NW and ISO 316L Flanges

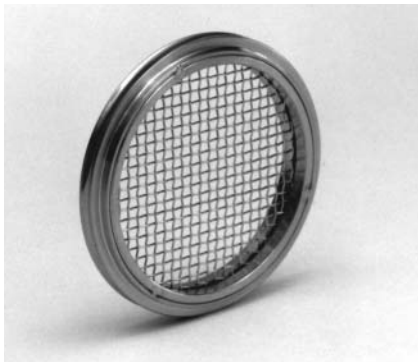
In response to requests from our customers for corrosion resistant flanges and fittings for downstream semiconductor applications, Nor-Cal now stocks several items made from 316L stainless steel material. NW and ISO flanges and centering rings are available in 25 to 100mm sizes. Conical reducers with 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.

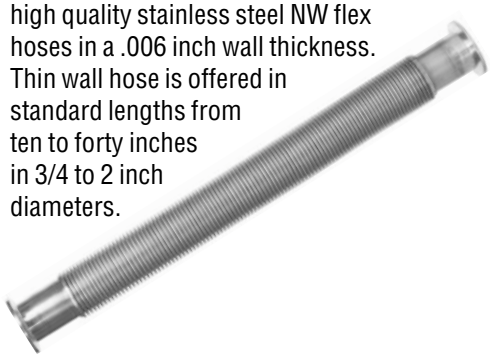


NW and ISO Centering Rings with Screens

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.



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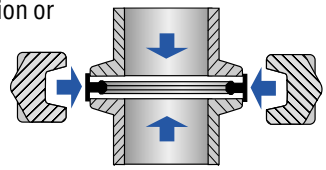
EVAC CHAIN CLAMPS, METAL SEALS & FLANGES

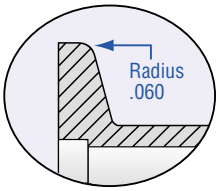
Nor-Cal Products stocks a complete line of EVAC chain clamps and aluminum metal seals for converting elastomer seal NW (KF) and ISO flanges to UHV metal seals. They provide a number of benefits over elastomer seals: reduced outgassing, no permeation, no hydrocarbons, resistance to radiation and short half-life. EVAC seals are used in high-energy physics, other UHV applications and, in some circumstances, cryogenic applications. EVAC seals are reliable in high vibration or temperature cycling environments. EVAC chain clamps and tapered flanges are the standard vacuum flange for many Japanese semiconductor equipment manufacturers. The advantages over using the standard ISO flange are the time and space savings during assembly and the flexibility to form high vacuum or UHV seals.



To install a metal seal on an existing KF flange, simply remove the standard clamp, centering ring and O-ring assembly. Replace them with an aluminum knife edge seal and chain clamp. (See drawing.) Standard ISO claw clamps can be used with EVAC aluminum seals to convert ISO flanges from high vacuum to UHV. Nor-Cal is the only authorized U.S. manufacturer of EVAC tapered flanges. Tapered flanges are similar to NW flanges and are available in 80 and 100mm sizes from stock. Chain clamps are used to form either elastomer or metal seals with tapered flanges.

Chain Clamps

Nor-Cal Products stocks chain clamps for NW (KF) and EVAC tapered flanges in two styles: one with Teflon® coated aluminum links and an uncoated version. The less expensive uncoated version is the preferred choice for sealing standard KF flanges with aluminum metal seals. The uncoated chain clamps can be used with Nor-Cal or other manufacturers' KF flanges with a radius of approximately .060 inches on the outer edge of the non-sealing side. (See drawing.) Most manufacturers' KF flanges have this feature. If the flanges to be sealed have a sharp edge, the Teflon coated chain clamps are required to ensure adequate sealing force for aluminum metal seals. Both versions use a single, hex head nut for closure. Stainless steel chain clamps and low cost composite chain clamps are available for elastomer KF connections.



