

Vacuum

Series 31

ISO-KF FITTINGS
SIZES NW 10 TO NW 100
(1/2" TO 4")

Technology
WWW.MKSINST.COM



Bulletin 02/08 - Series 31 ISO-KF Components

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Introduction

Series 31 is a line of ISO-KF standard vacuum components. The ISO-KF system refers to the family of small vacuum components (up to 2"), including flanges, elbows, tees and crosses. The International Standards Organization (ISO) has defined the interface dimensions, allowing the interchanging of components that conform to the standard's dimensions.

Applications

ISO-KF fittings can be used in a wide variety of applications including:

- Roughing and foreline plumbing
- Small systems
- Systems requiring frequent cleaning or modification
- Research and teaching laboratories.

ISO-KF components are primarily designed for use at subatmospheric pressure. Because of the large number of elastomer seals used, typical limiting pressure without baking is about 10^{-7} Torr. Baked systems using Vitor® seals can be used to two decades lower.

Standard components can be used to slight overpressure. If the ISO-KF system contains significant overpressure, i.e., 5-100 psig, then use the HPS® overpressure rings.

Description

The ISO-KF system is a modular, building block method of creating a piping system. There are several advantages in the use of ISO components. Since component dimensions

are standardized, elbows, tees, crosses or valves for a given size may be interchanged.

The flanges are "sexless" and the seal is symmetrical, so that the components are rotatable. By using ISO components, system assembly is quick and cost effective. See Figure 1 for the ISO dimensions of flange sizes 10, 16, 25, 40 and 50. These dimensions apply to ISO-KF flanges of these nominal diameters throughout this catalog. The catalog contains dimension specifics.

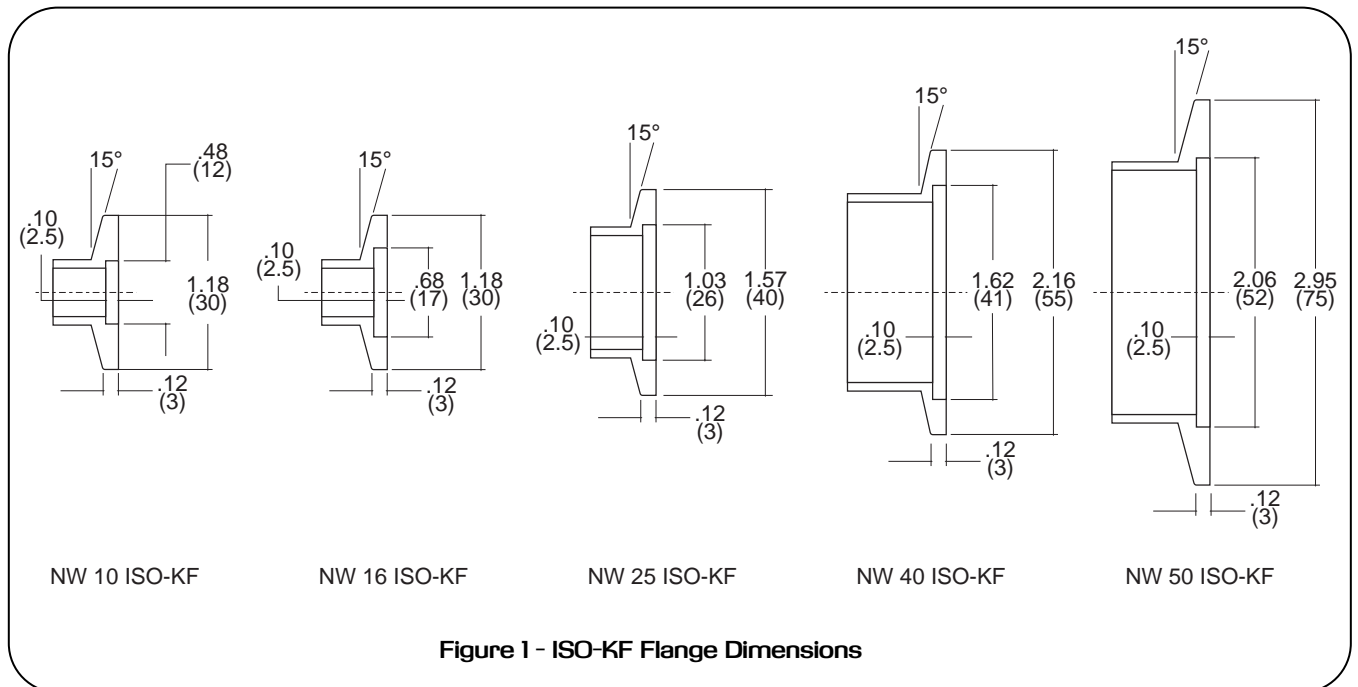
The Series 31 component line also includes a few components in NW 80 (3") and NW 100 (4") sizes. There is no international standard for these sizes in the KF style. MKS has designed the flanging using series consistencies and customer requirements.

Installation

The ISO-KF components are assembled by inserting a centering ring between the two flange faces, then securing the assembly with a flange encompassing clamp (see Figure 2).

There are a variety of clamp choices in the Series 31 line. The wing-nut clamp, shown in Figure 2, is hand tightened until metal contact is felt. A version of the wing-nut clamp with a washer is available, contact MKS for more information.

The HPS® toggle clamp is convenient and easy to use. The clamp provides enough sealing force to fully compress the O-Ring, so that the flanges and the centering ring are metal to metal. The heavy-duty spring supports the full range of production tolerance variables.



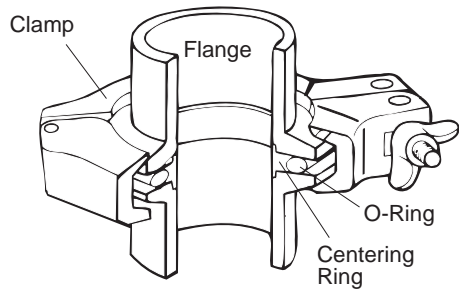
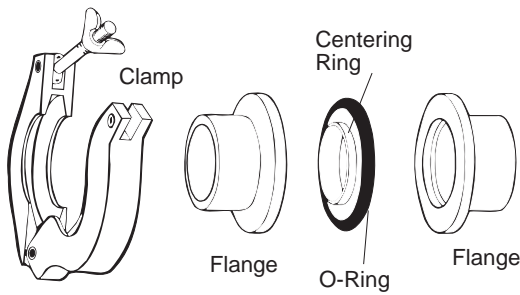


Figure 2 - Component Assembly

The self-adjusting clamp locks in a positive method. A pin can be inserted to prevent accidental release of the toggle lever (see Figure 3). The toggle clamps are ideal for situations where the clamp must be removed frequently, like leak testing or gauge calibration.

An additional option to the toggle clamp is a model with a fastening pin on a lanyard. The pin is fastened so that it cannot be accidentally removed and the lanyard prevents the pin's loss.

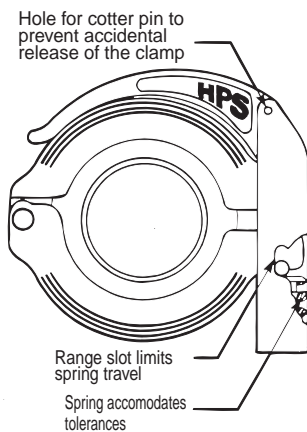


Figure 3 - Toggle Clamp

The Series 31 ISO-KF line also includes bulkhead clamps. They are used to attach an ISO-KF flange directly to a chamber or base plate. The two-part, bolted clamp fits over the flange. A centering ring assembly is needed between the flange and the opening. The bulkhead clamp kit includes the two-piece clamp, bolts and washers (see Figure 4).

