

Fittings and Flanges



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Flange Fittings



- Fast availability from responsive local supply centers
- Edwards worldwide support
- International ISO, Pneurop and British Standards
- Complete range for all common sizes in aluminium and stainless steel
- Stainless fittings made in 316L for highest corrosion resistance
- Precision material control ensures low outgassing and dependable vacuum performance

When you buy flange fittings from Edwards, you can expect the service that only a leading international supplier can offer you. Whether you are an OEM (needing scheduled deliveries of component kits for series production) or a unique system builder, you can rely on your local supplier to meet all your requirements.

70 Years of Vacuum Experience

From our experience in vacuum technology we enjoy solving your vacuum problems. You can rely on our library of vacuum applications and let us advise you on the most cost effective solutions. Our trained engineers will resolve any problem you have in choosing the right product for your application or troubleshooting a product that's not doing what you expected.

Partnership with Edwards

Edwards offers complete vacuum solutions. With our wide range of pumping technologies and sophisticated distribution networks we can offer flexible supply partnerships to match your competitive needs and offer the best value for your budget.

The Edwards Advantage

One Source Shopping

- Simplifies administration and purchasing costs
- Creates more purchasing power
- Ensures total quality performance

Kitting

- All components supplied for system build in one kit
- Simplifies ordering
- Ensures no missing parts in production
- Easier administration
- Reduces inventory levels, stock costs and warehousing space
- Easier control of usage

Consignment Stocks

- Only pay for when used
- Stocks on your premises
- No delivery problems
- Stocks regularly replenished when used

Total Quality

- Accredited ISO9001 supplier
- Customer contracts performance measures

Vacuum Fittings in General

Edwards vacuum fittings are designed to be leak-tight in vacuum applications. However, they are not intended to provide full structural support. When designing vacuum systems, it is essential that consideration be given to the static and dynamic loads imposed on each connection. If necessary, additional mechanical support should be provided.

Regular inspection including leak-checking and, where appropriate, periodic replacement of components should be considered.

These accessories are primarily designed for vacuum applications however some will withstand a small over-pressure, which is indicated in the tables below where appropriate. For the purpose of the European Union's Pressure Equipment Directive (97/23/EC), these items are considered to be piping for Group 2 gases (i.e. gas mixtures which are not explosive, flammable, toxic or oxidising) and are manufactured according to sound engineering practice as defined within the Directive.

NW and ISO Flange Fittings

Choose the optimum material to match your application and budget. Aluminium is ideal for achieving dependable cost-effective performance down to 10^{-7} mbar. Edwards also offers 316L/DIN 1.4404 stainless steel fittings for rugged corrosion resistance in semiconductor processing and excellent repeatability in high vacuum applications. In addition, careful quality control of elastomer specifications ensures critical sealing materials deliver the low outgassing performance your vacuum system performance depends on. Edwards attention to detail on all specifications delivers fit-and-forget dependability for your vacuum equipment.

UHV ConFlat[®] Flange Fittings

Sealing Principle A copper seal is squeezed axially and radially between two CF flanges, where knife-edges force the copper to cold flow. This flow is severely limited by the vertical flange wall which generates high pressures and fills surface imperfections to give a leak tight joint. At high bakeout temperatures, the flange geometry maintains high internal pressures despite softening of the gasket. A radial groove extends right up to the sealing ring and provides for leak testing of the vacuum connection.

Materials Our range of CF flanges is manufactured from AISI 304 stainless steel, which offers optimum performance at an affordable cost. Stainless steel 304 is used for the majority of UHV applications where a bakeout temperature of up to 450 °C is needed. AISI 316LN stainless steel is recommended for special applications where a harder material, higher bakeout temperature and much lower magnetic permeability are needed: these fittings are available on special order terms.

Dimensions Edwards CF flanges are manufactured to international standards and are compatible with all leading manufacturers. Metric flanges common in Europe and Asia use metric tapped holes and bored holes in flanges suitable for metric tubing. Flanges specified in inches, more commonly used in the USA, use UNF tapped flange threads and bored holes compatible with inch sized tube. Edwards offers both options.

CF Flange Names There are many descriptions used to describe the same flange sizes. Use the table below to cross-reference between common names.

	CF Flange Name Equivalents				Flange OD	
					mm	inch
DN16CF	NW16	CF34	NW16CF	1½ inch	34.00	1.33
DN25CF			NW25CF	2¼ inch	53.60	2.11
DN40CF	NW35	CF70	NW35CF	2 ¾ inch	70.00	2.73
DN50CF			NW50CF	3 ¾ inch	85.70	3.37
DN63CF	NW63	CF114	NW63CF	4½ inch	114.00	4.47
DN80CF			NW75CF	4¾ inch	117.35	4.62
DN100CF	NW100	CF150	NW100CF	6 inch	152.00	5.97
DN125CF			NW130CF	6 ¾ inch	171.45	6.75
DN160CF	NW150	CF200	NW150CF	8 inch	202.00	7.97
DN200CF	NW200	CF250	NW200CF	10 inch	253.00	9.97
DN250CF	NW250	CF300	NW250CF	12 inch	306.00	13.25

NW Polymer Clamping Rings



In addition to the traditional aluminium hinged clamp, Edwards also offers a range of coupling clamps manufactured from high technology polymer, offering important advantages for the vacuum system builder.

Compared to aluminium, the high flexural modulus and better strength-to-weight ratio has enabled Edwards to design and manufacture clamps which are lighter and more compact than existing aluminium products. The CX4 crystalline aryl polymer clamps can be used at temperatures up to 100 °C and are unaffected by most common solvents.

These clamps are competitively priced and the high quality finish will enhance the appearance of any vacuum system. The range is available in swing and quick release hinged versions covering the following flange sizes: NW10/16, 20/25, 25/32, 32/40 and 50. With Edwards Co-Seals, swing clamps are suitable for use in the pressure range 10⁻⁷ mbar to 10 bar. Electrical continuity across the clamps is achieved by built-in earth strips.

Co-Seal

The introduction of our Co-Seal represented a major advance in the method of sealing NW and ISO flange connections. Discerning users appreciate the benefits of a seal design which eliminates crevices and trapped volumes. Our NW Co-Seals with polymer carriers offer a more economical seal with even wider appeal.

A Co-Seal has a split outer ring, or carrier, which retains a moulded elastomer sealing ring. When fitted, the inner face of the Co-Seal is directly exposed to the vacuum system, eliminating any crevices or trapped volumes which can generate gas bursts and inhibit pump-down. Unlike the regular centring-ring and O-ring, the NW Co-Seal is fully restrained externally and is therefore suitable from 10⁻⁷ mbar to 10 bar. Available with either nitrile or fluoroelastomer seals.

For ISO bolted flanges, cut-outs around the external circumference of the Co-Seal are positioned so that the securing bolts centralise the Co-Seal precisely. For ISO collar flanges, claw clamps also centralise the seal and are themselves spaced around the flange by the cut-outs in the Co-Seal.

Centring Rings in High Technology Polymer

We complement our aluminium centring-rings with a range manufactured from a high-tech polymer. These centring-rings have a unique slotted design which prevents gas bursts. The CX2 polymer can be used at temperatures up to 100 °C and is unaffected by most common solvents. The material has an outgassing rate of 6.6 × 10⁻⁸ mbar l s⁻¹ cm⁻² which makes it suitable for use in most vacuum systems, whilst giving additional benefits in terms of lower weight and cost.

Technical Data

Physical Data

Operating pressure range (absolute)	
C clamp and centring-ring	10 ⁻⁷ mbar – 1 bar / 14.5 psi
Stainless steel clamping ring and Co-Seal	10 ⁻⁷ mbar – 10 bar / 145 psi
Stainless steel clamp and metal seal	10 ⁻⁸ mbar – 3 bar / 44 psi
Stainless steel clamp and Co-Seal (all sizes)	10 ⁻⁷ mbar – 10 bar / 145 psi
Polymer and aluminium clamps and Co-Seal	
NW10 to NW25	10 ⁻⁷ mbar – 10 bar / 145 psi
NW40 to NW50	10 ⁻⁷ mbar – 10 bar / 145 psi
NW trapped O-ring	10 ⁻⁷ mbar – 10 bar / 145 psi
O-ring and centring-ring (vacuum use only)	10 ⁻⁷ mbar – 1 bar / 14.5 psi
Bellows	10 ⁻⁷ mbar – 1 bar / 14.5 psi
Flexible pipelines*	10 ⁻⁷ mbar – 1.5 bar / 21 psi
Braided flexible pipelines*	10 ⁻⁷ mbar – 10 bar / 145 psi

* Depends on size

Operating Temperature

The maximum temperature for continuous operation with fluoroelastomer is 150 °C. It may be intermittently baked to 200 °C.

Polymer Co-Seal	-10 to 80 °C
Aluminium Co-Seal and nitrile seal	-10 to 100 °C
Aluminium Co-Seal and fluoroelastomer seal	-10 to 200 °C
Polymer centring-ring and nitrile O-ring	-10 to 100 °C
Polymer centring-ring and fluoroelastomer seal	-10 to 125 °C
Nitrile O-ring	-10 to 100 °C
Fluoroelastomer O-ring	-10 to 200 °C
Polymer clamp	
Constant vacuum use	-10 to 100 °C
Intermittent vacuum use	-10 to 125 °C
Stainless steel clamping ring	-10 to 125 °C
Aluminium clamping ring	-10 to 200 °C
Stainless steel clamp	-10 to 200 °C
Standards compliance	
NW and ISO fittings	Pneurop 6606 (1981), ISO1609 (1986) DIN28403, DIN28404
CF fittings	ISO3669
Stainless steel equivalents	

AISI Number	German Steel Number	DIN Standard
304	1.4301	X5 CrNi 18 10
303	1.4305	X10 CrNi 5 18 9
304L	1.4306	X2 CrNi 19 10
301	1.4310	X12 CrNi 17 7
316	1.4401	X5 CrNiMo 18 10
316L	1.4404	X2 CrNiMo 17 13 2
316Ti	1.4571	X6 CrNiMoTi 17 12 2
321	1.4541	X10 CrNiTi 18 9

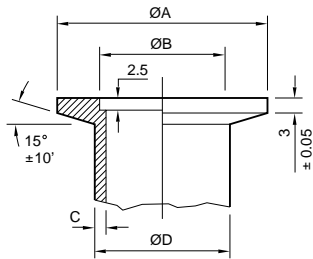
Chemical Resistance

This information is provided as a general guide only. Further guidance should be sought with respect to specific chemicals and their applications

Material	Generally Resistant To	Generally Attacked By
Nitrile		
Butadiene Acrylonitrile copolymer	Many hydrocarbons fats, oils greases, hydraulic fluids	Ozone, ketones, esters, aldehydes, chlorinated and nitro hydrocarbons
Neoprene		
Chloroprene polymer	Moderate chemicals and acids, ozone, oily fats, greases, many oils and solvents	Strong oxidizing acids and esters, ketones, chlori-nated aromatic and nitro hydrocarbons
Fluoroelastomer		
Fluorocarbon polymer	All aliphatic, aromatic and halogenated hydrocarbons, acids, animal and vegetable fats	Ketones, low molecular weight esters and nitro containing compounds
Aluminium		
	Organic acids, fatty acids, freons, nitric acid	Strong acids, alkalis chlorinated solvents, mercury
Stainless steel		
	Organic acids, alkalis, nitric acid. Sulphuric acid (10%)	Oxidizing chlorines, some organic acids, hydrochloric acid, hydrofluoric acid
Polymer		
Liquid crystal polymer	Organic acids, glycols, chlorinated solvents, ketones, mineral and oxidising acids, caustic solutions freons	Sodium hydroxide, sulphuric acid (70%)

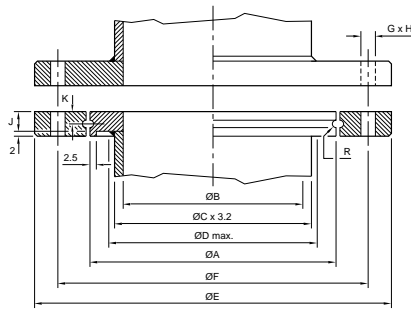
Dimensions

NW Dimensions



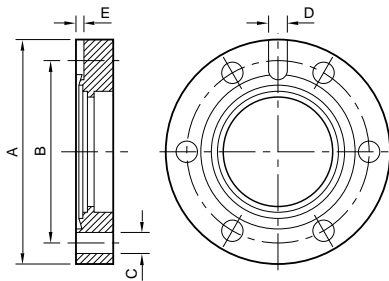
	A	B	C	D
NW10	30	12.2	2	14
NW16	30	17.2	2	20
NW20	40	22.2	2	25
NW25	40	26.2	2	28
NW32	55	34.2	2	38
NW40	55	41.2	2	44.5
NW50	75	52.2	2	57

ISO-K, ISO-F Dimensions



	A	B	C	D	E	F	G	H	J	K	R
ISO63	95	70	76.1	80	130	110	9	4	10	5	1.5
ISO80	110	83	88.9	95	145	125	9	8	10	5	1.5
ISO100	130	102	114.3	115	165	145	9	8	10	5	1.5
ISO160	180	153	160.3	165	225	200	11	8	10	5	2.5
ISO200	240	213	219	225	285	260	11	12	10	5	2.5
ISO250	290	261	273	275	335	310	11	12	10	5	2.5
ISO320	370	318	324	355	425	395	14	12	15	7.5	2.5
ISO400	450	400	406	435	510	480	14	16	15	7.5	4
ISO500	550	501	508	535	610	580	14	16	15	7.5	4
ISO630	690	630	660	660	750	720	14	20	20	10	5

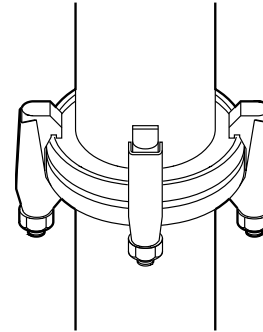
CF dimensions



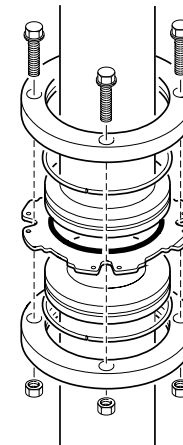
Nominal	A, mm	A, inch	B	C	D	E	Bolt Holes
DN16CF	34	1 1/8	27	4.4	—	—	6
DN40CF	70	2 3/4	58.7	6.6	—	—	6
DN63CF	114	4 1/2	92.1	8.4	6	3	8
DN100CF	152	6	130.2	8.4	6	3	16
DN160CF	202	8	181	8.4	6	3	20
DN200CF	253	10	231.8	8.4	6	3	24
DN250CF	306	12	284	8.4	6	3	32

ISO Flange Assembly with Co-Seals

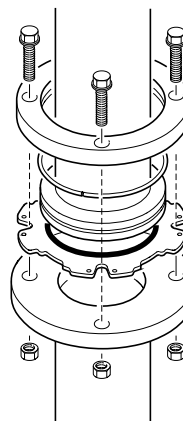
Two Fixed Collar Flanges with Claw Clamps



Two Rotatable Flanges



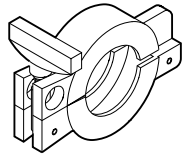
One Fixed Collar Flange, with One Rotatable Flange



