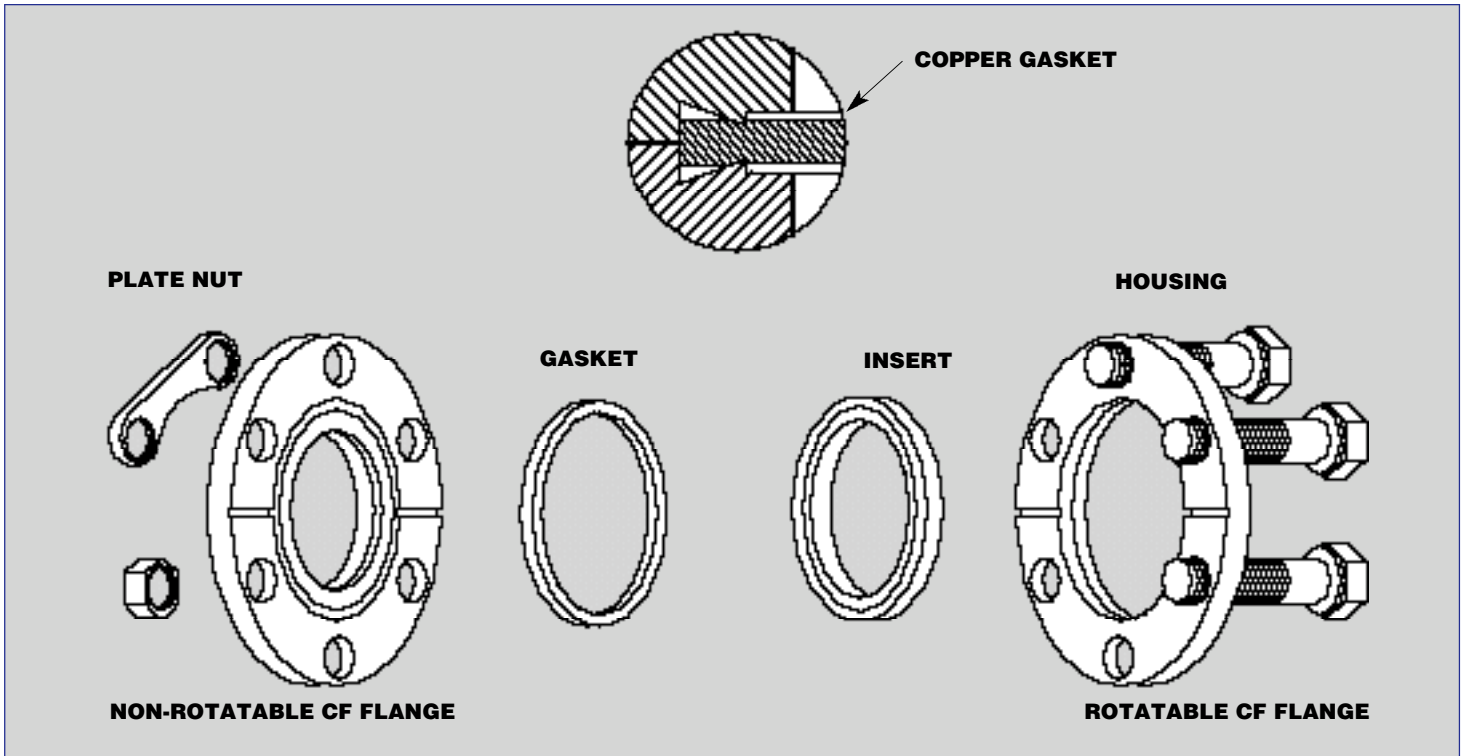


INTRODUCTION

CF FLANGE SYSTEM



I. GENERAL INTRODUCTION

ISA stocks a complete line of metal sealed knife-edge type CF flanges, fittings and accessories. These components are made to industry standards, are completely interchangeable with all other Conflat®-type flanges, and are designed to offer superior, leak-free performance in all high and ultra-high vacuum applications.

These flanges are manufactured on state-of-the-art CNC (computer controlled) lathes to insure consistently close dimensional tolerances, and extremely fine surface finishes. The flanges are carefully protected during the manufacturing process to prevent any damage to the knife-edge, and are cleaned and packaged to insure a perfect flange, ready for immediate use in any application.

II. OPERATION AND APPLICATIONS

ISA CF flanges offer superior leak-free performance on all vacuum applications, and will function perfectly to pressures of 1×10^{-13} torr in temperature ranges from -196°C to $+500^\circ \text{C}$. Each flange face is identical and contains a knife edge. When bolts tighten these flanges together with a copper gasket between them, the knife edge is forced into the copper. This action generates an annular groove in the gasket capable of withstanding high pressures or temperatures, fills all voids and defects and produces an extremely reliable leak tight seal. Suitable for all vacuum applications, CF flanges are especially suited to conditions requiring ultra-high vacuum, very clean environments, high temperatures or the containment of toxic, corrosive or radioactive gasses.

