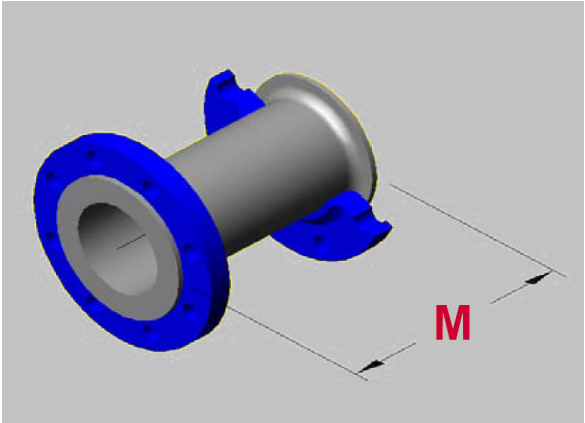
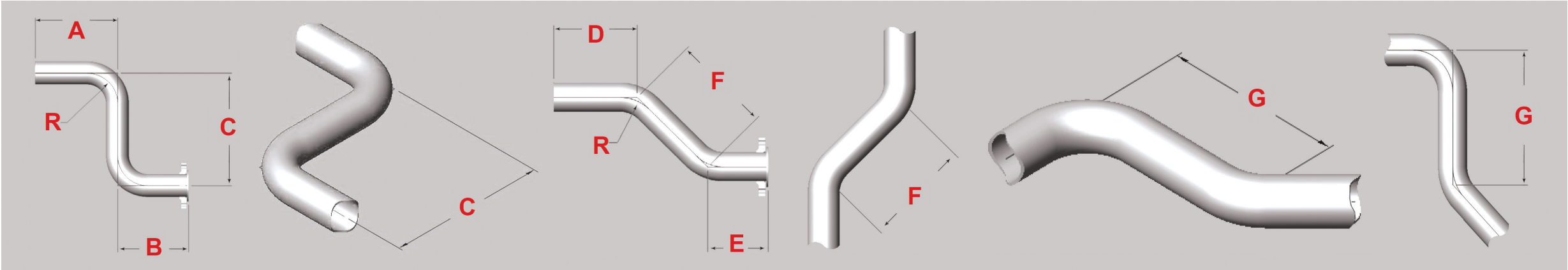


CLOSE RADIUS BENDING TABLES

Piping designers should refer to the Close Radius Bending Tables as a guide to maximizing the use of bending in their piping layout. These minimum dimensional values are established to allow adequate clamping during bending. Closer center-to-center or center-to-face dimensions are obtained by cutting pipe and/or adding welds as required. Minimum forming dimensions for degree of bend other than those shown are available upon request.



1-1/2 DIAMETER BENDING TABLE

Pipe Size	Radius R	90 Degree Bends			45 Degree Bends			G
		A	B	C	D	E	F	
1/2"	1 1/2"	5 1/2"	7"	7"	4 5/8"	6"	5 1/4"	6 1/8"
3/4"	1 1/2"	5 1/2"	7"	7"	4 5/8"	6"	5 1/4"	6 1/8"
1"*	1 1/2"	5 1/2"	7"	7"	4 5/8"	6"	5 1/4"	6 1/8"
1 1/2"*	2 1/4"	8"	8"	10 1/4"	6 11/16"	6"	7 5/8"	8 15/16"
2"	3"	11"	8"	14"	9 1/4"	6 1/2"	10 1/2"	12 1/4"
2 1/2"	3 3/4"	13 3/4"	10"	17 1/2"	11 9/16"	7 3/4"	13 1/8"	15 5/16"
3"	4 1/2"	13 1/2"	12"	18"	10 7/8"	9"	12 3/4"	15 3/8"
4"	6"	16 1/4"	14"	22 1/4"	12 3/4"	9 3/4"	15 1/4"	18 3/4"

A or D – Plain or Beveled End
B or E – Flanged End
C, F, G – Center-to-Center

Minimum Center-to-Center, and Center-to-Face Dimensions to allow forming. Some Center-to-Center bends may require a weld due to the plane of bend and/or the distance from the centerline of the bender mandrel to the shop floor.

*12" Center-to-Center is required for 1/2", 3/4" 1" N.P.S. and 13 1/2" Center-to-Center is required for 1 1/2" N.P.S., if the plane of bend is below the horizontal plane (due to bender limitations).
1 1/2 D pipe bends in 2 1/2" N.P.S. are not available in Carbon Steel.

3 DIAMETER BENDING TABLE

Pipe Size	Radius R	90 Degree Bends			45 Degree Bends			G
		A	B	C	D	E	F	
1/2"*	1 1/2"	5 1/2"	7"	7"	4 5/8"	6"	5 1/4"	6 1/8"
3/4"*	2 1/4"							
1"*	3"	7"	6 7/8"	10"	5 1/4"	6"	6 1/2"	8 1/4"
1 1/2"*	4 1/2"	10 1/4"	9 3/16"	14 3/4"	7 5/8"	6 1/2"	9 1/2"	12 1/8"
2"	6"	14"	10 15/16"	20"	10 1/2"	7 7/16"	13"	16 1/2"
2 1/2"	7 1/2"							
3"	9"	18"	16"	27"	12 3/4"	10 11/16"	16 1/2"	21 3/4"
4"	12"	22 1/2"	19"	34 1/4"	15 1/4"	12"	20 1/4"	27 1/4"
6"	18"	31 1/2"	34"	51 1/2"	21"	23 1/2"	30 1/2"	41"

A or D – Plain or Beveled End
B or E – Flanged End
C, F, G – Center-to-Center

Minimum Center-to-Center, and Center-to-Face Dimensions to allow forming. Some Center-to-Center bends may require a weld due to the plane of bend and/or the distance from the centerline of the bender mandrel to the shop floor.

*12" Center-to-Center is required for 1/2", 3/4" 1" N.P.S. and 13 1/2" Center-to-Center is required for 1 1/2" N.P.S., if the plane of bend is below the horizontal plane (due to bender limitations). Closer dimensions for 6" N.P.S. bends are available depending on pipe material. Minimum forming dimensions for 3/4" and 2 1/2" N.P.S. are available upon request.

FLARED PIPE DIMENSIONS

Pipe Size	Pipe O.D.	Lap Diameter	Min. Spool*
1/2"	0.840"	1 3/8"	6"
3/4"	1.050"	1 11/16"	6"
1"	1.315"	2"	7"
1 1/2"	1.90"	2 7/8"	7"
2"	2.375"	3 5/8"	7 1/2"
2 1/2"	2.875"	4 1/8"	9"
3"	3.50"	5"	10"
4"	4.50"	6 3/16"	10"
6"	6.625"	8 1/2"	17"
8"	8.625"	10 5/8"	17"
10"	10.75"	12 3/4"	18"
12"	12.75"	15"	18"



*Minimum Flared Pipe Spool Length with two (2) 150# flanges and without a weld. Dimension for Minimum Flared Pipe Spool Length with two (2) 300# flanges and without a weld are available upon request.

FOR MORE INFORMATION ON CLOSE RADIUS PIPE BENDING AND VAN STONE FLARED PIPING, CONSULT APEX SPECIFICATION ES-7 AND ES-8.

Please contact APEX with questions regarding minimum forming dimensions:
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