

VACUUM QUICK-RELEASE VACUUM FITTINGS

G

- KF Elastomer Seals, DN 10/16-63, UHVG 15
- KF Metal Seals, DN 16-63, UHVG 18
- ISO Elastomer Seals, DN 80-250, UHVG 21
- ISO Aluminum Metal Seals
for Tapered Flanges, DN 80-250, UHV G 23

CHAIN CLAMPS

These are chains for quick connection of two tubes by means of tapered flanges. The tubes are centered by means of the inserted seals and a tight vacuum is ensured.

Due to the sturdy design, high compression strengths can be achieved and various types of metal seals used. A decisive aspect in many applications, tightening can be done evenly, with just one or two screws. Tightness is guaranteed once a certain tightening torque has been reached. When opening the chains, just one screw needs to be loosened to remove the chain - swift work ensured.

Since suitable materials are used, such connections are usually not any larger - and above all, they are lighter - than fixed flange couplings. There are various standard designs. The entire system is designed for a wide range of diameters and forces so that corresponding combination of standardized parts can cater to many special demands regarding to sealing force, excess pressure and materials.

The main advantages of this system

- High tightening forces
- Even distribution of force
- Simple and swift assembly and removal
- Assembly possible even in places that is difficult to access
- Great flexibility of design
- Versatile use of various seals

Range of applications

These chains are the preferred choice for:

- Vacuum technology and applications demanding the highest sealing tightness (metal seals)
- Locations subject to radiation (nuclear industry, accelerators, etc.) where radiation-proof seals and quick assembly are essential
- Connections that have to withstand high temperatures or baking (UHV connections, furnaces, etc.)
- Chemical industry (corrosion resistant design), petrochemical industry
- Cryogenics
- Generally for connections with medium to large diameters
- Customized designs for critical applications (restricted space, pressure, etc.)
- Securing of units or assemblies with or without sealing but respective center rings (securing of filters, valves, etc.)

The application range is virtually limitless. The maximum diameter depends on requirements and is between 500 and 700 mm.

There are various materials for various purposes, such as antimagnetic systems made from Aluminum and Stainless Steel.

MATERIALS	RANGE OF APPLICATIONS
Plastic high-temperature	-20... +100°C, (150°C short time), antimagnetic, only for elastomer seals, electric insulation, suitable for cleanrooms, for glass and metal flanges
Plastic ultra high-temperature	-20... +200°C, (220°C short time), only for elastomer seals, electric insulation, antimagnetic, suitable for cleanrooms, for glass and metal flanges
Aluminum BX Type* with knob (1 catch)	-271... +150°C, suitable for cleanrooms, antimagnetic, only for elastomer seals
Stainless Steel (1 catch)	-271... +350°C, cryogenics, antimagnetic, radiation resistant, only elastomer seals
Stainless Steel (2 screws)	-271... +350°C, cryogenics, antimagnetic, radiation resistant, metal and elastomer seals
Plastic standard	-20... +60°C, (80°C short time), antimagnetic, only for elastomer seals, electric insulation, suitable for cleanrooms, for glass and metal flanges
Cast Aluminum	-20... +100°C, antimagnetic, only for elastomer seals, suitable for cleanrooms
Forged Aluminum	-271... +150°C, cryogenics, antimagnetic, for metal and elastomer seals, radiation resistant
Nickel plated Steel	-271... +350°C, cryogenics, pressure, radiation resistant, for metal and elastomer seals
Stainless Steel (CeFiX)	-271... +350°C, cryogenics, pressure, antimagnetic, radiation resistant, for elastomer and metal seals

*BX Type (4 contact per link) patented.