Chain clamps for NW-63 flanges are similar to the NW-16 to 50 sizes. The style to use with NW-63 elastomer seals has a single knob for tightening. The clamp used for sealing aluminum metal seals has a single hex head nut. Both have uncoated aluminum links, although Teflon® coated aluminum versions are available.

Chain clamps for 80 to 100mm tapered flanges are stocked in two styles: one with a single knob for elastomer seals and another with two Allen head bolts for aluminum metal seals. Although chain clamps are bakeable to 150°C, the knobs should not be baked above 60°C. Chain clamps for tube sizes up to 28 inches OD can be supplied on request.

Aluminum Metal Seals

Stocked EVAC aluminum seals locate on the centering ring groove (inner centering) or outside edge of the flange (outer centering) depending on the size. (Inner and outer centering versions are available for all NW flange sizes.) Aluminum knife-edges are compressed by the sealing surfaces of the mating flanges when the chain clamp or ISO claw clamp is tightened. The resultant seal has a helium leak rate of less than $1x10^{-11}$ standard cc/sec. and can be baked repeatedly to 150°C. Proper sealing occurs even if the flanges are slightly scratched or misaligned. The aluminum alloy is soft enough to make a good seal with reasonable force but will not flow at moderate temperatures. EVAC seals will even work with aluminum flanges. Normally the seals are for one-time use, however, by sealing the first time with a low torque and increasing the torque each time thereafter, they can be reused up to five times. If the seal is going to be baked or subject to vibration or pressure, it should be tightened to the recommended torque initially.

NW-63 Flanges

Nor-Cal Products stocks blank and bored NW-63 flanges that are compatible with other manufacturers' KF-63 flanges made to the ISO 2861 specification. They can be used with EVAC chain clamps to form elastomer or aluminum metal seals. Elastomer seals are formed with ISO-63 centering ring/O-ring assemblies and elastomer EVAC chain clamps. Metal seals are formed with EVAC aluminum seals and metal seal chain clamps. NW-63 flanges are made from 304 stainless steel for 2.5 inch OD tube size.

Tapered Flanges

Nor-Cal Products is the only authorized U.S. manufacturer of EVAC tapered flanges. These flanges are designed specifically for use with EVAC chain clamps for elastomer or aluminum metal seals. High vacuum seals are formed with a standard ISO centering ring/O- ring assembly and an elastomer seal EVAC chain clamp. UHV seals are formed with a metal seal chain clamp and an aluminum seal. Both blank and bored 304 stainless steel versions are available from stock in 80 and 100mm sizes for 3 and 4 inch OD tube sizes, respectively. Flanges for tube sizes up to 28 inches OD or metric tube sizes can be supplied upon request.

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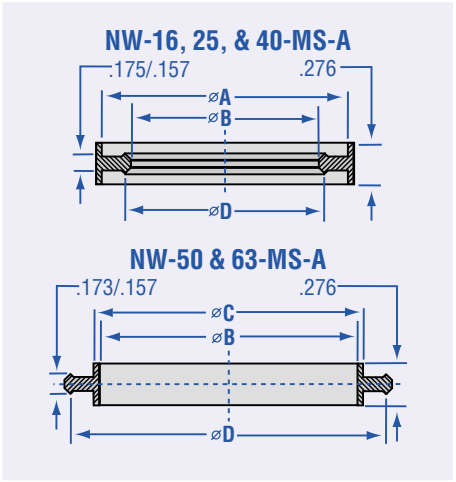
Aluminum Metal Seals for NW Flanges

Model Number	Application	A	B	C	D	Price
NW-16-MS-A	NW-16 Flange	1.18	0.63	-	0.91	
NW-25-MS-A	NW-25 Flange	1.58	0.96	-	1.30	
NW-40-MS-A	NW-40 Flange	2.16	1.58	-	1.89	
NW-50-MS-A	NW-50 Flange	-	1.97	2.05	2.32	
NW-63-MS-A	NW-63 Flange	-	2.68	2.76	3.03	

