



NW and ISO 316L Flanges

In response to requests from our customers for corrosion resistant flanges and fittings for downstream semiconductor applications, Nor-Cal now stocks several items made from 316L stainless steel material. NW and ISO flanges and centering rings are available in 25 to 100mm sizes. Conical reducers with NW flanges are also available for immediate shipment. Tubing and elbows in 316L stainless steel can be found in the Weld Fittings catalog.



EVAC Chain Clamps, Metal Seals and Tapered Flanges

Nor-Cal Products stocks a complete line of EVAC chain clamps and aluminum metal seals for converting elastomer seal NW (KF) and ISO flanges to UHV metal seals. They provide a number of benefits over elastomer seals: reduced outgassing, no permeation, no hydrocarbons, resistance to radiation and short half-life.



New Improved NW/ISO-KF Clamps

Nor-Cal's improved NW wing-nut and SureSeal clamps help prevent O-ring leaks, permeation and failure in your vacuum system due to unique centering ribs and a larger clamping surface for uniform O-ring compression. Limited hinge rotation facilitates one-handed installation. The SureSeal clamp features instant closure to optimal compression, saving at least 10 seconds per flange assembly/disassembly, and an ergonomic lever, which eliminates injury causing repetitive motions.

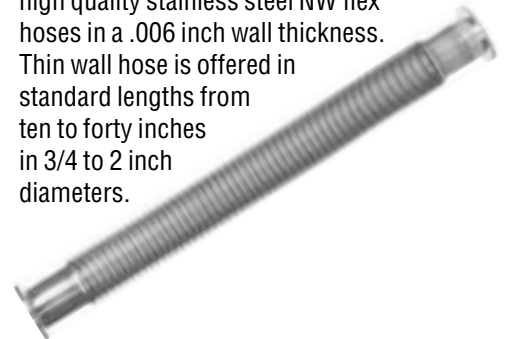


NW and ISO Centering Rings with Screens

Nor-Cal Products now stocks centering rings with stainless steel screen for NW and ISO flanges. These are commonly used at the inlet of the pump to protect it from small items that might damage it.

Thin Wall Flexible Stainless Steel Hose

For applications requiring increased flexibility, Nor-Cal now offers the same high quality stainless steel NW flex hoses in a .006 inch wall thickness. Thin wall hose is offered in standard lengths from ten to forty inches in 3/4 to 2 inch diameters.

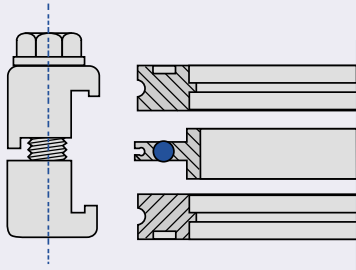


Prices subject to change without notice. - International product pricing will vary.

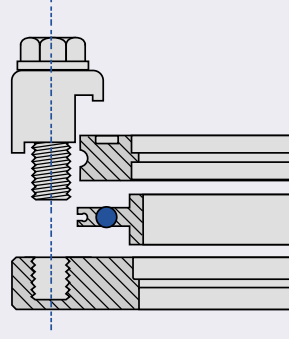
ISO-LIT 11/02



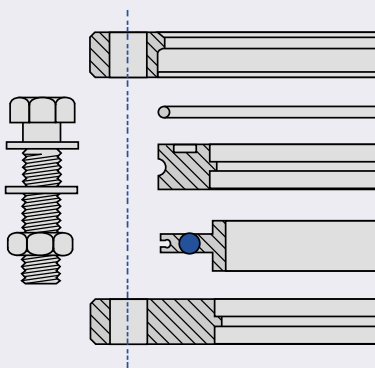
**A. Optional Fastener/
Optional Fastener
with Double Claw Clamp**



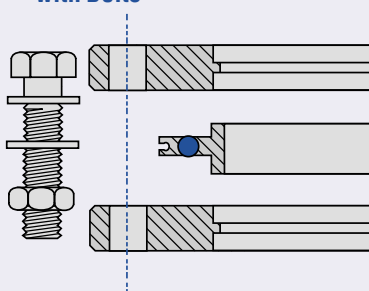
**B. Optional Fastener/Tapped
Non-Rotatable with
Single Claw Clamp**



**C. Optional Fastener/
Non-Rotatable with
Rotatable Bolt Ring & Bolts**



**D. Non-Rotatable/
Non-Rotatable
with Bolts**



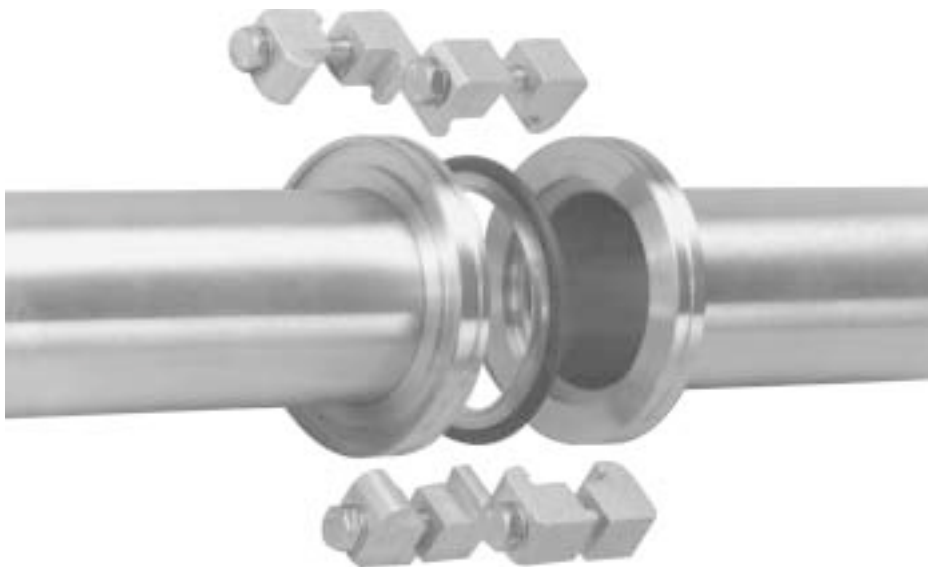
Nor-Cal ISO flanges and hardware are manufactured to the International Standards Organization specification so they can be mated to other manufacturers' ISO flanges. ISO flanges are made from Argon Oxygen Decarburization (AOD) 304 stainless steel. This material is certified to meet ASTM-240 and has less than .01% sulfur in order to prevent sulfur stringers. Grain size is 3 to 6 per ASTM E-112. Maximum inclusion size is 2.5 per ASTM E-45. Normally our standard material is in the low carbon range for 304 stainless steel. For increased corrosion resistance, some sizes are available from stock in 316L stainless steel.

Optional fastener and non-rotatable ISO flanges are available from stock for 2.5 to 20 inch tube sizes. Both use a Viton® O-ring, held in place by a centering ring, to effect a seal with a vacuum range of 10⁻⁸ Torr. ISO components can be baked to 204°C.

ISO flanges can also be used with standard clamps and aluminum seals to obtain a UHV seal bakeable to 150°C. EVAC seals are described in detail on pages 4 through 6 of this catalog.

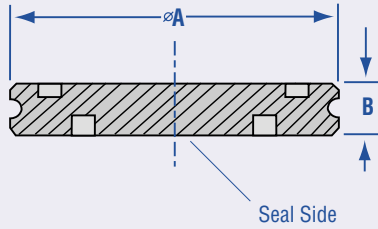
Optional fastener (OF) flanges are joined around the periphery with clamps. Double claw clamps are used when a pair of OF flanges are joined (Illustration A), or single claw clamps are used to join an OF flange to a tapped non-rotatable on a pump or gate valve (B). This fastening method allows the OF flange to be rotated for ease of component alignment. Additionally, a rotatable bolt ring can be used to fasten an OF flange to a non-rotatable flange using bolts (C). A retainer ring prevents the OF flange from slipping through the bolt ring.