CF flanges range from 1.33" OD up to 16 $\frac{1}{2}$ " OD. We have illustrated within up to 8". We also have available in stock 10", 12", 13 $\frac{1}{4}$ ", 14" 14 $\frac{1}{2}$ " and 16 $\frac{1}{2}$ ".

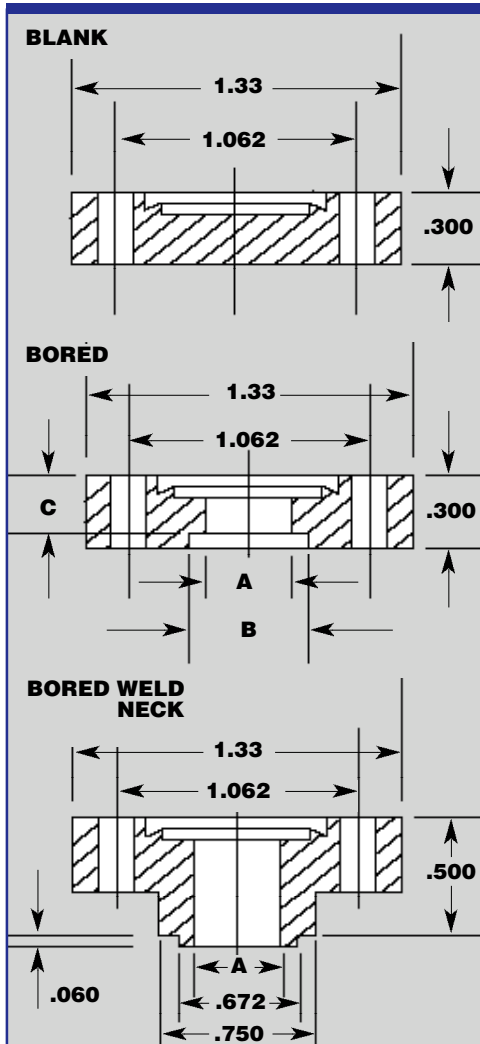
CF FLANGE HARDWARE

CF FLANGE DIMENSIONS	CF FLANGE PART NUMBER	COPPER GASKETS	VITON GASKETS	BOLT, NUT & WASHER KITS	BOLTS & WASHER KITS	12-POINT BOLT, NUT & WASHER KIT	12-POINT BOLTS & WASHERS	PLATE NUTS, BOLTS & WASHERS	PLATE NUTS	12-POINT PLATE NUTS, BOLTS &
Add to end of Part # to identify contents. →		CG	VG	BK	BT	BK12	BT12	PNK	PN	PNK12
Mini	133-	10 Call	5 Call	25 Call	25 Call	NA NA	NA NA	12 Call	24 Call	NA NA
2 1/8"	212-	10 Call	5 Call	25 Call	25 Call	25 Call	25 Call	NA NA	NA NA	NA NA
2 3/4"	275-	10 Call	5 Call	25 Call	25 Call	25 Call	25 Call	12 Call	24 Call	12 Call
3 3/4"	338-	10 Call	1 Call	25 Call	25 Call	25 Call	25 Call	16 Call	24 Call	16 Call
4 1/2"	450-	10 Call	1 Call	25 Call	25 Call	25 Call	25 Call	16 Call	24 Call	16 Call
4 5/8"	462-	10 Call	1 Call	25 Call	25 Call	25 Call	25 Call	20 Call	24 Call	20 Call
6"	600-	10 Call	1 Call	25 Call	25 Call	25 Call	25 Call	16 Call	16 Call	16 Call
6 3/4"	675-	10 Call	1 Call	25 Call	25 Call	25 Call	25 Call	NA NA	NA NA	NA NA
8"	800-	10 Call	1 Call	25 Call	25 Call	25 Call	25 Call	20 Call	24 Call	20 Call
10"	1000-	10 Call	1 Call	25 Call	25 Call	25 Call	25 Call	24 Call	24 Call	24 Call
12"	1200-	1 Call	NA NA	32 Call	32 Call	NA NA	NA NA	NA NA	NA NA	NA NA
13 1/4"	1325-	1 Call	1 Call	30 Call	30 Call	NA NA	NA NA	NA NA	NA NA	NA NA
14"	1400-	1 Call	1 Call	30 Call	30 Call	NA NA	NA NA	NA NA	NA NA	NA NA
14 1/2"	1450-	1 Call	1 Call	32 Call	32 Call	NA NA	NA NA	NA NA	NA NA	NA NA
16 1/2"	1650-	1 Call	1 Call	36 Call	36 Call	NA NA	NA NA	NA NA	NA NA	NA NA