The NW 10 flange uses the same basic flange and clamp as the NW 16 flange, and the two flanges can join via an adaptive centering ring (see Figure 5). Adaptive centering rings are also available for obsolete sizes (NW 20, NW 32) in the ISO-KF series.

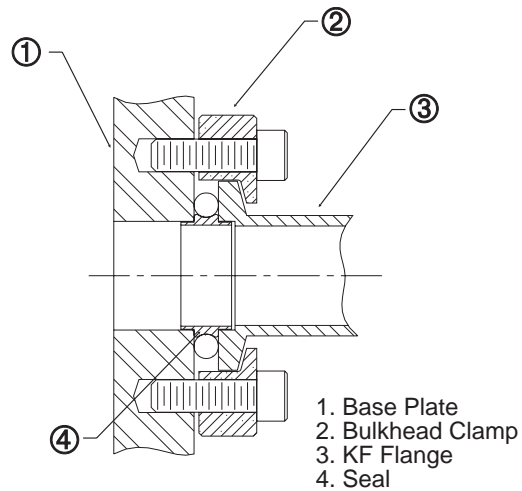


Figure 4 - Bulkhead Clamp

Weld assembly of stainless or aluminum parts should be performed by an experienced TIG welder. Using a rotating fixture simplifies creation of high quality joints. HPS® aluminum weld stubs are chamfered for using filler metal. Improper welding can lead to warping of flanges.

Brass flanges, stub or socket types, are toleranced for silver brazing where clearances of a few thousandths of an inch are optimal for alloy flow. Brass components may be soft sol-

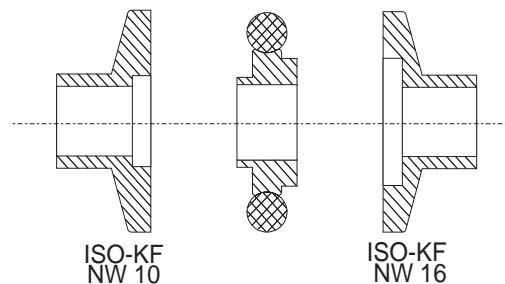


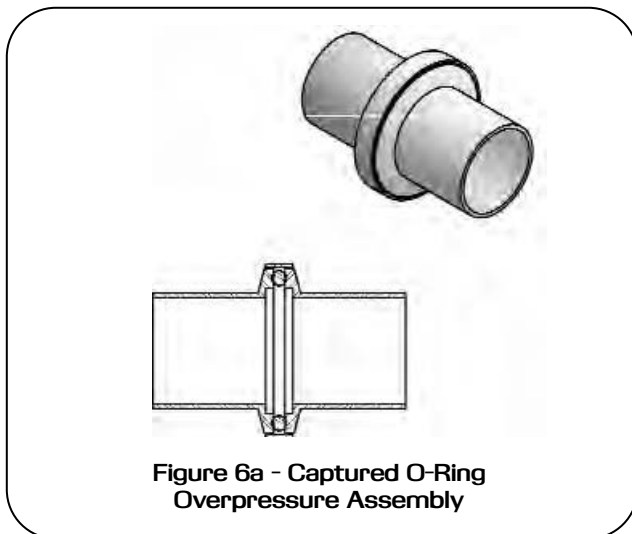
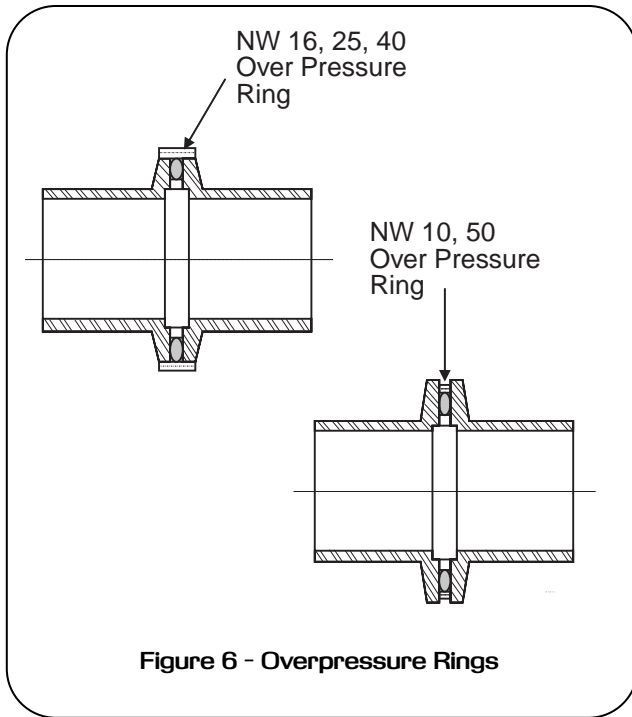
Figure 5 - Adaptive Centering Rings



dered. However, it is much more difficult to make leak free assemblies by soft soldering than by silver brazing. Soft soldering has little strength, and the assemblies cannot be cleaned by immersion in a chemical bright dip.

If system pressures are in the positive pressure range, it is recommended that over pressure rings are used. The ISO-KF over pressure rings are installed differently by size. The NW 16, 25, and 40 ISO-KF rings are installed over the two ISO-KF flanges. The NW 10 and 50 ISO-KF rings are installed between the two flange faces. The clamp is installed around all items to secure the assembly (see Figures 6 and 6a).

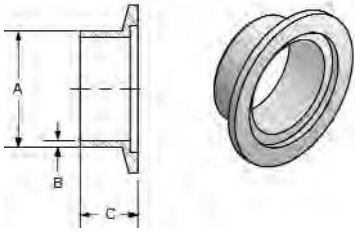
For more information, contact Customer Service at 1-800-345-1967 or 303-449-9861.

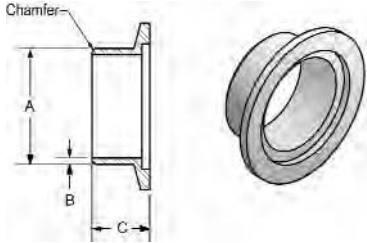


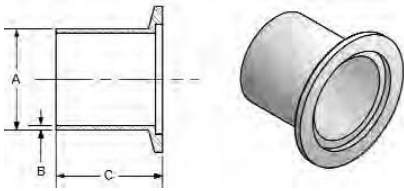
Elastomer Comparison			
	Buna-N	Viton®	Silicone
Compound	N674-70	V747-75	S604-70
Color	Black	Black	Rust
Bakeout	80°C	150°C	185°C
Benefits	Seals easier; lower cost	Chemical resistance; lasts longer	High temperature

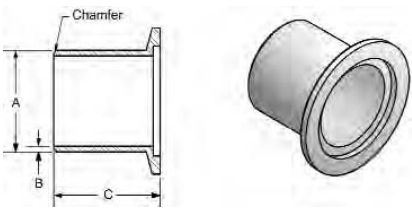
Specifications	
Maximum Pressure (with over pressure ring)	NW 10-25: 100 psig NW 40: 75 psig NW50: 50 psig
Minimum Pressure	10 ⁻⁹ Torr
Leak Check	<10 ⁻⁹ std-cc/s
Materials	
Fittings	304 Stainless Steel Yellow Brass 6061T6 Aluminum (316 Stainless is available on request)
Clamps	Aluminum
Over pressure rings	Stainless Steel
Seal Assembly	Choice of aluminum or stainless steel centering ring; Choice of Viton®, Silicone, or Buna-N elastomer seal



