

# Fittings and Flanges



# 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 aluminum 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. Aluminum 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	1 ½ inch	34.00	1.33
DN25CF			NW25CF	2 ½ 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	4 ½ inch	114.00	4.47
DN80CF			NW75CF	4 ¾ 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 aluminum 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 aluminum, 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 aluminum 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<sup>-7</sup> 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 centering ring and O-ring, the NW Co-Seal is fully restrained externally and is therefore suitable from 10<sup>-7</sup> 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 centralize the Co-Seal precisely. For ISO collar flanges, claw clamps also centralize the seal and are themselves spaced around the flange by the cut-outs in the Co-Seal.

## Centering Rings in High Technology Polymer

We complement our aluminum centering rings with a range manufactured from a high-tech polymer. These centering 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<sup>-8</sup> mbar l s<sup>-1</sup>cm<sup>-2</sup> 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 centering ring	10 <sup>-7</sup> mbar – 1 bar / 14.5 psi
Stainless steel clamping ring and Co-Seal	10 <sup>-7</sup> mbar – 10 bar / 145 psi
Stainless steel clamp and metal seal	10 <sup>-8</sup> mbar – 3 bar / 44 psi
Stainless steel clamp and Co-Seal (all sizes)	10 <sup>-7</sup> mbar – 10 bar / 145 psi
Polymer and aluminum clamps and Co-Seal	
NW10 to NW25	10 <sup>-7</sup> mbar – 10 bar / 145 psi
NW40 to NW50	10 <sup>-7</sup> mbar – 10 bar / 145 psi
NW trapped O-ring	10 <sup>-7</sup> mbar – 10 bar / 145 psi
O-ring and centering ring (vacuum use only)	10 <sup>-7</sup> mbar – 1 bar / 14.5 psi
Bellows	10 <sup>-7</sup> mbar – 1 bar / 14.5 psi
Flexible pipelines*	10 <sup>-7</sup> mbar – 1.5 bar / 21 psi
Braided flexible pipelines*	10 <sup>-7</sup> 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
Aluminum Co-Seal and nitrile seal	-10 to 100 °C
Aluminum Co-Seal and fluoroelastomer seal	-10 to 200 °C
Polymer centering ring and nitrile O-ring	-10 to 100 °C
Polymer centering 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
Aluminum 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 ISO3669
CF fittings	
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

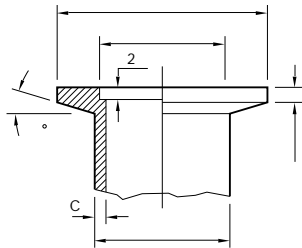
## Chemical Resistance

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

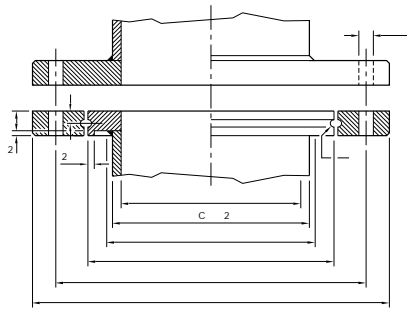
# Dimensions

## NW Dimensions



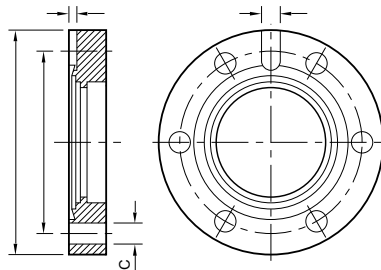
	A	B	C	D
NW10	30	12.2	2	14
NW16	30	17.2	2	20
NW20	40	22.2	2	25
NW25	40	26.2	2	28
NW32	55	34.2	2	38
NW40	55	41.2	2	44.5
NW50	75	52.2	2	57

## 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

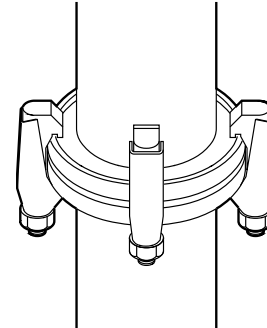
## CF dimensions



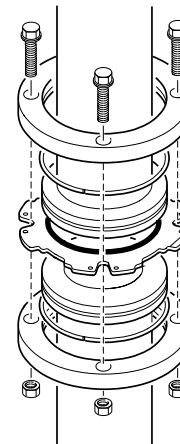
Nominal	A, mm	A, inch	B	C	D	E	Bolt Holes
DN16CF	34	1 1/8	27	4.4	-	-	6
DN40CF	70	2 3/4	58.7	6.6	-	-	6
DN63CF	114	4 1/2	92.1	8.4	6	3	8
DN100CF	152	6	130.2	8.4	6	3	16
DN160CF	202	8	181	8.4	6	3	20
DN200CF	253	10	231.8	8.4	6	3	24
DN250CF	306	12	284	8.4	6	3	32

## ISO Flange Assembly with Co-Seals

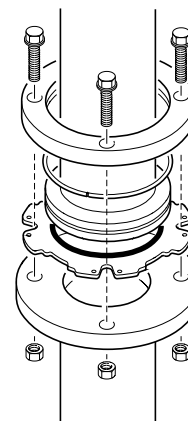
Two Fixed Collar Flanges with Claw Clamps



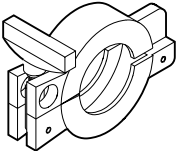
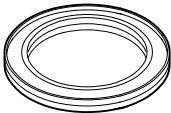
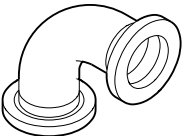
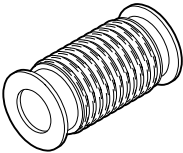
Two Rotatable Flanges



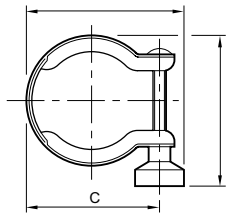
One Fixed Collar Flange, with One Rotatable Flange



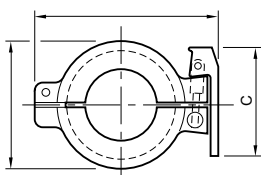
# Product Summary

Description	Semiconductor			Features	Page			
	Scientific	R & D	Industrial		NW	ISO	CF	
<b>Clamps</b>								
 Clamping Ring	-	✓	✓	✓	Low cost, compact Stainless steel	6-7	-	-
Polymer Clamp	-	✓	✓	✓	Low cost, lightweight Neat appearance	6-7	-	-
Aluminum Clamp	✓	✓	✓	✓	Rugged Pneurop standard Competitive price	6-7	-	-
Metal Clamp	-	✓	✓	-	Suitable for aluminum and indium seals Wide temperature range	6-7	-	-
Claw Clamps and Bolts	✓	✓	✓	✓	Wide range optimized for many applications High strength CF bolts for UHV flanges	6-8	6-19	6-32
<b>Seals</b>								
 Polymer Centering 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 Centering Ring	✓	✓	✓	✓	Stainless steel and aluminum carrier Pneurop standard Fluoroelastomer and nitrile versions	6-8	6-21	-
Metal Seal	-	✓	✓	-	Aluminum all metal seals Copper gaskets for UHV seals	6-9	-	6-31
<b>Pipeline Components</b>								
 Aluminum	-	✓	✓	✓	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
<b>Bellows and Flexible Pipelines</b>								
 Bellows	✓	✓	✓	✓	NW and ISO fittings in 316L, CF fittings in 304L Suitable for minimizing 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	-