Non-rotatable ISO flanges are assembled with bolts (D). They do not allow rotation of bolt holes on mating flanges to align components.

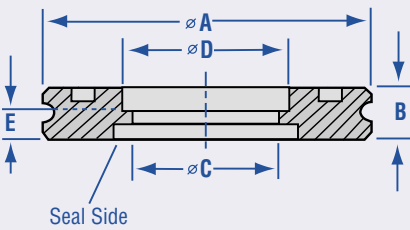




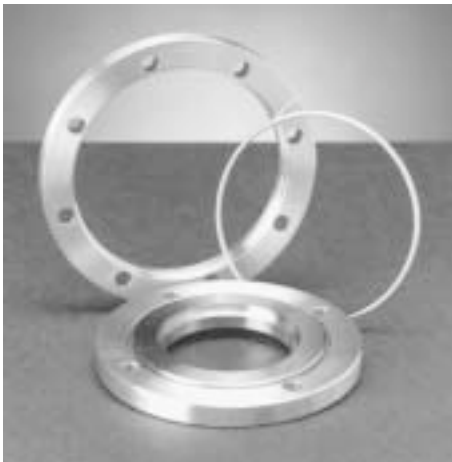
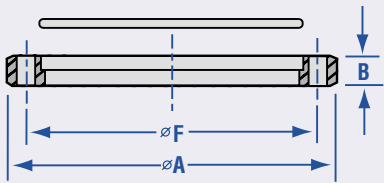
Optional Fastener Blank



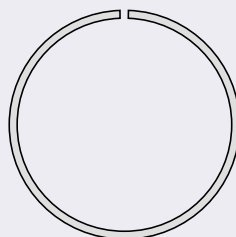
Optional Fastener Bored



Aluminum



Stainless Steel



ISO Optional Fastener Flanges

Nom ID	Model Number	A	B	C	D	E	Price
2.5	ISO-63-000-OF	3.740	.47	Blank	-	-	
	ISO-63-250-OF	3.740	.47	2.438	2.510	.250	
3.0	ISO-80-000-OF	4.331	.47	Blank	-	-	
	ISO-80-300-OF	4.331	.47	2.938	3.010	.250	
4.0	ISO-100-000-OF	5.118	.47	Blank	-	-	
	ISO-100-400-OF	5.118	.47	3.910	4.010	.250	
6.0	ISO-160-000-OF	7.087	.47	Blank	-	-	
	ISO-160-600-OF	7.087	.47	5.875	6.020	.375	
8.0	ISO-200-000-OF	9.449	.47	Blank	-	-	
	ISO-200-800-OF	9.449	.47	7.875	8.020	.375	
10.0	ISO-250-000-OF	11.417	.47	Blank	-	-	
	ISO-250-1000-OF	11.417	.47	9.875	10.020	.375	
12.0	ISO-320-000-OF	14.567	.67	Blank	-	-	
	ISO-320-1200-OF	14.567	.67	11.875	12.020	.375	
	ISO-320-1275-OF	14.567	.67	12.420	12.770	.375	
16.0	ISO-400-000-OF	17.716	.67	Blank	-	-	
	ISO-400-1600-OF	17.716	.67	15.624	16.020	.375	
20.0	ISO-500-000-OF	21.653	.67	Blank	-	-	
	ISO-500-2000-OF	21.653	.67	19.624	20.020	.375	

Dimensions in inches

ISO 316L Optional Fastener Flanges

Nom ID	Model Number	A	B	C	D	E	Price
2.5	ISO-63-250-OF-316L	3.740	.47	2.438	2.510	.250	
3.0	ISO-80-300-OF-316L	4.331	.47	2.938	3.010	.250	
4.0	ISO-100-400-OF-316L	5.118	.47	3.910	4.010	.250	

Dimensions in inches

ISO Rotatable Bolt Ring and Retainer Ring

Model Number	Flange Size	A	B	F	Price
ISO-63-BR	ISO-63	5.118	.472	4.331	
ISO-80-BR	ISO-80	5.709	.472	4.921	
ISO-100-BR	ISO-100	6.496	.472	5.709	
ISO-160-BR	ISO-160	8.858	.630	7.874	
ISO-200-BR	ISO-200	11.220	.630	10.236	
ISO-250-BR	ISO-250	13.189	.630	12.205	
ISO-320-BR	ISO-320	16.732	.787	15.551	
ISO-400-BR	ISO-400	20.079	.787	18.898	
ISO-500-BR	ISO-500	24.016	.787	22.835	

Dimensions in inches

Replacement Retainer Ring

Model Number	Price
ISO-63-RR	
ISO-80-RR	
ISO-100-RR	
ISO-160-RR	
ISO-200-RR	
ISO-250-RR	
ISO-320-RR	
ISO-400-RR	
ISO-500-RR	

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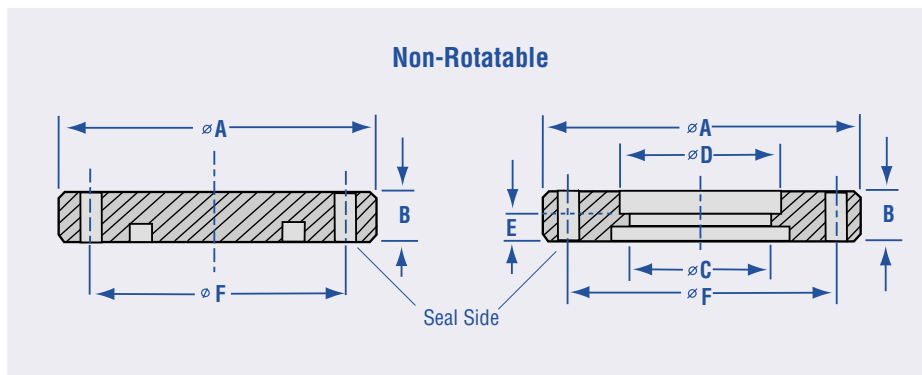
ISO-LIT 11/02



ISO Non-Rotatable Flanges

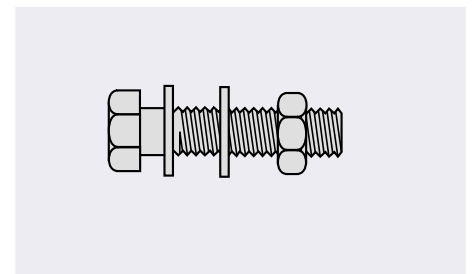
Nom ID	Model Number	A	B	C	D	E	F	Bolt Holes		Price
								Number	Diameter	
2.5	ISO-63-000N	5.118	.472	Blank	-	-	4.331	4	.359	
	ISO-63-250N	5.118	.472	2.438	2.510	.250	4.331	4	.359	
3.0	ISO-80-000N	5.709	.472	Blank	-	-	4.921	8	.359	
	ISO-80-300N	5.709	.472	2.938	3.010	.250	4.921	8	.359	
4.0	ISO-100-000N	6.496	.472	Blank	-	-	5.709	8	.359	
	ISO-100-400N	6.496	.472	3.910	4.010	.250	5.709	8	.359	
6.0	ISO-160-000N	8.858	.630	Blank	-	-	7.874	8	.438	
	ISO-160-600N	8.858	.630	5.875	6.020	.375	7.874	8	.438	
8.0	ISO-200-000N	11.220	.630	Blank	-	-	10.236	12	.438	
	ISO-200-800N	11.220	.630	7.875	8.020	.375	10.236	12	.438	
10.0	ISO-250-000N	13.189	.630	Blank	-	-	12.205	12	.438	
	ISO-250-1000N	13.189	.630	9.875	10.020	.375	12.205	12	.438	
12.0	ISO-320-000N	16.732	.787	Blank	-	-	15.551	12	.551	
	ISO-320-1200N	16.732	.787	11.760	12.020	.375	15.551	12	.551	
	ISO-320-1275N	16.732	.787	12.420	12.770	.375	15.551	12	.551	
16.0	ISO-400-000N	20.079	.787	Blank	-	-	18.898	16	.551	
	ISO-400-1600N	20.079	.787	15.642	16.020	.375	18.898	16	.551	
20.0	ISO-500-000N	24.016	.787	Blank	-	-	22.835	16	.551	
	ISO-500-2000N	24.016	.787	19.642	20.020	.375	22.835	16	.551	