Flange, Short Weld Stub, Stainless Steel						in./(mm)	
	Flange Size (ISO)	For Tubing OD	A	B	C	Part Number	Price
	NW 10	1/2"	0.50 (13)	0.065 (1.7)	0.50 (13)	100310300	
	NW 16	1/2"	0.50 (13)	0.065 (1.7)	0.50 (13)	100310301	
	NW 16	3/4"	0.75 (19)	0.065 (1.7)	0.50 (13)	100310311	
	NW 25	1"	1.00 (25)	0.065 (1.7)	0.50 (13)	100310303	
	NW 40	1 1/2"	1.50 (38)	0.065 (1.7)	0.75 (19)	100310305	
	NW 50	2"	2.00 (51)	0.065 (1.7)	0.75 (19)	100310306	
<ul style="list-style-type: none"> Stainless Steel Type 304 Butt Weld Standard Inch Stub Diameters 							

Flange, Short Weld Stub, Aluminum						in./(mm)	
	Flange Size (ISO)	For Tubing OD	A	B	C	Part Number	Price
	NW 16	1/2"	0.50 (13)	0.065 (1.7)	0.50 (13)	100310101	
	NW 16	3/4"	0.75 (19)	0.065 (1.7)	0.50 (13)	100310111	
	NW 25	1"	1.00 (25)	0.065 (1.7)	0.50 (13)	100310103	
	NW 40	1 1/2"	1.50 (38)	0.083 (2.1)	0.75 (19)	100310105	
	NW 50	2"	2.00 (51)	0.083 (2.1)	0.75 (19)	100310106	
<ul style="list-style-type: none"> Aluminum Type 6061T6 Butt Weld Standard Inch Stub Diameters 							

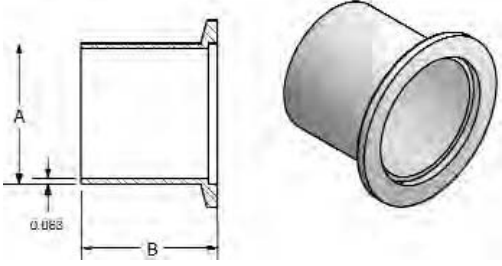
Flange, Long Weld Stub, Stainless Steel						in./(mm)	
	Flange Size (ISO)	For Tubing OD	A	B	C	Part Number	Price
	NW 10	1/2"	0.50 (13)	0.065 (1.7)	1.58 (40)	100315700	
	NW 16	1/2"	0.50 (13)	0.065 (1.7)	1.58 (40)	100315701	
	NW 16	3/4"	0.75 (19)	0.065 (1.7)	1.58 (40)	100315711	
	NW 25	1"	1.00 (25)	0.065 (1.7)	1.58 (40)	100315703	
	NW 40	1 1/2"	1.50 (38)	0.065 (1.7)	1.58 (40)	100315705	
	NW 50	2"	2.00 (51)	0.065 (1.7)	1.58 (40)	100315706	
<ul style="list-style-type: none"> Stainless Steel Type 304 Butt Weld Standard Inch Stub Diameters 							

Flange, Long Weld Stub, Aluminum						in./(mm)	
	Flange Size (ISO)	For Tubing OD	A	B	C	Part Number	Price
	NW 16	1/2"	0.50 (13)	0.065 (1.7)	1.58 (40)	100310201	
	NW 16	3/4"	0.75 (19)	0.065 (1.7)	1.58 (40)	100310211	
	NW 25	1"	1.00 (25)	0.065 (1.7)	1.58 (40)	100310203	
	NW 40	1 1/2"	1.50 (38)	0.083 (2.1)	1.58 (40)	100310205	
	NW 50	2"	2.00 (51)	0.083 (2.1)	1.58 (40)	100310206	
<ul style="list-style-type: none"> Aluminum Type 6061T6 Standard Inch Stub Diameters 							



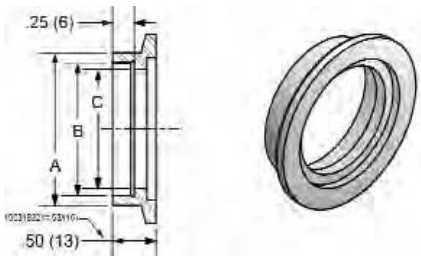
Flange, Braze Stub, Brass

in./ (mm)

	Flange Size (ISO)	For Tubing OD	A	B	Part Number	Price
	<ul style="list-style-type: none"> • Yellow Brass • Standard Inch Tube OD's 	NW 16	1/2"	0.50 (13)	1.00 (25)	100315401
	NW 16	5/8"	0.62 (16)	1.00 (25)	100315411	
	NW 16	3/4"	0.75 (19)	1.00 (25)	100315421	
	NW 25	1"	1.00 (25)	1.38 (35)	100315403	
	NW 25	1 1/8"	1.12 (28)	1.38 (35)	100315413	
	NW 40	1 5/8"	1.62 (41)	1.58 (40)	100315405	
	NW 50	2"	2.00 (51)	1.58 (40)	100315406	
	NW 50	2 1/8"	2.12 (54)	1.58 (40)	100315416	

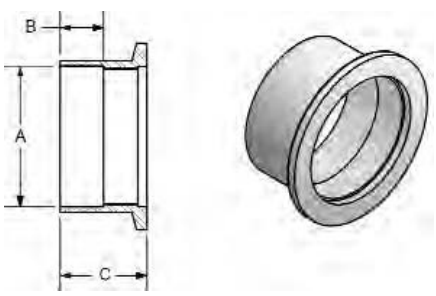
Flange, Weld Socket, Stainless Steel

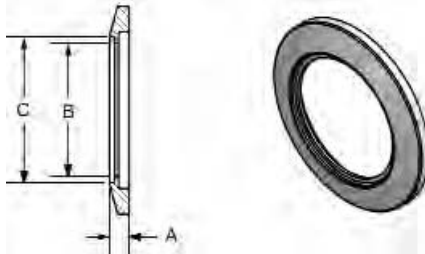
in./ (mm)

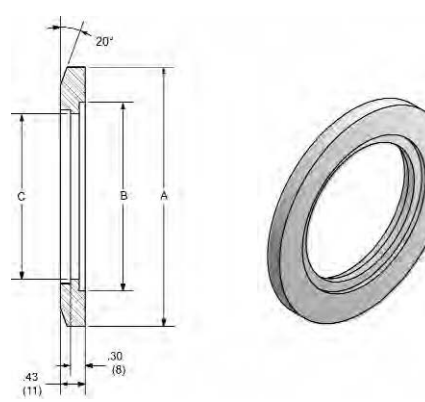
	Flange Size (ISO)	For Tubing OD	A	B	C	Part Number	Price
	<ul style="list-style-type: none"> • Stainless Steel Type 304 • Self Aligning • Standard Tube Weld Prep. • Also Suitable for Butt Weld 	NW 16	1/2"	0.61 (15)	0.51 (13)	0.45 (11)	100318301
	NW 16	5/8"	0.77 (20)	0.64 (16)	0.58 (15)	100318311	
	NW 16	3/4"	0.87 (22)	0.76 (19)	0.68 (17)	100318321	
	NW 25	1"	1.13 (29)	1.02 (26)	0.87 (22)	100318303	
	NW 40	1 1/2"	1.75 (44)	1.50 (38)	1.37 (35)	100318305	
	NW 50	2"	2.25 (57)	2.02 (51)	1.87 (47)	100318306	