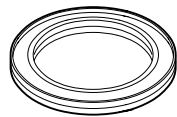
Product Summary

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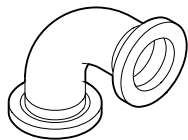
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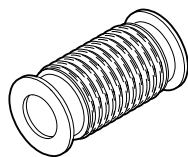
Description	Semiconductor			Features	Page			
	Scientific	R & D	Industrial		NW	ISO	CF	
Clamps								
Clamping Ring	-	✓	✓	✓	Low cost, compact Stainless steel	6-7	-	-
Polymer Clamp	-	✓	✓	✓	Low cost, lightweight Neat appearance	6-7	-	-
Aluminium Clamp	✓	✓	✓	✓	Rugged Pneurop standard Competitive price	6-7	-	-
Metal Clamp	-	✓	✓	-	Suitable for aluminium and indium seals Wide temperature range	6-7	-	-
Claw Clamps and Bolts	✓	✓	✓	✓	Wide range optimised for many applications High strength CF bolts for UHV flanges	6-8	6-19	6-32



Seals								
Polymer Centring Ring	-	✓	✓	✓	Low cost Gas vents – no gas bursts Resistant to solvents	6-8	-	-
Trapped O-Rings	✓	✓	✓	✓	No gas bursts	6-10	6-20	-
Polymer Co-Seal	-	✓	✓	✓	No gas bursts Suitable for up to 10 bar	6-9	6-20	-
Metal Centring Ring	✓	✓	✓	✓	Stainless steel and aluminium carrier Pneurop standard Fluoroelastomer and nitrile versions	6-8	6-21	-
Metal Seal	-	✓	✓	-	Aluminium all metal seals Copper gaskets for UHV seals	6-9	-	6-31

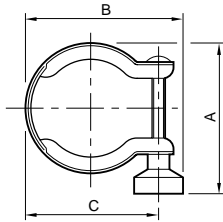


Pipeline Components								
Aluminium	-	✓	✓	✓	NW10 to NW50 components	6-10	6-22	-
Stainless Steel	✓	✓	✓	✓	NW10 to NW50 components NW and ISO fittings in 316L for corrosion resistance CF fittings in 304L for cost effectiveness	6-10	6-22	6-28

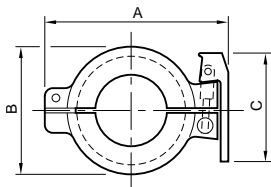


Bellows and Flexible Pipelines								
Bellows	✓	✓	✓	✓	NW and ISO fittings in 316L, CF fittings in 304L Suitable for minimising transfer of vibration from pump to vacuum systems	6-17	6-25	6-31
Flexible Pipelines	-	✓	✓	✓	Use to simplify connection of two components or correct misalignment Use braided versions for positive pressure applications (like dry pump exhausts)	6-17	6-25	-

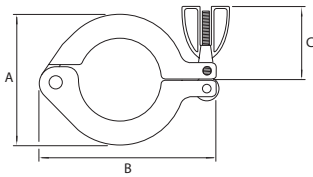
NW fittings



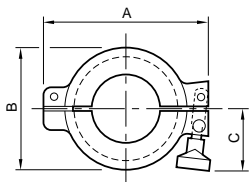
Size	A	B	C	D	E	F	Ordering Number
Clamping Ring							
Stainless steel							
NW10/16	44	46	34				C10512401
NW20/25	60	60	48				C10514401
NW32/40	73	75	63				C10516401
NW50	90	96	84				C10517401



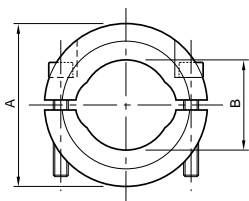
Hinged Clamp							
aluminium							
NW10/16	68	40	57				C10512402
NW20/25	80	50	57				C10514402
NW32/40	95	66	57				C10516402
Polymer							
NW10/16	68	40	57				C10512303
NW20/25	80	50	57				C10514303
NW32/40	95	66	57				C10516303
NW50	125	86	57				C10517303



Swing Clamp							
aluminium							
NW10/16	62	40	35				C10512403
NW20/25	75	50	35				C10514403
NW32/40	90	66	35				C10516403
NW50	120	86	35				C10517403

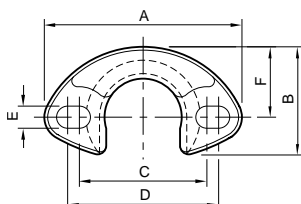


Polymer							
NW10/16	62	40	35				C10512304
NW20/25	75	50	35				C10514304
NW32/40	90	66	35				C10516304
NW50	120	86	35				C10517304



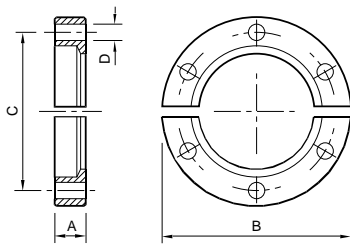
Clamp (Metal Seals)							
Stainless steel							
NW10/16	54	22					C10512404
NW20/25	64	32					C10514404
NW32/40	82	47					C10516404
NW50	112	62					C10517404

We recommend the use of thread lubricant, 1764 00030.



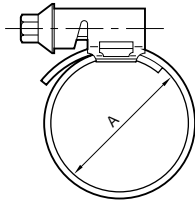
"C" Clamp							
Nickel plated brass including screw pack							
NW10/16	59	35	38	45	6.3	22	C11002340
NW25	70	44	54	54 [†]	8.3	25.4	C11004340
NW40*	100	73.5	79	81	8.3	50	C11005340

Stainless steel; † Non slotted



Size	A	B	C	D	E	F	Ordering Number	
Bulkhead Clamp							Europe	N. America
aluminium								
NW10/16	9.2	50.8	38.1	5.1			C10512007	C90512007
NW25	9.8	60.3	48.0	5.1			C10514007	C90514007
NW40	9.3	74.6	62.0	5.1			C10516007	C90516007
NW50	10.3	95.2	83.0	5.1			C10517007	C90517007

All sizes supplied with
6 x 10-32 UNF x 5/8" hex head stainless steel bolts
6 x 10-32 UNF stainless steel plain washers



PVC Hose Clamp

Stainless steel

NW10/16	25						C10512408
NW25	36						C10514408
NW40	50						C10516408
NW50	60						C10517408



Centring Ring with O-Ring

Fluoroelastomer/stainless steel carrier

NW10	12	3.9	8				C10511395
NW16	17	3.9	8				C10512395
NW25	26	3.9	8				C10514395
NW40	41	3.9	8				C10516395
NW50	52	3.9	8				C10517395

Fluoroelastomer/aluminium carrier

NW10	12	3.9	8				C10511397
NW16	17	3.9	8				C10512397
NW25	26	3.9	8				C10514397
NW40	41	3.9	8				C10516397

Fluoroelastomer/polymer carrier

NW10	12	3.9	8				C10511394
NW16	17	3.9	8				C10512394
NW25	26	3.9	8				C10514394
NW40	41	3.9	8				C10516394

Nitrile/stainless steel carrier

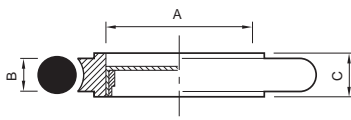
NW10	12	3.9	8				C10511396
NW16	17	3.9	8				C10512396
NW25	26	3.9	8				C10514396
NW40	41	3.9	8				C10516396
NW50	52	3.9	8				C10517396

Nitrile/aluminium carrier

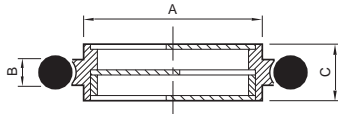
NW10	12	3.9	8				C10511398
NW16	17	3.9	8				C10512398
NW25	26	3.9	8				C10514398
NW40	41	3.9	8				C10516398

Nitrile/polymer carrier

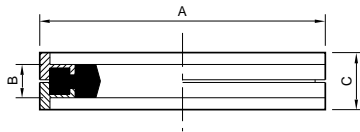
NW10	12	3.9	8				C10511393
NW16	17	3.9	8				C10512393
NW25	26	3.9	8				C10514393
NW40	41	3.9	8				C10516393



Size	A	B	C	D	E	F	Ordering Number
Centring Ring with Screen							
Fluoroelastomer/stainless steel AISI 316L DIN 1.4404 Stainless Steel wire Ø0.5 Aperture size 1 mm ²							
NW16	9.5	3.9	8				C10512085
NW25	19.5	3.9	8				C10514085
NW40	32	3.9	8				C10516085
NW50	43	3.9	8				C10517085



Centring Ring with Optical Baffle							
Fluoroelastomer/stainless steel AISI 304L DIN 1.4301							
NW25	26	3.9	8.5				D02110000



Centring Ring Sintered Filter							
NW10							D02158020
NW40							D15405110

Co-Seal

Nitrile/aluminium carrier

NW10/16	32	3.9	7				B27158480
NW20/25	42	3.9	7				B27158490
NW32/40	57	3.9	7				B27158500

Nitrile/polymer carrier

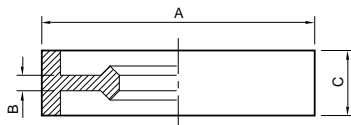
NW10/16	32	3.9	7				B27158426
NW20/25	42	3.9	7				B27158447
NW32/40	57	3.9	7				B27158454
NW50	77.5	3.9	7				B27158467

Fluoroelastomer/aluminium carrier

NW10/16	32	3.9	7				B27158481
NW20/25	42	3.9	7				B27158491
NW32/40	57	3.9	7				B27158501

Fluoroelastomer/polymer carrier

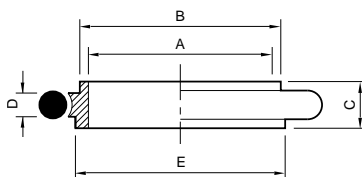
NW10/16	32	3.9	7				B27158427
NW20/25	42	3.9	7				B27158448
NW32/40	57	3.9	7				B27158453
NW50	77.5	3.9	7				B27158466



Metal Seals

aluminium
Use with clamps (metal seals) C105-XX-404.

NW10/16	32	2.0	7				C27159004
NW20/25	42	2.0	7				C27159005
NW32/40	57	2.0	7				C27159006
NW50	77	2.0	7				C27159007



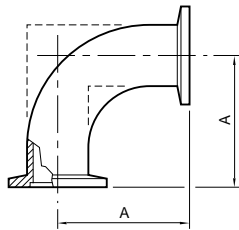
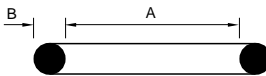
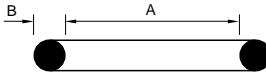
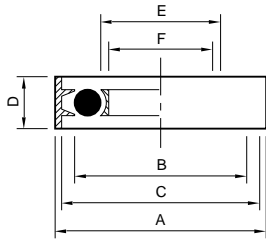
Adapting Centring Ring with O-Ring

Nitrile

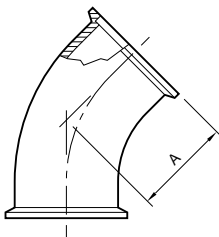
NW10/16 stainless steel	10	12	8	3.9	17		C10512346
NW10/16 polymer	10	12	8	3.9	17		C10512349

Fluoroelastomer

NW10/16 stainless steel	10	12	8	3.9	17		C10512345
NW10/16 polymer	10	12	8	3.9	17		C10512350



▲ Dimensions shown dotted in diagram



Size	A	B	C	D	E	F	Ordering Number
------	---	---	---	---	---	---	-----------------

NW Trapped O-Ring

Fluoroelastomer/stainless steel/aluminium

NW10/16	32.5	27.5	30.2	7	18.5	16	C10512490
NW25	42.5	37.5	40.2	7	28.5	25	C10514490
NW40	57.5	52.0	55.2	7	43	40	C10516490
NW50	77.5	64.5	75.2	7	55.5	50	C10517490

O-Ring (Pack of 10)

Nitrile

NW10	15	5					H02124012
NW16	18	5					H02124013
NW25	28	5					H02124015
NW40	42	5					H02124017
NW50	50	5					H02124018

O-Ring (Pack of 5)

Fluoroelastomer

NW10	15	5					H02124032
NW16	18	5					H02124033
NW25	28	5					H02124035
NW40	42	5					H02124037
NW50	50	5					H02124038

Elbow 90°

aluminium BS LM25 DIN 3.2371▲

NW10	30						C10511410
NW16	40						C10512410
NW25	50						C10514410
NW40	65						C10516410

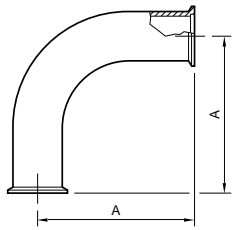
Stainless Steel AISI 316L DIN 1.4404

NW10	30						C10511420
NW16	40						C10512420
NW25	50						C10514420
NW40	65						C10516420
NW50	70						C10517420

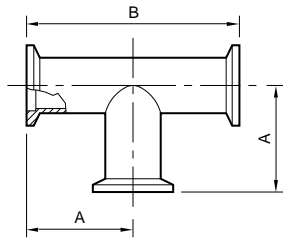
Elbow 45°

Stainless Steel AISI 316L DIN 1.4404

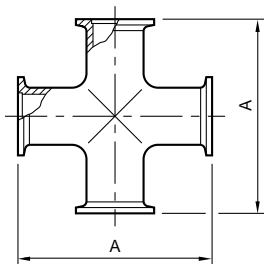
NW16	23.2						C10512405
NW25	28.5						C10514405
NW40	42.7						C10516405
NW50	50.6						C10517405



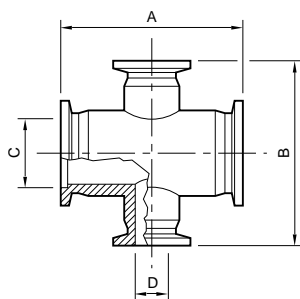
Size	A	B	C	D	E	F	Ordering Number
Long Radius Elbow							
Stainless Steel AISI 316L DIN 1.4404							
NW40	130						C10516406
NW50	140						C10517406



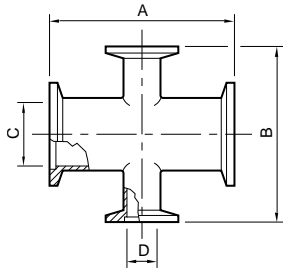
Size	A	B	C	D	E	F	Ordering Number
T-Piece							
aluminium BS LM25 DIN 3.2371							
NW10	30	60					C10511411
NW16	40	80					C10512411
NW25	50	100					C10514411
NW40	65	130					C10516411
Stainless Steel AISI 316L DIN 1.4404							
NW10	30	60					C10511421
NW16	40	80					C10512421
NW25	50	100					C10514421
NW40	65	130					C10516421
NW50	70	140					C10517421



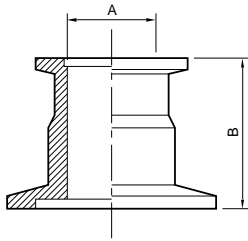
Size	A	B	C	D	E	F	Ordering Number
Cross Piece							
aluminium BS LM25 DIN 3.2371							
NW10	60						C10511412
NW16	80						C10512412
NW25	100						C10514412
NW40	130						C10516412
Stainless Steel AISI 316L DIN 1.4404							
NW10	60						C10511422
NW16	80						C10512422
NW25	100						C10514422
NW40	130						C10516422
NW50	140						C10517422