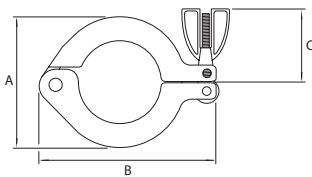
# NW fittings



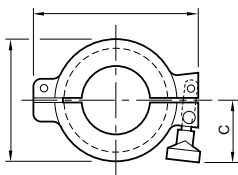
Size	A	B	C	D	E	F	Ordering Number
<b>Clamping Ring</b>							
Stainless steel							
NW10/16	44	46	34				C10512401
NW20/25	60	60	48				C10514401
NW32/40	73	75	63				C10516401
NW50	90	96	84				C10517401



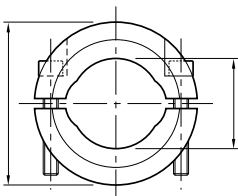
Size	A	B	C	D	E	F	Ordering Number
<b>Hinged Clamp</b>							
Aluminum							
NW10/16	68	40	57				C10512402
NW20/25	80	50	57				C10514402
NW32/40	95	66	57				C10516402
Polymer							
NW10/16	68	40	57				C10512303
NW20/25	80	50	57				C10514303
NW32/40	95	66	57				C10516303
NW50	125	86	57				C10517303



Size	A	B	C	D	E	F	Ordering Number
<b>Swing Clamp</b>							
Aluminum							
NW10/16	62	40	35				C10512403
NW20/25	75	50	35				C10514403
NW32/40	90	66	35				C10516403
NW50	120	86	35				C10517403

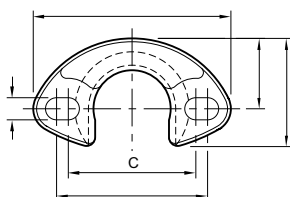


Polymer							
NW10/16	62	40	35				C10512304
NW20/25	75	50	35				C10514304
NW32/40	90	66	35				C10516304
NW50	120	86	35				C10517304



Size	A	B	C	D	E	F	Ordering Number
<b>Clamp (Metal Seals)</b>							
Stainless steel							
NW10/16	54	22					C10512404
NW20/25	64	32					C10514404
NW32/40	82	47					C10516404
NW50	112	62					C10517404

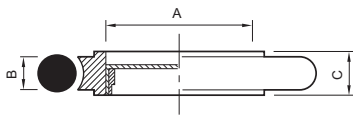
We recommend the use of thread lubricant, 1764 00030.



Size	A	B	C	D	E	F	Ordering Number
<b>"C" Clamp</b>							
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



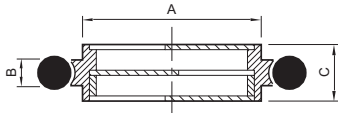


Size	A	B	C	D	E	F	Ordering Number
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### Centering Ring with Screen

Fluoroelastomer/stainless steel AISI 316L DIN 1.4404 Stainless Steel wire Ø0.5 Aperture size 1 mm<sup>2</sup>

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



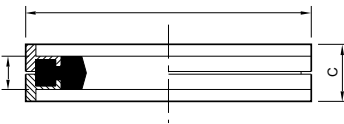
### Centering Ring with Optical Baffle

Fluoroelastomer/stainless steel AISI 304L DIN 1.4301

NW25	26	3.9	8.5				D02110000
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### Centering Ring Sintered Filter

NW10							D02158020
NW25							NGW288000
NW40							D15405110



### Co-Seal

Nitrile/aluminum 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

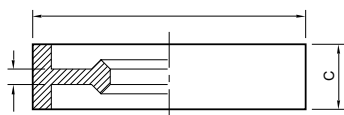
NW10/16	32	3.9	7				B27158426
NW20/25	42	3.9	7				B27158447
NW32/40	57	3.9	7				B27158454
NW50	77.5	3.9	7				B27158467

Fluoroelastomer/aluminum 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

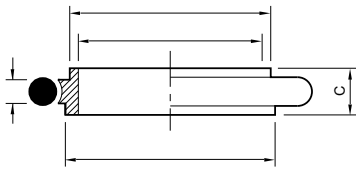
NW10/16	32	3.9	7				B27158427
NW20/25	42	3.9	7				B27158448
NW32/40	57	3.9	7				B27158453
NW50	77.5	3.9	7				B27158466



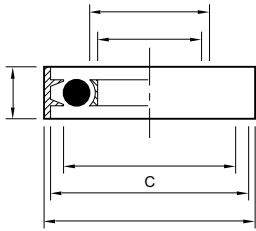
### Metal Seals

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

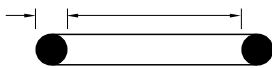
NW10/16	32	2.0	7				C27159004
NW20/25	42	2.0	7				C27159005
NW32/40	57	2.0	7				C27159006
NW50	77	2.0	7				C27159007



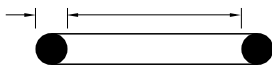
Size	A	B	C	D	E	F	Ordering Number
<b>Adapting Centering Ring with O-Ring</b>							
Nitrile							
NW10/16 stainless steel	10	12	8	3.9	17		C10512346
NW10/16 polymer	10	12	8	3.9	17		C10512349
Fluoroelastomer							
NW10/16 stainless steel	10	12	8	3.9	17		C10512345
NW10/16 polymer	10	12	8	3.9	17		C10512350



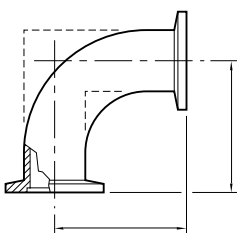
<b>NW Trapped O-Ring</b>							
Fluoroelastomer/stainless steel/aluminum							
NW10/16	32.5	27.5	30.2	7	18.5	16	C10512490
NW25	42.5	37.5	40.2	7	28.5	25	C10514490
NW40	57.5	52.0	55.2	7	43	40	C10516490
NW50	77.5	64.5	75.2	7	55.5	50	C10517490



<b>O-Ring (Pack of 10)</b>							
Nitrile							
NW10	15	5					H02124012
NW16	18	5					H02124013
NW25	28	5					H02124015
NW40	42	5					H02124017
NW50	50	5					H02124018

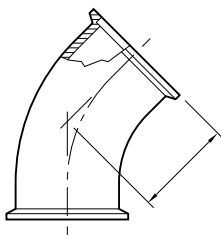


<b>O-Ring (Pack of 5)</b>							
Fluoroelastomer							
NW10	15	5					H02124032
NW16	18	5					H02124033
NW25	28	5					H02124035
NW40	42	5					H02124037
NW50	50	5					H02124038

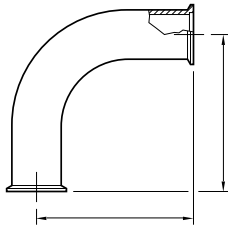
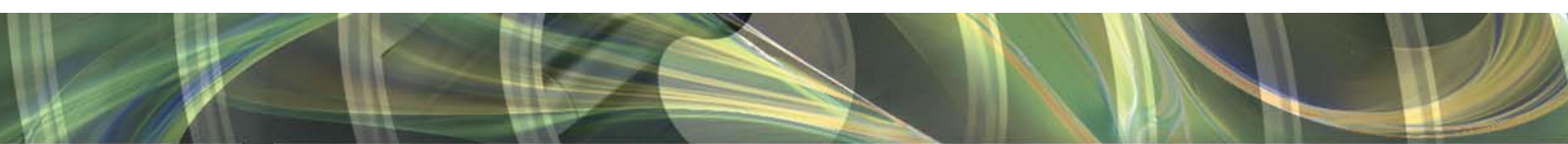