Dimensions in inches



ISO Bolt Kits

Model Number	Description	Price
B-ISO-63	(4) S.S. Bolts, Nuts & Washers, M8 x 40	
B-ISO-80	(8) S.S. Bolts, Nuts & Washers, M8 x 40	
B-ISO-100	(8) S.S. Bolts, Nuts & Washers, M8 x 40	
B-ISO-160	(8) S.S. Bolts, Nuts & Washers, M10 x 50	
B-ISO-200	(12) S.S. Bolts, Nuts & Washers, M10 x 50	
B-ISO-250	(12) S.S. Bolts, Nuts & Washers, M10 x 50	
B-ISO-320	(12) S.S. Bolts, Nuts & Washers, M12 x 60	
B-ISO-400	(16) S.S. Bolts, Nuts & Washers, M12 x 60	
B-ISO-500	(16) S.S. Bolts, Nuts & Washers, M12 x 60	



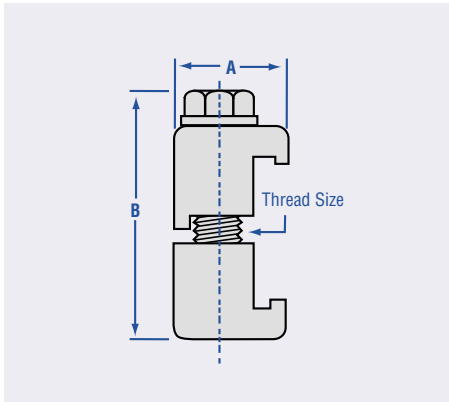
Dimensions in inches

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ISO-LIT 11/02



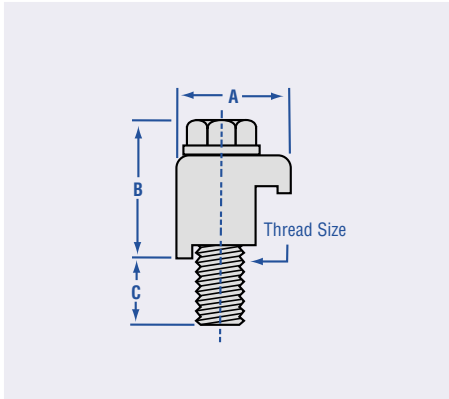
ISO Double Claw Aluminum Clamps



Model Number	Flange Size	A	B	Thread Size	Clamps Required	Price
ISO-63-DCP	ISO-63	.94	1.96	5/16-18	3-4	
ISO-80-DCP	ISO-80	.94	1.96	5/16-18	4-8	
ISO-100-DCP	ISO-100	.94	1.96	5/16-18	4-8	
ISO-160-DCP	ISO-160	1.10	1.96	5/16-18	4-8	
ISO-200-DCP	ISO-200	1.10	1.96	5/16-18	6-12	
ISO-250-DCP	ISO-250	1.10	1.96	5/16-18	6-12	
ISO-320-DCP	ISO-320	1.34	2.20	7/16-14	8-12	
ISO-400-DCP	ISO-400	1.34	2.20	7/16-14	8-16	
ISO-500-DCP	ISO-500	1.34	2.20	7/16-14	12-16	

Dimensions in inches

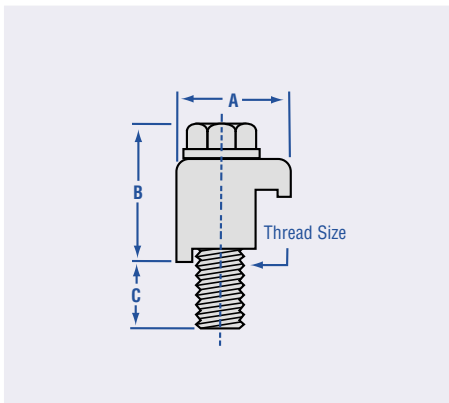
ISO Single Claw Aluminum Clamps



Model Number	Flange Size	A	B	C	Thread Size	Clamps Required	Price
ISO-63-SCP	ISO-63	.94	1.18	.52	5/16-18	4	
ISO-80-SCP	ISO-80	.94	1.18	.52	5/16-18	8	
ISO-100-SCP	ISO-100	.94	1.18	.52	5/16-18	8	
ISO-160-SCP	ISO-160	1.10	1.18	.52	5/16-18	8	
ISO-200-SCP	ISO-200	1.10	1.18	.52	5/16-18	12	
ISO-250-SCP	ISO-250	1.10	1.18	.52	5/16-18	12	
ISO-320-SCP	ISO-320	1.34	1.46	.88	7/16-14	12	
ISO-400-SCP	ISO-400	1.34	1.46	.88	7/16-14	16	
ISO-500-SCP	ISO-500	1.34	1.46	.88	7/16-14	16	

Dimensions in inches

ISO Single Claw Aluminum Clamps - Metric



Model Number	Flange Size	A	B	C	Metric Thread Size	Clamps Required	Price
ISO-63-SCP-M	ISO-63	.94	1.20	.40	M8	4	
ISO-80-SCP-M	ISO-80	.94	1.20	.40	M8	8	
ISO-100-SCP-M	ISO-100	.94	1.20	.40	M8	8	
ISO-160-SCP-M	ISO-160	1.10	1.20	.40	M10	8	
ISO-200-SCP-M	ISO-200	1.10	1.20	.40	M10	12	
ISO-250-SCP-M	ISO-250	1.10	1.20	.40	M10	12	
ISO-320-SCP-M	ISO-320	1.34	1.48	.79	M12	12	
ISO-400-SCP-M	ISO-400	1.34	1.48	.79	M12	16	
ISO-500-SCP-M	ISO-500	1.34	1.48	.79	M12	16	

Dimensions in inches

See pages 4 through 6 for EVAC chain clamps, metal seals and flanges.