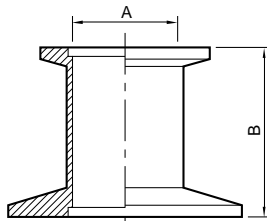
Size	A	B	C	D	E	F	Ordering Number
Reducing Cross							
aluminium ISO 6082 DIN 3.2315							
NW25/10	70	70	26.2	12.2			C10514413
NW40/10	80	90	41.2	12.2			C10516413



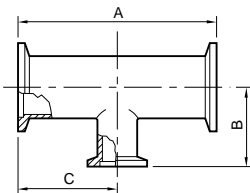
Size	A	B	C	D	E	F	Ordering Number
Reducing Cross							
Stainless Steel AISI 316L DIN 1.4404							
NW25/10	70	70	26.2	12.2			C10514423
NW25/16	100	80	26.2	17.2			C10514424
NW40/16	130	80	41.2	17.2			C10516424
NW40/25	130	100	41.2	26.2			C10516425
NW50/25	140	100	52.2	26.2			C10517425



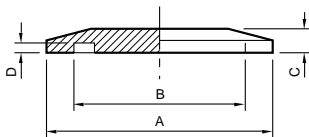
Size	A	B	Ordering Number
Reducing Piece			
aluminium ISO 6082 DIN 3.2315			
NW25/10	10	40	C10514436
NW25/16	16	40	C10514437
NW40/25	24	40	C10516439
NW40/16	16	40	C10516438
NW50/16	16	40	C10517040
NW50/25	24	40	C10517043
NW50/40	41	40	C10517041



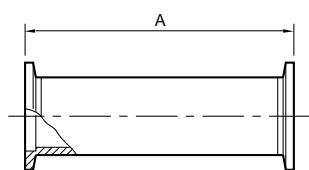
Size	A	B	Ordering Number
Reducing Piece			
Stainless Steel AISI 316L DIN 1.4404			
NW25/10	10	40	C10514446
NW25/16	16	28	C10514447
NW40/16	16	28	C10516448
NW40/25	24	28	C10516449
NW50/16	16	28	C10517450
NW50/25	24	40	C10517051
NW50/40	40	28	C10517452



Size	A	B	C	Ordering Number
Reducing T-Piece				
Stainless Steel AISI 316L DIN 1.4404				
NW25/16	100	40	50	C10514427
NW40/16	130	40	65	C10516428
NW40/25	130	50	65	C10516429
NW50/16	140	50	70	C10517430
NW50/25	140	65	70	C10517431

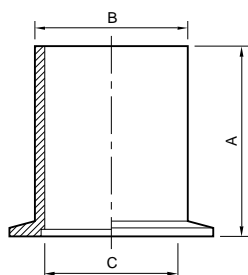


Size	A	B	C	D	Ordering Number
Blanking Flange					
aluminium BS LM 25 DIN 3.2371					
NW10	30	12.2	6	2.5	C10511368
NW16	30	17.2	6	2.5	C10512368
NW25	40	26.2	6	2.5	C10514368
NW40	55	41.2	6	2.5	C10516368
Stainless Steel AISI 316L DIN 1.4404					
NW10	30	12.2	6	2.5	C10511366
NW16	30	17.2	6	2.5	C10512366
NW25	40	26.2	6	2.5	C10514366
NW40	55	41.2	6	2.5	C10516366
NW50	75	52.2	6	2.5	C10517366



Size	A	B	C	D	E	F	Ordering Number
Full Nipple							
aluminium BS LM 25 DIN 3.2371							
NW10	60						C10511409
NW16	80						C10512409
NW25	100						C10514409
NW40	130						C10516409

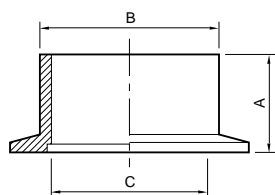
Stainless Steel AISI 316L DIN 1.4404							
NW10	60						C10511433
NW16	80						C10512433
NW25	100						C10514433
NW40	130						C10516433
NW50	140						C10517433



For inch tube: D= tube OD

Long Flange Weld Stub							
Stainless Steel AISI 316L DIN 1.4404							
For metric tube							
NW10	70	15	10				C10511316
NW16	70	20	16				C10512316
NW25	70	28	24				C10514316
NW40	70	44.5	41				C10516616
NW50	70	57	51				C10517316

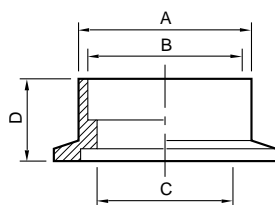
For inch tube							
NW10	40	12.7	9.3	½			C10504080
NW16	40	19.1	15.7	¾			C10504101
NW25	40	25.4	22	1			C10504223
NW40	40	38.1	34.7	1½			C10504324
NW50	40	50.8	47.4	2			C10504351



For inch tube: D= tube OD

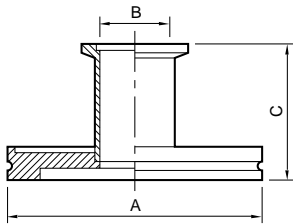
Short Flange Weld Stub							
Stainless Steel AISI 316L DIN 1.4404							
For metric tube							
NW10	30	15	10				C10511311
NW16	30	20	16				C10512311
NW25	30	28	24				C10514311
NW40	30	44.5	41				C10516611
NW50	30	57	51				C10517311

For inch tube							
NW10	12.7	12.7	9.3	½			C10504079
NW16	12.7	19.1	15.7	¾			C10504100
NW25	12.7	25.4	22	1			C10504222
NW40	19.1	38.1	34.7	1½			C10504323
NW50	19.1	50.8	47.4	2			C10504350

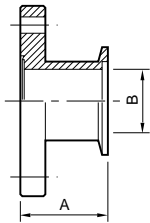


E= tube OD, mm
F= tube OD, inches

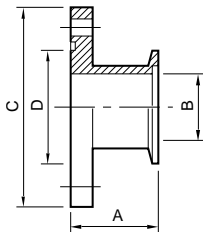
Weld Socket Flange for Inch Tube							
Stainless Steel AISI 316L DIN 1.4404							
NW16	15.5	13	11.4	12.7	12.7	½	C10504102
NW16	22.1	19.3	17.3	12.7	19.1	¾	C10504103
NW25	28.6	25.9	22.1	12.7	25.4	1	C10504224
NW40	44.5	38.6	34.9	12.7	38.1	1½	C10504325
NW50	57.2	51.3	47.5	12.7	50.8	2	C10504353



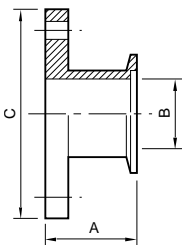
Size	A	B	C	D	E	F	Ordering Number
Adaptor NW/ISO							
Stainless Steel AISI 316L DIN 1.4404							
NW25/ISO63	95	25	50				C10007115
NW40/ISO63	95	40	50				C10007116
NW40/ISO80	110	40	118				C10008002
NW40/ISO100	130	40	50				C10009122
NW50/ISO63	95	50	50				C10007118
NW50/ISO80	110	50	118				C10008003
NW50/ISO100	130	50	50				C10009123



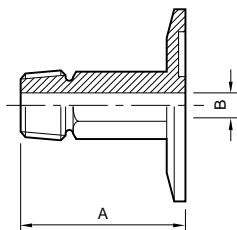
Adaptor NW/CF							
Stainless Steel AISI 316L DIN 1.4404							
NW16/DN16CF/1½	52.7	15.8					C10503104
NW16/DN40CF/2¾	45.3	15.8					C10503105
NW25/DN40CF/2¾	45.3	22					C10503207
NW40/DN40CF/2¾	45.3	40					C10503305
NW50/DN63CF/4½	49.5	50					C10503405



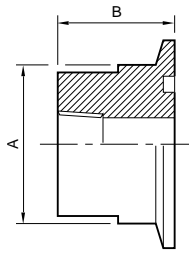
Adaptor NW/ASA with O-Ring Groove							
Stainless Steel AISI 316L DIN 1.4404							
NW40/2 inch ASA	46	40	152	86.9			C10503310
NW40/3 inch ASA	46	40	190	118			C10503311
NW50/2 inch ASA	46	50	152	86.9			C10503410



Adaptor NW/ASA without O-Ring Groove							
Stainless Steel AISI 316L DIN 1.4404							
NW40/1½ inch ASA	46	40	127				C10503303
NW40/2 inch ASA	46	40	152				C10503300
NW50/2 inch ASA	46	50	152				C10503400



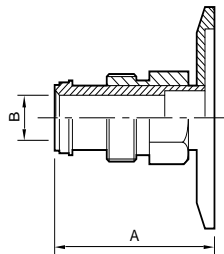
Adaptor NW/NPT Threaded Pipe Male							
Stainless Steel AISI 316L DIN 1.4404							
NW16/⅝ inch NPT male	40	4.7					C10501102
NW16/¾ inch NPT male	50	7.1					C10501103
NW25/⅝ inch NPT male	40	4.7					C10501217
NW25/¾ inch NPT male	50	7.1					C10501218
NW25/½ inch NPT male	75	11.9					C10501219
NW25/¾ inch NPT male	75	15.9					C10501220
NW40/¾ inch NPT male	50	7.1					C10501303
NW40/½ inch NPT male	75	11.9					C10501304
NW40/¾ inch NPT male	75	15.9					C10501305
NW40/1 inch NPT male	75	22.2					C10501306
NW50/½ inch NPT male	75	11.9					C10501501
NW50/1 inch NPT male	75	22.2					C10501503



Size	A	B	C	D	E	F	Ordering Number
Adaptor NW/NPT Threaded Pipe Female							
aluminium ISO 6082 DIN 3.2315							
NW10 ¹ / ₈ inch NPT female	15.8	19.1					C10501070
NW16 ¹ / ₈ inch NPT female	15.8	19.1					C10501104
NW25 ¹ / ₈ inch NPT female	22.4	19.1					C10501221
NW40 ¹ / ₈ inch NPT female	31.8	25.4					C10501307
NW10 ¹ / ₄ inch NPT female	15.8	19.1					C10501071
NW16 ¹ / ₄ inch NPT female	15.8	19.1					C10501105
NW25 ¹ / ₄ inch NPT female	22.4	19.1					C10501222
NW40 ¹ / ₄ inch NPT female	31.8	25.4					C10501308

Stainless Steel AISI 316L DIN 1.4404

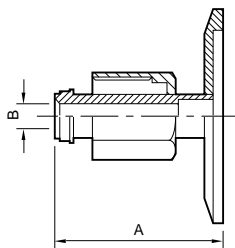
NW10 ¹ / ₈ inch NPT female	15.8	19.1					C10501072
NW16 ¹ / ₈ inch NPT female	15.8	19.1					C10501106
NW25 ¹ / ₈ inch NPT female	22.4	19.1					C10501223
NW40 ¹ / ₈ inch NPT female	31.8	25.4					C10501309
NW10 ¹ / ₄ inch NPT female	15.8	19.1					C10501073
NW16 ¹ / ₄ inch NPT female	15.8	19.1					C10501107
NW25 ¹ / ₄ inch NPT female	22.4	19.1					C10501224
NW40 ¹ / ₄ inch NPT female	31.8	25.4					C10501310



Adaptor NW/VCR Male

Stainless Steel AISI 316L DIN 1.4404

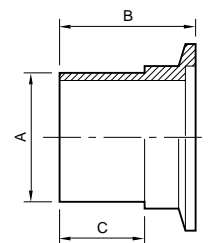
NW16 ¹ / ₄ inch VCR male	35.6	4.8					C10501108
NW16 ¹ / ₂ inch VCR male	41.4	10.4					C10501110
NW25 ¹ / ₄ inch VCR male	35.6	4.8					C10501225
NW25 ¹ / ₂ inch VCR male	40.6	10.4					C10501227
NW40 ¹ / ₄ inch VCR male	35.6	4.8					C10501311
NW40 ¹ / ₂ inch VCR male	40.6	10.4					C10501313
NW50 ¹ / ₄ inch VCR male	35.6	4.8					C10501508



Adaptor NW/VCR Female

Stainless Steel AISI 316L DIN 1.4404

NW16 ¹ / ₄ inch VCR female	35.6	4.8					C10501109
NW16 ¹ / ₂ inch VCR female	41.4	10.4					C10501111
NW25 ¹ / ₄ inch VCR female	35.6	4.8					C10501226
NW25 ¹ / ₂ inch VCR female	40.6	10.4					C10501228
NW25 ³ / ₄ inch VCR female	54.4	15.7					C10501230
NW40 ¹ / ₄ inch VCR female	35.6	4.8					C10501312
NW40 ¹ / ₂ inch VCR female	40.6	10.4					C10501314

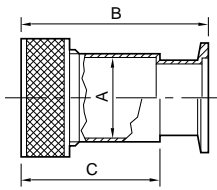


D= hose internal diameter

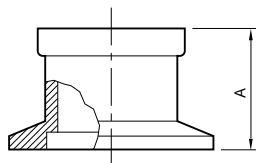
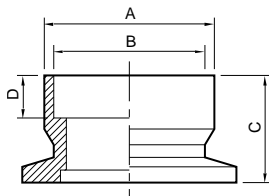
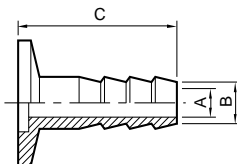
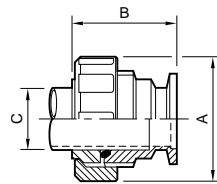
Adaptor PVC Hose

Stainless Steel AISI 316L DIN 1.4404

NW10 ¹ / ₂ inch hose	12.7	32	20	12.7			C10504081
NW16 ¹ / ₂ inch hose	12.7	32	20	12.7			C10504104
NW16 ³ / ₄ inch hose	19.1	32	20	19.1			C10504105
NW25 ¹ / ₁ inch hose	25.4	38.1	26	25.4			C10504225
NW40 ¹ / ₁ / ₂ inch hose	38.1	50	38.1	38.1			C10504326
NW50 ¹ / ₂ inch hose	47.4	55	41	50.8			C10504352



D= tube od in mm
E= tube OD in inches



Temperature range -40 to 380 °C,
Temperature gradient <math><3 \text{ }^\circ\text{C min}^{-1}</math>

Size	A	B	C	D	E	F	Ordering Number
Gauge Tube Adaptor and Compression O-Ring							
Stainless Steel AISI 316L DIN 1.4404 Fluoroelastomer O-ring							
NW10	13.1	50	33	12.7	½		C10502001
NW16	6.7	32	–	6.4	¼		C10502101
NW16	13.1	50	33	12.7	½		C10502102
NW16	19.4	56	40	19.1	¾		C10502103
NW25	13.1	50	33	12.7	½		C10502201
NW25	19.4	58	40	19.1	¾		C10502202
NW25	25.8	62	46	25.4	1		C10502203
NW40	13.1	58	33	12.7	½		C10502300
NW40	19.4	63.5	40	19.1	¾		C10502301
NW40	25.8	71	46	25.4	1		C10502302
NW40	29	74	49	28.6	1 ⅛		C10502303
NW40	38.4	84	63.5	38.1	1 ½		C10502304
NW50	19.4	63.5	40	19.1	¾		C10502400
NW50	25.8	71	46	25.4	1		C10502401
NW50	51.1	87	66	50.8	2		C10502404