Flange, Braze Socket, Brass

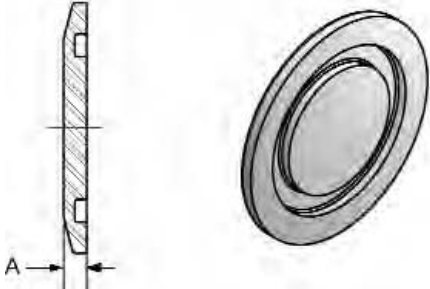
in./ (mm)

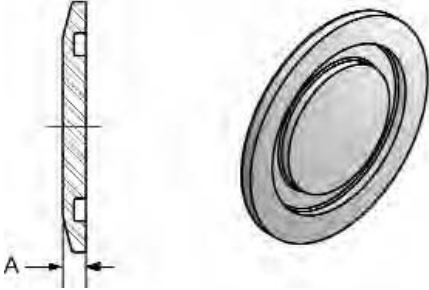
	Flange Size (ISO)	For Tubing OD	A	B	C	Part Number	Price
	<ul style="list-style-type: none"> • Yellow Brass • Standard Inch Tube OD's 	NW 16	1/2"	0.50 (13)	0.25 (6)	0.50 (13)	100315301
	NW 16	5/8"	0.63 (16)	0.25 (6)	0.50 (13)	100315311	
	NW 16	3/4"	0.75 (19)	0.25 (6)	0.62 (16)	100315321	
	NW 25	1"	1.00 (25)	0.25 (6)	0.50 (13)	100315303	
	NW 25	1 1/8"	1.13 (29)	0.25 (6)	0.62 (16)	100315313	
	NW 40	1 5/8"	1.63 (41)	0.50 (13)	1.00 (25)	100315305	
	NW 50	2"	2.00 (51)	0.50 (13)	1.00 (25)	100315306	
	NW 50	2 1/8"	2.13 (54)	0.50 (13)	1.00 (25)	100315316	

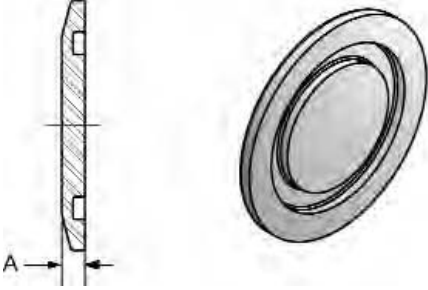
Flange, Blank with Bore, Stainless Steel						in./ (mm)	
	Flange Size (ISO)	Bore Size	A	B	C	Part Number	Price
	<ul style="list-style-type: none"> Stainless Steel Type 304 Standard Inch Tube OD's 	NW 10	1/4"	0.20 (5)	0.26 (7)	N/A	100319710
	NW 10	3/8"	0.20 (5)	0.39 (10)	N/A	100319720	
	NW 10	1/2"	0.20 (5)	0.44 (11)	0.51 (13)	100319700	
	NW 16	1/4"	0.20 (5)	0.26 (7)	N/A	100319711	
	NW 16	3/8"	0.20 (5)	0.39 (10)	N/A	100319721	
	NW 16	1/2"	0.20 (5)	0.51 (13)	N/A	100319731	
	NW 16	3/4"	0.20 (5)	0.68 (17)	0.76 (19)	100319701	
	NW 25	1/4"	0.20 (5)	0.26 (7)	N/A	100319713	
	NW 25	3/8"	0.20 (5)	0.39 (10)	N/A	100319723	
	NW 25	1/2"	0.20 (5)	0.51 (13)	N/A	100319733	
	NW 25	3/4"	0.20 (5)	0.63 (16)	0.76 (19)	100319743	
	NW 25	1"	0.20 (5)	0.89 (23)	1.02 (26)	100319703	
	NW 40	1/4"	0.20 (5)	0.26 (7)	N/A	100319715	
	NW 40	3/8"	0.20 (5)	0.39 (10)	N/A	100319725	
	NW 40	1/2"	0.20 (5)	0.51 (13)	N/A	100319735	
	NW 40	3/4"	0.20 (5)	0.63 (16)	0.76 (19)	100319745	
	NW 40	1"	0.20 (5)	0.89 (23)	1.02 (26)	100319755	
	NW 40	1 1/2"	0.20 (5)	1.39 (35)	1.52 (39)	100319705	
	NW 50	1/4"	0.20 (5)	0.26 (7)	N/A	100319716	
	NW 50	3/8"	0.20 (5)	0.39 (10)	N/A	100319726	
	NW 50	1/2"	0.20 (5)	0.51 (13)	N/A	100319736	
	NW 50	3/4"	0.20 (5)	0.63 (16)	0.76 (19)	100319746	
	NW 50	1"	0.20 (5)	0.89 (23)	1.02 (26)	100319756	
	NW 50	1 1/2"	0.20 (5)	1.39 (35)	1.52 (39)	100319766	
	NW 50	2"	0.20 (5)	1.89 (48)	2.02 (51)	100319706	

Flange, Blank with Bore, KF 80 / KF 100, Stainless Steel						in./ (mm)	
	Flange Size (ISO)	Bore Size	A	B	C	Part Number	Price
	<ul style="list-style-type: none"> Stainless Steel Type 304 	NW 80	3"	4.49 (114)	3.27 (83)	2.90 (74)	100319801
	NW 100	4"	5.28 (134)	4.02 (102)	3.87 (98)	100319803	

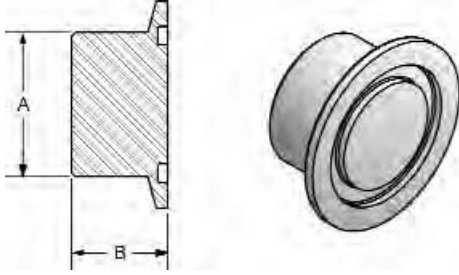


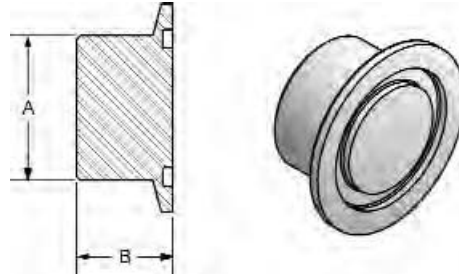
Flange, Blank-Off, Stainless Steel			in./ (mm)	
	Flange Size (ISO)	A	Part Number	Price
	NW 10	0.20 (5)	100311700	
	NW 16	0.20 (5)	100311701	
	NW 25	0.20 (5)	100311703	
	NW 40	0.20 (5)	100311705	
	NW 50	0.20 (5)	100311706	
	NW 80	0.43 (11)	100319802	
	NW 100	0.43 (11)	100319804	
<ul style="list-style-type: none"> • Stainless Steel Type 304 • To Close Off Unused Ports 				