▲ Dimensions shown dotted in diagram

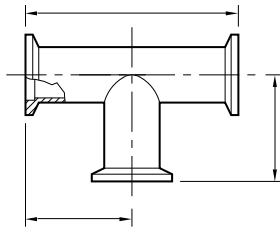
<b>Elbow 90°</b>							
Aluminum BS LM25 DIN 3.2371 ▲							
NW10	30						C10511410
NW16	40						C10512410
NW25	50						C10514410
NW40	65						C10516410
Stainless Steel AISI 316L DIN 1.4404							
NW10	30						C10511420
NW16	40						C10512420
NW25	50						C10514420
NW40	65						C10516420
NW50	70						C10517420



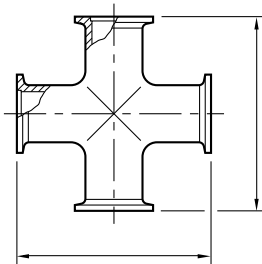
<b>Elbow 45°</b>							
Stainless Steel AISI 316L DIN 1.4404							
NW16	23.2						C10512405
NW25	28.5						C10514405
NW40	42.7						C10516405
NW50	50.6						C10517405



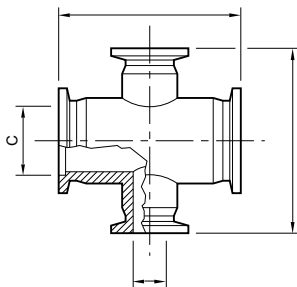
Size	A	B	C	D	E	F	Ordering Number
<b>Long Radius Elbow</b>							
Stainless Steel AISI 316L DIN 1.4404							
NW40	130						C10516406
NW50	140						C10517406



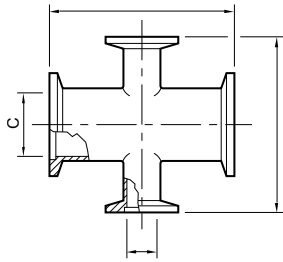
Size	A	B	C	D	E	F	Ordering Number
<b>T-Piece</b>							
Aluminum BS LM25 DIN 3.2371							
NW10	30	60					C10511411
NW16	40	80					C10512411
NW25	50	100					C10514411
NW40	65	130					C10516411
Stainless Steel AISI 316L DIN 1.4404							
NW10	30	60					C10511421
NW16	40	80					C10512421
NW25	50	100			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



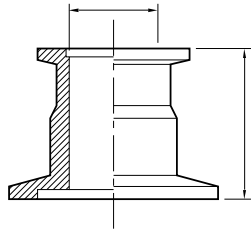
Size	A	B	C	D	E	F	Ordering Number
<b>Cross Piece</b>							
Aluminum BS LM25 DIN 3.2371							
NW10	60						C10511412
NW16	80						C10512412
NW25	100						C10514412
NW40	130						C10516412
Stainless Steel AISI 316L DIN 1.4404							
NW10	60						C10511422
NW16	80						C10512422
NW25	100						C10514422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



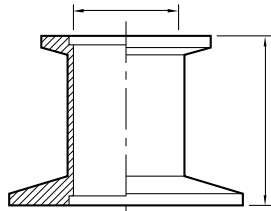
Size	A	B	C	D	E	F	Ordering Number
<b>Reducing Cross</b>							
Aluminum ISO 6082 DIN 3.2315							
NW25/10	70	70	26.2	12.2			C10514413
NW40/10	80	90	41.2	12.2			C10516413



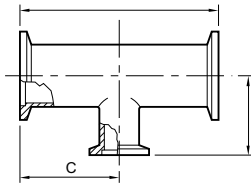
Size	A	B	C	D	E	F	Ordering Number
<b>Reducing Cross</b>							
Stainless Steel AISI 316L DIN 1.4404							
NW25/10	70	70	26.2	12.2			C10514423
NW25/16	100	80	26.2	17.2			C10514424
NW40/16	130	80	41.2	17.2			C10516424
NW40/25	130	100	41.2	26.2			C10516425
NW50/25	140	100	52.2	26.2			C10517425



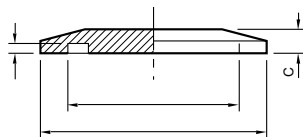
<b>Reducing Piece</b>							
Aluminum ISO 6082 DIN 3.2315							
NW25/10	10	40					C10514436
NW25/16	16	40					C10514437
NW40/25	24	40					C10516439
NW40/16	16	40					C10516438
NW50/16	16	40					C10517040
NW50/25	24	40					C10517043
NW50/40	41	40					C10517041



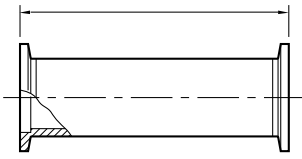
<b>Reducing Piece</b>							
Stainless Steel AISI 316L DIN 1.4404							
NW25/10	10	40					C10514446
NW25/16	16	28					C10514447
NW40/16	16	28					C10516448
NW40/25	24	28					C10516449
NW50/16	16	28					C10517450
NW50/25	24	40					C10517051
NW50/40	40	28					C10517452



<b>Reducing T-Piece</b>							
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



<b>Blanking Flange</b>							
Aluminum 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
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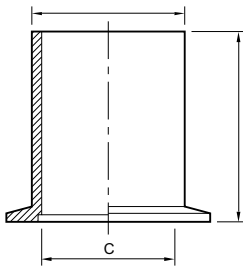
**Full Nipple**

Aluminum 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**

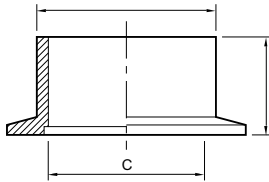
Stainless Steel AISI 316L DIN 1.4404

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**

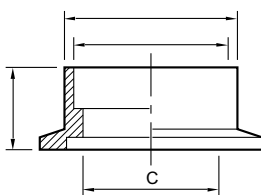
Stainless Steel AISI 316L DIN 1.4404

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

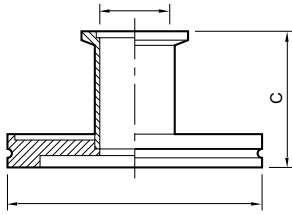


E= tube OD, mm  
F= tube OD, inches

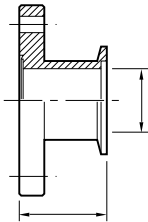
**Weld Socket Flange for Inch Tube**

Stainless Steel AISI 316L DIN 1.4404

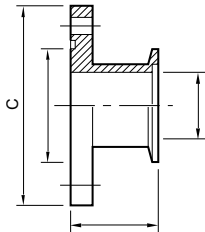
NW16	15.5	13	11.4	12.7	12.7	½	C10504102
NW16	22.1	19.3	17.3	12.7	19.1	¾	C10504103
NW25	28.6	25.9	22.1	12.7	25.4	1	C10504224
NW40	44.5	38.6	34.9	12.7	38.1	1½	C10504325
NW50	57.2	51.3	47.5	12.7	50.8	2	C10504353