Compression Fitting

aluminium

NW10	44	43	14/15				C10520050
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Nozzle

aluminium ISO 6082 DIN 3.2315

NW10	7	12	40				C10511645
NW25	7	12	40				C10514645
NW40	7	12	40				C10516645

Coupling Body

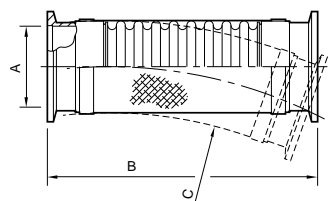
Brass

NW10	18	15.2	13	6			C10511328
NW25	32	28.2	20	8			C10514328
NW40	46	42.2	18	8			C10516628

NW Optical Viewpoint

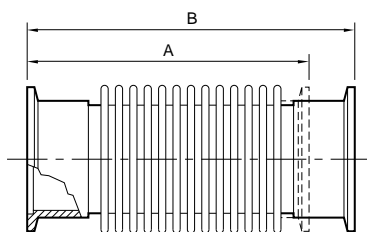
Body: Stainless Steel AISI 316L DIN 1.4404; Mounting: Nilo K; Glass: Borosilicate (8250 Schott)

NW40	23.6						C10516407
NW50	31.8						C10517407



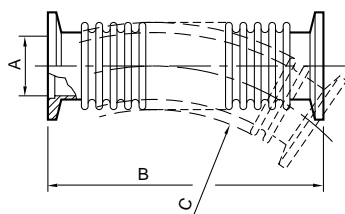
C= minimum bend radius, static
 D= minimum bend radius, dynamic
 E= maximum operating pressure, bar absolute

Size	A	B	C	D	E	F	Ordering Number
Braided Flexible Exhaust Pipeline							
Stainless Steel AISI 316L DIN 1.4404							
NW25	26.2	135	50	320	10.0		C10514294
NW40	41.2	135	80	400	10.0		C10516294
NW50	52.2	135	100	450	10.0		C10517294
NW25	26.2	250	50	320	10.0		C10514295
NW40	41.2	250	80	400	10.0		C10516295
NW50	52.2	250	100	450	10.0		C10517295
NW25	26.2	500	50	320	10.0		C10514296
NW40	41.2	500	80	400	10.0		C10516296
NW50	52.2	500	100	450	10.0		C10517296
NW25	26.2	1000	50	320	10.0		C10514297
NW40	41.2	1000	80	400	10.0		C10516297
NW50	52.2	1000	100	450	10.0		C10517297



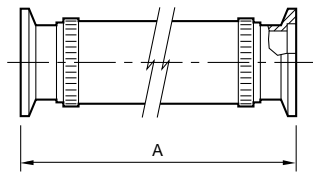
C= maximum operating pressure, bar absolute

Size	A	B	C	Ordering Number
Flexible Bellows				
Stainless Steel AISI 316L DIN 1.4404				
NW10	102	123	1.2	C10511670
NW16	102	123	1.2	C10512670
NW25	102	123	1.2	C10514670
NW40	102	123	1.2	C10516670
NW50	102	123	1.2	C10517670



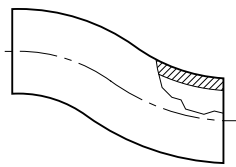
C= minimum bend radius, static
 D= minimum bend radius, dynamic
 E= maximum operating pressure, bar absolute

Size	A	B	C	D	E	F	Ordering Number
Flexible Pipelines							
Stainless Steel AISI 316L DIN 1.4404							
NW10	12.2	250	30	100	1.5		C10511285
NW16	17.2	250	30	130	1.5		C10512285
NW25	26.2	250	50	210	1.5		C10514285
NW40	41.2	250	80	260	1.5		C10516285
NW50	52.2	250	100	320	1.5		C10517285
NW10	12.2	500	30	100	1.5		C10511286
NW16	17.2	500	30	130	1.5		C10512286
NW25	26.2	500	50	210	1.5		C10514286
NW40	41.2	500	80	260	1.5		C10516286
NW50	52.2	500	100	320	1.5		C10517286
NW10	12.2	750	30	100	1.5		C10511300
NW16	17.2	750	30	130	1.5		C10512300
NW25	26.2	750	50	210	1.5		C10514300
NW40	41.2	750	80	260	1.5		C10516300
NW50	52.2	750	100	320	1.5		C10517300
NW10	12.2	1000	30	100	1.5		C10511287
NW16	17.2	1000	30	130	1.5		C10512287
NW25	26.2	1000	50	210	1.5		C10514287
NW40	41.2	1000	80	260	1.5		C10516287
NW50	52.2	1000	100	320	1.5		C10517287



Size	A	B	C	D	E	F	Ordering Number
Reinforced PVC Tube with NW Flanges and Hose Clamps							
Stainless Steel AISI 316L DIN 1.4404							
NW10	500						C10511055
NW16	500						C10512055
NW25	500						C10514055
NW40	500						C10516055
NW50	500						C10517055
NW10	1000						C10511155
NW16	1000						C10512155
NW25	1000						C10514155
NW40	1000						C10516155
NW50	1000						C10517155

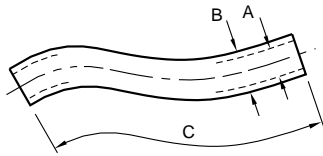
Maximum operating pressure 1 bar absolute, Temperature 5 to 60 °C



Reinforced PVC Tube, 1 metre

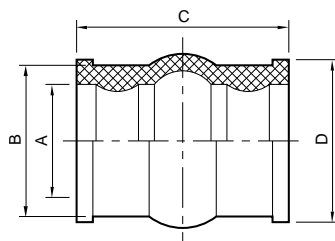
	Europe	N. America
½ inch ID tube	N/A	A63012220
¾ inch ID tube	H02100016	U30002173
1 inch ID tube	H02100017	A63012343
1½ inch ID tube	H02100018	U30000484
2 inch ID tube	H02100019	U30003837

Maximum operating pressure 1 bar absolute, Temperature 5 to 60 °C



Neoprene Rubber Tube

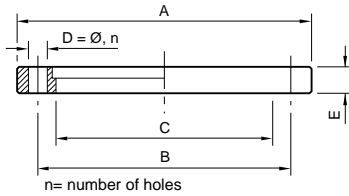
5 x 19 mm	5	19	1000	H02100002
7 x 17 mm	7	17	1000	H02100003
9 x 25 mm	9	25	1000	H02100004
12 x 28 mm	12	28	1000	H02100005
20 mm x 34 mm	20	34	1000	H02100006
Reinforced hose	25	32	305	C06600025



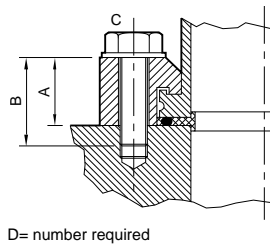
Moulded Sleeve

Neoprene							
NW10	13	21	38	23			C26501002
NW25	27	36	55	38			C26501004

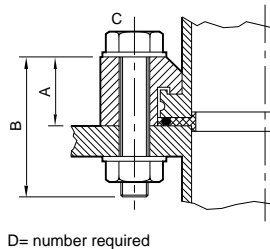
ISO fittings



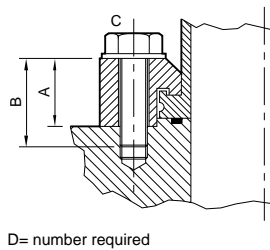
Size	A	B	C	D	E	F	Ordering Number
Rotatable Flange with Fitting Kit							
Mild steel nickel plated							
ISO63	130	110	95.5	Ø9, 4	12		C10007010
ISO80	145	125	110	Ø9, 8	12		C10008012
ISO100	165	145	130.5	Ø9, 8	12		C10009010
ISO160	225	200	180.7	Ø11,8	16		C10011010
ISO200	285	260	240.7	Ø11,12	16		C10012010
ISO250	335	310	290.7	Ø11,12	16		C10013010
ISO320	425	395	371	Ø14,12	20		C10014012



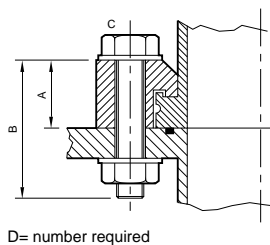
Size	A	B	C	D	Ordering Number
Half Claw Clamp for use with Centring Ring (Tapped Holes)					
Zinc plated mild steel body, stainless steel bolt					
ISO63	22.5	35	M8	4	C10007151
ISO100	22.5	35	M8	8	C10007151
ISO160	23	40	M10	8	C10011151
ISO200	23	40	M10	12	C10011151
ISO250	23	45	M10	12	C10011151
ISO320	36.5	60	M12	12	C10014151
ISO400	36.5	60	M12	16	C10014151
ISO500	36.5	60	M12	16	C10014151



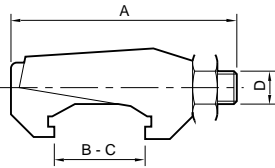
Size	A	B	C	D	Ordering Number
Half Claw Clamp for use with Centring Ring (Clear Holes)					
Zinc plated mild steel body, stainless steel bolt					
ISO63	22.5	35	M8	4	C10007150
ISO100	22.5	35	M8	8	C10007150
ISO160	23	40	M10	8	C10011150
ISO200	23	40	M10	12	C10011150
ISO250	23	45	M10	12	C10011150
ISO320	30.5	60	M12	12	C10014150
ISO400	30.5	60	M12	16	C10014150
ISO500	30.5	60	M12	16	C10014150



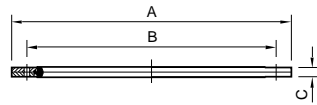
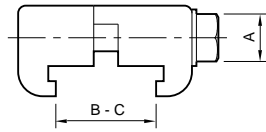
Size	A	B	C	D	Ordering Number
Half Claw Clamp for use with O-ring groove (tapped holes)					
Zinc plated mild steel body, stainless steel bolt					
ISO63	18.6	35	M8	4	C10007093
ISO100	18.6	35	M8	8	C10007093
ISO160	19	40	M10	8	C10011093
ISO200	19	40	M10	12	C10011093
ISO250	19	40	M10	12	C10011093
ISO320	31	50	M12	12	C10014093
ISO400	31	50	M12	16	C10014093
ISO500	31	50	M12	16	C10014093



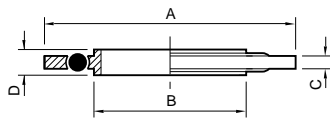
Size	A	B	C	D	Ordering Number
Half Claw Clamp for use with O-ring Groove (Clear Holes)					
Zinc plated mild steel body, stainless steel bolt					
ISO63	18.6	45	M8	4	C10007149
ISO100	18.6	45	M8	8	C10007149



ISO63 requires 4 clamps; ISO80-160 requires 4-8 clamps; ISO200-320 requires 6-12 clamps; ISO400-500 requires 8-16 clamps



Use ISO polymer Co-Seals only for high vacuum applications $<10^{-6}$ mbar). In other applications, use the trapped O-ring seal; O-ring seals have higher mechanical strength.



Size	A	B	C	D	E	F	Ordering Number
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Claw Clamps

Zinc plated 1.1181 steel

ISO63/ISO250	60	22	33	M10			C10007090
ISO320/ISO500	75	32	42	M12			C10014090

Claw Clamps

aluminium

ISO63/100	–	22	33	M8			C10007156
ISO160/250	–	24	38	M10			C10011094
ISO320/500	–	35	56	M12			C10014094

Co-Seal

Nylon, nitrile

ISO40	101	80	4.2				B27158458
ISO63	116	110	4.2				B27158063
ISO100	151	145	4.2				B27158070
ISO160	200	190	5.7				B27158073

Fluoroelastomer

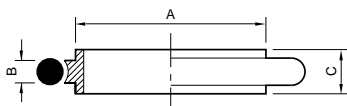
ISO40	101	80	4.2				B27158457
ISO63	116	110	4.2				B27158064
ISO100	151	145	4.2				B27158071
ISO160	200	190	5.7				B27158074

Trapped O-Ring

aluminium centring-ring, aluminium outer ring

Fluoroelastomer

ISO63	95	70	3.9	8			C10521001
ISO100	128	102	3.9	8			C10523001
ISO160	179	153	3.9	8			C10524001



Size	A	B	C	D	E	F	Ordering Number
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Centring-ring with O-Ring

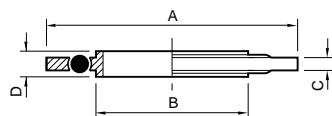
Stainless steel AISI 316L centring-ring

Nitrile

ISO63	70	3.9	8				C10007173
ISO80	83	3.9	8				C10008173
ISO100	102	3.9	8				C10009173
ISO160	153	3.9	8				C10011173
ISO200	213	3.9	8				C10012173
ISO250	261	3.9	8				C10013173
ISO320	318	5.6	14				C10014173
ISO400	400	5.6	14				C10015173
ISO500	501	5.6	14				C10016173

Fluoroelastomer

ISO63	70	3.9	8				C10007174
ISO80	83	3.9	8				C10008174
ISO100	102	3.9	8				C10009174
ISO160	153	3.9	8				C10011174
ISO200	213	3.9	8				C10012174
ISO250	261	3.9	8				C10013174
ISO320	318	5.6	14				C10014174
ISO400	400	5.6	14				C10015174
ISO500	501	5.6	14				C10016174



Trapped O-Ring

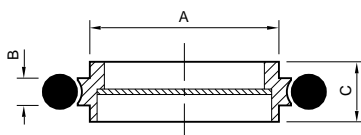
Stainless steel AISI 316L centring ring with aluminium outer ring

Nitrile

ISO40	63	41	3.9	8			B27158175
ISO63	95	70	3.9	8			B27158176
ISO80	109	83	3.9	8			B27158169
ISO100	128	102	3.9	8			B27158177
ISO160	179	153	3.9	8			B27158178
ISO200	239	213	3.9	8			B27158080
ISO250	287	261	3.9	8			B27158180
ISO320	358	318	5.6	14			B27158182
ISO400	440	400	5.6	14			B27158183
ISO500	541	501	5.6	14			B27158184

Fluoroelastomer

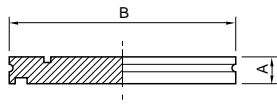
ISO40	63	41	3.9	8			B27158165
ISO63	95	70	3.9	8			B27158170
ISO80	109	83	3.9	8			B27158181
ISO100	128	102	3.9	8			B27158171
ISO160	179	153	3.9	8			B27158172
ISO200	239	213	3.9	8			B27158081
ISO250	287	261	3.9	8			B27158143
ISO320	358	318	5.6	14			B27158166
ISO400	440	400	5.6	14			B27158167
ISO500	541	501	5.6	14			B27158168



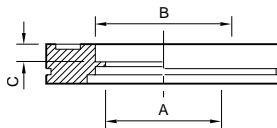
ISO Centring-ring and Screen

Stainless steel AISI 316L DIN 1.4404 Mesh \varnothing 3.3 mm aperture, \varnothing 0.9 mm wire Fluoroelastomer O-ring

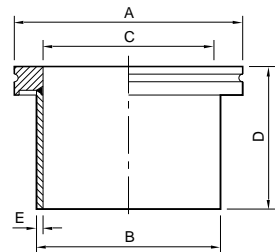
ISO63	70	3.9	8				C10521085
ISO80	83	3.9	8				C10522085
ISO100	102	3.9	8				C10523085
ISO160	153	3.9	8				C10524085