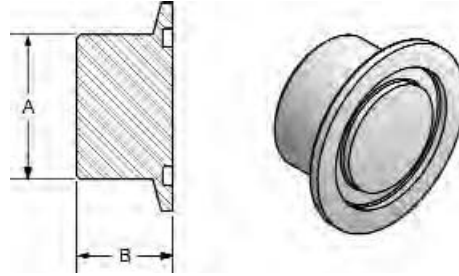
Flange, Blank-Off, Aluminum			in./ (mm)	
	Flange Size (ISO)	A	Part Number	Price
	NW 10	0.20 (5)	100311600	
	NW 16	0.20 (5)	100311601	
	NW 25	0.20 (5)	100311603	
	NW 40	0.20 (5)	100311605	
	NW 50	0.20 (5)	100311606	
<ul style="list-style-type: none"> • Aluminum Alloy • To Close Off Unused Ports 				

Flange, Blank-Off, Brass			in./ (mm)	
	Flange Size (ISO)	A	Part Number	Price
	NW 16	0.20 (5)	100315501	
	NW 25	0.20 (5)	100315503	
	NW 40	0.20 (5)	100315505	
	NW 50	0.20 (5)	100315506	
<ul style="list-style-type: none"> • Yellow Brass • To Close Off Unused Ports 				





Flange, Unbored Stub, Stainless Steel				in./ (mm)	
	Flange Size (ISO)	A	B	Part Number	Price
	NW 10	0.75 (19)	0.75 (19)	100311300	
	NW 16	0.75 (19)	0.75 (19)	100311301	
	NW 25	1.00 (25)	0.75 (19)	100311303	
	NW 40	1.50 (38)	1.00 (25)	100311305	
	NW 50	2.00 (51)	1.00 (25)	100311306	
<ul style="list-style-type: none"> Stainless Steel Type 304 Stub may be turned, bored or tapped to fit 					

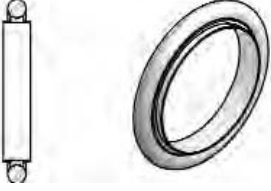
Flange, Unbored Stub, Aluminum				in./ (mm)	
	Flange Size (ISO)	A	B	Part Number	Price
	NW 10	0.75 (19)	0.75 (19)	100311100	
	NW 16	0.75 (19)	0.75 (19)	100311101	
	NW 25	1.00 (25)	0.75 (19)	100311103	
	NW 40	1.50 (38)	1.00 (25)	100311105	
	NW 50	2.00 (51)	1.00 (25)	100311106	
<ul style="list-style-type: none"> Aluminum Type 6061T6 Stub may be turned, bored or tapped to fit 					

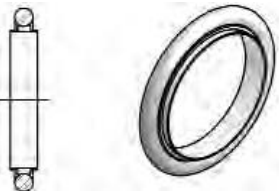
Flange, Unbored Stub, Brass				in./ (mm)	
	Flange Size (ISO)	A	B	Part Number	Price
	NW 16	0.75 (19)	0.75 (19)	100311401	
	NW 25	1.00 (25)	0.75 (19)	100311403	
	NW 40	1.50 (38)	1.00 (25)	100311405	
	NW 50	2.00 (51)	1.00 (25)	100311406	
<ul style="list-style-type: none"> Yellow Brass Stub may be turned, bored or tapped to fit 					

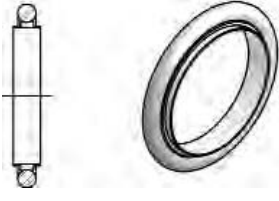


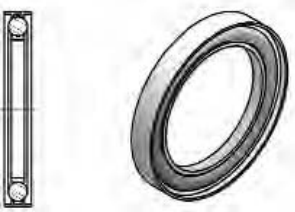
Seal, Centering Ring Assembly, Stainless Steel/Viton®			in./ (mm)
 <ul style="list-style-type: none"> • 180°C Max • Replaceable O-Ring • NW 80/100 includes aluminum spacer ring 	Flange Size (ISO)	Part Number	Price
	NW 10	100312700	
	NW 16	100312701	
	NW 25	100312703	
	NW 40	100312705	
	NW 50	100312706	
	NW 80	100760508	
	NW 100	100760510	


Seal, Centering Ring Assembly, Aluminum/Viton®			in./ (mm)
 <ul style="list-style-type: none"> • 180°C Max • Replaceable O-Ring • NW 80/100 includes aluminum spacer ring 	Flange Size (ISO)	Part Number	Price
	NW 10	100312600	
	NW 16	100312601	
	NW 25	100312603	
	NW 40	100312605	
	NW 50	100312606	
	NW 80	100760608	
	NW 100	100760610	

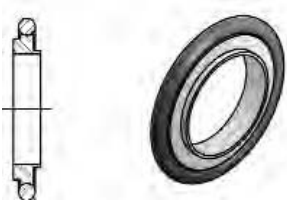
Seal, Centering Ring Assembly, Stainless Steel/Buna-N			in./ (mm)
 <ul style="list-style-type: none"> • 80°C Max • Replaceable O-Ring 	Flange Size (ISO)	Part Number	Price
	NW 10	100312800	
	NW 16	100312801	
	NW 25	100312803	
	NW 40	100312805	
	NW 50	100312806	

Seal, Centering Ring Assembly, Aluminum/Buna-N			in./ (mm)
 <ul style="list-style-type: none"> • 80°C Max • Replaceable O-Ring • NW 80/100 includes aluminum spacer ring 	Flange Size (ISO)	Part Number	Price
	NW 10	100312500	
	NW 16	100312501	
	NW 25	100312503	
	NW 40	100312505	
	NW 50	100312506	
	NW 80	100760708	
	NW 100	100760710	

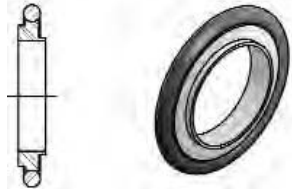
Seal, Centering Ring Assembly, Stainless Steel/Silicone		in./ (mm)	
	Flange Size (ISO)	Part Number	Price
	NW 10 NW 16 NW 25 NW 40 NW 50	100317300 100317301 100317303 100317305 100317306	
<ul style="list-style-type: none"> • 200°C Max • Replaceable O-Ring 			

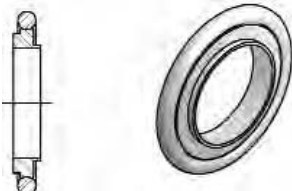
Seal, Centering Ring Assembly Overpressure, Stainless Steel/Viton		in./ (mm)	
	Flange Size (ISO)	Part Number	Price
	NW 25 NW 40 NW 50	100936525 100936524 100936523	
<ul style="list-style-type: none"> • Stainless Steel Centering Ring • Replaceable Viton O-Ring • Includes Aluminum Overpressure Ring 			


Seal, Centering Ring Assembly w/ Screen, Stainless Steel/Viton		in./ (mm)	
	Flange Size (ISO)	Part Number	Price
	NW 16 NW 25 NW 40 NW 50	100318601 100318603 100318605 100318606	
<ul style="list-style-type: none"> • Stainless Steel Centering Ring • Replaceable Viton O-Ring • 72 Mesh Screen Stainless Steel 			