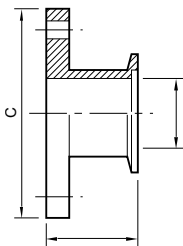
Size	A	B	C	D	E	F	Ordering Number
<b>Adaptor NW/ISO</b>							
Stainless Steel AISI 316L DIN 1.4404							
NW25/ISO63	95	25	50				C10007115
NW40/ISO63	95	40	50				C10007116
NW40/ISO80	110	40	118				C10008002
NW40/ISO100	130	40	50				C10009122
NW50/ISO63	95	50	50				C10007118
NW50/ISO80	110	50	118				C10008003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



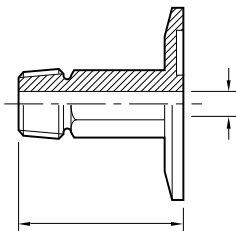
<b>Adaptor NW/CF</b>							
Stainless Steel AISI 316L DIN 1.4404							
NW16/DN16CF/1½	52.7	15.8					C10503104
NW16/DN40CF/2¾	45.3	15.8					C10503105
NW25/DN40CF/2¾	45.3	22					C10503207
NW40/DN40CF/2¾	45.3	40					C10503305
NW50/DN63CF/4½	49.5	50					C10503405



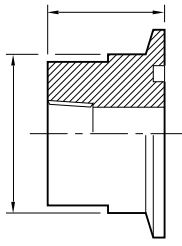
<b>Adaptor NW/ASA with O-Ring Groove</b>							
Stainless Steel AISI 316L DIN 1.4404							
NW40/2 inch ASA	46	40	152	86.9			C10503310
NW40/3 inch ASA	46	40	190	118			C10503311
NW50/2 inch ASA	46	50	152	86.9			C10503410



<b>Adaptor NW/ASA without O-Ring Groove</b>							
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

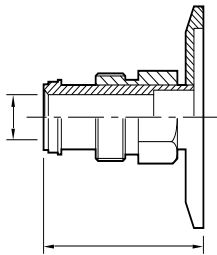


<b>Adaptor NW/NPT Threaded Pipe Male</b>							
Stainless Steel AISI 316L DIN 1.4404							
NW16/½ inch NPT male	40	4.7					C10501102
NW16/¼ inch NPT male	50	7.1					C10501103
NW25/½ inch NPT male	40	4.7					C10501217
NW25/¼ inch NPT male	50	7.1					C10501218
NW25/½ inch NPT male	75	11.9					C10501219
NW25/¾ inch NPT male	75	15.9					C10501220
NW40/¼ 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

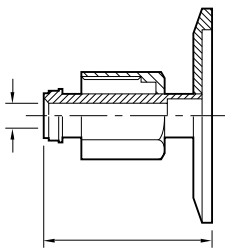


Size	A	B	C	D	E	F	Ordering Number
<b>Adaptor NW/NPT Threaded Pipe Female</b>							
Aluminum ISO 6082 DIN 3.2315							
NW10/1/8 inch NPT female	15.8	19.1					C10501070
NW16/1/8 inch NPT female	15.8	19.1					C10501104
NW25/1/8 inch NPT female	22.4	19.1					C10501221
NW40/1/8 inch NPT female	31.8	25.4					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

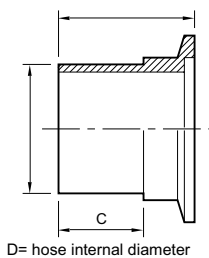
Stainless Steel AISI 316L DIN 1.4404							
NW10/1/8 inch NPT female	15.8	19.1					C10501072
NW16/1/8 inch NPT female	15.8	19.1					C10501106
NW25/1/8 inch NPT female	22.4	19.1					C10501223
NW40/1/8 inch NPT female	31.8	25.4					C10501309
NW10/1/4 inch NPT female	15.8	19.1					C10501073
NW16/1/4 inch 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



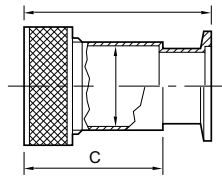
<b>Adaptor NW/VCR Male</b>							
Stainless Steel AISI 316L DIN 1.4404							
NW16/1/4 inch VCR male	35.6	4.8					C10501108
NW16/1/2 inch VCR male	41.4	10.4					C10501110
NW25/1/4 inch VCR male	35.6	4.8					C10501225
NW25/1/2 inch VCR male	40.6	10.4					C10501227
NW40/1/4 inch VCR male	35.6	4.8					C10501311
NW40/1/2 inch VCR male	40.6	10.4					C10501313
NW50/1/4 inch VCR male	35.6	4.8					C10501508



<b>Adaptor NW/VCR Female</b>							
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



<b>Adaptor PVC Hose</b>							
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 inch hose	25.4	38.1	26	25.4			C10504225
NW40/1 1/2 inch hose	38.1	50	38.1	38.1			C10504326
NW50/2 inch hose	47.4	55	41	50.8			C10504352



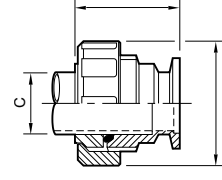
D= tube od in mm  
E= tube OD in inches

Size	A	B	C	D	E	F	Ordering Number
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**Gauge Tube Adaptor and Compression O-Ring**

Stainless Steel AISI 316L DIN 1.4404 Fluoroelastomer O-ring

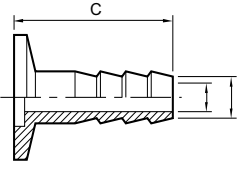
NW10	13.1	50	33	12.7	½		C10502001
NW16	6.7	32	–	6.4	¼		C10502101
NW16	13.1	50	33	12.7	½		C10502102
NW16	19.4	56	40	19.1	¾		C10502103
NW25	13.1	50	33	12.7	½		C10502201
NW25	19.4	58	40	19.1	¾		C10502202
NW25	25.8	62	46	25.4	1		C10502203
NW40	13.1	58	33	12.7	½		C10502300
NW40	19.4	63.5	40	19.1	¾		C10502301
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**

Aluminum

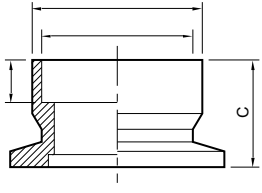
NW10	44	43	14/15				C10520050
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**Nozzle**

Aluminum ISO 6082 DIN 3.2315

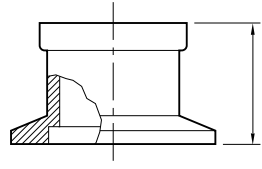
NW10	7	12	40				C10511645
NW25	7	12	40				C10514645
NW40	7	12	40				C10516645



**Coupling Body**

Brass

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

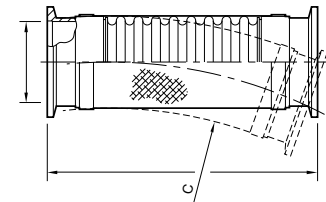


**NW Optical Viewpoint**

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

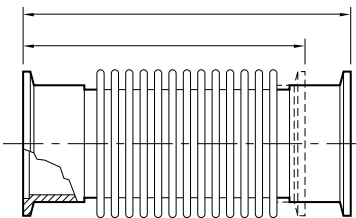
NW40	23.6						C10516407
NW50	31.8						C10517407

Temperature range -40 to 380 °C<sub>1</sub>  
Temperature gradient <3 °C min<sub>1</sub>



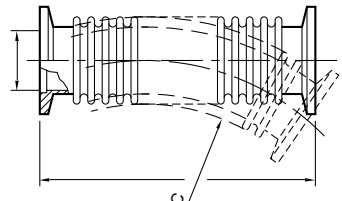
C= minimum bend radius, static  
 D= minimum bend radius, dynamic  
 E= maximum operating pressure, bar absolute