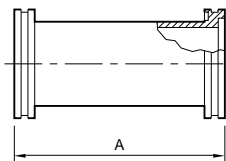
Size	A	B	C	D	E	F	Ordering Number
Blanking Flange for use with Collar Flange							
Stainless steel AISI 316L DIN 1.4404							
ISO63	12	95					C10007049
ISO80	12	110					C10008015
ISO100	12	130					C10009049
ISO160	12	180					C10011049
ISO200	12	240					C10012049
ISO250	12	290					C10013049
ISO320	17	370					C10014003
ISO500	17	550					C10016003



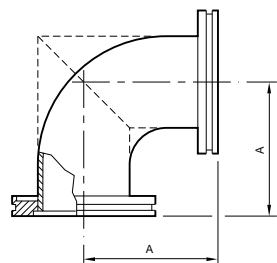
Size	A	B	C	D	E	F	Ordering Number
ISO Bored Flange							
Stainless steel AISI 316L DIN 1.4404							
ISO63	60.2	63.5	5.5				C10007138
ISO100	98.3	102	5.5				C10009157
ISO160	148	152	5.5				C10011068
ISO200	197	203	5.5				C10012053
ISO250	248	254	5.5				C10013059



Size	A	B	C	D	E	F	Ordering Number
Collar Weld Stub							
Stainless steel AISI 316L DIN 1.4404							
ISO63	95	76	70	100	3.2		C10007032
ISO80	110	76	83	100	3.2		C10008013
ISO100	130	108	102	100	3.2		C10009032
ISO160	180	159	153	100	3.2		C10011032
ISO200	240	219.1	213	100	3.2		C10012032
ISO250	290	267	261	100	3.2		C10013032

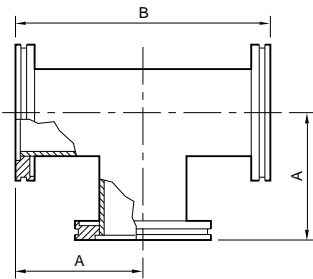


Size	A	B	C	D	E	F	Ordering Number
Nipple							
Stainless steel AISI 316L DIN 1.4404							
ISO63	176						C10007140
ISO100	216						C10009160
ISO160	276						C10011071
ISO200	356						C10012054
ISO250	416						C10013060

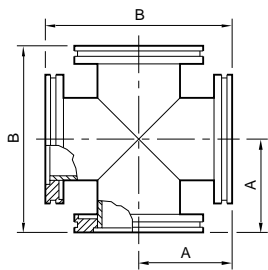


Size	A	B	C	D	E	F	Ordering Number
Elbow 90°							
Stainless steel AISI 316L DIN 1.4404							
ISO63	88						C10007203
ISO100	108						C10009203
ISO160*	138						C10011203
ISO200*	178						C10012203
ISO250*	208						C10013203

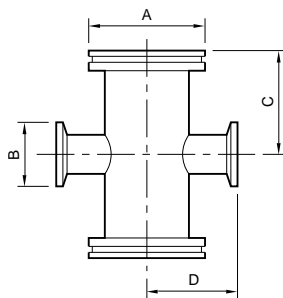
* Shown dotted



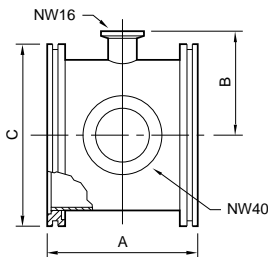
Size	A	B	C	D	E	F	Ordering Number
T-piece							
Stainless steel AISI 316L DIN 1.4404							
ISO63	88	176					C10007207
ISO100	108	216					C10009207
ISO160	138	276					C10011207
ISO200	178	356					C10012207



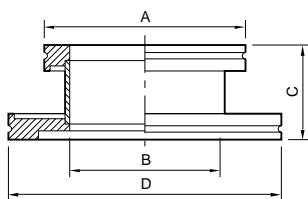
Size	A	B	C	D	E	F	Ordering Number
Cross Piece							
Stainless steel AISI 316L DIN 1.4404							
ISO63	88	176					C10007211
ISO100	108	216					C10009211



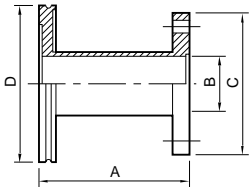
Size	A	B	C	D	E	F	Ordering Number
ISO to NW Reducing Cross							
Stainless steel AISI 316L DIN 1.4404							
ISO63/NW40	95	55	102	76			C10007232
ISO100/NW25	130	40	130	98			C10009231
ISO160/NW40	180	55	160	121			C10011232



Size	A	B	C	D	E	F	Ordering Number
Connector with Two Lateral Flanges							
Stainless steel AISI 316L DIN 1.4404							
ISO63	88	60	95				C10007215
ISO100	108	75	130				C10009215
ISO160	138	100	180				C10011215

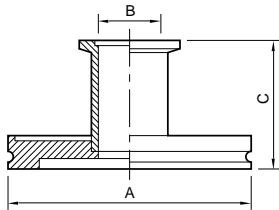


Size	A	B	C	D	E	F	Ordering Number
ISO/ISO Adapting Piece							
Stainless steel AISI 316L DIN 1.4404							
ISO80/ISO63	95	60	105	110	95		C10008021
ISO80/ISO100	110	73	105	130	110		C10009158
ISO100/ISO63	95	70	50	130	95		C10009111
ISO160/ISO63	95	70	50	180	95		C10011110
ISO160/ISO80	110	73	242	180	110		C10011069
ISO160/ISO100	130	102	50	180	130		C10011111



Supplied with bolts for tapped holes and bolts plus nuts and washers for plain holes

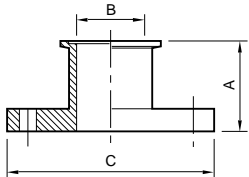
Size	A	B	C	D	E	F	Ordering Number
Adaptor ISO Bolted/ISO Collar							
Stainless steel AISI 316L DIN 1.4404							
ISO40 bolted/ISO63	106	41	100	95			C10007087
ISO63 bolted/ISO63	160	70	130	95			C10007155



Adaptor ISO/NW

Stainless steel AISI 316L DIN 1.4404

ISO63/NW25	95	25	50				C10007115
ISO63/NW40	95	40	50				C10007116
ISO100/NW40	130	40	50				C10009122
ISO63/NW50	95	50	50				C10007118
ISO80/NW50	110	50	118				C10008003
ISO100/NW50	130	50	50				C10009123
ISO80/NW40	110	40	118				C10008002

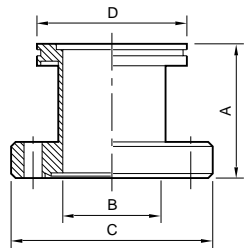


* Supplied with bolts for tapped holes and bolts plus nuts and washers for plain holes

Adaptor ISO Bolted/NW

Stainless steel AISI 316L DIN 1.4404

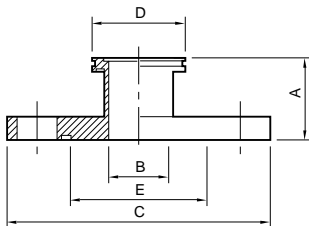
					Europe	N. America
ISO40 bolted/NW50*	50	41	100		C10005080	C10005080
ISO40 bolted/NW40	69	40	100	No bolts supplied	N/A	A1516
ISO63 bolted/NW50	50	50	130	No bolts supplied	N/A	A1509
ISO63 bolted/NW40	68	40	130	No bolts supplied	N/A	A1448
ISO63 bolted/NW40	50	40	130	No bolts supplied	N/A	A1574
ISO40/ISO63 bolt kit for clear and tapped holes					N/A	NGV515000



Adaptor ISO/CF

Stainless steel AISI 316L DIN 1.4404

ISO63/DN63CF/4½	110	60	114	95		C10007130
ISO100/DN100CF/6	111	98	152	130		C10009149
ISO100/DN160CF/8	113	148	203	180		C10011063



Adaptor ISO/ASA

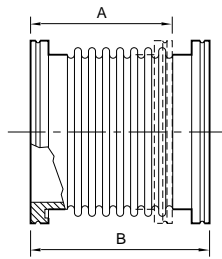
Stainless steel AISI 316L DIN 1.4404

Without O-ring groove

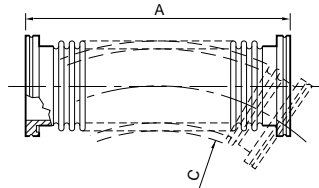
ISO63/2 inch ASA	106	60.2	152	95		C10007131
ISO80/3 inch ASA	106	72.9	190	110		C10008011
ISO100/3 inch ASA	106	98.3	190	130		C10009152
ISO100/4 inch ASA	106	98.3	229	130		C10009154
ISO160/6 inch ASA	112	148	279	180		C10011066

With O-ring groove

ISO63/2 inch ASA	106	60.2	152	95	88.5	C10007132
ISO63/3 inch ASA	106	60.2	190	95	114.5	C10007134



C= maximum pressure, bar absolute



C= minimum band radius, static
D= minimum band radius, dynamic
E= maximum pressure, bar absolute

Size	A	B	C	D	E	F	Ordering Number
Flexible Bellows							
Stainless steel AISI 316L DIN 1.4404							
ISO63	106	127	1.5				C10007670
ISO80	106	127	1.5				C10008028
ISO100	107	127	1.5				C10009670
ISO160	170	220	1.5				C10011670
ISO200	170	220	1.5				C10012670
ISO250	170	220	1.5				C10013670

Size	A	B	C	D	E	F	Ordering Number
Flexible Pipelines							
Stainless steel AISI 316L DIN 1.4404							
ISO63	250		140	360	1.4		C10007285
ISO100	250		200	550	1.3		C10009285
ISO63	500		140	360	1.4		C10007286
ISO100	500		200	550	1.3		C10009286
ISO63	750		140	360	1.4		C10007288
ISO80	750		160	420	1.4		C10008024
ISO100	750		200	550	1.3		C10009288
ISO63	1000		140	360	1.4		C10007287
ISO100	1000		200	550	1.3		C10009287

Pump Hook-Up Kits



Pump hook-up kits are available as convenient boxed sets containing components, seals and clamps to connect pumps to mating flanges.

We offer a number of standard hook-up kits to simplify the installation of dry vacuum pumps.

Each kit has the required spool piece (if needed), bellows, seals and claw-clamps for direct connection of the dry pump to the appropriate size fore-line. All exhaust lines include NW40 braided flexibles.

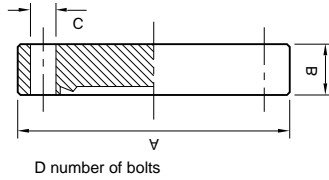
Kits are available with gate valves and can include a dead leg to reduce particulates from falling directly into the pump inlet.

For greater protection, KIT7-14-100 includes an ITO catchpot. KIT7-15-100 can be used with (but does not include) a Water Cooled Trap. Consult Edwards for more details.

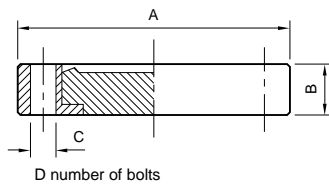
Ordering Information

Product Description	Order No.
Straight inlet, no gate valve, 40 mm fore-line	KIT710040
Straight inlet, no gate valve, 50 mm fore-line	KIT710050
Straight inlet, no gate valve, 63 mm fore-line	KIT710063
Straight inlet, no gate valve, 100 mm fore-line	KIT710100
Straight inlet, pneumatic gate valve, 63 mm fore-line	KIT712064
Straight inlet, pneumatic gate valve, 100 mm fore-line	KIT712101
Dead-leg inlet, pneumatic gate valve, 100 mm fore-line	KIT713101
Catchpot, pneumatic gate valve, 100 mm fore-line	KIT714101
Dead-leg inlet, pneumatic gate valve, 100 mm fore-line for water cooled trap (not included)	KIT715101

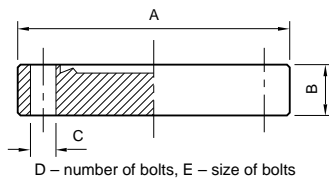
CF Flange Fittings



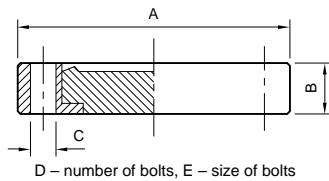
Size	A	B	C	D	E	F	Ordering Number
Blank Flange Non-Rotatable Clear							
Stainless steel AISI 304L DIN 1.4306							
Metric	Inch						
DN16CF	1½	34	7.6	4.3	6		C10001200
DN40CF	2¾	70	12.7	6.7	6		C10005200
DN63CF	4½	114	17.4	8.3	8		C10007400
DN100CF	6	152	19.9	8.3	16		C10009400
DN160CF	8	203	22.3	8.3	20		C10011300
DN200CF	10	254	24.6	8.3	24		C10012300



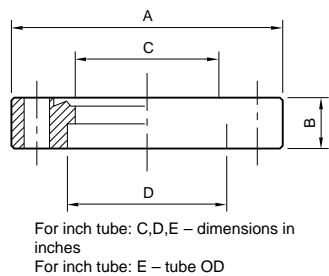
Blank Flange Rotatable Clear							
Stainless steel AISI 304L DIN 1.4306							
Metric	Inch						
DN16CF	1½	34	7.6	4.3	6		C10001201
DN40CF	2¾	70	12.7	6.7	6		C10005201
DN100CF	6	152	19.9	8.3	16		C10009401



Blank Flange Non-Rotatable Tapped							
Stainless steel AISI 304L DIN 1.4306							
Metric	Inch						
DN16CF	1½	34	7.6	4.3	6	M4	C10001202
DN40CF	2¾	70	12.7	6.7	6	M6	C10005202
DN63CF	4½	114	17.4	8.3	8	M8	C10007402
DN100CF	6	152	19.9	8.3	16	M8	C10009402



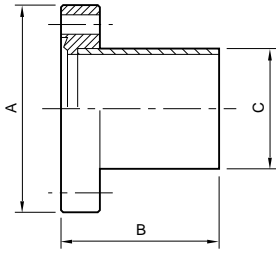
Blank Flange Rotatable Tapped							
Stainless steel AISI 304L DIN 1.4306							
Metric	Inch						
DN100CF	6	152	19.9	8.3	16	M8	C10009403
DN160CF	8	203	22.3	8.3	20	M8	C10011303



Bored Weld Flange Non-Rotatable Clear							
Stainless steel AISI 304L DIN 1.4306							
For metric tube							
Metric	Inch						
DN40CF	2¾	70	12.7	36.9	38.2		C10005207
DN40CF	2¾	70	12.7	40.1	41.3		C10005208
DN63CF	4½	114	17.4	49.6	51.1		C10007405
DN100CF	6	152	19.9	99.4	101.9		C10009405
DN200CF	10	254	24.6	200.4	203.5		C10012305

For inch tube							
Metric	Inch						
DN63CF	4½	114	17.4	1.875	2.01	2	C10007405
DN100CF	6	152	19.9	3.81	4.01	4	C10009405
DN200CF	10	254	24.6	7.812	8.02	8	C10012305

For inch tube: C,D,E – dimensions in inches
For inch tube: E – tube OD

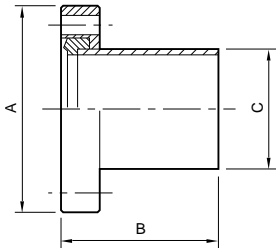
**Size****A****B****C****D****E****F****Ordering Number****Half-Nipple Non-Rotatable Clear**

