	1/2"	3.75	0.56	1.38	0.85	4	0.63	2.63	1.5
3010	3/4"	4.63	0.63	1.69	1.06	4	0.75	3.25	2.5
3015	1"	4.88	0.69	2.00	1.32	4	0.75	3.50	3.0
3020	1-1/4"	5.25	0.75	2.50	1.67	4	0.75	3.88	4.0
3025	1-1/2"	6.13	0.81	2.88	1.91	4	0.88	4.50	5.0
3030	2"	6.50	0.88	3.63	2.38	8	0.75	5.00	6.0
3035	2-1/2"	7.50	1.00	4.13	2.89	8	0.88	5.88	9.0
3040	3"	8.25	1.13	5.00	3.52	8	0.88	6.63	12.0
3045	4"	10.00	1.25	6.19	4.52	8	0.88	7.88	20.0
3055	6"	12.50	1.44	8.50	6.66	12	0.88	10.63	32.0

• The 1⁄16” raised face is included in the F & L • All Dimensions are in inches •

SIFCO®

1-800-87-SIFCO • 610-494-1800 • FAX 610-494-1803

Standard Piping Insert Flanges
Slip-On



150 LB
Series 1900

SIFCO Part Number	Flange Size	O	F/Y	R	B	No. of Holes	Diam. of Holes	Bolt Circle	Weight
1905	1/2"	3.50	0.44	1.38	0.88	4	0.63	2.38	1.0
1910	3/4"	3.88	0.50	1.69	1.09	4	0.63	2.75	1.5
1915	1"	4.25	0.56	2.00	1.36	4	0.63	3.13	2.0
1920	1-1/4"	4.63	0.63	2.50	1.70	4	0.63	3.50	2.5
1925	1-1/2"	5.00	0.69	2.88	1.95	4	0.63	3.88	3.0
1930	2"	6.00	0.75	3.63	2.44	4	0.75	4.75	4.5
1935	2-1/2"	7.00	0.88	4.13	2.94	4	0.75	5.50	7.5
1940	3"	7.50	0.94	5.00	3.57	4	0.75	6.00	8.5
1945	4"	9.00	0.94	6.19	4.57	8	0.75	7.50	11.5
1950	5"	10.00	0.94	7.31	5.66	8	0.88	8.50	13.0
1955	6"	11.00	1.00	8.50	6.72	8	0.88	9.50	16.0
1960	8"	13.50	1.13	10.63	8.72	8	0.88	11.75	26.0
1965	10"	16.00	1.19	12.75	10.88	12	1.00	14.25	34.0
1970	12"	19.00	1.25	15.00	12.88	12	1.00	17.00	55.0
1975	14"	21.00	1.38	16.25	14.14	12	1.13	18.75	77.0
1980	16"	23.50	1.44	18.50	16.16	16	1.13	21.25	93.0
1985	18"	25.00	1.56	21.00	18.18	16	1.25	22.75	120.0
1990	20"	27.50	1.69	23.00	20.20	20	1.25	25.00	155.0
1995	24"	32.00	1.88	27.25	24.25	20	1.38	29.50	210.0

300 LB
Series 3900

SIFCO Part Number	Flange Size	O	F/Y	R	B	No. of Holes	Diam. of Holes	Bolt Circle	Weight
3905	1/2"	3.75	0.56	1.38	0.88	4	0.63	2.63	1.5
3910	3/4"	4.63	0.63	1.69	1.09	4	0.75	3.25	2.5
3915	1"	4.88	0.69	2.00	1.36	4	0.75	3.50	3.0
3920	1-1/4"	5.25	0.75	2.50	1.70	4	0.75	3.88	4.0
3925	1-1/2"	6.13	0.81	2.88	1.95	4	0.88	4.50	5.0
3930	2"	6.50	0.88	3.63	2.44	8	0.75	5.00	6.0
3935	2-1/2"	7.50	1.00	4.13	2.94	8	0.88	5.88	9.0
3940	3"	8.25	1.13	5.00	3.57	8	0.88	6.63	12.0
3945	4"	10.00	1.25	6.19	4.57	8	0.88	7.88	20.0
3950	5"	11.00	1.38	7.31	5.66	8	0.88	9.25	25.0
3955	6"	12.50	1.44	8.50	6.72	12	0.88	10.63	32.0
3960	8"	15.00	1.63	10.63	8.72	12	1.00	13.00	49.0
3965	10"	17.50	1.88	12.75	10.88	16	1.13	15.25	69.0
3970	12"	20.50	2.00	15.00	12.88	16	1.25	17.75	100.0
3975	14"	23.00	2.13	16.25	14.14	20	1.25	20.25	138.0
3980	16"	25.50	2.25	18.50	16.16	20	1.38	22.50	173.0
3985	18"	28.00	2.38	21.00	18.18	24	1.38	24.75	212.0
3990	20"	30.50	2.50	23.00	20.20	24	1.38	27.00	261.0
3995	24"	36.00	2.75	27.25	24.25	24	1.63	32.00	388.0