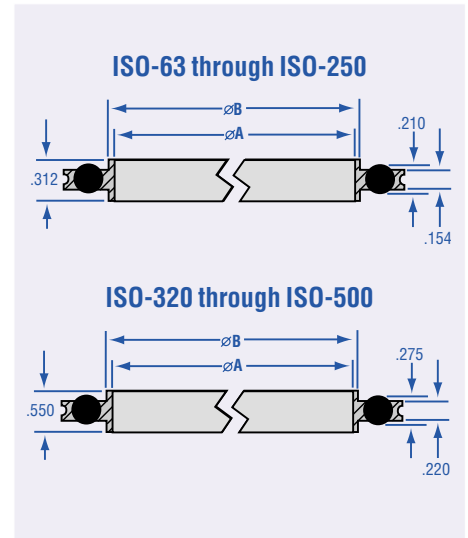


ISO Aluminum Centering Rings with O-ring and Aluminum Spacer Ring

Model Number	O-ring Material	A	B	Price
ISO-63-CR-AV	Viton	2.63	2.74	
ISO-63-CR-AB	Buna	2.63	2.74	
ISO-80-CR-AV*	Viton	3.14	3.25	
ISO-80-CR-AB*	Buna	3.14	3.25	
ISO-100-CR-AV*	Viton	3.89	4.00	
ISO-100-CR-AB*	Buna	3.89	4.00	
ISO-160-CR-AV*	Viton	5.90	6.01	
ISO-160-CR-AB*	Buna	5.90	6.01	
ISO-200-CR-AV*	Viton	8.26	8.37	
ISO-200-CR-AB*	Buna	8.26	8.37	
ISO-250-CR-AV*	Viton	10.14	10.25	
ISO-250-CR-AB*	Buna	10.14	10.25	
ISO-320-CR-AV*	Viton	12.32	12.51	
ISO-320-CR-AB*	Buna	12.32	12.51	
ISO-400-CR-AV*	Viton	15.55	15.75	
ISO-400-CR-AB*	Buna	15.55	15.75	
ISO-500-CR-AV*	Viton	19.53	19.72	
ISO-500-CR-AB*	Buna	19.53	19.72	

* Rolled Centering Ring. See page 32 for replacement O-rings.

Dimensions in inches

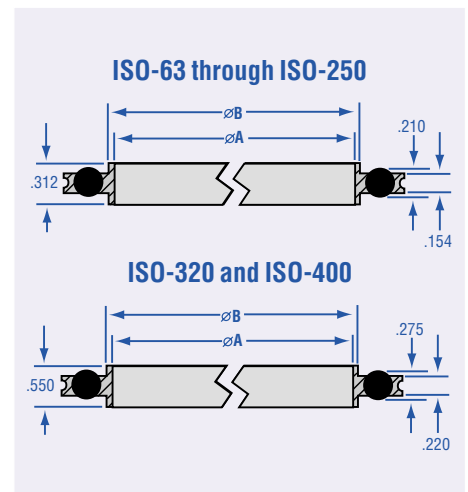


ISO Stainless Steel Centering Rings with O-Ring and Aluminum Spacer Ring

Model Number	O-ring Material	A	B	Price
ISO-63-CR-SV	Viton	2.63	2.74	
ISO-80-CR-SV	Viton	3.14	3.25	
ISO-100-CR-SV	Viton	3.89	4.00	
ISO-160-CR-SV	Viton	5.90	6.01	
ISO-200-CR-SV	Viton	8.26	8.37	
ISO-250-CR-SV	Viton	10.14	10.25	
ISO-320-CR-SV	Viton	12.36	12.52	
ISO-400-CR-SV	Viton	15.55	15.75	

See page 32 for replacement O-rings.

Dimensions in inches

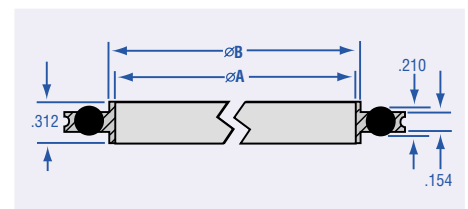


ISO 316L Stainless Steel Centering Rings with O-Ring and Aluminum Spacer Ring

Model Number	O-ring Material	A	B	Price
ISO-63-CR-SV-316L	Viton	2.63	2.74	
ISO-80-CR-SV-316L	Viton	3.14	3.25	
ISO-100-CR-SV-316L	Viton	3.89	4.00	

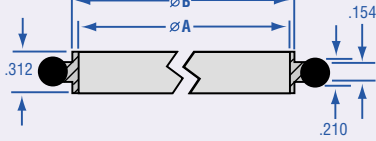
See page 32 for replacement O-rings.

Dimensions in inches

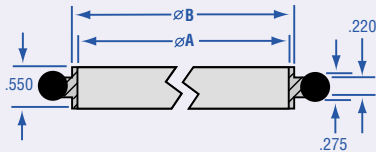




ISO-63 through ISO-250



ISO-320 and ISO-400



ISO Stainless Steel Centering Rings with O-ring

Model Number	O-ring Material	A	B	Price
ISO-63-CR	Viton	2.63	2.74	
ISO-80-CR	Viton	3.14	3.25	
ISO-100-CR	Viton	3.89	4.00	
ISO-160-CR	Viton	5.90	6.01	
ISO-200-CR	Viton	8.26	8.37	
ISO-250-CR	Viton	10.14	10.25	
ISO-320-CR	Viton	12.32	12.52	
ISO-400-CR	Viton	15.55	15.74	

See below for replacement O-rings.

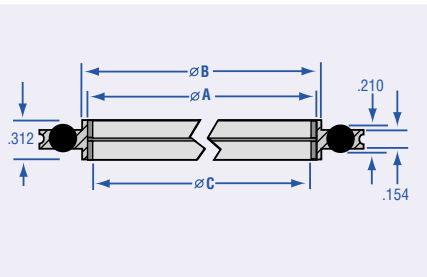
Dimensions in inches

ISO Screened Stainless Steel Centering Rings with O-ring and Aluminum Spacer Ring

Model Number	O-ring Material	A	B	C	Mesh	Price
ISO-63-CR-SV-16	Viton	2.63	2.74	2.38	16	
ISO-80-CR-SV-16	Viton	3.14	3.25	2.87	16	
ISO-100-CR-SV-16	Viton	3.89	4.00	3.50	16	
ISO-160-CR-SV-16	Viton	5.90	6.01	5.50	16	

Includes O-ring. See below for replacement O-rings.

Dimensions in inches



Viton® Replacement O-Rings

Model Number	Flange Type	Price
ISO-63-OR-V	ISO-63	\$ 8.00
ISO-80-OR-V	ISO-80	\$ 11.00
ISO-100-OR-V	ISO-100	\$ 19.00
ISO-160-OR-V	ISO-160	\$ 24.00
ISO-200-OR-V	ISO-200	\$ 27.00
ISO-250-OR-V	ISO-250	\$ 32.00
ISO-320-OR-V	ISO-320	\$ 40.00
ISO-400-OR-V	ISO-400	\$ 42.00
ISO-500-OR-V	ISO-500	\$ 55.00

Buna Replacement O-Rings

Model Number	Flange Type	Price
ISO-63-OR-B	ISO-63	
ISO-80-OR-B	ISO-80	
ISO-100-OR-B	ISO-100	
ISO-160-OR-B	ISO-160	
ISO-200-OR-B	ISO-200	
ISO-250-OR-B	ISO-250	
ISO-320-OR-B	ISO-320	
ISO-400-OR-B	ISO-400	
ISO-500-OR-B	ISO-500	

See pages 4 through 6 for EVAC chain clamps, metal seals and flanges.



Nor-Cal manufactures a complete line of ISO vacuum fittings. The tube portions are fabricated from 304 stainless steel. For increased resistance to corrosion in downstream semiconductor processes, Nor-Cal now stocks some ISO flanges and fittings in 316L material. Nor-Cal makes its own elbows, and all tees and crosses are made with the pulled-port technique. This allows smooth, crevice-free butt welds to provide the maximum in cleanliness for UHV applications. Bakeout range is up to 204°C. Nor-Cal fittings are also available with CF (Conflat style), NW (ISO-KF compatible) and ASA flanges.