Stainless steel AISI 304L DIN 1.4306

Metric

Inch

DN16CF	1½	34	38	19		C10001250
DN40CF	2¾	70	63	38		C10005250
DN63CF	4½	114	105	64		C10007450
DN100CF	6	152	135	102		C10009450
DN160CF	8	203	167	152		C10011450

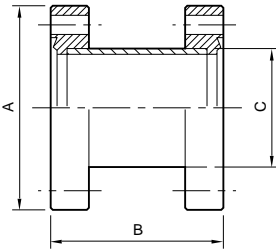
**Half-Nipple Rotatable Clear**

Stainless steel AISI 304L DIN 1.4306

Metric

Inch

DN40CF	2¾	70	63	38		C10005251
DN63CF	4½	114	105	64		C10007451
DN100CF	6	152	135	102		C10009451
DN160CF	8	203	167	152		C10011451

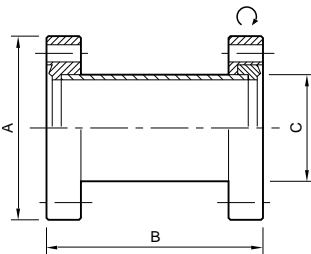
**Full-Nipple Non-Rotatable Clear**

Stainless steel AISI 304L DIN 1.4306

Metric

Inch

DN40CF	2¾	70	126	38		C10005260
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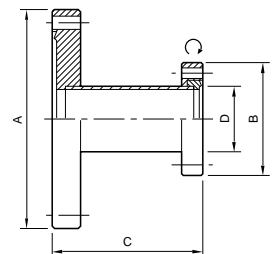
**Full-Nipple Rotatable Clear**

Stainless steel AISI 304L DIN 1.4306

Metric

Inch

DN40CF	2¾	70	126	38		C10005261
DN63CF	4½	114	210	64		C10007461
DN100CF	6	152	270	102		C10009461

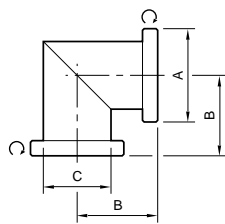
**Reducing Nipple Rotatable Clear**

Stainless steel AISI 304L DIN 1.4306

Metric

Inch

DN40/16CF	2¾/1½	70	34	70	19	C10005370
DN63/40CF	4½/2¾	114	70	70	38	C10007570
DN100/40CF	6/2¾	152	70	70	38	C10009570



Size

A

B

C

D

E

F

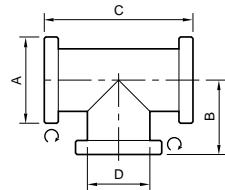
Ordering Number

Elbow 90 ° Rotatable

Stainless steel AISI 304L DIN 1.4306

Metric Inch

DN16CF	1½	34	38	19		C10001300
DN40CF	2¾	70	63	38		C10005300
DN63CF	4½	114	105	64		C10007500

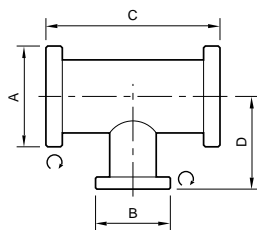


Tee Rotatable

Stainless steel AISI 304L DIN 1.4306

Metric Inch

DN40CF	2¾	70	63	126	38	C10005310
DN63CF	4½	114	105	210	64	C10007510

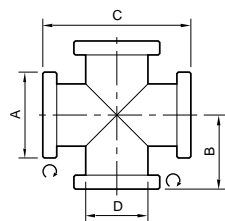


Reducing Tee Rotatable

Stainless steel AISI 304L DIN 1.4306

Metric Inch

DN40/16CF	2¾/1½	70	34	126	60	C10005350
DN63/40CF	4½/2¾	114	70	210	77	C10007551
DN100/40CF	6/2¾	152	70	270	95	C10009551
DN160/63CF	8/4½	203	114	334	120	C10011552

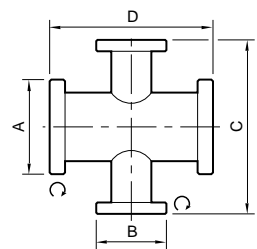


4-Way Cross Rotatable

Stainless steel AISI 304L DIN 1.4306

Metric Inch

DN40CF	2¾	70	63	126	38	C10005320
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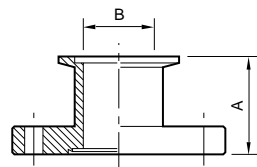


Reducing Cross Rotatable

Stainless steel AISI 304L DIN 1.4306

Metric Inch

DN40/16CF	2¾/1½	70	34	120	126	C10005360
DN100/40CF	6/2¾	152	70	190	270	C10009561

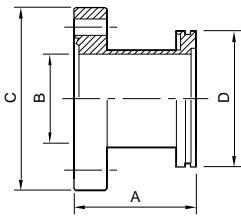


Adaptors NW/CF

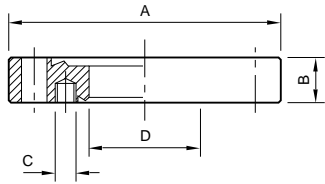
Stainless steel AISI 316L DIN 1.4404

Metric/inch

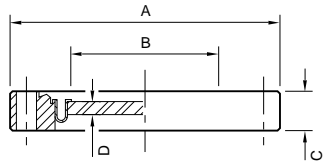
NW16/DN16CF/1½	52.7	15.8				C10503104
NW16/DN40CF/2¾	45.3	15.8				C10503105
NW25/DN40CF/2¾	45.3	22				C10503207
NW40/DN40CF/2¾	45.3	40				C10503305
NW50/DN63CF/4½	49.5	50				C10503405



Size	A	B	C	D	E	F	Ordering Number
Adaptors ISO/CF							
Stainless steel AISI 316L DIN 1.4404							
Metric/inch							
ISO63/DN63CF/4½	110	60	114	95			C10007130
ISO100/DN100CF/6	111	98	152	130			C10009149
ISO160/DN160CF/8	113	148	203	180			C10011063

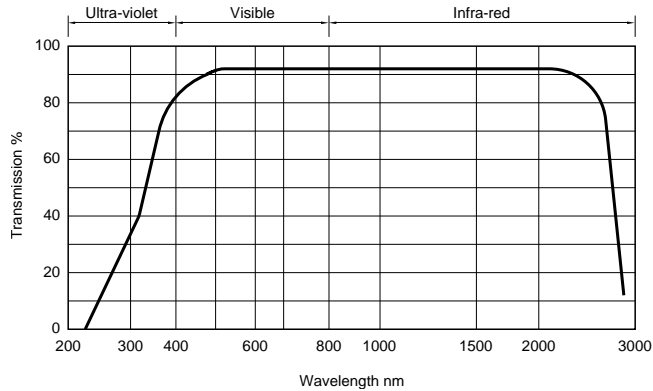


Zero Length Adaptor Major Clear/Minor Tapped							
Stainless steel AISI 304L DIN 1.4306							
Metric Inch							
DN40/16CF	2¾/1½	70	12.7	M4	13.2		C10005240
DN63/40CF	4½/2¾	114	17.5	M6	36.9		C10007440
DN100/40CF	6/2¾	152	19.9	M6	36.9		C10009440
DN100/63CF	6/4½	152	19.9	M8	61.2		C10009441
DN63/40CF	4½/2¾	114	17.5	¼-28	36.9		C10007441

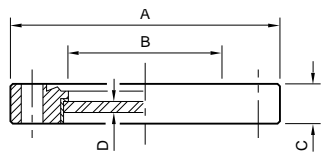


Bakeable to 350 °C, at no greater than 2 to 3 °C per minute.
Use annealed copper gaskets.

NW Zero Length Kodial Viewport							
Stainless steel AISI 304L DIN 1.4306							
Metric Inch							
DN16CF	1½	34	16	12.7	1		C10001600
DN40CF	2¾	70	38	12.7	2.5		C10005600
DN63CF	4½	114	63	17.4	3		C10007600
DN100CF	6	152	89	19.9	4		C10009600
DN160CF	8	203	136	22.3	6.5		C10011600

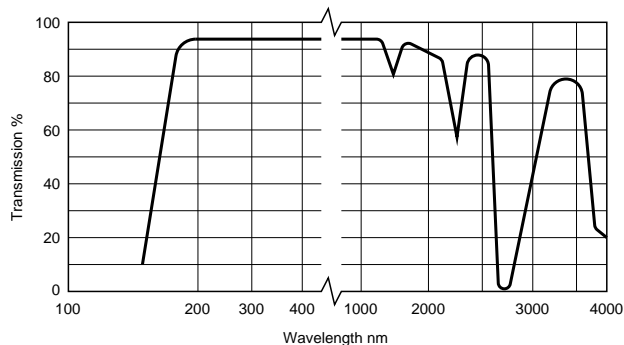


Kodial transmission curve

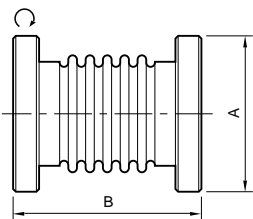


Bakeable to 200 °C, at no greater than 2 to 3 °C per minute.
Use annealed copper gaskets.

Size	A	B	C	D	E	F	Ordering Number
Zero Length Quartz Viewport							
Stainless steel AISI 304L DIN 1.4306							
Metric	Inch						
DN40CF	2¾	70	29.5	12.7	4		C10005610
DN63CF	4½	114	60	17.3	5		C10007610

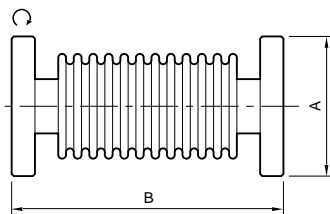


Quartz transmission curve.



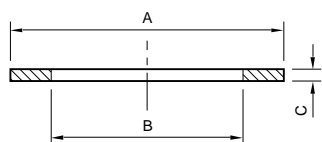
C – maximum pressure, bar absolute

Size	A	B	C	Ordering Number
Hydroformed Bellows Rotatable				
Stainless steel AISI 304L DIN 1.4306				
Metric	Inch			
DN16CF	1½	34	110	1.2
DN40CF	2¾	70	160	1.2



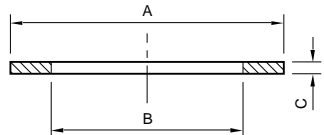
C – Minimum bend radius, static
D – Minimum bend radius, dynamic
E – Maximum pressure, bar absolute

Size	A	B	C	D	E	Ordering Number
Flexible Hose Rotatable						
Stainless steel AISI 304L DIN 1.4306						
Metric	Inch					
DN40CF	2¾	70	250	80	260	1.5
DN63CF	4½	114	250	140	360	1.5
DN16CF	1½	34	500	30	130	1.5
DN40CF	2¾	70	500	80	260	1.5
DN63CF	4½	114	500	140	360	1.5
DN100CF	6	152	750	200	550	1.5
DN40CF	2¾	70	1000	80	260	1.5
DN63CF	4½	114	1000	140	360	1.5

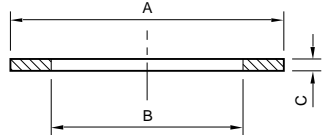


D – For flange OD, mm; E – For flange OD, inch
F – Number per pack

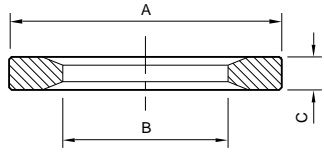
Size	A	B	C	D	E	F	Ordering Number
Copper Gaskets							
Metric	Inch						
DN16CF	1½	21	16	2	34	1.33	10
DN40CF	2¾	48	37	2	70	2.75	10
DN63CF	4½	82	63	2	114	4.5	10
DN100CF	6	120	101	2	152	6	10
DN160CF	8	171	152	2	203	8	5
DN200CF	10	222	203	2	254	10	5
DN250CF	12	270	254	2	304	12	5



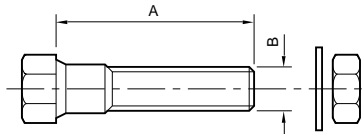
D – For flange OD, mm; E – For flange OD, inch
F – Number per pack



D – For flange OD, mm; E – For flange OD, inch
F – Number per pack



D – For flange OD, mm; E – For flange OD, inch
F – Number per pack



C – number per pack

Size	A	B	C	D	E	F	Ordering Number	
Annealed Copper Gaskets								
Metric	Inch							
DN16CF	1½	21	16	2	34	1.33	5	C10001270
DN40CF	2¾	48	37	2	70	2.75	5	C10005270
DN63CF	4½	82	63	2	114	4.5	5	C10007270
DN100CF	6	120	101	2	152	6	5	C10009270
DN160CF	8	171	152	2	203	8	5	C10011270
DN200CF	10	222	203	2	254	10	5	C10012270
DN250CF	12	270	254	2	304	12	5	C10013270

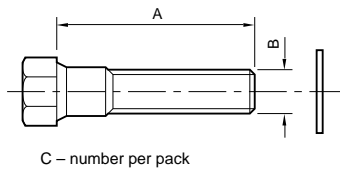
Size	A	B	C	D	E	F	Ordering Number	
Silver Plated Copper Gaskets								
Metric	Inch							
DN16CF	1½	21	16	2	34	1.33	5	C10001280
DN40CF	2¾	48	37	2	70	2.75	5	C10005280
DN63CF	4½	82	63	2	114	4.5	5	C10007280
DN100CF	6	120	101	2	152	6	5	C10009280
DN160CF	8	171	152	2	203	8	5	C10011280
DN200CF	10	222	203	2	254	10	5	C10012280

Size	A	B	C	D	E	F	Ordering Number	
Fluoroelastomer Gaskets								
Metric	Inch							
DN16CF	1½	29	19	2	34	1.33	2	C10001620
DN40CF	2¾	50	38	3	70	2.75	2	C10005620
DN63CF	4½	76	64	3	114	4.5	2	C10007620
DN100CF	6	112	100	3	152	6	2	C10009620
DN160CF	8	162	150	3	203	8	2	C10011620

HEX Head Nut, Bolt and Washers for Clear Hole CF Flanges

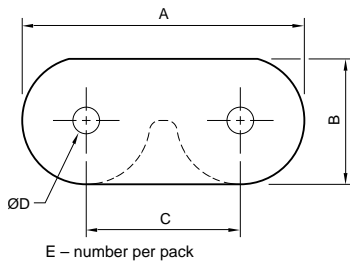
Standard	Metric	Inch			Ordering Number
DN16CF	1½	20	M4	25	C10001630
DN40CF	2¾	35	M6	25	C10005630
DN63CF	4½	45	M8	25	C10007630
DN100CF	6	50	M8	25	C10009630
DN160CF	8	60	M8	25	C10011630
DN200CF	10	60	M8	25	C10012630
DN40CF	2¾	35	¼-28	25	C10005640
DN200CF	10	60	½-24	25	C10012640

Standard	Metric	Inch			Ordering Number
DN40CF	2¾	35	M6	25	C10005650
DN63CF	4½	45	M8	25	C10007650
DN100CF	6	50	M8	25	C10009650
DN160CF	8	60	M8	25	C10011650
DN200CF	10	60	M8	25	C10012650



Size	A	B	C	D	E	F	Ordering Number
HEX Head Bolt and Washers for Tapped Hole CF Flanges							
Standard							
Metric	Inch						
DN40CF	2¾	25	M6	25			C10005670
DN63CF	4½	30	M8	25			C10007730

Silver Plated							
Metric	Inch						
DN40CF	2¾	25	M6	25			C10005690
DN63CF	4½	30	M8	25			C10007690
DN100CF	6	35	M8	25			C10009690



Size	A	B	C	D	E	F	Ordering Number
Plate Nuts							
Metric	Inch						
DN40CF	2¾	41	11	29	M6	25	C10005710
DN63CF	4½	51	12	35	M8	25	C10007710
DN40CF	2¾	41	11	29	¼-28	25	C10005720

Cord and Tubing

Lubrication All O-rings, nitrile rubber extruded cord and sheet used in low vacuum applications should be lubricated with either vapour pump fluid, Fomblin[®] vacuum grease or Apiezon[®] grease M. Lubrication will prolong the life of the material and facilitate sealing.