Size	A	B	C	D	E	F	Ordering Number
<b>Braided Flexible Exhaust Pipeline</b>							
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



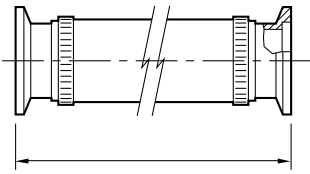
C= maximum operating pressure, bar absolute

Size	A	B	C	D	E	F	Ordering Number
<b>Flexible Bellows</b>							
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



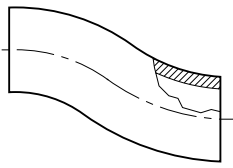
C= minimum bend radius, static  
 D= minimum bend radius, dynamic  
 E= maximum operating pressure, bar absolute

Size	A	B	C	D	E	F	Ordering Number
<b>Flexible Pipelines</b>							
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
<b>Reinforced PVC Tube with NW Flanges and Hose Clamps</b>							
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

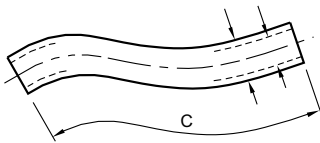
Maximum operating pressure 1 bar absolute, Temperature 5 to 60 °C



**Reinforced PVC Tube, 1 metre**

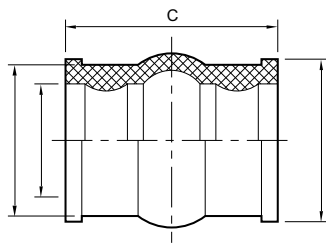
	Europe	N. America
½ inch ID tube	N/A	A63012220
¾ inch ID tube	H02100016	U30002173
1 inch ID tube	H02100017	A63012343
1½ inch ID tube	H02100018	U30000484
2 inch ID tube	H02100019	U30003837

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



**Neoprene Rubber Tube**

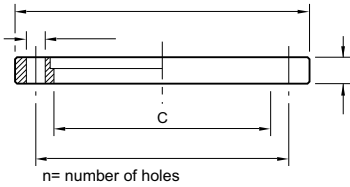
5 × 19 mm	5	19	1000	H02100002
7 × 17 mm	7	17	1000	H02100003
9 × 25 mm	9	25	1000	H02100004
12 × 28 mm	12	28	1000	H02100005
20 mm × 34 mm	20	34	1000	H02100006
Reinforced hose	25	32	305	C06600025



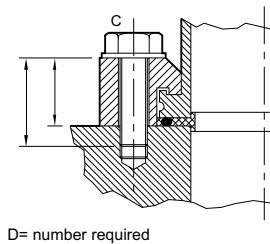
**Moulded Sleeve**

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

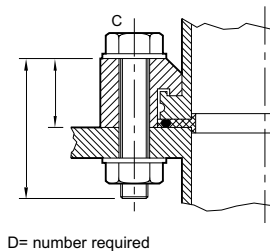
# ISO fittings



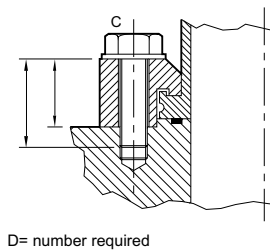
Size	A	B	C	D	E	F	Ordering Number
<b>Rotatable Flange with Fitting Kit</b>							
Mild steel nickel plated							
ISO63	130	110	95.5	Ø9,4	12		C10007010
ISO80	145	125	110	Ø9,8	12		C10008012
ISO100	165	145	130.5	Ø9,8	12		C10009010
ISO160	225	200	180.7	Ø11,8	16		C10011010
ISO200	285	260	240.7	Ø11,12	16	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



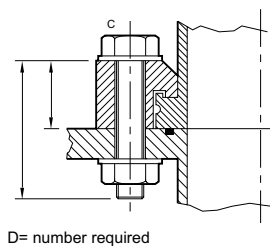
<b>Half Claw Clamp for use with Centering Ring (Tapped Holes)</b>							
Zinc plated mild steel body, stainless steel bolt							
ISO63	22.5	35	M8	4			C10007151
ISO100	22.5	35	M8	8			C10007151
ISO160	23	40	M10	8			C10011151
ISO200	23	40	M10	12			C10011151
ISO250	23	45	M10	12			C10011151
ISO320	36.5	60	M12	12			C10014151
ISO400	36.5	60	M12	16			C10014151
ISO500	36.5	60	M12	16			C10014151



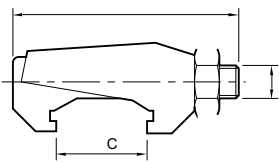
<b>Half Claw Clamp for use with Centering Ring (Clear Holes)</b>							
Zinc plated mild steel body, stainless steel bolt							
ISO63	22.5	35	M8	4			C10007150
ISO100	22.5	35	M8	8			C10007150
ISO160	23	40	M10	8			C10011150
ISO200	23	40	M10	12			C10011150
ISO250	23	45	M10	12			C10011150
ISO320	30.5	60	M12	12			C10014150
ISO400	30.5	60	M12	16			C10014150
ISO500	30.5	60	M12	16			C10014150



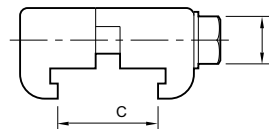
<b>Half Claw Clamp for use with O-ring groove (tapped holes)</b>							
Zinc plated mild steel body, stainless steel bolt							
ISO63	18.6	35	M8	4			C10007093
ISO100	18.6	35	M8	8			C10007093
ISO160	19	40	M10	8			C10011093
ISO200	19	40	M10	12			C10011093
ISO250	19	40	M10	12			C10011093
ISO320	31	50	M12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



<b>Half Claw Clamp for use with O-ring Groove (Clear Holes)</b>							
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 <math><10^{-9}</math> 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

Aluminum

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

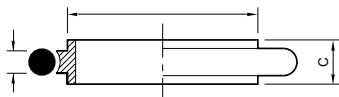
ISO40	101	80	4.2				B27158457
ISO63	116	110	4.2				B27158064
ISO100	151	145	4.2				B27158071
ISO160	200	190	5.7				B27158074

### Trapped O-Ring

Aluminum centering ring, aluminum 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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### Centering Ring with O-Ring

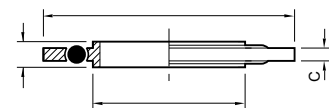
Stainless steel AISI 316L centering ring

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

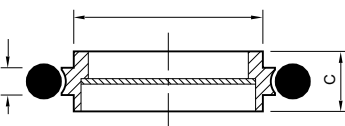
Stainless steel AISI 316L centering ring with aluminum outer ring

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

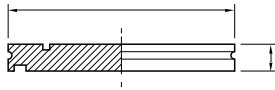
ISO40	63	41	3.9	8			B27158165
ISO63	95	70	3.9	8			B27158170
ISO80	109	83	3.9	8			B27158181
ISO100	128	102	3.9	8			B27158171
ISO160	179	153	3.9	8			B27158172
ISO200	239	213	3.9	8			B27158081
ISO250	287	261	3.9	8			B27158143
ISO320	358	318	5.6	14			B27158166
ISO400	440	400	5.6	14			B27158167
ISO500	541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



### ISO Centering Ring and Screen

Stainless steel AISI 316L DIN 1.4404 Mesh Ø 3.3 mm aperture, Ø 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