SEALS

Neyco provides several types of seals, as following:

- Seals with center rings on the inside or outside made from various elastomer materials
- Seals with center rings on the inside or outside as Aluminum edge seals with various cross-sections
- Moulded seals in various shapes and sizes, Aluminum
- CeFiX seals for UHV applications in Aluminum, Copper or Nickel
- CeFiX seals in various shapes and sizes, Aluminum

MATERIALS	RANGE OF APPLICATIONS
Teflon/Viton	Suitable for cleanrooms, electric insulation, leak rate: $<1.10^{-9}$ mbar.l.s ⁻¹ , antimagnetic, -20... +200°C
Teflon/FEP	Suitable for cleanrooms, electrical insulation, leak rate: $<1.10^{-6}$ mbar.l.s ⁻¹ , antimagnetic, chem./corrosion, -50... +200°C
Aluminum/Viton	Suitable for cleanrooms, pressure, antimagnetic, leak rate: $<1.10^{-9}$ mbar.l.s ⁻¹ , -20... +200°C
Stainless Steel/Viton	Pressure, suitable for cleanrooms, leak rate: $<1.10^{-9}$ mbar.l.s ⁻¹ , antimagnetic, -20... +200°C
Stainless Steel/Kalrez	Excellent chem. /corrosion, suitable for cleanrooms, antimagnetic, leak rate: $<1.10^{-9}$ mbar.l.s ⁻¹ , -10... +315°C
Aluminum	Antimagnetic, radiation resistant, cryogenics, temperature range: -271... +150°C leak rate: $<1.10^{-11}$ mbar.l.s ⁻¹
OFS* Copper/ OFS* Copper Silver plated	Radiation resistant, antimagnetic, pressure, temperature range: -271... +350°C, cryogenics, leak rate: $<1.10^{-11}$ mbar.l.s ⁻¹
Nickel	Antimagnetic, radiation resistant, cryogenics, temperature range: -271... +150°C leak rate: $<1.10^{-11}$ mbar.l.s ⁻¹

*OFS: Oxygen-free, silver-alloyed copper for higher thermal stability.

FLANGES

Flanges can be used with chain clamps and elastomer seals or with metal seals for UHV applications.

Neyco provides several systems: KF, ISO-Tapered™, CeFiX

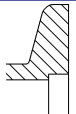

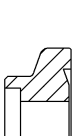
KF / ISO-Tapered™ Systems (metal)

- Materials: Stainless Steel 304/ Stainless Steel 316L

- Temperature: -271°C to +300°C (304), -271°C to +350°C (316L)
- Leak rate: $<1.10^{-9}$ mbar.l.s⁻¹
- Antimagnetic, cryogenics

Advantages

- Space-saving, quick connections
- Exceedingly high vacuum tightness
- Temperature- and radiation-resistant designs
- Antimagnetic designs
- Even distribution of force
- Rotary connection

DRAWING	FLANGE TYPE	FLANGE MATERIAL	SEALS	SEALING SURFACE	CLAMPING MEANS
	KF DN 10 to 63	Aluminum Stainless Steel Glass	Elastomer Aluminum (Copper)	Unprotected	Chain clamps (1 screw)
	ISO-Tapered DN 80 to 250	Aluminum Stainless Steel Glass	Elastomer Aluminum	Unprotected	Chain clamps (1 or 2 screws)
	EVAC-CeFiX DN 80 to 250	Aluminum Stainless Steel	Elastomer Aluminum Copper Nickel	Protected No cutting edge	Chain clamps

CeFiX systems

The most striking feature of the CeFiX flange compared to the CF flange is the lack of a cutting edge. The edge is easily damaged and requires high sealing forces and has therefore been omitted with the CeFiX system.

The seals are designed in such a way that they seal on the 20 degree taper of the flange, thereby reducing the necessary sealing force by up to 50 %. Since the dimensions of the

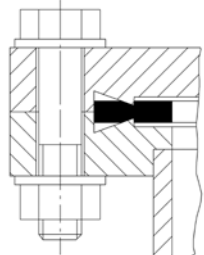
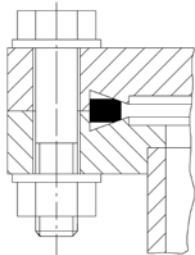
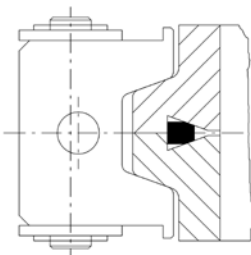
sealing groove of both systems are absolutely identical, the CeFiX seal can also be used for standard CF flanges. So the seal can also be used for flanges with slightly damaged flange edges.