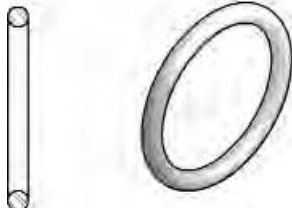
Seal, Adaptive Centering Ring Assembly, Stainless Steel/Viton			in./ (mm)	
	Flange Size (ISO)	Flange Size (ISO)	Part Number	Price
	NW 16 NW 25 NW 40	NW 10 NW 20 NW 32	100315821 100315823 100315825	
<ul style="list-style-type: none"> • Stainless Steel Centering Ring • Replaceable Viton O-Ring • For Obsolete Bore Sizes 				

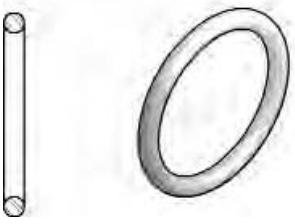


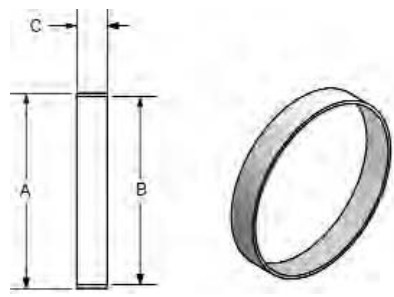
Seal, Adaptive Centering Ring Assembly, Aluminum/Viton			in./ (mm)	
	Flange Size (ISO)	Flange Size (ISO)	Part Number	Price
	NW 16 NW 25 NW 40	NW 10 NW 20 NW 32	100315811 100315813 100315815	
<ul style="list-style-type: none"> • Replaceable Viton O-Ring • For Obsolete Bore Sizes 				

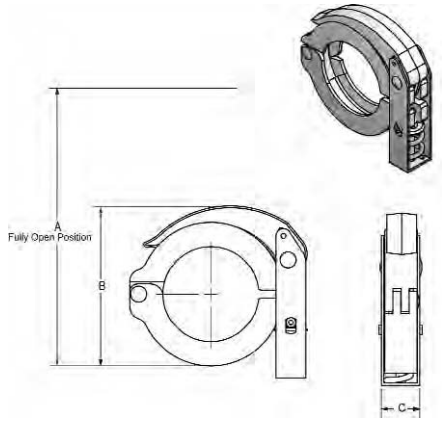
Seal, Adaptive Centering Ring Assembly, Aluminum/Buna-N			in./ (mm)	
	Flange Size (ISO)	Flange Size (ISO)	Part Number	Price
	NW 16 NW 25 NW 40	NW 10 NW 20 NW 32	100315801 100315803 100315805	
<ul style="list-style-type: none"> • Replaceable O-Ring • For Obsolete Bore Sizes 				

Seal, Replacement O-Ring, Viton®			in./ (mm)	
	Flange Size (ISO)	Standard O-Ring Size	Part Number	Price
	NW 10	2-312	100314000	
	NW 16	2-314	100314001	
	NW 25	2-320	100314003	
	NW 40	2-326	100314005	
	NW 50	2-330	100314006	
	NW 80	2-340	100762008	
	NW 100	2-346	100762010	
<ul style="list-style-type: none"> • Standard Inch O-Ring Sizes 				

Seal, Replacement O-Ring, Buna-N			in./ (mm)	
	Flange Size (ISO)	Standard O-Ring Size	Part Number	Price
	NW 10	2-312	100313900	
	NW 16	2-314	100313901	
	NW 25	2-320	100313903	
	NW 40	2-326	100313905	
	NW 50	2-330	100313906	
	NW 80	2-340	100761908	
	NW 100	2-346	100761910	
<ul style="list-style-type: none"> • Standard Inch O-Ring Sizes 				

Seal, Replacement O-Ring, Silicone				in./ (mm)	
	Flange Size (ISO)	Standard O-Ring Size	Part Number	Price	
	NW 10	2-312	100317310		
	NW 16	2-314	100317311		
	NW 25	2-320	100317313		
	NW 40	2-326	100317315		
	NW 50	2-330	100317316		
<ul style="list-style-type: none"> Standard Inch O-Ring Sizes 					

Ring, Overpressure							in./ (mm)	
	Flange Size (ISO)	Max. Pressure	A	B	C	Part Number	Price	
	NW 10	100 psig	1.25 (31)	1.09 (28)	0.14 (4)	100316300		
	NW 16	100 psig	1.25 (31)	1.19 (30)	0.35 (9)	100316301		
	NW 25	100 psig	1.66 (42)	1.58 (40)	0.35 (9)	100316303		
	NW 40	75 psig	2.25 (57)	2.17 (55)	0.35 (9)	100316305		
	NW 50	50 psig	2.75 (70)	2.66 (68)	0.14 (4)	100316306		
<ul style="list-style-type: none"> Stainless Steel Fits over OD of O-ring Use to retain O-ring when system is used at internal pressures over atmospheric 								

Clamp, Toggle						in./ (mm)		
	Flange Size (ISO)	Fits Sizes	A	B	C	Part Number	Price	
	NW 16	16/10	4.05 (103)	2.50 (64)	0.75 (19)	100318801		
	NW 25	25/20	4.31 (109)	2.96 (75)	0.75 (19)	100318803		
	NW 40	40/32	4.87 (124)	3.29 (84)	0.75 (19)	100318805		
	NW 50	50	6.34 (161)	4.73 (120)	0.89 (23)	100318806		
<ul style="list-style-type: none"> Aluminum Quick Operating Positive Locking Method Self Adjusting Cannot Be Over-tightened 								



Clamp, Toggle w/ Lanyard						in./ (mm)	
	Flange Size (ISO)	Fits Sizes	A	B	C	Part Number	Price
	NW 16	16/10	4.05 (103)	2.50 (64)	0.75 (19)	100318801-L	
	NW 25	25/20	4.31 (109)	2.96 (75)	0.75 (19)	100318803-L	
	NW 40	40/32	4.87 (124)	3.29 (84)	0.75 (19)	100318805-L	
	NW 50	50	6.34 (161)	4.73 (120)	0.89 (23)	100318806-L	
<ul style="list-style-type: none"> • Aluminum • Fastening pin on lanyard prevents accidental opening and pin loss • Positive locking method • Self-adjusting • Heavy duty spring supports the full range of production tolerance variables 							

Clamp, Wing Nut						in./ (mm)	
	Flange Size (ISO)	Fits Sizes	A	B	C	Part Number	Price
	NW 16	16/10	2.24 (57)	1.69 (43)	0.63 (16)	100312901	
	NW 25	25/20	2.76 (70)	2.17 (55)	0.63 (16)	100312903	
	NW 40	40/32	3.39 (86)	2.76 (70)	0.63 (16)	100312905	
	NW 50	50	4.33 (110)	3.70 (94)	0.79 (20)	100312906	
<ul style="list-style-type: none"> • Aluminum 							

Clamp, Bulkhead						in./ (mm)	
	Flange Size (ISO)	Number of Bolts	A	B	C	Part Number	Price
	NW 16	6	0.36 (9)	2.00 (51)	1.50 (38)	100318901	
	NW 25	6	0.39 (10)	2.38 (60)	1.89 (48)	100318903	
	NW 40	6	0.37 (9)	2.94 (75)	2.44 (62)	100318905	
	NW 50	8	0.40 (10)	3.75 (95)	3.25 (83)	100318906	
<ul style="list-style-type: none"> • Aluminum • Adapts to a baseplate or fixed flange • Standard KF seal assembly • Stainless steel bolts and washers included, 10-32 x 5/8" 							