Apply the oil or grease very sparingly and evenly, coating the seal to give it no more than a shining surface with no visible smears. Excessive lubrication may cause leaks.

In general, but with certain exceptions dictated by common sense, seals used in high vacuum applications should be lubricated, but even more sparingly, using vapour pump fluid.

Cleaning The only necessary and recommended method of cleaning O-rings and nitrile rubber extruded cord or sheet is by wiping with a dry, lint free, soft cloth. Most solvent fluids are liable to be absorbed by fluoroelastomer and nitrile rubber, swelling these materials and subsequently outgassing into the system.

Nitrile Rubber Cord

Nitrile cord should be cut perfectly square and to a length which is 5% above the mean circumference of the groove in which it is laid. Compression and sealing of the butt joint is thereby assured.

Ordering Information

Product Description	Order No.
Nitrile rubber cord	
0.275 inch (7 mm) diameter	H02101008
0.312 inch (8 mm) diameter	H02101009
0.500 inch (12.7 mm) diameter	H02101015

State exact length required (per metre).

Vacuum Tubing

This high quality neoprene rubber vacuum tubing is suitable for use down to approximately 10^{-4} mbar. We recommend that you use the shortest length possible.

Ordering Information

Product Description	Order No.
Rubber vacuum tube, 1 m lengths	
5 mm bore, 19 mm external diameter	H02100002
7 mm bore, 17 mm external diameter	H02100003
9 mm bore, 25 mm external diameter	H02100004
12 mm bore, 28 mm external diameter	H02100005
20 mm bore, 34 mm external diameter	H02100006
Flexible hose connection*	C06600025

* Neoprene, steel reinforced, 12 inch (305 mm) long, to suit 1½ inch external diameter tube

Oils, Fluids, Sealants and Greases



We strongly recommend that you use only the recommended grades and qualities of fluids and sealants, to maintain the high performance of Edwards products. If you use inferior materials, this can lead to a reduction in the pump or system efficiency, partial or complete failure of the equipment, and excessive outgassing. We think it is a false economy to use cheaper fluids and sealants which are untried for many demanding applications.

All our fluids and sealants are tested under formal laboratory conditions. In addition, we have gained considerable on-site experience through our own use of these materials and by maintaining close contact with users who have specific problems. As many cases of suspected equipment under-performance are eventually traced to the use of unsuitable or unsatisfactory fluids and sealants, we are pleased to advise on the correct selection of fluids and sealants for your application.

Mineral Based Materials

These materials include rotary pump oils, Diffstak and diffusion pump oils and greases. They are available with or without various additives for different applications.

Silicone Based Materials

These materials are used for Diffstak and diffusion pump fluids and greases. They comprise either di-methyl siloxanes or phenyl methyl siloxanes.

Synthetic-Organic Compounds

These include various hindered esters, phenyl ethers and naphthalene based compounds. They are offered for use in Diffstak and diffusion pumps, but they can also be used as a rotary pump oils in certain unique applications. Edwards can advise on the matching of the fluids to particular applications.

Fluorinated Materials (PFPE)

These are perfluoropolyethers. Perfluoropolyether is a fully fluorinated material free from other halogens and from hydrogen, and so is of particular value where freedom from hydrocarbons is important. It is inert to most reactive chemicals such as UF_6 , F_2 , O_2 , O_3 , and so on, and it does not polymerise when exposed to electron and most ion bombardment.

Perfluoropolyether fluid is available in grades suitable for use in rotary pumps. A low vapour pressure Fomblin® grease (AR555) is available which combines good lubrication properties with superior vacuum properties.

PFPE for Semiconductor Applications

The major growth in the use of perfluoropolyether (PFPE) compounds has been in applications where hostile process conditions quickly destroy normal hydrocarbon pump oils. This applies particularly in semiconductor processing. The corrosion resistant properties and chemical inertness of PFPE result in greatly increased operation times between oil changes and pump maintenance, and this provides a cost effective solution to many difficult pumping applications.

These are the basic properties of PFPE and the advantages for use in vacuum systems:

- **Chemically Inert** Ideal for pumping aggressive materials, particularly in semiconductor processes.
- **High Oxidation Resistance** Fluid is not damaged by repeated exposure to air at operating temperatures.
- **Non-Inflammable** No fire risk.
- **High Thermal Resistance** No residual tar compounds formed by overheating. Eventually reduced to gaseous products.
- **Oxygen Compatible** Allows absolutely safe pumping of oxygen (NASA approved for liquid oxygen systems). Maximum recommended operation temperature and pressure for 100% oxygen is 250 °C and 91.4 kg cm⁻² and 60 °C, 175.75 kg cm⁻².
- **Non-Polymerization** Does not polymerise on exposure to energetic particle bombardment (except hydrogen ions). This reduces the impact of backstreamed vapours, and is an important property where polymers cannot be tolerated (for example, in electron microscopes).
- **Miscible with Most Common Solvents** Allows pumping of solvent even without gas ballast.

Before charging with PFPE, thoroughly clean the pumps to achieve maximum advantage. If you do not have skilled technicians available, we recommend that you return the pumps to a Edwards Service Center to be cleaned and filled. Some models of high vacuum rotary pumps and mechanical booster pumps adapted for use with PFPE are available as standard and can be found in the appropriate sections of this catalogue: these pumps are assembled and tested with PFPE.

Safety note Perfluoropolyether is a fluorinated compound and will give-off toxic vapours if exposed to temperatures above 280 °C. Do not expose PFPE to naked flames and prohibit smoking in work areas.

Mechanical Pump Oils



Edwards supplies the widest range of oils of different viscosities and specifications to enable customers to obtain the best performance from mechanical pumps under different application conditions. Mineral oils are manufactured by a hydro treatment process to reduce carcinogenic risk. All are specially prepared for high vacuum use, having low vapour pressures even at high temperatures. The particular mechanical pump specification should be consulted to find which oil to use.

Ultragrade® Mineral Oils

Edwards offers a range of new oils, Ultragrade® 15, 19, 20 and 70, which result from a new process. Most manufacturers use a solvent refining process, whereas these oils are produced by a unique hydrotreating process. This process eliminates nitrogen, sulphur and oxygen and the aromatic hydrocarbons, leaving a clear base stock essentially free of impurities.

When combined with additives, the Ultragrade® oils give improved vacuum performance, thermal and oxidation stability and rust inhibition. The anti-oxidants included in the oils enable the pump to withstand high operating temperatures without oil degradation, so extending intervals between oil changes.

The properties of the oils allow them to be used in a wide range of applications. New Ultragrade® 70 oils are the best choice for large pumps used in heavy-duty, cycling applications. Contact Edwards or your local supplier for detailed recommendations.

Ultragrade Oil	Use In	Replaces
Ultragrade 15	E2M0.7, E2M1.5. Also suitable for cold start applications.	Edwards 8A
Ultragrade 19	RV pumps, E2M18	Supergrade A, Edwards 17 and 20
Ultragrade 70	E2M40 to E2M275	–
Ultragrade 20	EH boosters	Edwards 16 and 18

Ordering Information

Product Description	Order No.
Ultragrade 15	
1 litre	H11026015
12 x 1 litre	H11026012
4 litre	H11026013
4 x 4 litre	H11026011
205 litre	H11026010
Ultragrade 19	
1 litre	H11025015
12 x 1 litre	H11025012
4 litre	H11025013
4 x 4 litre	H11025011
205 litre	H11025010
Ultragrade 20	
1 litre	H11024015
12 x 1 litre	H11024012
4 litre	H11024013
4 x 4 litre	H11024011
205 litre	H11024010
Ultragrade 70	
4 litre	H11028013
4 x 4 litre	H11028011
205 litre	H11028010

Edwards TW has been developed for applications where rotary pump oils are likely to be exposed to reactive or corrosive gases. The oil is distilled hydrocarbon containing no additives, but unsaturates and aromatic links have been removed. The result is that the oil will last up to 20 times longer, depending on process, than refined mineral oils. Longer oil life significantly extends the intervals between oil changes.

Ordering Information

Product Description		Order No.	
		Europe	N. America
Edwards TW mineral oil	1 litre	H11012015	H02100001TW
	4 litre	H11012013	H02100002TW
	20 litre	H11012026	H02100003TW
	205 litre (55 US gal)	N/A	H02100004TW

Edwards 45 Oil

Edwards 45 is a hydrocarbon synthetic polymer whose molecular structure offers chemical inertness, high temperature stability and low vapour pressure ($<10^{-7}$ mbar at 25 °C). It is commonly used in mass spectrometry applications because of its well defined peaks. Edwards 45 oil is non-toxic, non-corrosive and reclaimable.

Ordering Information

Product Description	Order No.	
	Europe	N. America
Edwards 45 oil		
1 litre	H11022015	H01800001
4 litre	H11022013	H01800003
12 x 1 litre	N/A	H01800005

V-Lube

The V-Lube range of oils offer good thermal stability and oxidation resistance and have been selected for use with the Stokes range of vacuum pumps. Choose from the following:

V-Lube Oil	Application
V-Lube CD	Chemical Dry and Chemical Dry Eagle pumps
V-Lube F	Microvac piston pumps
V-Lube G	Hot Microvac, 912H, 612MB

Ordering Information

Product Description	Order No.
V-Lube CD oil	
3.8 litres (1 US gal)	254-539-004
19 litres (5 US gal)	254-539-003
208 litres (55 US gal)	085-048-764
V-Lube G oil	
19 litres (5 US gal)	262-461-003
208 litres (55 US gal)	421-793-001
V-Lube H oil	
3.8 litres (1 US gal)	424-051-001
19 litres (5 US gal)	419-699-001
208 litres (55 US gal)	419-698-001
V-Lube F oil	
5 litres (1.3 US gal)	H11030001
25 litres (6.6 US gal)	H11030002
205 litres (54 US gal)	H11030003
3.8 litres (1 US gal) North America only	254-117-002
19 litres (5 US gal) North America only	254-539-002
208 litres (55 US gal) North America only	254-780-001

Mechanical Pump Oil Selection Chart

Application	Ultragrade 15	Ultragrade 19	Ultragrade 20	Ultragrade 70	Edwards TW	Fomblin® 06/6	Krytox® 1506	Fomblin® 16/6	Krytox® 1514	Fomblin® 25/6	Krytox® 1525	
Mass spectrometers	•	•	•	•								
Electron microscopes	•	•	•	•								
Thin film sputtering	•	•	•	•								
Surface studies	•	•	•	•								
UHV systems	•	•	•	•								
Leak detection	•	•	•	•								
TV tubes	•	•	•	•								
Power valves	•	•	•	•								
Distillation	•	•	•	•	•							
Space studies	•	•	•	•								
Furnaces	•	•	•	•								
EB welders	•	•	•	•								
Semiconductors	•	•	•	•	•							
Impregnation	•	•	•	•								
Chemical pumping	•	•	•	•	•							
Oxygen pumping	•	•	•	•								
Radioactive	•	•	•	•								
Packaging	•	•	•	•								
Mechanical booster	•	•	•	•				•				
Metallisation	•	•	•	•								
vapour pressure mbar	5.8 x 10 ⁻⁶	1 x 10 ⁻⁸	2.1 x 10 ⁻⁷	2.1 x 10 ⁻⁷	1.3 x 10 ⁻⁶ f	4 x 10 ⁻⁶	5.2 x 10 ⁻⁷	3 x 10 ⁻⁶	2.6 x 10 ⁻⁷	4 x 10 ⁻⁸	1.3 x 10 ⁻⁷	
100 °C	3.0 x 10 ⁻²	1.0 x 10 ⁻³	3.0 x 10 ⁻³	3 x 10 ⁻³	–	5 x 10 ⁻³	1.3 x 10 ⁻³	1 x 10 ⁻³	1.3 x 10 ⁻⁴	6 x 10 ⁻⁵	3.9 x 10 ⁻⁵	
Molecular weight	385	420	500	600	430	1900	2400	2700	3500	3300	4600	
Specific gravity at 15 °C	0.86	0.86	0.86	0.86	0.860	1.88	1.88	1.89	1.89	1.9	1.9	
Viscosity cSt	104.2	143.7	352	222	155	64	70	168	140	276	250	
at 20 °C	38.1	48.6	103	70	65	25	22	48	48	80	80	
at 40 °C	-18	-16	-12	-12	-12	-50	-45	-45	-40	-35	-35	
Pour point °C	220	230	260	230	243	none*	none*	none*	none*	none*	none*	
Flash point °C	355	355	365	360	270	none*	none*	none*	none*	none*	none*	
Auto ignition point °C	0	0	0	0	0	0	0	0	0	0	0	
Sulphur content% mass/mass	Conducting polymers formed											
Energetic particle impact	good	good	good	good	poor	No polymers formed (except with H ₂ ions)						
Thermal stability	good	good	good	good	poor to fair	Excellent – decomposes to gas only above 300 °C*						
Oxidation resistance	good	good	good	good	poor to good	Excellent						
Chemical resistance	fair	fair	fair	fair	poor to good	Excellent						
Radiation resistance	fair	fair	fair	fair	fair	Good – but reacts with electro-positive metals (for example, sodium)						

* WARNING – Perfluoropolyether is a fluorinated compound which will give off toxic vapours if exposed to temperatures above 280 °C. The fluid should not be exposed to naked flames and smoking should be prohibited in the working area.
 • Suitable for this application.
 † Vapour pressure at 25 °C.

Krytox® is a registered trademark of Dupont Dow Elastomers

Perfluoropolyether Oils

Edwards now offers an extended range of Fomblin® and Krytox®, perfluoropolyether oils for use in rotary vacuum pumps. Fomblin® YVAC 06/6 and Krytox® 1506 are recommended for Edwards oil sealed rotary pumps and are practically a direct replacement for mineral oil in terms of viscosity and vapour pressure. Krytox® 1525 is suitable for use in rotary pumps requiring a viscosity equivalent to Fomblin® Y25 fluid. Fomblin® Y16/6 and Krytox® 1514 are recommended for use in perfluoropolyether adapted mechanical booster pumps.

Edwards, in conjunction with Ausimont UK, has developed Drynert fluid which contains anti-rust and anti-wear additives soluble in Fomblin®. These additives cover metallic surfaces with a protective, corrosion resistant film.