Thanks to the reduced sealing force, Nickel alloys can also be used, but just for CeFiX flanges, since standard CF flanges could be damaged.

Comparison of sealing force (N/mm sealing length)

	CeFiX	STANDARD
Aluminum	70	100
Copper	220	410
Nickel	400	680

- Materials: Stainless Steel 316L
- Temperature: -271°C to +350°C
- Leak rate: <math> < 1.10^{-11} \text{ mbar.l.s}^{-1} </math>
- Antimagnetic, cryogenics, suitable for UHV, excess pressure, resistant to chemicals

STANDARD CF CONNECTION	CeFiX SEAL WITH CF FLANGES	CeFiX SEAL CHAIN CLAMP WITH SPECIFIC FLANGES
Sealing force 100%	Sealing force 50%	Sealing force 50%
		

BELLOWS AND HOSES

Advantages

- Highly flexible, without annealing
- Highest bending and torsion strength
- Can be used for ultra-high vacuum to slight pressure
- Bakeable, suitable for cryogenics
- Radiation resistant, antimagnetic
- Perfect to clean (ultrasound)
- Optimum corrosion resistance
- Minimum outgassing

Behaviour under pressure

Metal bellows and tubes are used for vacuum, excess pressure and on both sides.

If subjected to excess pressure, the bellows and tubes tend to elongate or - in the case of tightly clamped flanges - to buckle.


Applications

- Compensation of axial, lateral or angular set-offs
- Prevention of vibration transfer
- Substitute for elastomer compensators
- Compensate thermal expansion

Metal bellows and hoses

- Materials: Stainless Steel 304 (flanges), Stainless Steel 316Ti (bellows), Stainless Steel 316L (hoses)
- Temperature: -200°C to +350°C
- Leak rate: $<1.10^{-9}$ mbar.l.s⁻¹
- Antimagnetic, cryogenics, radiation resistant, suitable for clean rooms, usable with metal or elastomer seals

Teflon bellows

 See Section H - Glass & Quartz Components in this catalogue.

All given dimensions are nominal in mm.



Chain clamps



Metal bellows

KF Elastomer Seals, DN 10/16-63, UHV

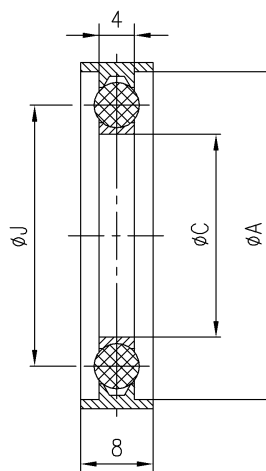
OUTER CENTER RING



APPLICATIONS

- Carriers made of Teflon, Aluminum or Stainless Steel 316L
- FEP multilayer material (Teflon with silicone core)
- FEP O-ring material for low temperatures down to -50°C
- High temperature Viton up to 200°C available
- Outer center ring for overpressure up to 20 bar
- Inner support ring for UHV applications
- Vacuum up to 10^{-9} mbar
- Inner support ring and outer center ring with intrinsic torque stop