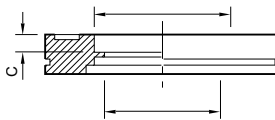


Size	A	B	C	D	E	F	Ordering Number
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#### Blanking Flange for use with Collar Flange

Stainless steel AISI 316L DIN 1.4404

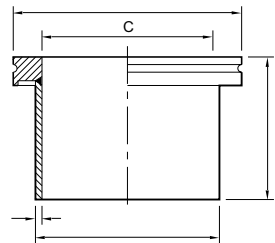
ISO63	12	95					C10007049
ISO80	12	110					C10008015
ISO100	12	130					C10009049
ISO160	12	180					C10011049
ISO200	12	240					C10012049
ISO250	12	290					C10013049
ISO320	17	370					C10014003
ISO500	17	550					C10016003



#### ISO Bored Flange

Stainless steel AISI 316L DIN 1.4404

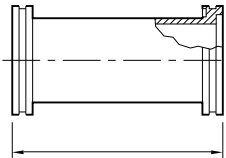
ISO63	60.2	63.5	5.5				C10007138
ISO100	98.3	102	5.5				C10009157
ISO160	148	152	5.5				C10011068
ISO200	197	203	5.5				C10012053
ISO250	248	254	5.5				C10013059



#### Collar Weld Stub

Stainless steel AISI 316L DIN 1.4404

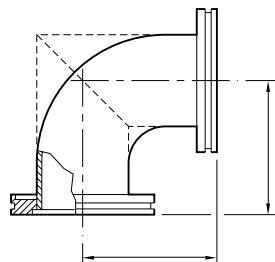
ISO63	95	76	70	100	3.2		C10007032
ISO80	110	76	83	100	3.2		C10008013
ISO100	130	108	102	100	3.2		C10009032
ISO160	180	159	153	100	3.2		C10011032
ISO200	240	219.1	213	100	3.2		C10012032
ISO250	290	267	261	100	3.2		C10013032



#### Nipple

Stainless steel AISI 316L DIN 1.4404

ISO63	176						C10007140
ISO100	216						C10009160
ISO160	276						C10011071
ISO200	356						C10012054
ISO250	416						C10013060



#### Elbow 90°

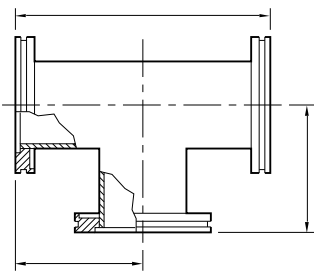
Stainless steel AISI 316L DIN 1.4404

ISO63	88						C10007203
ISO100	108						C10009203
ISO160*	138						C10011203
ISO200*	178						C10012203
ISO250*	208						C10013203

\* Shown dotted



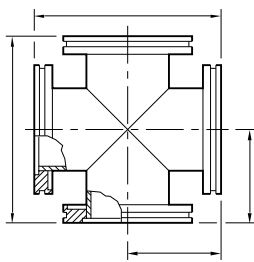
Size	A	B	C	D	E	F	Ordering Number
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#### T-piece

Stainless steel AISI 316L DIN 1.4404

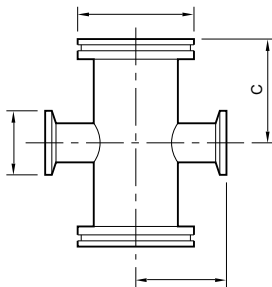
ISO63	88	176					C10007207
ISO100	108	216					C10009207
ISO160	138	276					C10011207
ISO200	178	356					C10012207



#### Cross Piece

Stainless steel AISI 316L DIN 1.4404

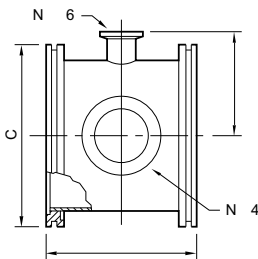
ISO63	88	176					C10007211
ISO100	108	216					C10009211



#### ISO to NW Reducing Cross

Stainless steel AISI 316L DIN 1.4404

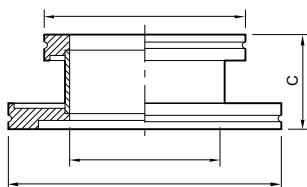
ISO63/NW40	95	55	102	76			C10007232
ISO100/NW25	130	40	130	98			C10009231
ISO160/NW40	180	55	160	121			C10011232



#### Connector with Two Lateral Flanges

Stainless steel AISI 316L DIN 1.4404

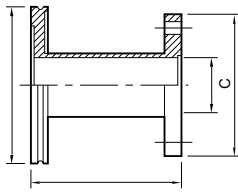
ISO63	88	60	95				C10007215
ISO100	108	75	130				C10009215
ISO160	138	100	180				C10011215



#### ISO/ISO Adapting Piece

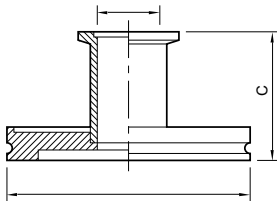
Stainless steel AISI 316L DIN 1.4404

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

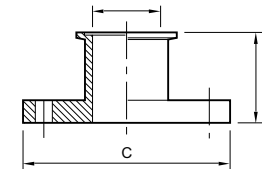


Supplied with bolts for tapped holes and bolts plus nuts and washers for plain holes

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

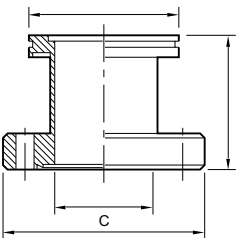


<b>Adaptor ISO/NW</b>							
Stainless steel AISI 316L DIN 1.4404							
ISO63/NW25	95	25	50				C10007115
ISO63/NW40	95	40	50				C10007116
ISO100/NW40	130	40	50				C10009122
ISO63/NW50	95	50	50				C10007118
ISO80/NW50	110	50	118				C10008003
ISO100/NW50	130	50	50				C10009123
ISO80/NW40	110	40	118				C10008002

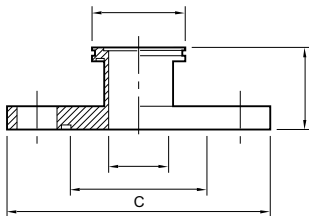


\* Supplied with bolts for tapped holes and bolts plus nuts and washers for plain holes

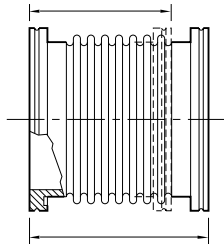
<b>Adaptor ISO Bolted/NW</b>							
Stainless steel AISI 316L DIN 1.4404							
					<b>Europe</b>	<b>N. America</b>	
ISO40 bolted/NW50*	50	41	100		C10005080	C10005080	
ISO40 bolted/NW40	69	40	100	No bolts supplied	N/A	A1516	
ISO63 bolted/NW50	50	50	130	No bolts supplied	N/A	A1509	
ISO63 bolted/NW40	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	



<b>Adaptor ISO/CF</b>							
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



<b>Adaptor ISO/ASA</b>							
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



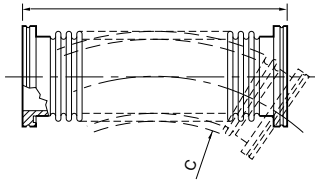
C= maximum pressure, bar absolute

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



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

#### 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.

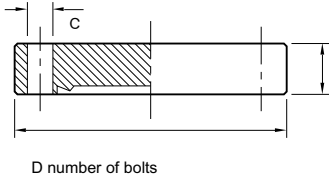
For greater protection, KIT7-14-100 includes an ITO catchpot.