Clamp, Chain		in./(mm)	
<ul style="list-style-type: none"> For use with KF 80 and 100 flanges Aluminum 	Flange Size (ISO)	Part Number	Price
	NW 80 NW 100	100993460 100994717	

Conical Reducer, Stainless Steel		in./(mm)				
	Flange Size (ISO)	Flange Size (ISO)	A	B	Part Number	Price
	NW 16	NW 25	0.62 (16)	1.57 (40)	100313711	
	NW 16	NW 40	0.62 (16)	1.57 (40)	100313712	
	NW 16	NW 50	0.62 (16)	1.57 (40)	100313713	
	NW 25	NW 40	0.87 (22)	1.57 (40)	100313714	
	NW 25	NW 50	0.87 (22)	1.57 (40)	100313715	
NW 40	NW 50	1.34 (34)	1.57 (40)	100313716		
<ul style="list-style-type: none"> Mates differing ISO-KF flange sizes 						

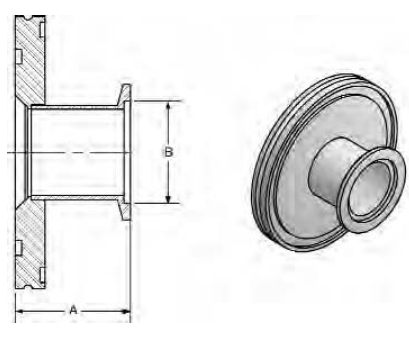
Conical Reducer, Aluminum		in./(mm)				
	Flange Size (ISO)	Flange Size (ISO)	A	B	Part Number	Price
	NW 16	NW 25	0.62 (16)	1.57 (40)	100313511	
	NW 16	NW 40	0.62 (16)	1.57 (40)	100313512	
	NW 16	NW 50	0.62 (16)	1.57 (40)	100313513	
	NW 25	NW 40	0.87 (22)	1.57 (40)	100313514	
	NW 25	NW 50	0.87 (22)	1.57 (40)	100313515	
NW 40	NW 50	1.34 (34)	1.57 (40)	100313516		
<ul style="list-style-type: none"> Mates differing ISO-KF flange sizes 						

Conical Adapter, ISO-MF to ISO-KF		in./(mm)				
	Flange Size (ISO)	A	B	C	Part Number	Price
	NW 63 to NW 40	3.39 (86)	2.37 (60)	1.37 (35)	100765006	
	NW 63 to NW 50	3.39 (86)	2.37 (60)	1.87 (47)	100765017	
	NW 80 to NW 40	4.64 (118)	2.87 (73)	1.37 (35)	100765016	
	NW 80 to NW 50	4.64 (118)	2.87 (73)	1.87 (47)	100765008	
	NW 100 to NW 50	4.64 (118)	3.83 (97)	1.87 (47)	100765018	
<ul style="list-style-type: none"> Stainless Steel Type 304 High conductance adapter Special adapters available upon request 						



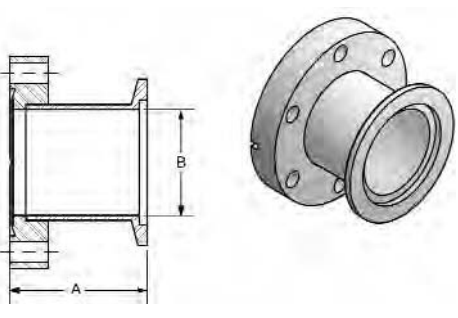
Step Adapter, ISO-MF to ISO-KF

in./ (mm)

	Flange Size (ISO)	A	B	Part Number	Price
	<ul style="list-style-type: none"> Stainless Steel Type 304 	NW 63 to NW 40	1.77 (45)	1.37 (35)	100762606
	NW 63 to NW 50	1.77 (45)	1.87 (47)	100762617	
	NW 80 to NW 40	1.77 (45)	1.87 (47)	100762616	
	NW 80 to NW 50	1.77 (45)	1.87 (47)	100762608	
	NW 100 to NW 40	1.77 (45)	1.37 (35)	100762620	
	NW 100 to NW 50	1.77 (45)	1.87 (47)	100762618	

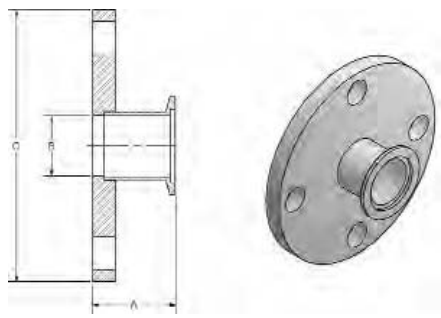
Adapter, ISO-KF to CF

in./ (mm)

	Flange Size (KF)	Flange Size (CF)	A	B	Part Number	Price
	<ul style="list-style-type: none"> Stainless Steel Type 304 	NW 16	Mini 1 1/2"	2.08 (53)	0.62 (16)	100315601
	NW 16	2 3/4"	1.78 (45)	0.62 (16)	100315611	
	NW 25	2 1/8"	1.89 (48)	0.87 (22)	100319812	
	NW 25	2 3/4"	1.78 (45)	0.87 (22)	100315603	
	NW 40	2 3/4"	1.78 (45)	1.33 (34)	100315605	
	NW 50	2 3/4"	2.11 (54)	1.37 (35)	100319813	
	NW 50	4 1/2"	1.95 (50)	1.83 (46)	100315606	

Adapter, ISO-KF to ASA, without O-Ring Groove

in./ (mm)

	Flange Size (KF)	Flange Size (ASA)	A	B	C	Part Number	Price
	<ul style="list-style-type: none"> Stainless Steel Type 304 Without O-Ring Groove 	NW 40	1 1/2"	1.81 (46)	1.33 (34)	5.00 (127)	100316755
	NW 40	2"	1.81 (46)	1.33 (34)	6.00 (152)	100316705	
	NW 40	3"	1.81 (46)	1.33 (34)	7.50 (191)	100316715	
	NW 50	1 1/2"	1.81 (46)	1.83 (46)	5.00 (127)	100316756	
	NW 50	2"	1.81 (46)	1.83 (46)	6.00 (152)	100316706	
	NW 50	3"	1.81 (46)	1.83 (46)	7.50 (191)	100316716	

Adapter, ISO-KF to ASA, with O-Ring Groove							in./ (mm)	
	Flange Size (KF)	Flange Size (ASA)	Groove ID (O-Ring)	A	B	C	Part Number	Price
	NW 40	1½"	2.66" (2-231)	1.81 (46)	1.33 (34)	5.00 (127)	100316775	
	NW 40	2"	3.42" (2-237)	1.81 (46)	1.33 (34)	6.00 (152)	100316725	
	NW 40	3"	4.69" (2-247)	1.81 (46)	1.33 (34)	7.50 (191)	100316735	
	NW 50	1½"	2.66" (2-231)	1.81 (46)	1.83 (46)	5.00 (127)	100316776	
	NW 50	2"	3.42" (2-237)	1.81 (46)	1.83 (46)	6.00 (152)	100316726	
	NW 50	3"	4.69" (2-247)	1.81 (46)	1.83 (46)	7.50 (191)	100316736	
<ul style="list-style-type: none"> • Stainless Steel Type 304 • With O-ring Groove 								