Description of Chart →

Qty.
Price

CF FLANGES & HARDWARE



- Mini-CF Flanges are designed for an internal weld using standard O.D. tubing.
- “WN” Suffix = Weld Neck
- “WNB” Suffix = Weld Neck Without .060 Weld Prep

MINI - CF FLANGES - 1.33" O.D. NON-ROTATABLE & ROTATABLE

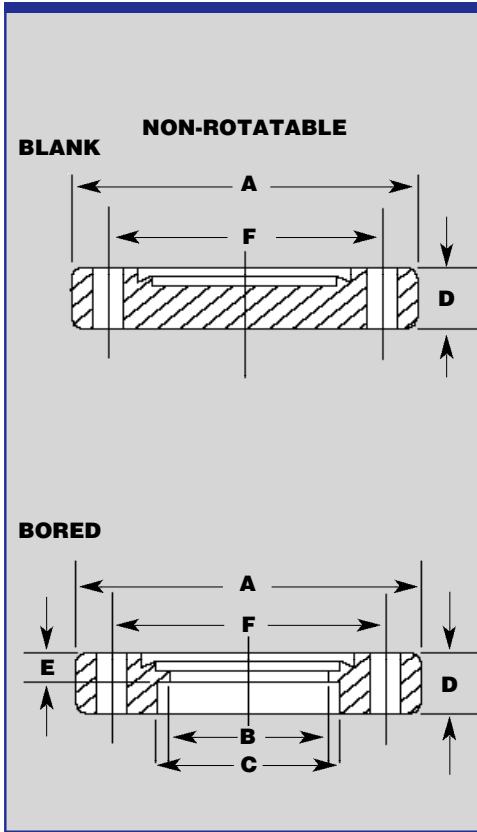
PART NUMBER	SETBACK			BOLT HOLES NO. DIA/THRD	NON-ROTATABLE PRICE	ROTATABLE PRICE
	A	B	C			
THROUGH HOLES						
133-000	-	-	-	6 .172	Call	Call
133-000-WN	-	-	-	6 .172	Call	Call
133-000-WNB	-	-	-	6 .172	Call	Call
133-025	.255	-	-	6 .172	Call	Call
133-038	.380	-	-	6 .172	Call	Call
133-050	.505	-	-	6 .172	Call	Call
133-075	.630	.755	.175	6 .172	Call	Call
133-075-WN	.630	-	-	6 .172	Call	Call
133-075-WNB	.630	-	-	6 .172	Call	Call
TAPPED HOLES						
133-000-T	-	-	-	6 8-32	Call	Call
133-000-WN-T	-	-	-	6 8-32	Call	Call
133-000-WNB-T	-	-	-	6 8-32	Call	Call
133-025-T	.255	-	-	6 8-32	Call	Call
133-038-T	.380	-	-	6 8-32	Call	Call
133-050-T	.505	-	-	6 8-32	Call	Call
133-075-T	.630	.755	.175	6 8-32	Call	Call
133-075-WN-T	.630	-	-	6 8-32	Call	Call
133-075-WNB-T	.630	-	-	6 8-32	Call	Call

MINI - CF FLANGE HARDWARE

133-CG	(10)	Copper Gaskets	Call
133-VG	(5)	Viton Gaskets	Call
133-BK	(25)	Bolt & Nut Kit, 8-32x3/4"	Call
133-BT	(25)	Bolt & Washer kit, 8-32x1/2"	Call
133-PNK	(12)	Plate Nuts, (24) Bolts, 8-32x3/4" Bolts & Washer	Call
133-PN	(24)	Plate Nuts, 8-32	Call

- Add “R” to part number for rotatable flanges.
- Above can be manufactured as half/full nipple, straight/conical reducers or in 45°/90° elbow, tees or crosses.
Call for prices and availability.