DN	A	C	J
10/16	30	16	23
20/25	40	24	33
32/40	55	40	48
50	75	50	59
63	87	68	77



	TYPE	TEFLON / FEP	TEFLON / VITON	ALU / VITON	ALU / SS / VITON	STAINLESS STEEL / VITON
	DN	P/N				
	Centering	Outside				
	10/16	-	34.016035.121.616	34.016037.121.816	34.016034.121.516	34.016032.121.316
	20/25	34.025031.121.225	34.025035.121.625	34.025037.121.825	34.025034.121.525	34.025032.121.325
	32/40	34.040031.121.240	34.040035.121.640	34.040037.121.840	34.040034.121.540	34.040032.121.340
	50	34.050031.121.250	34.050035.121.650	34.050037.121.850	34.050034.121.550	34.050032.121.350
	63	34.063031.121.263	34.063035.121.663	34.063037.211.806	-	34.063032.211.306
Materials	Inner Ring	Teflon	Teflon	Aluminum	316L	316L
	Outer Ring	Teflon	Teflon	Aluminum	Aluminum	316L
	O-Ring	FEP	Viton	Viton	Viton	Viton
Range of Application	Vacuum	Rough- / High-	Rough- / High-	Rough- / High-	Rough- / High-	Rough- / High-
	Temperature range	-50... 200°C	-20... 200°C	-20... 200°C	-20... 200°C	-20... 200°C
	Cryogenics	-	-	-	-	-
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹
	Pressure	Yes	Yes	Yes	Yes	Yes
	Antimagnetic	Yes	Yes	Yes	Yes	Yes
	Radiation resistant	-	-	-	-	-
	Chemistry / Corrosion	Very good	Good	Good	Good	Good
	Cleanroom suitable	Yes	Yes	Yes	Yes	Yes
	Electrical isolation	Yes	Yes	-	-	-

FEP = Silicone O-Ring seamlessly coated with Teflon

Other material combinations are available on request.

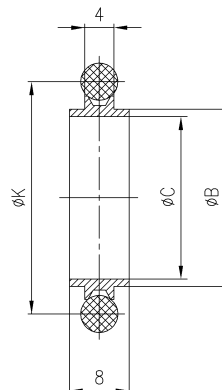
INNER CENTER RING



DN	B	C	K
16	17	16	25
25	26	24	35
40	41	40	49
50	52	50	61.5
63	70	68	80

APPLICATIONS

- Carriers made of Aluminum or Stainless Steel 316L
- Kalrez O-ring for high temperature up to 315°C
- High temperature Viton up to 200°C available
- Outer center ring for overpressure up to 20 bar
- Vacuum up to 10⁻⁹ mbar
- Inner center ring with intrinsic torque stop



	TYPE	STAINLESS STEEL / KALREZ	ALU / VITON	STAINLESS STEEL / VITON
	DN	P/N		
	Centering	Inside		
	10/16	34.016043.121.F16-iz	34.016037.121.816-iz	34.016032.121.316-iz
	20/25	34.025043.121.F25-iz	34.025037.121.825-iz	34.02032.121.325-iz
	32/40	34.040043.121.F40-iz	34.040037.121.840-iz	34.040032.121.340-iz
	50	34.050043.121.F50-iz	34.050037.121.850-iz	34.050032.121.350-iz
	63	-	34.063037.211.806	34.063032.211.306
Materials	Inner Ring	316L	Aluminum	316L
	O-Ring	Kalrez	Viton	Viton
Range of Application	Vacuum	Rough- /High-	Rough- /High-	Rough- /High-
	Temperature range	-10... 315°C	-20... 200°C	-20... 200°C
	Cryogenics	-	-	-
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹
	Pressure	-	-	-
	Antimagnetic	Yes	Yes	Yes
	Radiation resistant	-	-	-
	Chemistry / Corrosion	Excellent	Good	Good
	Cleanroom suitable	Yes	Yes	Yes
Electrical isolation	-	-	-	

Other material combinations are available on request.

KF Metal Seals, DN 16-63, UHV

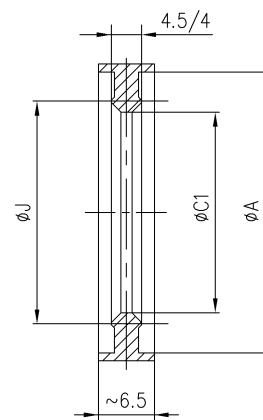
APPLICATIONS

- UHV applications up to 10^{-11} mbar
- Pressurized applications up to 20 bar
- Cryogenics applications down to -270°C
- Maximum temperature up to 150°C
- Flange seals reusable up to 10 times
- Radiation tolerant and nuclear applications
- Cleanroom compatible