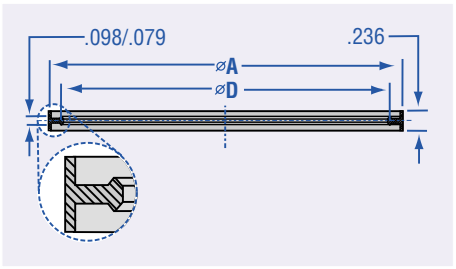
Dimensions in inches



Aluminum Metal Seals for EVAC Tapered Flanges

Model Number	Application	A	D	Price
NW-80-MS-A	NW-80 Tapered Flange	4.49	4.25	
NW-100-MS-A	NW-100 Tapered Flange	5.28	5.04	

Dimensions in inches

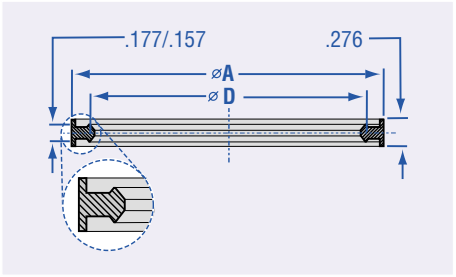


Aluminum Metal Seals for ISO Flanges

Model Number	Application	A	D	Torque (lb. in.)	Number Clamps*	Price
ISO-63-MS-A	ISO-63 Flange	3.74	3.47	100	4	
ISO-80-MS-A	ISO-80 Flange	4.33	4.06	100	6	
ISO-100-MS-A	ISO-100 Flange	5.12	4.84	100	8	

** Use with Nor-Cal ISO double or single claw clamps.*

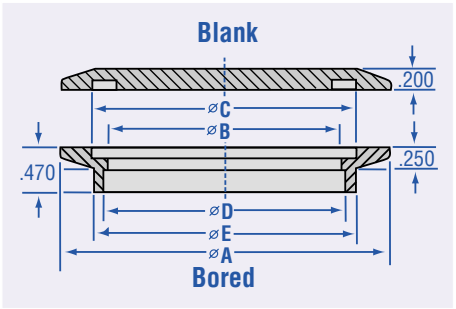
Dimensions in inches



NW-63 Flanges

Part Number	Description	A	B	C	D	E	Price
NW-63-250	Bored for 2.5 tube OD	3.43	2.44	2.76	2.51	2.71	
NW-63B	Blank	3.43	-	2.76	-	-	

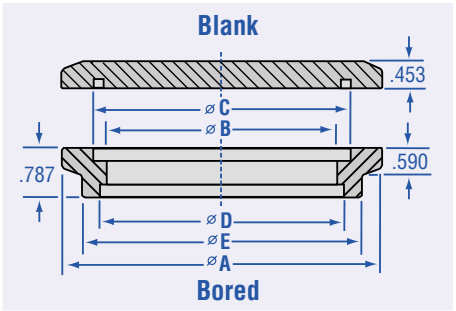
Dimensions in inches



EVAC Tapered Flanges

Part Number	Description	A	B	C	D	E	Price
NW-80-300	Bored for 3.0 tube OD	4.49	2.87	3.27	3.01	3.82	
NW-80B	Blank	4.49	-	3.27	-	-	
NW-100-400	Bored for 4.0 tube OD	5.28	3.87	4.02	4.01	4.61	
NW-100B	Blank	5.28	-	4.02	-	-	

Dimensions in inches



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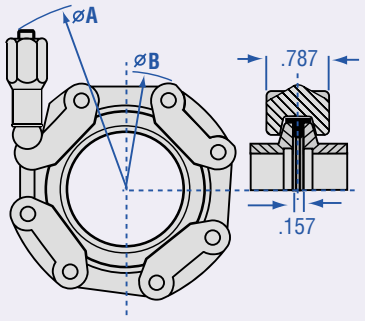
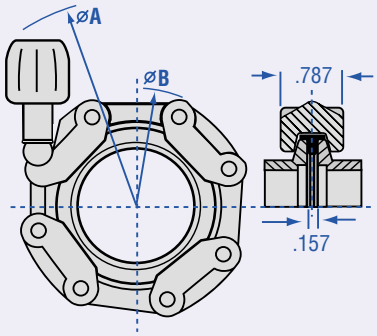
NW-63-CC-AN
NW-16 through -50-CC-AN
NW-16 through -50-CC-TN