KIT7-15-100 can be used with (but does not include) a Water Cooled Trap. Consult Edwards for more details.

## Ordering Information

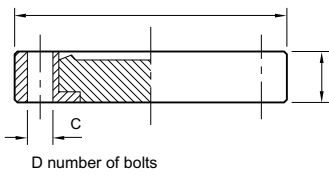
Product Description	Order No.
Straight inlet, no gate valve, 40 mm fore-line	KIT710040
Straight inlet, no gate valve, 50 mm fore-line	KIT710050
Straight inlet, no gate valve, 63 mm fore-line	KIT710063
Straight inlet, no gate valve, 100 mm fore-line	KIT710100
Straight inlet, pneumatic gate valve, 63 mm fore-line	KIT712063
Straight inlet, pneumatic gate valve, 100 mm fore-line	KIT712100
Dead-leg inlet, pneumatic gate valve, 100 mm fore-line	KIT713100
Catchpot, pneumatic gate valve, 100 mm fore-line	KIT714100
Dead-leg inlet, pneumatic gate valve, 100 mm fore-line for water cooled trap (not included)	KIT715100

# CF Flange Fittings



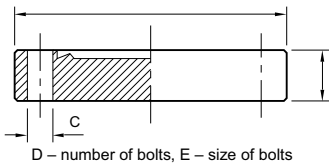
D number of bolts

Size	A	B	C	D	E	F	Ordering Number
<b>Blank Flange Non-Rotatable Clear</b>							
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



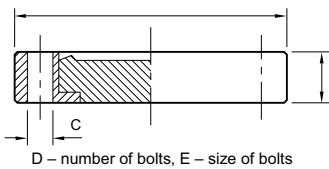
D number of bolts

<b>Blank Flange Rotatable Clear</b>							
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



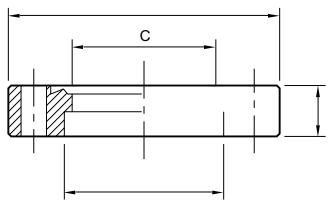
D – number of bolts, E – size of bolts

<b>Blank Flange Non-Rotatable Tapped</b>							
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
DN250CF	12	304	27.3	8.3	32	M8	C10013302



D – number of bolts, E – size of bolts

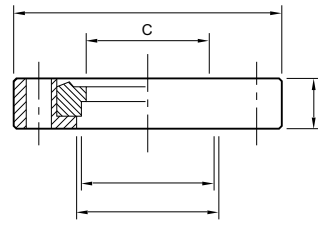
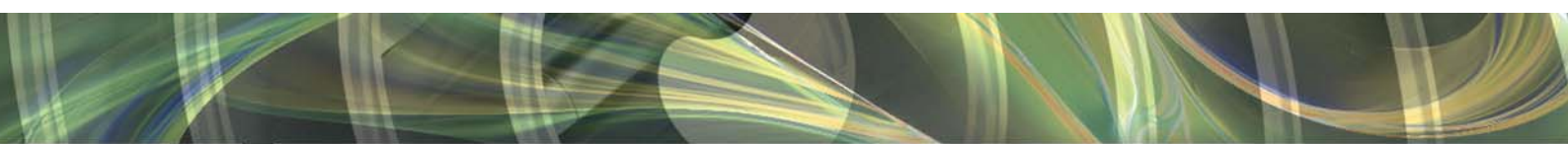
<b>Blank Flange Rotatable Tapped</b>							
Stainless steel AISI 304L DIN 1.4306							
Metric	Inch						
DN100CF	6	152	19.9	8.3	16	M8	C10009403
DN160CF	8	203	22.3	8.3	20	M8	C10011303



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

<b>Bored Weld Flange Non-Rotatable Clear</b>							
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, F – dimensions in inches  
For inch tube: F – tube OD

Size	A	B	C	D	E	F	Ordering Number
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**Bored Weld Flange Rotatable Clear**

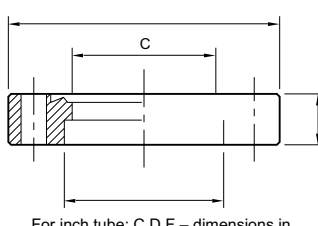
Stainless steel AISI 304L DIN 1.4306

For metric tube

Metric	Inch	A	B	C	D	E	F	Ordering Number
DN40CF	2¾	70	12.7	36.9	38.2	38.7		C10005213
DN63CF	4½	114	17.4	49.6	51.1	68.0		C10007407
DN63CF	4½	114	17.4	61.2	63.6	68.0		C10007408

For inch tube

Metric	Inch	A	B	C	D	E	F	Ordering Number
DN40CF	2¾	70	12.7	1.375	1.51	38.7	1½	C10005213
DN63CF	4½	114	17.4	1.875	2.01	68.0	2	C10007407
DN63CF	4½	114	17.4	2.375	2.51	68.0	2½	C10007408



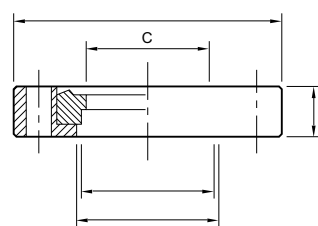
For inch tube: C,D,F – dimensions in inches  
E – size of bolts  
For inch tube: F – tube OD

**Bored Weld Flange Non-Rotatable Tapped**

Stainless steel AISI 304L DIN 1.4306

For metric tube

Metric	Inch	A	B	C	D	E	F	Ordering Number
DN16CF	1½	34	7.6	12.7	12.7	M4		C10001218
DN40CF	2¾	70	12.7	36.9	38.2	M6		C10005219
DN40CF	2¾	70	12.7	40.1	41.3	M6		C10005220
DN63CF	4½	114	17.4	49.6	51.1	M8		C10007409
DN100CF	6	152	19.9	99.4	101.9	M8		C10009407
DN160CF	8	203	22.3	149.7	152.6	M8		C10011307



For inch tube: C,D – dimensions in inches  
F – size of bolts  
Dimensions of suitable inch tube are shown in the table for non-rotatable tapped flanges (above)

**Bored Weld Flange Rotatable Tapped**

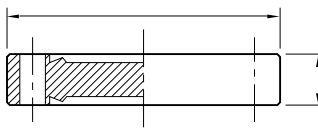
Stainless steel AISI 304L DIN 1.4306

For metric tube

Metric	Inch	A	B	C	D	E	F	Ordering Number
DN40CF	2¾	70	12.7	36.9	38.2	38.7	M6	C10005227
DN63CF	4½	114	17.4	49.6	51.1	68.0	M8	C10007413
DN63CF	4½	114	17.4	61.2	63.6	68.0	M8	C10007414

For inch tube

Metric	Inch	A	B	C	D	E	F	Ordering Number
DN63CF	4½	114	17.4	1.875	2.01	68.0	¾-24	C10007415
DN100CF	6	152	19.9	3.81	4.01	104.9	¾-24	C10009410

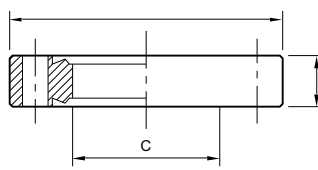


**Double-Sided Blank Flange Clear**

Stainless steel AISI 304L DIN 1.4306

For metric tube

Metric	Inch	A	B	C	D	Ordering Number
DN16CF	1½	34	7.6			C10001233
DN40CF	2¾	70	12.7			C10005233