KF ALUMINUM EDGE SEALS - OUTER CENTER RING



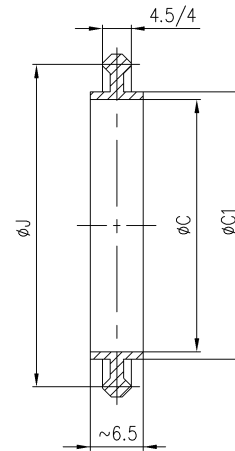
DN	A	C1	J
10/16	30	20	23
20/25	40	32	33
32/40	55	45	48
50	75	65	68
63	87	77	80



KF ALUMINUM EDGE SEALS - INNER CENTER RING



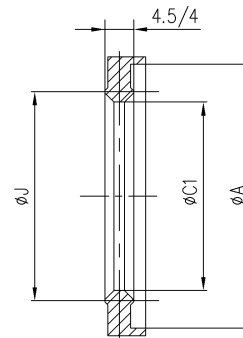
DN	C	C1	J
10/16	15	17	21
20/25	24	26	30
32/40	39	41	47
50	50	52	59
63	68	70	77



KF ALUMINUM EDGE SEALS - ONE-SIDE OUTER CENTER RING



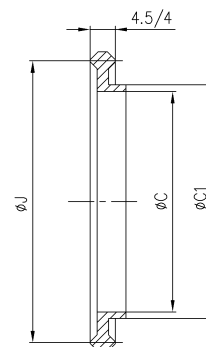
DN	A	C1	J
10/16	30	20	23
20/25	40	32	33
32/40	55	45	48
50	75	65	68
63	87	77	80



KF ALUMINUM EDGE SEALS - ONE-SIDE INNER CENTER RING



DN	C	C1	J
10/16	15	17	21
20/25	24	26	30
32/40	39	41	47
50	50	52	59
63	68	70	77



	TYPE	OUTSIDE CENTERING	INSIDE CENTERING	ONE-SIDE OUTER CENTERING	ONE-SIDE INNER CENTERING
	DN	P/N			
	10/16	34.016001.142.116-az	34.016001.142.116-iz	34.016001.142.116az1	34.016001.142.116iz1
	20/25	34.025001.142.125-az	34.025001.142.125-iz	34.025001.142.125az1	34.025001.142.125iz1
	32/40	34.040001.142.140-az	34.040001.142.140-iz	34.040001.142.140az1	34.040001.142.140iz1
	50	34.050001.142.150-az	34.050001.142.150-iz	34.050001.142.150az1	34.050001.142.150iz1
	63	34.063001.142.163-az	34.063001.142.163-iz	34.063001.142.163az1	34.063001.142.163iz1
Materials	Seal	Aluminum	Aluminum	Aluminum	Aluminum
Range of Application	Vacuum	Rough-/High-/UHV	Rough-/High-/UHV	Rough-/High-/UHV	Rough-/High-/UHV
	Temperature range	-271... 150°C	-271... 150°C	-271... 150°C	-271... 150°C
	Cryogenics	Yes	Yes	Yes	Yes
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻¹¹	<1.10 ⁻¹¹	<1.10 ⁻¹¹	<1.10 ⁻¹¹
	Pressure	Yes	Yes	Yes	Yes
	Antimagnetic	Yes	Yes	Yes	Yes
	Radiation resistant	Yes	Yes	Yes	Yes
	Chemistry/Corrosion	Limited	Limited	Limited	Limited
	Cleanroom suitable	Yes	Yes	Yes	Yes
Electrical isolation	-	-	-	-	

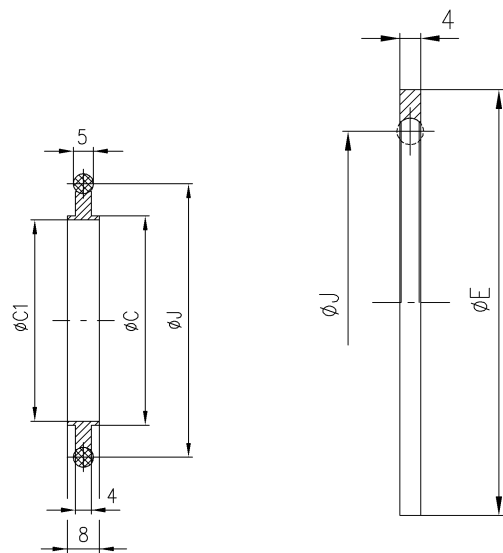
Other material combinations are available on request.