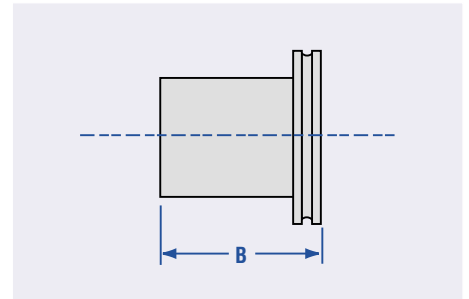
ISO flanged fittings are available with optional fastener (OF) or non-rotatable (N) flanges, although they are shown here with OF flanges only. To order a fitting with non-rotatable flanges substitute an "N" for "OF" in the model number.

Standard finish is bead blasted. As an option, a tumbled finish can be provided at no extra charge. Indicate this by adding "-T" to the part number. Electropolished finish can also be provided as an option. Call for pricing.

ISO Half Nipples

Model Number	Tube OD	B	Price
1N-ISO-63-OF	2.50	3.25	
1N-ISO-63-OF-V	2.50	4.00	
1N-ISO-63-OF-H	2.50	3.94	
1N-ISO-80-OF	3.00	3.50	
1N-ISO-80-OF-H	3.00	3.94	
1N-ISO-100-OF	4.00	4.13	
1N-ISO-100-OF-V	4.00	5.12	
1N-ISO-100-OF-H	4.00	3.94	
1N-ISO-160-OF	6.00	5.38	
1N-ISO-160-OF-V	6.00	6.44	
1N-ISO-160-OF-H	6.00	3.94	
1N-ISO-200-OF	8.00	7.38	
1N-ISO-250-OF	10.00	9.88	
1N-ISO-320-OF	12.00	9.88	
1N-ISO-400-OF	16.00	9.88	
1N-ISO-500-OF	20.00	9.88	

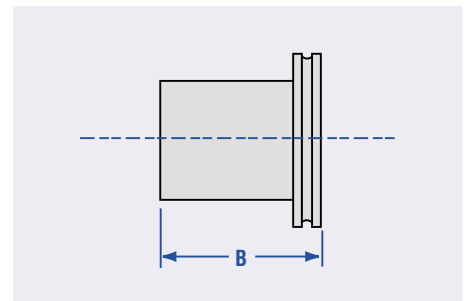
Dimensions in inches



ISO 316L Half Nipples

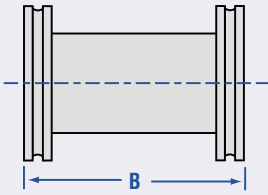
Model Number	Tube OD	B	Price
1N-ISO-63-OF-316L	2.50	3.25	
1N-ISO-80-OF-316L	3.00	3.50	
1N-ISO-100-OF-316L	4.00	4.13	

Dimensions in inches





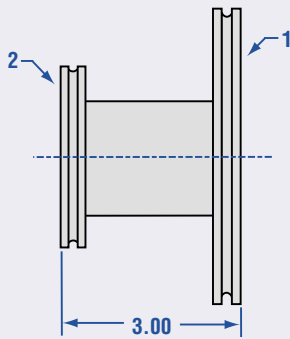
ISO Full Nipples



Model Number	Tube OD	B	Price
2N-ISO-63-OF	2.50	6.50	
2N-ISO-80-OF	3.00	7.00	
2N-ISO-100-OF	4.00	8.26	
2N-ISO-160-OF	6.00	10.76	
2N-ISO-200-OF	8.00	14.76	
2N-ISO-250-OF	10.00	19.76	
2N-ISO-320-OF	12.00	19.76	
2N-ISO-400-OF	16.00	19.76	
2N-ISO-500-OF	20.00	19.76	

Dimensions in inches

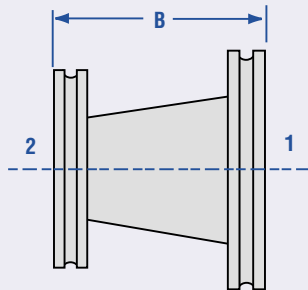
ISO Reducer Nipples



Model Number	Flange 1	Flange 2	Tube OD	Price
2NR-ISO-80-63-OF	ISO-80	ISO-63	2.50	
2NR-ISO-100-63-OF	ISO-100	ISO-63	2.50	
2NR-ISO-100-80-OF	ISO-100	ISO-80	3.00	
2NR-ISO-160-63-OF	ISO-160	ISO-63	2.50	
2NR-ISO-160-80-OF	ISO-160	ISO-80	3.00	
2NR-ISO-160-100-OF	ISO-160	ISO-100	4.00	
2NR-ISO-200-63-OF	ISO-200	ISO-63	2.50	
2NR-ISO-200-80-OF	ISO-200	ISO-80	3.00	
2NR-ISO-200-100-OF	ISO-200	ISO-100	4.00	
2NR-ISO-200-160-OF	ISO-200	ISO-160	6.00	
2NR-ISO-250-63-OF	ISO-250	ISO-63	2.50	
2NR-ISO-250-80-OF	ISO-250	ISO-80	3.00	
2NR-ISO-250-100-OF	ISO-250	ISO-100	4.00	
2NR-ISO-250-160-OF	ISO-250	ISO-160	6.00	
2NR-ISO-250-200-OF	ISO-250	ISO-200	8.00	

Dimensions in inches

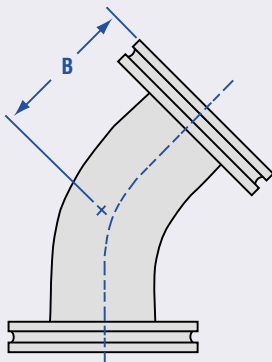
ISO Conical Reducer Nipples



Model Number	Flange 1		Flange 2		B	Price
	Type	Tube OD	Type	Tube OD		
2NRC-ISO-80-63-OF	ISO-80	3.00	ISO-63	2.50	4.12	
2NRC-ISO-100-63-OF	ISO-100	4.00	ISO-63	2.50	4.12	
2NRC-ISO-100-80-OF	ISO-100	4.00	ISO-80	3.00	4.12	

Dimensions in inches

ISO 45° Elbows with Tangents



Model Number	Tube OD	B	Price
2KL-ISO-63-OF	2.50	3.25	
2KL-ISO-80-OF	3.00	3.93	
2KL-ISO-100-OF	4.00	5.03	

Dimensions in inches

Prices subject to change without notice. - International product pricing will vary.

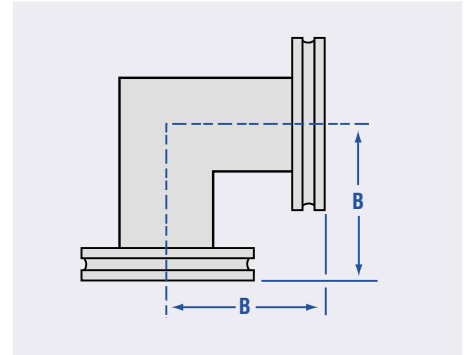
ISO-LIT 11/02



ISO 90° Mitered Elbows

Model Number	Tube OD	B	Price
2E-ISO-63-OF-M	2.50	3.25	
2E-ISO-80-OF-M	3.00	3.50	
2E-ISO-100-OF-M	4.00	4.13	
2E-ISO-160-OF-M	6.00	5.38	
2E-ISO-200-OF-M	8.00	7.38	
2E-ISO-250-OF-M	10.00	9.88	