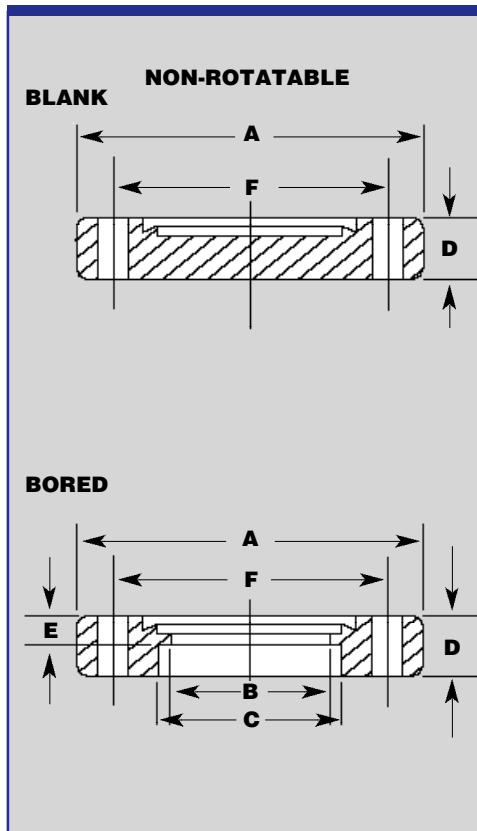
CF FLANGES & HARDWARE



CF FLANGES - 2 1/8" O.D. NON-ROTATABLE & ROTATABLE

PART NUMBER	O.D THRU HOLE			SETBACK			BOLT HOLES NO. DIA/THRD	NON-ROTATABLE PRICE	ROTATABLE PRICE	
	A	B	C	D	E	F				
THROUGH HOLES										
212-000	2.12	-	-	.470	-	1.625	4 .265	Call	Call	
212-025	2.12	.255	-	.470	-	1.625	4 .265	Call	Call	
212-050	2.12	.505	-	.470	-	1.625	4 .265	Call	Call	
212-075	2.12	.625	.760	.470	.170	1.625	4 .265	Call	Call	
212-100	2.12	.875	1.010	.470	.170	1.625	4 .265	Call	Call	
TAPPED HOLES										
212-000-T	2.12	-	-	.470	-	1.625	4 1/4-28	Call	Call	
212-025-T	2.12	.255	-	.470	-	1.625	4 1/4-28	Call	Call	
212-050-T	2.12	.505	-	.470	-	1.625	4 1/4-28	Call	Call	
212-075-T	2.12	.625	.760	.470	.170	1.625	4 1/4-28	Call	Call	
212-100-T	2.12	.875	1.010	.470	.170	1.625	4 1/4-28	Call	Call	
ROTATABLE INSERT ONLY										
212- (size) RI										Call

■ Add "R" suffix for rotatable.

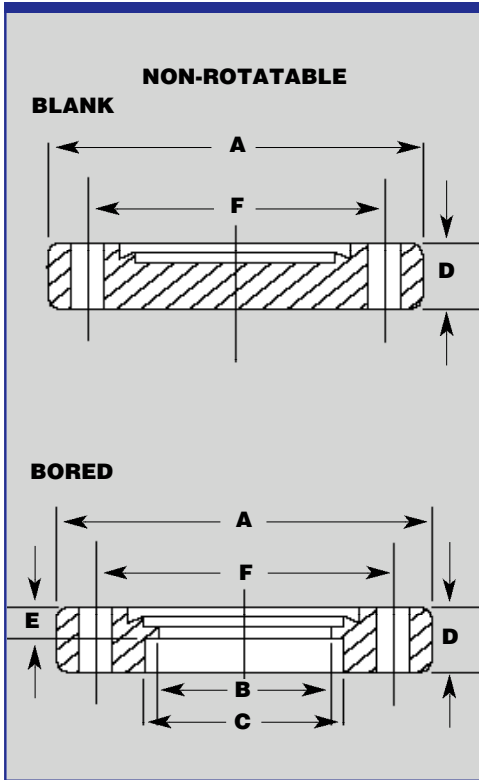


CF FLANGES - 2 3/4" O.D. NON-ROTATABLE & ROTATABLE

PART NUMBER	O.D THRU HOLE			SETBACK			BOLT HOLES NO. DIA/THRD	NON-ROTATABLE PRICE	ROTATABLE PRICE	
	A	B	C	D	E	F				
THROUGH HOLES										
275-000	2.72	-	-	.500	-	2.312	6 .265	Call	Call	
275-025	2.72	.255	-	.500	-	2.312	6 .265	Call	Call	
275-050	2.72	.505	-	.500	-	2.312	6 .265	Call	Call	
275-075	2.72	.625	.760	.500	.209	2.312	6 .265	Call	Call	
275-100	2.72	.875	1.010	.500	.209	2.312	6 .265	Call	Call	
275-125	2.72	1.125	1.260	.500	.209	2.312	6 .265	Call	Call	
275-150	2.72	1.375	1.510	.500	.209	2.312	6 .265	Call	Call	
275-162	2.72	1.500	1.635	.500	.209	2.312	6 .265	Call	Call	
TAPPED HOLES										
275-000-T	2.72	-	-	.500	-	2.312	6 1/4-28	Call	Call	
275-025-T	2.72	.255	-	.500	-	2.312	6 1/4-28	Call	Call	
275-050-T	2.72	.505	-	.500	-	2.312	6 1/4-28	Call	Call	
275-075-T	2.72	.625	.760	.500	.209	2.312	6 1/4-28	Call	Call	
275-100-T	2.72	.875	1.010	.500	.209	2.312	6 1/4-28	Call	Call	
275-125-T	2.72	1.125	1.260	.500	.209	2.312	6 1/4-28	Call	Call	
275-150-T	2.72	1.375	1.510	.500	.209	2.312	6 1/4-28	Call	Call	
275-162-T	2.72	1.500	1.635	.500	.209	2.312	6 1/4-28	Call	Call	
ROTATABLE INSERT ONLY										
275- (size) RI										Call

■ Add "R" suffix for rotatable.