ISO Elastomer Seals, DN 80-250, UHV



APPLICATIONS

- Carriers made of Aluminum, or Stainless Steel 316L
- Kalrez O-ring for high temperature up to 315°C
- High temperature Viton up to 200°C available
- Vacuum up to 10^{-9} mbar
- Inner center ring with intrinsic torque stop



With inside center ring

Outer ring required for pressure applications

DN	C	C1	J	E
80	83	81	98	112
100	102	100	118	132
125	127	125	144	157
160	153	151	167	182
200	213	211	227	242
250	261	259	275	292

	TYPE	ALU/VITON	STAINLESS STEEL/ VITON	TEFLON/VITON	TEFLON/FEP
	DN	P/N			
	80	34.080037.211.808	34.080032.211.308	34.080035.211.508	34.080031.211.208
	100	34.100037.211.810	34.100032.211.310	34.100035.211.510	34.100031.211.210
	125	34.125037.211.812	34.125032.211.312	34.125035.211.512	34.125031.211.212
	160	34.160037.211.816	34.160032.211.316	34.160035.211.516	34.160031.211.216
	200	34.200037.211.820	34.200032.211.320	34.200035.211.520	34.200031.211.220
	250	34.250037.211.825	34.250032.211.325	34.250035.211.525	34.250031.211.225
Materials	Inner Ring	Aluminum	316L	Teflon	Teflon
	O-Ring	Viton	Viton	Viton	FEP
Range of Application	Vacuum	Rough-/High-	Rough-/High-	Rough-/High-	Rough-/High-
	Temperature range	-50... 200°C	-20... 200°C	-20... 200°C	-20... 200°C
	Cryogenics	-	-	-	-
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹	<1.10 ⁻⁹
	Pressure	Yes	Yes	Yes	Yes
	Antimagnetic	Yes	Yes	Yes	Yes
	Radiation resistant	-	-	-	-
	Chemistry/Corrosion	Very good	Good	Good	Good
	Cleanroom suitable	Yes	Yes	Yes	Yes
Electrical isolation	Yes	Yes	-	-	

FEP = Silicone O-Ring seamlessly coated with Teflon

	TYPE	STAINLESS STEEL/ KALREZ	OUTER RING (OPTIONAL*)
	DN	P/N	
	80	34.080043.211.F08	34.080001.289.108
	100	34.100043.211.F10	34.100001.289.110
	125	34.125043.211.F12	34.125001.289.112
	160	34.160043.211.F16	34.160001.289.116
	200	34.200031.211.F20	34.200001.289.120
	250	34.250043.211.F25	34.250001.289.125
Materials	Centering Ring	316L	-
	O-Ring	Kalrez	-
	Outer Ring	-	Aluminum
Range of Application	Vacuum	Rough-/High-	Rough-/High-
	Temperature range	-10... 315°C	-50... 200°C
	Cryogenics	-	-
	Leak rate (mbar.l.s ⁻¹)	<1.10 ⁻⁹	-
	Pressure	With Outer Ring	With Outer Ring
	Antimagnetic	Yes	Yes
	Radiation resistant	-	-
	Chemistry/Corrosion	Excellent	-
	Cleanroom suitable	Yes	Yes
Electrical isolation	-	-	

*Optional: with outer suitable for pressure applications

Other material combinations are available on request.