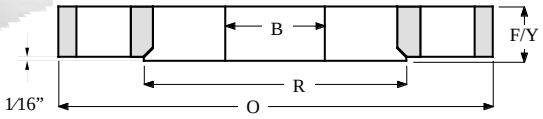
• The 1⁄16” raised face is included in the F & L • All Dimensions are in inches •

Standard Piping Insert Flanges

Reducing 150 LB

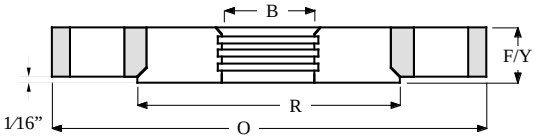
Slip-On

Series 1600



Roll-On

Series 1500



Nominal Sizes		Common Dimensions			Bore		Length Thru Hub		Drilling		
Flange Size	Process Pipe	Outside Diam.	Flange Thickness	Raised Face	Slip-On	Roll-On	Slip-On	Roll-On	No. of Holes	Diam. of Holes	Bolt Circle
		O	**F**	**R**	**B**	**B1**	**Y/Y1**				
3/4"	1/2"	3.88	0.50	1.69	0.88	0.85	0.50		4	0.63	2.75
1"	1/2"	4.25	0.56	2.00	0.88	0.85	0.56		4	0.63	3.13
	3/4"	4.25	0.56	2.00	1.09	1.06	0.56		4	0.63	3.13
1-1/2"	1/2"	5.00	0.69	3.00	0.88	0.85	0.69		4	0.63	3.88
	3/4"	5.00	0.69	3.00	1.09	1.06	0.69		4	0.63	3.88
	1"	5.00	0.69	3.00	1.36	1.32	0.69		4	0.63	3.88
2"	1/2"	6.00	0.75	3.63	0.88	0.85	0.75		4	0.75	4.75
	3/4"	6.00	0.75	3.63	1.09	1.06	0.75		4	0.75	4.75
	1"	6.00	0.75	3.63	1.36	1.32	0.75		4	0.75	4.75
	1-1/2"	6.00	0.75	3.63	1.95	1.91	0.75		4	0.75	4.75
2-1/2"	1/2"	7.00	0.88	4.25	0.88	0.85	0.88		4	0.75	5.50
	3/4"	7.00	0.88	4.25	1.09	1.06	0.88		4	0.75	5.50
	1"	7.00	0.88	4.25	1.36	1.32	0.88		4	0.75	5.50
	1-1/2"	7.00	0.88	4.25	1.95	1.91	0.88		4	0.75	5.50
	2"	7.00	0.88	4.25	2.44	2.38	0.88		4	0.75	5.50
3"	1/2"	7.50	0.94	5.00	0.88	0.85	0.94		4	0.75	6.00
	3/4"	7.50	0.94	5.00	1.09	1.06	0.94		4	0.75	6.00
	1"	7.50	0.94	5.00	1.36	1.32	0.94		4	0.75	6.00
	1-1/2"	7.50	0.94	5.00	1.95	1.91	0.94		4	0.75	6.00
	2"	7.50	0.94	5.00	2.44	2.38	0.94		4	0.75	6.00
	2-1/2"	7.50	0.94	5.00	2.94	2.89	0.94		4	0.75	6.00
4"	1/2"	9.00	0.94	6.19	0.88	0.85	0.94		8	0.75	7.50
	3/4"	9.00	0.94	6.19	1.09	1.06	0.94		8	0.75	7.50
	1"	9.00	0.94	6.19	1.36	1.32	0.94		8	0.75	7.50
	1-1/2"	9.00	0.94	6.19	1.95	1.91	0.94		8	0.75	7.50
	2"	9.00	0.94	6.19	2.44	2.38	0.94		8	0.75	7.50
	2-1/2"	9.00	0.94	6.19	2.94	2.89	0.94		8	0.75	7.50
	3"	9.00	0.94	6.19	3.57	3.52	0.94		8	0.75	7.50
6"	2"	11.00	1.00	8.50	2.44	2.38	1.00		8	0.88	9.50
	3"	11.00	1.00	8.50	3.57	3.52	1.00		8	0.88	9.50
	4"	11.00	1.00	8.50	4.57	4.52	1.00		8	0.88	9.50
8"	4"	13.50	1.13	10.63	4.57	4.52	1.13		8	0.88	11.75
	6"	13.50	1.13	10.63	6.72	6.66	1.13		8	0.88	11.75
10"	6"	16.00	1.19	12.75	8.72	6.66	1.19		12	1.00	14.25
	8"	16.00	1.19	12.75	8.72	8.66	1.19		12	1.00	14.25
12"	8"	19.00	1.25	15.00	8.72	8.66	1.25		12	1.00	17.00
	10"	19.00	1.25	15.00	10.88	10.79	1.25		12	1.00	17.00

• The 1⁄16” raised face is included in the F & L • All Dimensions are in inches •

SIFCO®

1-800-87-SIFCO • 610-494-1800 • FAX 610-494-1803