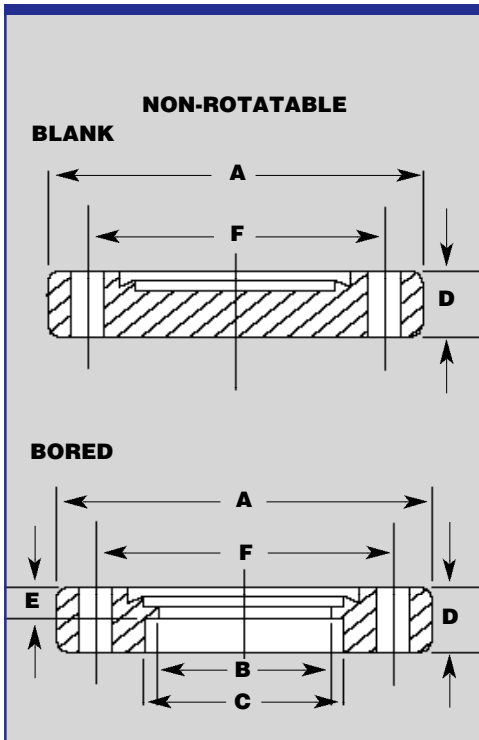
CF FLANGES & HARDWARE



CF FLANGES - 4 1/2" O.D. NON-ROTATABLE & ROTATABLE

PART NUMBER	O.D THRU HOLE			SETBACK			BOLT HOLES NO. DIA/THRD	NON-ROTATABLE PRICE	ROTATABLE PRICE	
	A	B	C	D	E	F				
THROUGH HOLES										
450-000	4.47	-	-	.680	-	3.628	8 .332	Call	Call	
450-150	4.47	1.375	1.510	.680	.375	3.628	8 .332	Call	Call	
450-200	4.47	1.875	2.010	.680	.375	3.628	8 .332	Call	Call	
450-250	4.47	2.375	2.510	.680	.375	3.628	8 .332	Call	Call	
TAPPED HOLES										
450-000-T	4.47	-	-	.680	-	3.628	8 5/16-24	Call	Call	
450-150-T	4.47	1.375	1.510	.680	.375	3.628	8 5/16-24	Call	Call	
450-200-T	4.47	1.875	2.010	.680	.375	3.628	8 5/16-24	Call	Call	
450-250-T	4.47	2.375	2.510	.680	.375	3.628	8 5/16-24	Call	Call	
ROTATABLE INSERT ONLY										
450- (size) RI										Call

■ Add "R" suffix for rotatable.