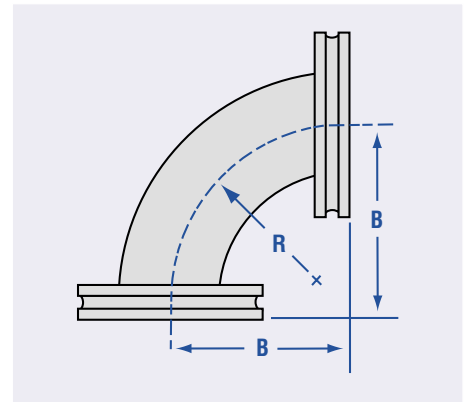
Dimensions in inches



ISO 90° Radius Elbows

Model Number	Tube OD	B	R	Price
2E-ISO-63-OF	2.50	4.00	3.75	
2E-ISO-80-OF	3.00	4.75	4.50	
2E-ISO-100-OF	4.00	6.25	6.00	
2E-ISO-160-OF	6.00	9.38	9.00	
2E-ISO-200-OF	8.00	12.38	12.00	
2E-ISO-250-OF	10.00	15.38	15.00	

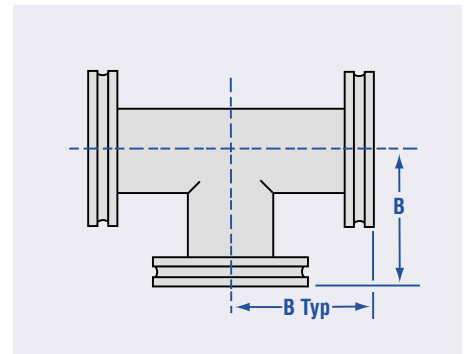
Dimensions in inches



ISO Tees

Model Number	Tube OD	B	Price
3T-ISO-63-OF	2.50	3.25	
3T-ISO-80-OF	3.00	3.50	
3T-ISO-100-OF	4.00	4.13	
3T-ISO-160-OF	6.00	5.38	
3T-ISO-200-OF	8.00	7.38	
3T-ISO-250-OF	10.00	9.88	

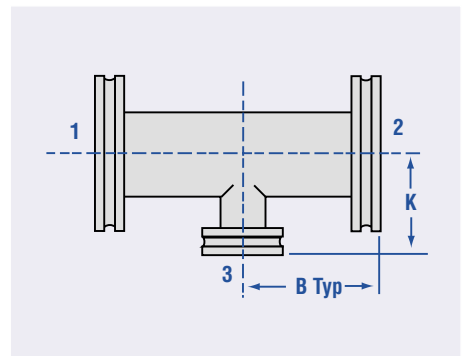
Dimensions in inches



ISO Reducer Tees

Model Number	Flange 1 & 2		Flange 3		B	K	Price
	Type	Arm OD	Type	Leg OD			
3TR-ISO-80-63-OF	ISO-80	3.00	ISO-63	2.50	3.50	3.50	
3TR-ISO-100-63-OF	ISO-100	4.00	ISO-63	2.50	4.13	4.00	
3TR-ISO-100-80-OF	ISO-100	4.00	ISO-80	3.00	4.13	4.00	
3TR-ISO-160-63-OF	ISO-160	6.00	ISO-63	2.50	5.38	5.00	
3TR-ISO-160-80-OF	ISO-160	6.00	ISO-80	3.00	5.38	5.00	
3TR-ISO-160-100-OF	ISO-160	6.00	ISO-100	4.00	5.38	5.13	
3TR-ISO-200-63-OF	ISO-200	8.00	ISO-63	2.50	7.38	6.00	
3TR-ISO-200-80-OF	ISO-200	8.00	ISO-80	3.00	7.38	6.00	
3TR-ISO-200-100-OF	ISO-200	8.00	ISO-100	4.00	7.38	6.13	
3TR-ISO-200-160-OF	ISO-200	8.00	ISO-160	6.00	7.38	6.38	

Dimensions in inches

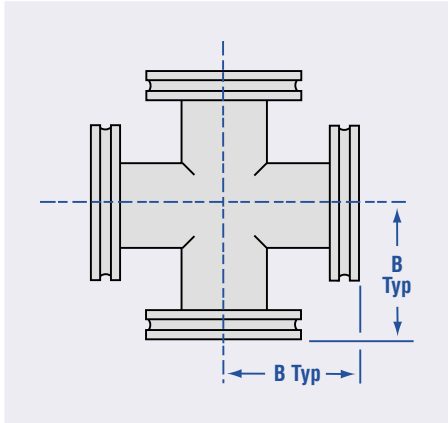


Prices subject to change without notice. - International product pricing will vary.

ISO-LIT 11/02



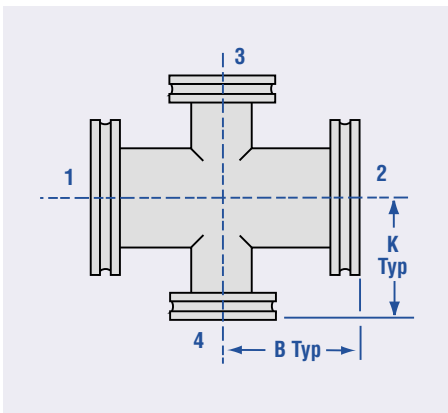
ISO 4-Way Crosses



Model Number	Tube OD	B	Price
4C-ISO-63-OF	2.50	3.25	
4C-ISO-80-OF	3.00	3.50	
4C-ISO-100-OF	4.00	4.13	
4C-ISO-160-OF	6.00	5.38	
4C-ISO-200-OF	8.00	7.38	
4C-ISO-250-OF	10.00	9.88	

Dimensions in inches

ISO Reducer Crosses

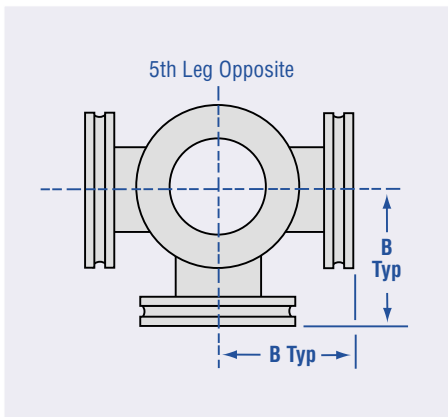


Model Number	Flanges 1 & 2		Flanges 3 & 4		B	K	Price
	Type	Arm OD	Type	Leg OD			
4CR-ISO-80-63-OF	ISO-80	3.00	ISO-63	2.50	3.50	3.50	
4CR-ISO-100-63-OF	ISO-100	4.00	ISO-63	2.50	4.13	4.00	
4CR-ISO-100-80-OF	ISO-100	4.00	ISO-80	3.00	4.13	4.00	
4CR-ISO-160-63-OF	ISO-160	6.00	ISO-63	2.50	5.38	5.00	
4CR-ISO-160-80-OF	ISO-160	6.00	ISO-80	3.00	5.38	5.00	
4CR-ISO-160-100-OF	ISO-160	6.00	ISO-100	4.00	5.38	5.13	
4CR-ISO-200-160-OF	ISO-200	8.00	ISO-160	6.00	7.38	6.38	

Other reducer combinations can be supplied upon request.