NW-63-CCV-AN



Chain Clamps for NW-16 to 50 Flanges - Aluminum Links

Model Number	Application	A	B	Max. Temp.	Torque (lb. in.) Elastomer / Metal	Price
NW-16-CC-AN	Metal or Elastomer Seals	4.53	2.36	150°C	9 / 22	
NW-25-CC-AN	Metal or Elastomer Seals	4.92	2.76	150°C	13 / 26	
NW-40-CC-AN	Metal or Elastomer Seals	5.32	3.35	150°C	18 / 39	
NW-50-CC-AN	Metal or Elastomer Seals	5.98	4.13	150°C	22 / 44	

Dimensions in inches

Chain Clamps for NW-16 to 50 Flanges - Teflon Coated Links*

Model Number	Application	A	B	Max. Temp.	Torque (lb. in.) Elastomer / Metal	Price
NW-16-CC-TN	No radius, metal/elastomer	4.53	2.36	150°C	9 / 22	
NW-25-CC-TN	No radius, metal/elastomer	4.92	2.76	150°C	13 / 26	
NW-40-CC-TN	No radius, metal/elastomer	5.32	3.35	150°C	18 / 39	
NW-50-CC-TN	No radius, metal/elastomer	5.98	4.13	150°C	22 / 44	

**Not Radiation Resistant*

Dimensions in inches

Chain Clamps for NW-63 Flanges

Model Number	Application	A	B	Max. Bakeout	Torque (lb. in.) Elastomer / Metal	Price
NW-63-CCV-AN	Elastomer Seals only	6.69	4.72	100°C	-	
NW-63-CC-AN	Metal or Elastomer Seals	6.30	4.72	150°C	22 / 44	

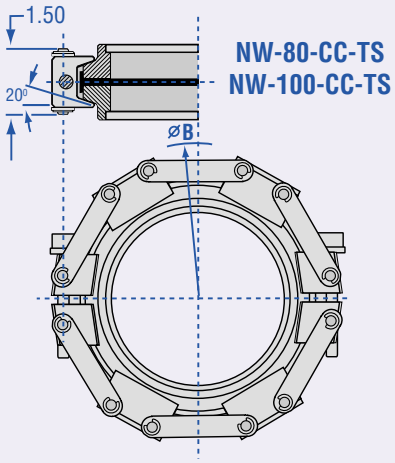
Dimensions in inches

Chain Clamps for 80 and 100mm Tapered Flanges

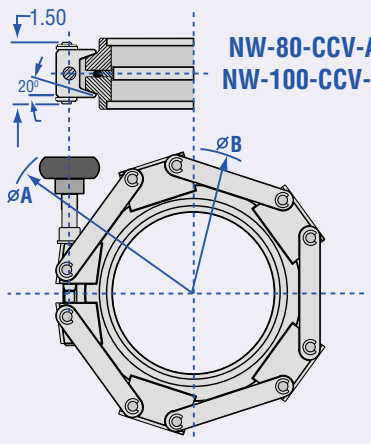
Model Number	Application	A	B	Max. Bakeout	Torque (lb. in.)	Price
NW-80-CCV-AS	Elastomer Seals only	9.61	6.06	150°C	-	
NW-80-CC-TS	Metal Seals only	-	6.30	150°C	75	
NW-100-CCV-AS	Elastomer Seals only	10.08	6.77	150°C	-	
NW-100-CC-TS	Metal Seals only	-	7.09	150°C	88	

Dimensions in inches

NW-80-CC-TS
NW-100-CC-TS



NW-80-CCV-AS
NW-100-CCV-AS



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