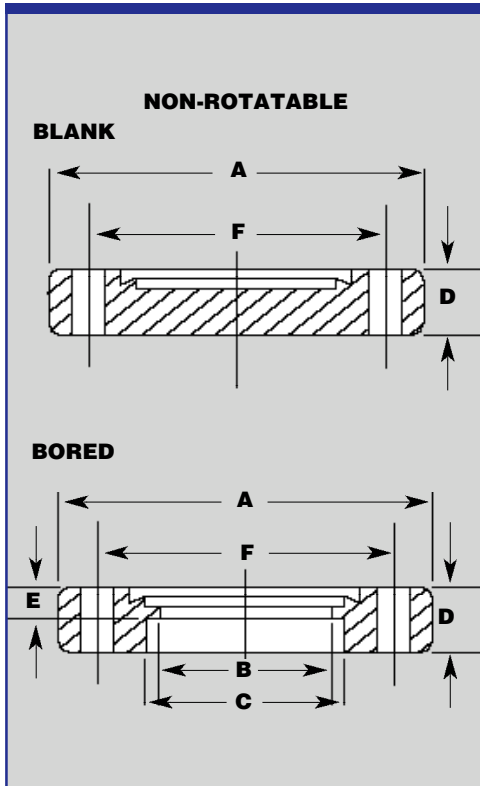


CF FLANGES - 6" O.D. NON-ROTATABLE & ROTATABLE

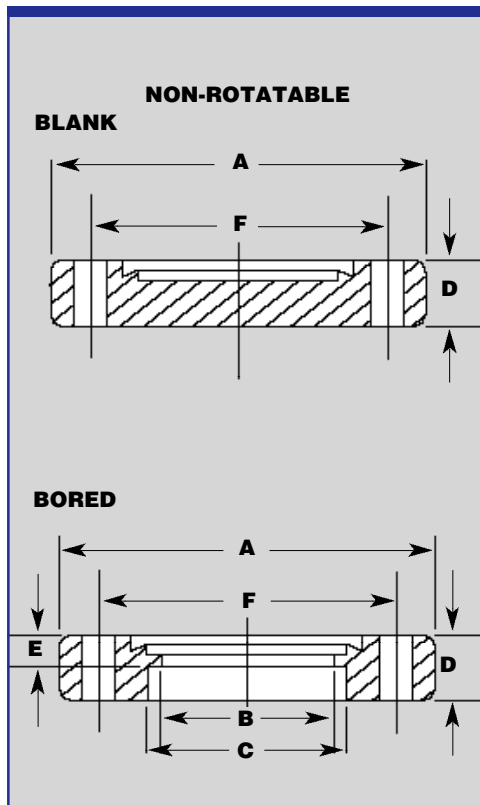
PART NUMBER	O.D THRU HOLE			SETBACK			BOLT HOLES NO. DIA/THRD	NON-ROTATABLE PRICE	ROTATABLE PRICE	
	A	B	C	D	E	F				
THROUGH HOLES										
600-000	5.97	-	-	.780	-	5.128	16 .332	Call	Call	
600-400	5.97	3.875	4.010	.780	.437	5.128	16 .332	Call	Call	
TAPPED HOLES										
600-000-T	5.97	-	-	.780	-	5.128	16 5/16-24	Call	Call	
600-400-T	5.97	3.875	4.010	.780	.437	5.128	16 5/16-24	Call	Call	
ROTATABLE INSERT ONLY										
600- (size) RI										Call

■ Add "R" suffix for rotatable.

CF FLANGES & HARDWARE

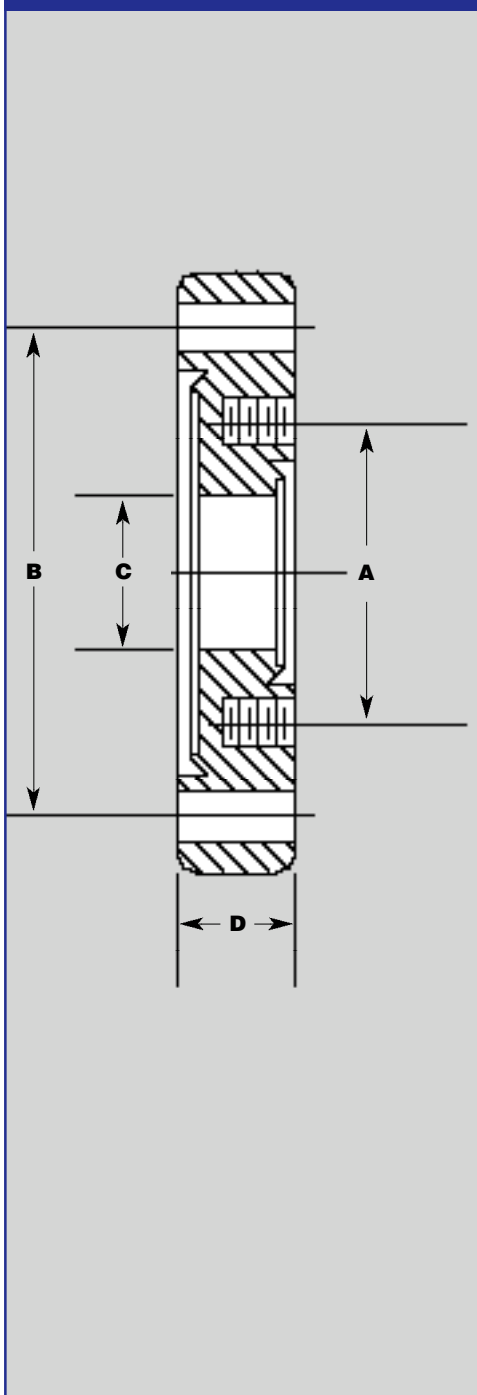


CF FLANGES - 6 3/4" O.D. NON-ROTATABLE & ROTATABLE									NON-ROTATABLE PRICE	ROTATABLE PRICE
PART NUMBER	O.D THRU HOLE			SETBACK			BOLT HOLES			
	A	B	C	D	E	F	NO. DIA/THRD			
THROUGH HOLES										
675-000	6.75	-	-	.840	-	5.969	18	.332	Call	Call
675-400	6.75	3.875	4.010	.840	.460	5.969	18	.332	Call	Call
675-500	6.75	4.875	5.010	.840	.460	5.969	18	.332	Call	Call
TAPPED HOLES										
675-000-T	6.75	-	-	.840	-	5.969	18	5/16-24	Call	Call
675-400-T	6.75	3.875	4.010	.840	.460	5.969	18	5/16-24	Call	Call
675-500-T	6.75	4.875	5.010	.840	.460	5.969	18	5/16-24	Call	Call
ROTATABLE INSERT ONLY										
675- (size) RI										Call
■ Add "R" suffix for rotatable.										