Dimensions in inches

ISO 5-Way Crosses



Model Number	Tube OD	B	Price
5C-ISO-63-OF	2.50	3.25	
5C-ISO-80-OF	3.00	3.50	
5C-ISO-100-OF	4.00	4.13	
5C-ISO-160-OF	6.00	5.38	
5C-ISO-200-OF	8.00	7.38	
5C-ISO-250-OF	10.00	9.88	

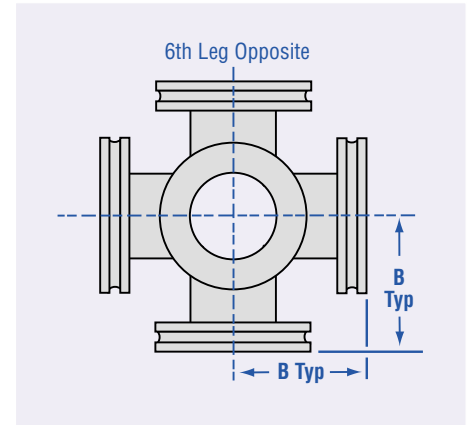
Dimensions in inches



ISO 6-Way Crosses

Model Number	Tube OD	B	Price
6C-ISO-63-OF	2.50	3.25	
6C-ISO-80-OF	3.00	3.50	
6C-ISO-100-OF	4.00	4.13	
6C-ISO-160-OF	6.00	5.38	
6C-ISO-200-OF	8.00	7.38	
6C-ISO-250-OF	10.00	9.88	

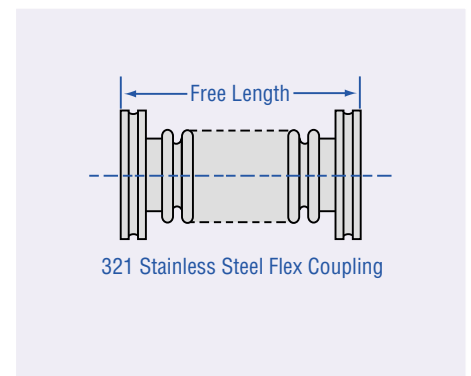
Dimensions in inches



ISO Flex Couplings

Model Number	Flange Type	Bellows ID	Free Length	Compressed Length	Price
2FC-ISO-250-4	ISO-63	2.50	7.00	6.00	
2FC-ISO-300-4	ISO-80	3.00	7.00	6.00	
2FC-ISO-400-4	ISO-100	4.00	7.00	6.00	
2FC-ISO-600-4	ISO-160	6.00	7.00	6.00	
2FC-ISO-800-4	ISO-200	8.00	7.00	6.00	
2FC-ISO-1000-10	ISO-250	10.00	13.50	10.50	

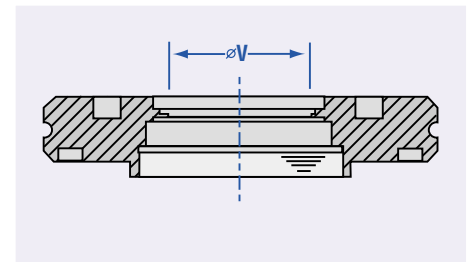
Dimensions in inches



ISO Viewports - 7056 Glass

Model Number	Flange Type	View Diameter V	Price
ZV-ISO-63-OF	ISO-63	1.49	
ZV-ISO-80-OF	ISO-80	1.49	
ZV-ISO-100-OF	ISO-100	2.66	
ZV-ISO-160-OF	ISO-160	3.97	
ZV-ISO-200-OF	ISO-200	5.60	

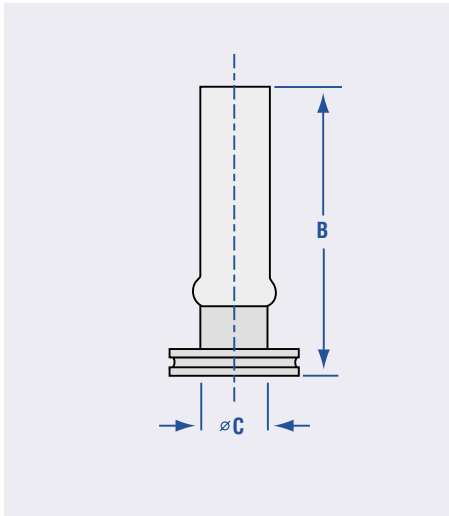
Dimensions in inches





Nor-Cal offers a full line of adapter nipples and conical adapter nipples with ISO flanges. Other flange sizes and combinations are available upon request. They are made from select grade 304 stainless steel to provide the maximum in cleanliness for UHV applications. Also see CF and Wire Seal and ASA catalogs for other adapter combinations.

ISO Glass Adapters - 7052 Glass / Kovar®



Model Number	Flange Type	B	C	Price
1GA-ISO-63-OF-K	ISO-63	7.36	2.50	
1GA-ISO-80-OF-K	ISO-80	7.36	3.00	
1GA-ISO-100-OF-K	ISO-100	10.25	4.00	
1GA-ISO-160-OF-K	ISO-160	10.88	6.00	

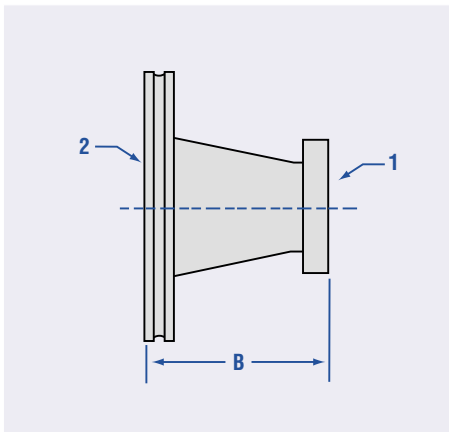
Dimensions in inches

ISO Glass Adapters - 7740 Pyrex® / Stainless Steel

Model Number	Flange Type	B	C	Price
1GA-ISO-63-OF-P	ISO-63	5.50	2.50	
1GA-ISO-80-OF-P	ISO-80	6.50	3.00	
1GA-ISO-100-OF-P	ISO-100	6.50	4.00	
1GA-ISO-160-OF-P	ISO-160	8.63	6.00	

Dimensions in inches

ISO to CF Conical Adapter Nipples



Model Number	Flange 1		Flange 2		B	Price
	Type	Tube OD	Type	Tube OD		
ANC-275-ISO-63-OF	2.75 CF	1.50	ISO-63	2.50	2.83	
ANC-275-ISO-80-OF	2.75 CF	1.50	ISO-80	3.00	4.08	
ANC-338-ISO-63-OF	3.38 CF	2.00	ISO-63	2.50	2.85	
ANC-338-ISO-80-OF	3.38 CF	2.00	ISO-80	3.00	4.10	
ANC-338-ISO-100-OF	3.38 CF	2.00	ISO-100	4.00	4.10	
ANC-450-ISO-80-OF	4.50 CF	2.50	ISO-80	3.00	4.25	
ANC-450-ISO-100-OF	4.50 CF	2.50	ISO-100	4.00	4.25	
ANC-462-ISO-63-OF	4.62 CF	3.00	ISO-63	2.50	4.16	
ANC-462-ISO-100-OF	4.62 CF	3.00	ISO-100	4.00	4.16	
ANC-600-ISO-63-OF	6.00 CF	4.00	ISO-63	2.50	4.31	
ANC-600-ISO-80-OF	6.00 CF	4.00	ISO-80	3.00	4.31	

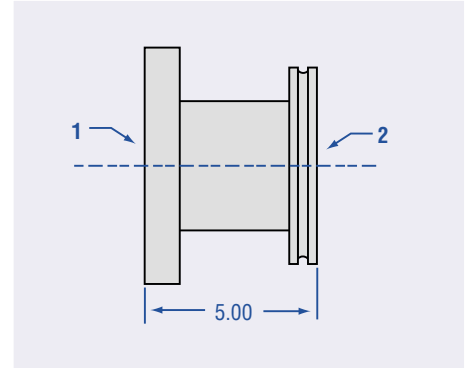
Dimensions in inches



ISO to CF Adapter Nipples

Model Number	Flange 1	Flange 2	Tube OD	Price
AN-450-ISO-63-OF	4.50 CF	ISO-63	2.50	
AN-462-ISO-80-OF	4.62 CF	ISO-80	3.00	
AN-600-ISO-100-OF	6.00 CF	ISO-100	4.00	
AN-800-ISO-160-OF	8.00 CF	ISO-160	6.00	
AN-1000-ISO-200-OF	10.00 CF	ISO-200	8.00	