**Double-Sided Bored Flange Clear**

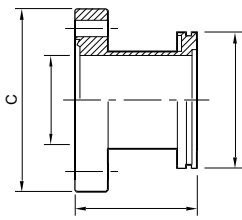
Stainless steel AISI 304L DIN 1.4306

For metric tube

Metric	Inch	A	B	C	D	Ordering Number
DN100CF	6	152	19.8	99.4		C10009412







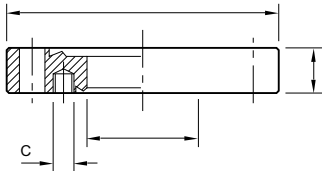
Size	A	B	C	D	E	F	Ordering Number
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**Adaptors ISO/CF**

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



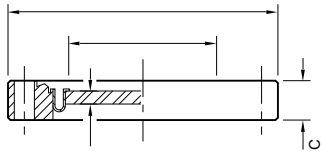
**Zero Length Adaptor Major Clear/Minor Tapped**

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
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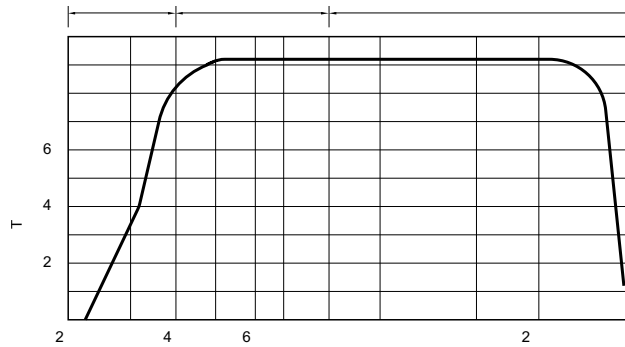
**NW Zero Length Kodial Viewport**

Stainless steel AISI 304L DIN 1.4306

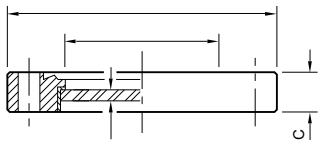
Metric Inch

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

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

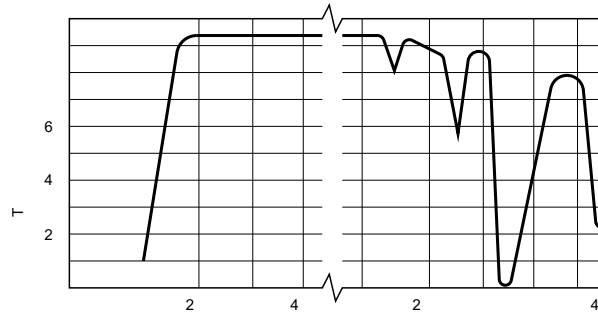


Kodial transmission curve

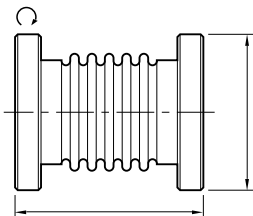


Bakeable to 200 °C, at no greater than 2 to 3 °C per minute.  
Use annealed copper gaskets.

Size	A	B	C	D	E	F	Ordering Number
<b>Zero Length Quartz Viewport</b>							
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

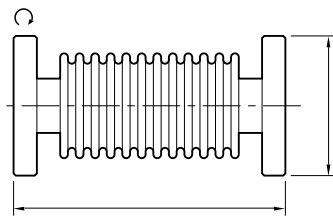


Quartz transmission curve.



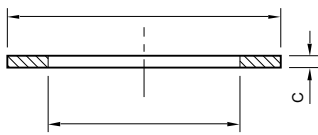
C – maximum pressure, bar absolute

<b>Hydroformed Bellows Rotatable</b>							
Stainless steel AISI 304L DIN 1.4306							
Metric	Inch						
DN16CF	1½	34	110	1.2			C10001340
DN40CF	2¾	70	160	1.2			C10005340



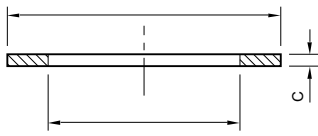
C – Minimum bend radius, static  
D – Minimum bend radius, dynamic  
E – Maximum pressure, bar absolute

<b>Flexible Hose Rotatable</b>							
Stainless steel AISI 304L DIN 1.4306							
Metric	Inch						
DN40CF	2¾	70	250	80	260	1.5	C10005330
DN63CF	4½	114	250	140	360	1.5	C10007530
DN16CF	1½	34	500	30	130	1.5	C10001331
DN40CF	2¾	70	500	80	260	1.5	C10005331
DN63CF	4½	114	500	140	360	1.5	C10007531
DN100CF	6	152	750	200	550	1.5	C10009532
DN40CF	2¾	70	1000	80	260	1.5	C10005333
DN63CF	4½	114	1000	140	360	1.5	C10007533



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

<b>Copper Gaskets</b>								
Metric	Inch							
DN16CF	1½	21	16	2	34	1.33	10	C10001290
DN40CF	2¾	48	37	2	70	2.75	10	C10005290
DN63CF	4½	82	63	2	114	4.5	10	C10007490
DN100CF	6	120	101	2	152	6	10	C10009290
DN160CF	8	171	152	2	203	8	5	C10011290
DN200CF	10	222	203	2	254	10	5	C10012290
DN250CF	12	270	254	2	304	12	5	C10013290

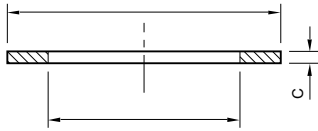


D – For flange OD, mm; E – For flange OD, inch  
F – Number per pack

Size	A	B	C	D	E	F	Ordering Number
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**Annealed Copper Gaskets**

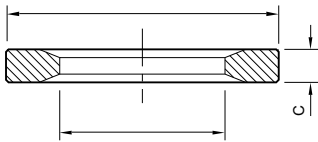
Metric	Inch						
DN16CF	1½	21	16	2	34	1.33	5
DN40CF	2¾	48	37	2	70	2.75	5
DN63CF	4½	82	63	2	114	4.5	5
DN100CF	6	120	101	2	152	6	5
DN160CF	8	171	152	2	203	8	5
DN200CF	10	222	203	2	254	10	5
DN250CF	12	270	254	2	304	12	5



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

**Silver Plated Copper Gaskets**

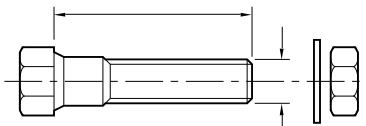
Metric	Inch						
DN16CF	1½	21	16	2	34	1.33	5
DN40CF	2¾	48	37	2	70	2.75	5
DN63CF	4½	82	63	2	114	4.5	5
DN100CF	6	120	101	2	152	6	5
DN160CF	8	171	152	2	203	8	5
DN200CF	10	222	203	2	254	10	5



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

**Fluoroelastomer Gaskets**

Metric	Inch						
DN16CF	1½	29	19	2	34	1.33	2
DN40CF	2¾	50	38	3	70	2.75	2
DN63CF	4½	76	64	3	114	4.5	2
DN100CF	6	112	100	3	152	6	2
DN160CF	8	162	150	3	203	8	2



C – number per pack

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

Standard	Metric	Inch				
	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	¾-24	25	C10012640

**Silver Plated**

Metric	Inch				
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



# Cord and Tubing

**Lubrication** All O-rings, nitrile rubber extruded cord and sheet used in low vacuum applications should be lubricated with either vapor 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 vapor 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