CF FLANGES - 8" O.D. NON-ROTATABLE & ROTATABLE									NON-ROTATABLE PRICE	ROTATABLE PRICE
PART NUMBER	O.D THRU HOLE			SETBACK			BOLT HOLES			
	A	B	C	D	E	F	NO. DIA/THRD			
THROUGH HOLES										
800-000	7.97	-	-	.880	-	7.128	20	.332	Call	Call
800-600	7.97	5.835	6.020	.880	.500	7.128	20	.332	Call	Call
TAPPED HOLES										
800-000-T	7.97	-	-	.880	-	7.128	20	5/16-24	Call	Call
800-600-T	7.97	5.835	6.020	.880	.500	7.128	20	5/16-24	Call	Call
ROTATABLE INSERT ONLY										
800- (size) RI										Call
■ Add "R" suffix for rotatable.										

CF FLANGES - ZERO LENGTH REDUCERS



CF FLANGES - ZERO LENGTH REDUCERS

PART NUMBER	FOR FLANGE DETAIL SEE				PRICE
	A	B	C	D	
212x133-075-0-T2	133-000-T	212-000-T	.620	.470	Call
275x133-075-0-T1	133-000-T	275-000	.620	.500	Call
275x212-100-0-T2	212-000-T	275-000-T	1.000	.500	Call
338x133-075-0-T1	133-000-T	338-000	.620	.620	Call
338x212-100-0-T2	212-000-T	338-000-T	1.000	.620	Call
338x275-150-0-T2	275-000-T	338-000-T	1.500	.620	Call
450x133-075-0-T1	133-000-T	450-000	.620	.680	Call
450x212-100-0-T1	212-000-T	450-000	1.000	.680	Call
450x275-150-0-T1	275-000-T	450-000	1.500	.680	Call
450x338-200-0-T2	338-000-T	450-000-T	2.000	.680	Call
462x133-075-0-T1	133-000-T	462-000	.620	.750	Call
462x212-100-0-T1	212-000-T	462-000	1.000	.750	Call
462x275-150-0-T1	275-000-T	462-000	1.500	.750	Call
462x338-200-0-T1	338-000-T	462-000	2.000	.750	Call
600x133-075-0-T1	133-000-T	600-000	.620	.780	Call
600x212-100-0-T1	212-000-T	600-000	1.000	.780	Call
600x275-150-0-T1	275-000-T	600-000	1.500	.780	Call
600x338-200-0-T1	338-000-T	600-000	2.000	.780	Call
600x450-250-0-T1	450-000-T	600-000	2.500	.780	Call
600x462-300-0-T2	462-000-T	600-000-T	3.000	.780	Call
675x133-075-0-T1	133-000-T	675-000	.620	.840	Call
675x212-100-0-T1	212-000-T	675-000	1.000	.840	Call
675x275-150-0-T1	275-000-T	675-000	1.500	.840	Call
675x338-200-0-T1	338-000-T	675-000	2.000	.840	Call
675x450-250-0-T1	450-000-T	675-000	2.500	.840	Call
675x462-300-0-T1	462-000-T	675-000	3.000	.840	Call
675x600-400-0-T2	600-000-T	675-000-T	4.000	.840	Call

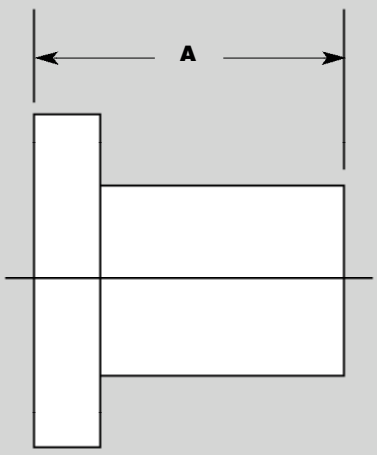
■ "T1 and T2" designate one or both sets of bolt holes are tapped.

8"—10"—13 1/4"—Also Available

■ Double-sided CF flanges also available.

Call for prices and availability.

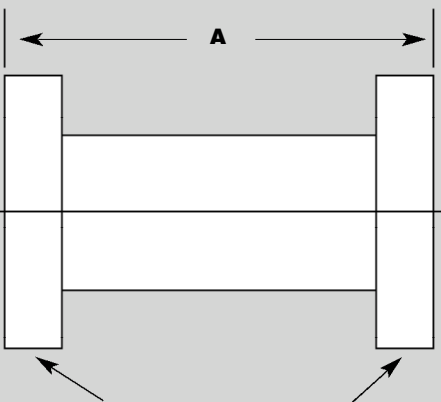
CF FLANGE FITTINGS



NON-ROTATABLE

- Other lengths available
- Available with rotatable (add "-R") or tapped (add "-T") flanges at extra cost.