Dimensions in inches

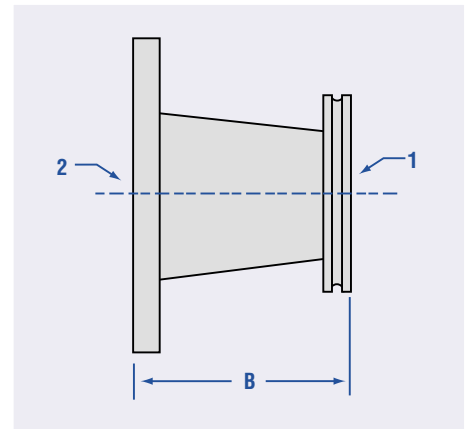


ISO to ASA Conical Adapter Nipples

Model Number	Flange 1		Flange 2			Price
	Type	Tube OD	Type	Tube OD	B	
ANC-ISO-63-OF-ASA-5	ISO-63	2.50	ASA-5	2.00	2.88	
ANC-ISO-63-OF-ASA-6	ISO-63	2.50	ASA-6	3.00	4.13	
ANC-ISO-63-OF-ASA-7.5	ISO-63	2.50	ASA-7.5	4.00	4.13	
ANC-ISO-80-OF-ASA-5	ISO-80	3.00	ASA-5	2.00	4.13	
ANC-ISO-80-OF-ASA-7.5	ISO-80	3.00	ASA-7.5	4.00	4.13	
ANC-ISO-100-OF-ASA-5	ISO-100	4.00	ASA-5	2.00	4.13	
ANC-ISO-100-OF-ASA-6	ISO-100	4.00	ASA-6	3.00	4.13	

Note: Add suffix "-G" to model number if O-ring groove is required on ASA flange. See ASA flange catalog for groove prices.

Dimensions in inches

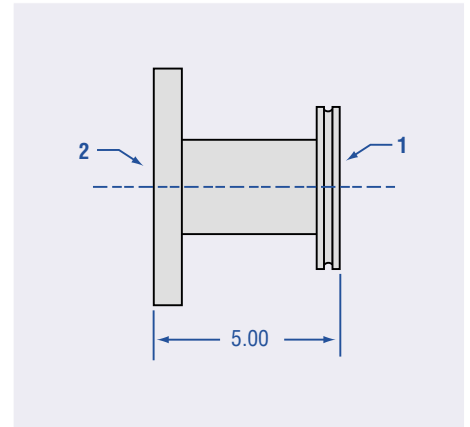


ISO to ASA Adapter Nipples

Model Number	Flange 1	Flange 2	Tube OD	Price
AN-ISO-63-OF-ASA-11	ISO-63	ASA-11	2.50	
AN-ISO-80-OF-ASA-6	ISO-80	ASA-6	3.00	
AN-ISO-80-OF-ASA-11	ISO-80	ASA-11	3.00	
AN-ISO-100-OF-ASA-7.5	ISO-100	ASA-7.5	4.00	
AN-ISO-100-OF-ASA-9	ISO-100	ASA-9	4.00	
AN-ISO-100-OF-ASA-11	ISO-100	ASA-11	4.00	
AN-ISO-160-OF-ASA-9	ISO-160	ASA-9	6.00	
AN-ISO-160-OF-ASA-11	ISO-160	ASA-11	6.00	
AN-ISO-200-OF-ASA-11	ISO-200	ASA-11	8.00	
AN-ISO-200-OF-ASA-13.5	ISO-200	ASA-13.5	8.00	

Note: Add suffix "-G" to model number if O-ring groove is required on ASA flange. See ASA flange catalog for groove prices.

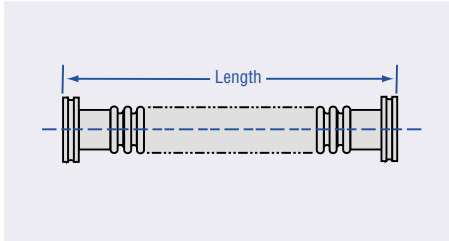
Dimensions in inches





Flexible stainless steel vacuum hose is available in 2.5 to 4 inch diameters with ISO flanges. Medium wall hose is available in standard lengths of 10, 12, 18, 20, 24, 36 and 40 inches, while thick wall is available in 20 and 40 inch lengths. Non-standard lengths can be supplied upon request. Flex hoses can be found with other flange types or with butt weld fittings in their appropriate catalog. The flexibility and reliability of these hoses, provided by 321 stainless steel, make them ideally suited for vibration isolation and roughing and alignment manifolds.

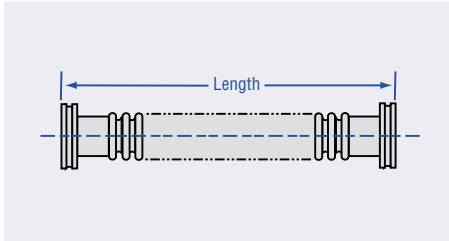
ISO Flexible Stainless Steel Hose - Medium Wall



Nom ID	Model Number	Overall Length	Flange Type	Wall Thickness	Static Bend Radius	Price
2.5	FH-250-10-2ISO	10	ISO-63	.012	3.15	
	FH-250-12-2ISO	12	ISO-63	.012	3.15	
	FH-250-18-2ISO	18	ISO-63	.012	3.15	
	FH-250-20-2ISO	20	ISO-63	.012	3.15	
	FH-250-24-2ISO	24	ISO-63	.012	3.15	
	FH-250-36-2ISO	36	ISO-63	.012	3.15	
	FH-250-40-2ISO	40	ISO-63	.012	3.15	
3.0	FH-300-10-2ISO	10	ISO-80	.016	3.82	
	FH-300-12-2ISO	12	ISO-80	.016	3.82	
	FH-300-18-2ISO	18	ISO-80	.016	3.82	
	FH-300-20-2ISO	20	ISO-80	.016	3.82	
	FH-300-24-2ISO	24	ISO-80	.016	3.82	
	FH-300-36-2ISO	36	ISO-80	.016	3.82	
	FH-300-40-2ISO	40	ISO-80	.016	3.82	
4.0	FH-400-10-2ISO	10	ISO-100	.016	4.45	
	FH-400-12-2ISO	12	ISO-100	.016	4.45	
	FH-400-18-2ISO	18	ISO-100	.016	4.45	
	FH-400-20-2ISO	20	ISO-100	.016	4.45	
	FH-400-24-2ISO	24	ISO-100	.016	4.45	
	FH-400-36-2ISO	36	ISO-100	.016	4.45	
	FH-400-40-2ISO	40	ISO-100	.016	4.45	

Dimensions in inches

ISO Flexible Stainless Steel Hose - Thick Wall



Nom ID	Model Number	Overall Length	Flange Type	Wall Thickness	Static Bend Radius	Price
2.5	TH-250-20-2ISO	20	ISO-63	.020	8.00	
	TH-250-40-2ISO	40	ISO-63	.020	8.00	
3.0	TH-300-20-2ISO	20	ISO-80	.020	9.00	
	TH-300-40-2ISO	40	ISO-80	.020	9.00	
4.0	TH-400-20-2ISO	20	ISO-100	.020	13.00	
	TH-400-40-2ISO	40	ISO-100	.020	13.00	

Dimensions in inches