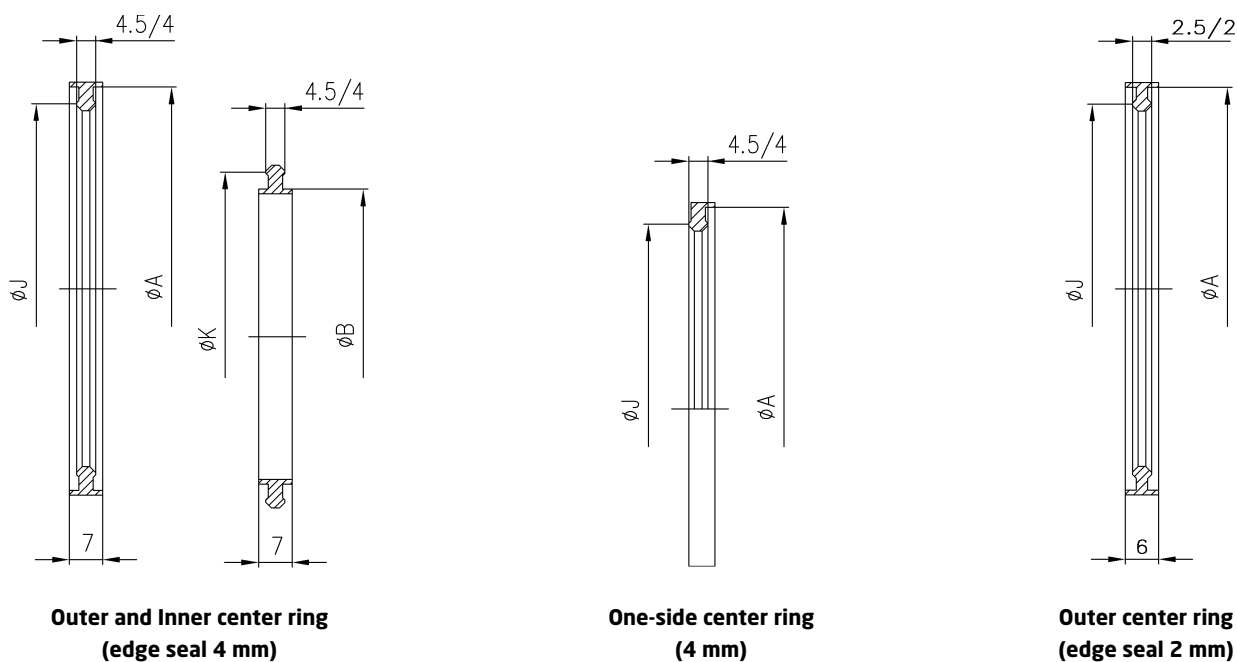
ISO Aluminum Metal Seals for Tapered Flanges, DN 80-250, UHV



APPLICATIONS

- UHV applications up to 10^{-11} mbar
- Pressurized applications up to 20 bar
- Cryogenics applications down to -270°C
- Maximum temperature up to 150°C
- Flange seals reusable up to 10 times
- Radiation tolerant and nuclear applications
- Cleanroom compatible

DN	A	J (4 mm)	J (2 mm)	B	K
80	114	107	108	83	90
100	134	127	128	102	109
125	161	154	155	127	134
160	190	183	184	153	160
200	252	245	246	213	220
250	301	294	295	261	268



These Aluminum seals must be used only with EVAC flanges.

DN	ALUMINUM OUTER CENTER RING* (4 mm)	ALUMINUM INNER CENTER RING** (4 mm)	ALUMINUM ONE-SIDE CENTERING* (4 mm)	ALUMINUM OUTER CENTER RING (2 mm)
80	34.080001.272.108	34.080001.342.108	34.080001.272.108az1	34.080001.271.108
100	34.100001.272.110	34.100001.342.110	34.100001.272.110az1	34.100001.271.110
125	34.125001.272.112	34.125001.342.112	34.125001.272.112az1	34.125001.271.112
160	34.160001.272.116	34.160001.342.116	34.160001.272.116az1	34.160001.271.116
200	34.200001.272.120	34.200001.342.120	34.200001.272.120az1	34.200001.271.120
250	34.250001.272.125	34.250001.342.125	34.250001.272.125az1	34.250001.271.125

*Only for chain clamp BX type

**Can also be used with ISO-F flanges



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