CF FLANGE HALF NIPPLES				
PART NUMBER	FLANGE TYPE	TUBE O.D.	A	PRICE
133-075-LF	1.33	.75	1.50	Call
212-100-LF	2.12	1.00	2.05	Call
275-150-LF	2.75	1.50	2.46	Call
338-200-LF	3.38	2.00	3.21	Call
450-250-LF	4.50	2.50	3.38	Call
450-250-LF-L	4.50	2.50	4.12	Call
462-300-LF	4.62	3.00	3.53	Call
600-400-LF	6.00	4.00	4.32	Call
600-400-LF-L	6.00	4.00	5.31	Call
675-500-LF	6.75	5.00	4.32	Call
800-600-LF	8.00	6.00	5.50	Call
800-600-LF-L	8.00	6.00	6.56	Call
1000-800-LF	10.00	8.00	8.00	Call
1325-1000-LF	13.25	10.00	10.00	Call
1400-1200-LF	14.00	12.00	10.00	Call

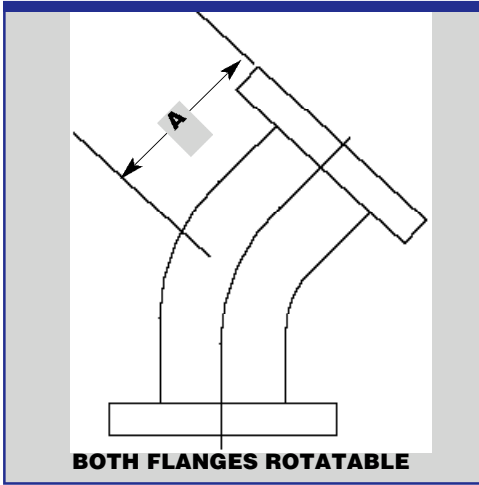


NON-ROTATABLE
ROTATABLE

- Other lengths available
- Available with tapped flanges (add "-T" to part number) at extra cost.

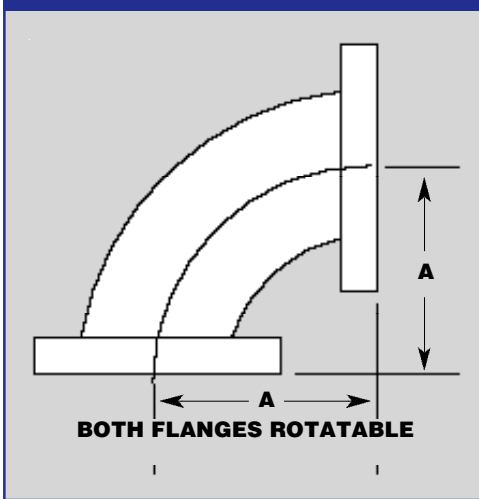
CF FLANGE NIPPLES				
PART NUMBER	FLANGE TYPE	TUBE O.D.	A	PRICE
133-075-N	1.33	.75	3.00	Call
212-100-N	2.12	1.00	4.10	Call
275-150-N	2.75	1.50	4.93	Call
338-200-N	3.38	2.00	6.43	Call
450-250-N	4.50	2.50	6.76	Call
450-250-N-L	4.50	2.50	8.25	Call
462-300-N	4.62	3.00	7.06	Call
600-400-N	6.00	4.00	8.64	Call
600-400-N-L	6.00	4.00	10.62	Call
675-500-N	6.75	5.00	8.46	Call
675-500-N-L	6.75	5.00	9.87	Call
800-600-N	8.00	6.00	11.00	Call
800-600-N-L	8.00	6.00	13.12	Call
1000-800-N	10.00	8.00	16.00	Call
1325-1000-N	13.25	10.00	20.00	Call
1400-1200-N	14.00	12.00	20.00	Call

CF FLANGE FITTINGS



CF FLANGES - 45° RADIUS ELBOW

PART NUMBER	FLANGE O.D.	TUBE O.D.	A	PRICE
133-075-E45	1.33	.75	.936	Call
212-100-E45	2.12	1.00	1.138	Call
275-150-E45	2.75	1.50	1.741	Call
338-200-E45	3.38	2.00	2.067	Call
450-250-E45	4.50	2.50	3.370	Call
462-300-E45	4.62	3.00	3.964	Call
600-400-E45	6.00	4.00	5.215	Call



CF FLANGES - 90° RADIUS ELBOW

PART NUMBER	FLANGE O.D.	TUBE O.D.	A	PRICE
133-075-E90	1.33	.75	1.50	Call
212-100-E90	2.12	1.00	2.04	Call
275-150-E90	2.75	1.50	2.46	Call
338-200-E90	3.38	2.00	3.21	Call
450-250-E90	4.50	2.50	4.12	Call
462-300-E90	4.62	3.00	4.94	Call
600-400-E90	6.00	4.00	6.44	Call
800-600-E90	8.00	6.00	9.50	Call