Ordering Information

Product Description		Order No.	
		Europe	N. America
Fomblin® YVAC 06/6	100 ml	N/A	H026004001
	240 ml	N/A	H026004002
	0.5 kg	N/A	H026004003
	1 kg (532 ml)	H11301019	H11301019
	2 kg	N/A	H026004005
Krytox® 1506 fluid	0.5 kg	N/A	H11307017
	1 kg (532 ml)	H11307018	H11307018
	5 kg (2660 ml)	H11307020	H11307020
Krytox® 1525 fluid	0.5 kg	N/A	H11309017
	1 kg (526 ml)	H11309018	H11309018
	5 kg	H11309020	H11309020
Fomblin® Y16/6 fluid	0.5 kg	N/A	H026001003
	1 kg (529 ml)	H11306019	H11306019
	2 kg	N/A	H026001005
	5 kg	H11306020	H11306020
Krytox® 1514 fluid	0.5 kg	N/A	H11308017
	1 kg (529 ml)	H11308018	H11308018
	5 kg (2646 ml)	H11308020	H11308020
Fomblin® 25/6 fluid	100 ml	N/A	H026008001
	0.5 kg	N/A	H026008003
	1 kg (529 ml)	H11312019	H11312019
	2 kg	N/A	H026008005
	8 kg	N/A	H026008006
Drynert 25/6 fluid	1 kg (529 ml)	H11312021	H11312021
	5 kg (2646 ml)	H11312025	H11312025

Single Stage and Rough Pump Oil Selection Chart

		LOWVAC 60	V-Lube CD	V-Lube F	V-Lube G	V-lube H
Technical Data	Vapour pressure mbar	20 °C	7.5×10^{-5}	<1.3	<1.3	<1.3
		100 °C	3.9×10^{-2}	<1.3	<1.3	<1.3
Properties	Molecular weight		485	350-500	350-500	350-500
	Specific gravity at 20 °C		0.80	0.87-0.89	0.86-0.88	0.88-0.89
	Viscosity cSt at 40 °C	0	59.1	68	95.5-100	183-191
	Pour point °C		-45	-31	-36	-30
	Flash point °C		209	210	223	216
	Auto ignition point °C		360	343	TBC	343
	Sulphur content% mass/mass		0	0	0.281	0
	Energetic particle impact		Conducting polymers formed			
	Thermal stability		good	good	good	good
	Oxidation resistance		good	good	good	good
Chemical resistance		fair	fair	fair	fair	
Radiation resistance		fair	fair	fair	fair	

Vapour Pump Fluids



Edwards supplies a range of fluids of different vapour pressures and physical properties. From this range, you can choose the optimum fluid for your applications.

In general, the more volatile fluids are used with vapour booster pumps and for vapour diffusion pumps used on industrial processes (for example, decorative coating and vacuum furnaces) where high gas loads are encountered and high critical backing pressure is advantageous. The less volatile fluids are used for processes or experiments requiring more exacting high vacuum conditions. The least volatile fluids are used for clean or ultra high vacuum applications (mass spectrometry, electron probe apparatus, surface studies, and so forth). Fluid selection depends also on the particular physical and chemical characteristics of the fluids (apart from vapour pressure).

Edwards has a long history of co-operation with various fluid manufacturers in the development of new pumping fluids and is well placed to advise in cases of uncertainty.

AP201 Vapour Booster Pump Fluid

Apiezon® AP201 is a hydrocarbon fluid prepared by molecular distillation and protected against oxidation by a thermally stable additive of matched vapour pressure. It has an auto ignition temperature of 305 °C.

It exhibits a fair degree of resistance to chemical degradation (so that high throughputs of air and water vapour can be pumped without damage to the fluid) and it can withstand limited accidental admission of atmospheric air at operating temperature. The fluid has low viscosity which permits easy filling and draining. It does not attack synthetic rubbers used for seals and gaskets in vacuum systems. It is non-irritant, non-toxic and environmentally non-polluting.

Ordering Information

Product Description	Order No.
AP201 vapour booster pump fluid	
4 litres	H02601054
20 litres	H02601052
200 litres	H02601050

Silicone DC702, DC704EU and DC705 Diffusion Pump Fluids

These synthetic fluids are organo-silicon oxide polymers and have exceptional chemical stability both at high temperature and when in contact with most gases and vapours. They provide a range of general purpose fluids for ultimate vacuum from about 10^{-5} to 10^{-9} mbar, and are particularly useful in industrial processing applications due to their exceptional ruggedness. High throughputs of air, water vapour and corrosive gases can be pumped without fluid degradation. The fluids can withstand repeated admission of atmospheric air while at operating temperature and are widely used in valveless quick-cycle pumping processes. They have low toxicity and good resistance to gamma radiation.

Fluid breakdown products (due to bombardment and so on) tend to be electrically insulating and so we do not recommend these fluids for physical electronic applications such as mass spectrometers and surface analysis systems. The fluids are indifferent lubricants. Their decomposition is catalysed by traces of alkali metals (for example, caesium) and their use should be avoided where possible.

Ordering Information

Product Description	Order No.	
	Europe	N. America
Silicone 702		
500 ml	H02400007	H02400007
1 US gal	N/A	H02400008
5 kg (4673 ml)	H02400038	N/A
Silicone 704EU		
500 ml	H11201040	H02400043
1 US gal	N/A	H02400011
5 kg (4673 ml)	H11201041	N/A
Silicone 705		
500 ml	H02400027	H02400027

Santovac® 5 Diffusion Pump Fluid

This synthetic fluid is a polyphenyl ether developed from fluids originally produced as lubricants for space vehicles. It has exceptionally low vapour pressure, exceptional thermal stability and a tendency to wet surfaces less readily and "creep" to a lesser extent than is common with most fluids. The fluid is employed for the cleanest high vacuum and ultra high vacuum applications down to less than 10^{-9} mbar (for example, electron microscopes, mass spectrometers and surface physics studies) where its excellent high vacuum performance and low tendency to migrate into the pump system particularly recommend it. The fluid is chemically stable, non-corrosive, safe and non-toxic at normal operating temperatures. Fluid breakdown products (due to bombardment and so forth) tend to be electrically conducting. Lubricating qualities are good and the fluid finds application to lubricate mechanisms in vacuum systems.

Ordering Information

Product Description	Order No.	
	Europe	N. America
Santovac® 5 fluid		
100 ml	H11401001	H02300045
500 ml	H11401002	H02300046

Edwards L9 Diffusion Pump Fluid

Edwards L9 fluid has been developed for use in Diffstak and diffusion pumps. It is a naphthalene based synthetic material which is ideal for use in applications where silicones (which form insulating films) cannot be tolerated.

L9 fluid is rugged, has a very good vacuum performance and gives an ultimate pressure of typically 5×10^{-9} mbar (at 20 °C).

In addition, the fluid is chemically stable and is resistant to acids, alkalis, halogens and oxides of nitrogen. It does not react with common engineering metals or elastomers. It is immiscible to the common solvents alcohol, acetone and trichlorotrifluoroethane. The toxicity level of L9 is very low.

Safety note: When changing to this fluid the pump should be cleaned using a proprietary fluid. The pump should then be rinsed in acetone and dried prior to re-charging.

Ordering Information

Product Description	Order No.
Edwards L9 fluid 1 litre	H11501015

Vapour Pump Fluid Selection Chart

	Apiezon® AP201	Silicone			Santovac® 5	L9
		702	704EU	705		
Mass Spectrometers	•				•	•
Electron Microscopes					•	•
Thin Film Sputtering					•	
Surface Studies					•	
UHV Systems				•	•	
Leak Detection					•	
TV Tubes		•	•			
Power Valves					•	•
Spaces Studies					•	
Furnaces	•					
Radioactive					•	
Vapour Booster	•					
Metallisation		•	•			
Typical ultimate vacuum achievable at 20 °C (mbar)	6.5×10^{-5}	6.5×10^{-6}	6.5×10^{-8}	1.3×10^{-9}	1.3×10^{-9}	5×10^{-9}
Vapour pressure (mbar) at 20 °C	5×10^{-6}	6.5×10^{-7}	1.3×10^{-8}	2.6×10^{-10}	2.6×10^{-10}	7.8×10^{-10}
at 100 °C	2.4×10^{-2}	1.3×10^{-3}	2.6×10^{-4}	1.3×10^{-5}	6.5×10^{-6}	2.6×10^{-5}
at 150 °C	6.5×10^{-1}	$< 10^{-1}$	1.3×10^{-2}	$< 10^{-3}$	4×10^{-4}	2.3×10^{-3}
Boiling temperature at 1.3 mbar (°C) (approximate)	160	185	223	254	295	251
Molecular weight (average)	310	530	484	546	446	407
Viscosity cSt at						
20 °C	34	55	47	240	2400	71.3
100 °C	5.0	4.9	4.3	7.9	12	5.6
150 °C	2.7	2.4	2.2	3.3	4.5	1.2
Pour point (°C) (approximate)	-30	< -20	< -20	-10	+5	-5
Flash point (°C)	196	193	221	243	288	241
Fire point (°C) (approximate)	204	275	275	275	350	281
Auto ignition point (°C) (approximate)	305	500	500	500	590	370
Specific heat (cal/g/°C)	0.46	0.42	0.41	0.42	–	0.46
Latent heat (cal/g)	69	40.9	52.7	51.6	49.2	42
Specific gravity at 25 °C	0.862	1.07	1.07	1.09	1.195	0.901
Coefficient of expansion per deg C	0.0007 (10 – 30 °C)	0.0008 (25 – 50 °C)	0.0008 (25 – 50 °C)	0.0006 (25 – 50 °C)	0.0008 (25 – 50 °C)	0.00042 (25 – 50 °C)
Refractive index at room temperature	1.476	1.516	1.557	1.579	1.6306 (25 °C)	1.5154 (25 °C)
Energetic Particle Bombardment	conducting polymers formed	insulating polymers formed			conducting polymers formed	
Thermal Stability	poor	very good			excellent	good
Oxidation Resistance	Poor to fair	excellent			very good	good
Chemical Resistance	poor	very good but decomposed by alkali metal			good	very good
Radiation Resistance	fair	good			very good	fair

• Recommended for this application

Greases and Waxes



Silicone Grease

A high vacuum grade grease, which is for use at system pressures lower than 10^{-6} mbar.

Ordering Information

Product Description	Order No.
Silicone, high vacuum grease, tube 50 g	H02400036
Silicone, high vacuum grease, pack 5 kg	H11251015

Fomblin® Grease

This grease is an excellent lubricant for sliding elastomer seals, and exhibits the chemical inertness typical of the Fomblin® range.

It has a very low vapour pressure and is suitable for use in the presence of gaseous and liquid oxygen under severe conditions.

The general purpose AR555 grease offered by Edwards has the basic properties of Fomblin®, but the vapour pressure is not specifically controlled. The vapour pressure is $<10^{-7}$ mbar at 20 °C.

Ordering Information

Product Description	Order No.
Fomblin® vacuum grease AR555 grade, syringe 100 g	H11350013

Krytox® Grease

DuPont Krytox® fluorinated greases are a family of multipurpose lubricants intended for use in speciality applications at elevated temperatures or in aggressive environments.

Ordering Information

Product Description	Order No.
	N. America
Krytox® 240AD, tube (57 g, 2 oz)	U30002525
Krytox® 240AD, tube (226 g, 8 oz)	U30002206
Krytox® 240AB, tube (57 g, 2 oz)	U30002536
Krytox® 240AB, tube (226 g, 8 oz)	U30002535
Krytox® 240AC, tube (57 g, 2 oz)	U30002538
Krytox® 240AC, tube (226 g, 8 oz)	U30002537
Krytox® LVP, tube (57 g, 2 oz)	U30002075
Krytox® LVP, tube (226 g, 8 oz)	U30002539

Waxes and Sealing Compounds (Mineral Based)

Apiezon® wax W is a low vapour pressure wax for sealing joints in high vacuum systems. This wax softens at 80-90 °C and has a vapour pressure at 80 °C of 10^{-3} mbar and at 20 °C of 10^{-8} mbar.

Apiezon® wax W40 is similar to type W, but has a lower softening point which makes it very suitable for flow sealing in or around vacuum joints. It is not recommended for use at temperatures above 30 °C. It has a vapour pressure at 20 °C of 10^{-7} mbar.

Apiezon® sealing compound Q remains firm for temperatures up to 30 °C, but is sufficiently pliable to permit easy moulding into position. It is an excellent material for shielding or blanking off sections of apparatus. The compound is easily applied and can be readily removed. It has a vapour pressure at 20 °C of 10^{-4} mbar.

Ordering Information

Product Description	Order No.
Apiezon® W wax 20 x 25 g	H02301014
Apiezon® W wax pack 1 kg	H11176007
Apiezon® W40 wax pack 250 g	H02301015
Apiezon® Q sealing compound tin 1 kg	H02300012

Apiezon® Greases

A range of Apiezon® greases is offered for use on high vacuum systems and for many general applications in the laboratory. These high purity greases are non-toxic, easy to apply, easy to clean off and have long shelf lives.

Applications include:

- Lubrication of glass and metal taps in vacuum systems
- Sealing polymer joints in vacuum systems
- Leak detection
- Protecting metal contacts in vacuum-encapsulated relays
- Sealing polished and ground glass/metal surfaces
- Optical surfaces in vacuum systems and laser systems – does not cause clouding (L and M greases only)
- Non vacuum uses include lubrication of glass and metal taps in laboratory, medical and industrial applications
- Good "gettering" qualities (absorbs grease and chemical impurities) – ideal for electronics industry

Choice of grease depends largely on operating temperature (see below).

Anti Seize Greases

	AP100	AP101
Melting point	47 °C	>200 °C
Radiation resistant	No	No
Vapour pressure at 20 °C (mbar)	$<10^{-10}$	$<10^{-5}$
Approvals	Marconi Radar	Marconi Radar, NATO
Comments	High vacuum; good lubrication, resists alkali, acid and corrosive gas; easily removed by most solvents. Particularly good for polished/ground glass joints.	Medium vacuum, heavy duty grease; wide temperature base, ideal for laboratory work.

Lubricant (unmodified)

	L	M
Melting point	47 °C	44 °C
Radiation resistant	Yes	Yes
Vapour pressure at 20 °C (mbar)	<10 ⁻¹⁰	<10 ⁻¹⁰
Approvals	ESA, MatraMarconi, NASA, NATO	NATO
Comments	High vacuum, low temperature; nuclear, space industries; liquid gas chromatography	Similar to L grease, but stiffer; good gettering properties

Lubricant (polymers added)

	N	T	H
Melting point	43 °C	125 °C	N/A*
Radiation resistant	No	No	No
Vapour pressure at 20 °C (mbar)	<10 ⁻⁹	<10 ⁻⁸	<10 ⁻⁷
Approvals	NASA, US Navy	NATO, US Navy	British Aerospace, ESA, Matra, Marconi, NASA
Comments	Rubbery, tenacious; cushions glass mating surfaces, ideal for burette taps. Cryogenic.	As N grease, but higher temperature; glass and general lubrication	Very high temperature; becomes stiffer as temperature increases

* Grease H can withstand temperatures up to 250 °C without melting

Ordering Information

Product Description	Order No.	
	Europe	N. America
Apiezon® L grease (50 g)	H02301041	H02301041
Apiezon® L grease (25 g)	N/A	H02301042
Apiezon® M grease (100 g)	H02301040	H02301040
Apiezon® M grease (25 g)	N/A	H11151002
Apiezon® N grease (25 g)	H02301011	H02301011
Apiezon® T grease (25 g)	H02301018	H02301018
Apiezon® AP100 grease (50 g)	H02300043	H02300043
Apiezon® AP101 grease (50 g)	H02301044	H02301044
Apiezon® AP101 grease (4 kg)	H02301045	H02301045
Apiezon® H grease (25 g)	H11150001	H11150001
Apiezon® J 500 ml	H11103016	H11103016
Apiezon® K 500 ml	H11104016	H11104016

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