ASA O-Ring, Viton®				in./ (mm)	
	Flange Size (ASA)	O-Ring	Part Number	Price	
	1½"	2-231	100001380		
	2"	2-237	100006098		
	3"	2-247	100006099		

Adapter, ISO-KF to Welch Pump Connector							in./ (mm)	
	Flange Size (ISO)	Welch Pump Number	Thread Size	A	B	Part Number	Price	
	NW 16	1399, 1400, 1410	3/8 - 18	1.77 (45)	0.47 (12)	100316601		
	NW 16	1405	3/4 - 20	2.56 (65)	0.56 (14)	100316621		
	NW 25	1380, 1402, 1403, 8806, 8811, 8816, 8821	1 - 20	2.76 (70)	0.75 (19)	100316603		
	NW 40	1374, 1397, 8851	1-3/4 - 20	2.56 (65)	1.44 (37)	100316615		
<ul style="list-style-type: none"> • Includes Metal Gasket • Stainless Steel Type 304 								



Adapter, ISO-KF to NPT-F Pipe, Stainless Steel						in./ (mm)	
	Flange Size (KF)	Flange Size (NPT)	A	B	Part Number	Price	
	NW 10	1/8"	0.62 (16)	0.75 (19)	100312100		
	NW 10	1/4"	0.62 (16)	0.75 (19)	100312300		
	NW 16	1/8"	0.62 (16)	0.75 (19)	100312101		
	NW 16	1/4"	0.62 (16)	0.75 (19)	100312301		
	NW 25	1/8"	0.88 (22)	0.75 (19)	100312103		
	NW 25	1/4"	0.88 (22)	0.75 (19)	100312303		
	NW 40	1/8"	1.25 (32)	1.00 (25)	100312105		
	NW 40	1/4"	1.25 (32)	1.00 (25)	100312305		
	NW 50	1/8"	1.75 (44)	1.00 (25)	100312106		
NW 50	1/4"	1.75 (44)	1.00 (25)	100312306			

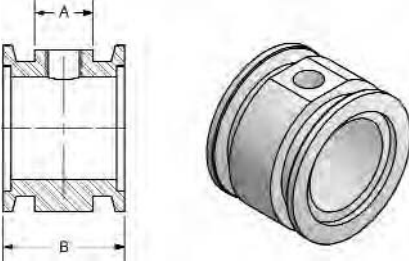
- Teflon tape recommended to seal
- Compatible with most TC and Pirani tubes

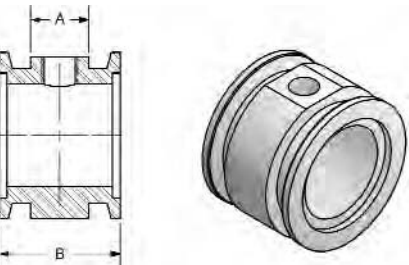
Adapter, ISO-KF to NPT-F Pipe, Aluminum						in./ (mm)	
	Flange Size (KF)	Flange Size (NPT)	A	B	Part Number	Price	
	NW 10	1/8"	0.62 (16)	0.75 (19)	100312000		
	NW 10	1/4"	0.62 (16)	0.75 (19)	100312200		
	NW 16	1/8"	0.62 (16)	0.75 (19)	100312001		
	NW 16	1/4"	0.62 (16)	0.75 (19)	100312201		
	NW 25	1/8"	0.88 (22)	0.75 (19)	100312003		
	NW 25	1/4"	0.88 (22)	0.75 (19)	100312203		
	NW 40	1/8"	1.25 (32)	1.00 (25)	100312005		
	NW 40	1/4"	1.25 (32)	1.00 (25)	100312205		
	NW 50	1/8"	1.75 (44)	1.00 (25)	100312006		
NW 50	1/4"	1.75 (44)	1.00 (25)	100312206			

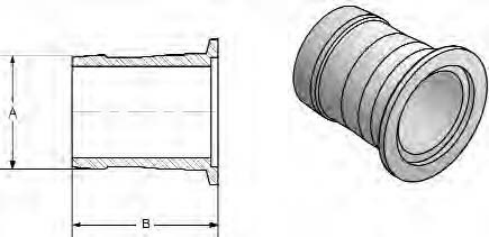
- Teflon tape recommended to seal
- Compatible with most TC and Pirani tubes

Adapter, ISO-KF to NPT-M Pipe, Stainless Steel						in./ (mm)	
	Flange Size (KF)	Flange Size (NPT)	A	B	Part Number	Price	
	NW 16	1/8"	1.57 (40)	0.19 (5)	100316801		
	NW 16	1/4"	1.97 (50)	0.26 (7)	100316811		
	NW 25	1/8"	1.57 (40)	0.19 (5)	100316803		
	NW 25	1/4"	1.97 (50)	0.26 (7)	100316813		
	NW 25	1/2"	2.95 (75)	0.45 (11)	100316823		
	NW 25	3/4"	2.95 (75)	0.78 (20)	100316833		
	NW 40	1/4"	1.97 (50)	0.26 (7)	100316805		
	NW 40	1/2"	2.95 (75)	0.45 (11)	100316815		
	NW 40	3/4"	2.95 (75)	0.78 (20)	100316825		
	NW 40	1"	2.95 (75)	0.88 (22)	100316835		
	NW 40	1 1/4"	2.00 (51)	1.12 (28)	100316844		
	NW 40	1 1/2"	2.00 (51)	1.34 (34)	100316845		
	NW 50	1/4"	1.97 (50)	0.26 (7)	100316806		
	NW 50	1/2"	2.95 (75)	0.45 (11)	100316816		
	NW 50	3/4"	2.95 (75)	0.78 (20)	100316826		
	NW 50	1"	2.95 (75)	0.88 (22)	100316836		
	NW 50	2"	2.00 (51)	1.87 (47)	100316846		

- Stainless Steel
- Hex Shank
- Teflon tape recommended to seal

Adapter Tee, ISO-KF to NPT-F Pipe, Stainless Steel					in./ (mm)	
	Flange Size (KF)	Flange Size (NPT)	A	B	Part Number	Price
	NW 16	1/8" Tapped	0.76 (19)	1.57 (40)	100319401	
	NW 16	1/4" Tapped	0.76 (19)	1.57 (40)	100319601	
	NW 25	1/8" Tapped	0.76 (19)	1.57 (40)	100319403	
	NW 25	1/4" Tapped	0.76 (19)	1.57 (40)	100319603	
	NW 40	1/8" Tapped	0.76 (19)	1.57 (40)	100319405	
	NW 40	1/4" Tapped	0.76 (19)	1.57 (40)	100319605	
	NW 50	1/8" Tapped	0.76 (19)	1.57 (40)	100319406	
	NW 50	1/4" Tapped	0.76 (19)	1.57 (40)	100319606	
	<ul style="list-style-type: none"> • Available with additional NPT holes • Teflon tape recommended to seal 					

Adapter Tee, ISO-KF to NPT-F Pipe, Aluminum					in./ (mm)	
	Flange Size (KF)	Flange Size (NPT)	A	B	Part Number	Price
	NW 16	1/8" Tapped	0.76 (19)	1.57 (40)	100319301	
	NW 16	1/4" Tapped	0.76 (19)	1.57 (40)	100319501	
	NW 25	1/8" Tapped	0.76 (19)	1.57 (40)	100319303	
	NW 25	1/4" Tapped	0.76 (19)	1.57 (40)	100319503	
	NW 40	1/8" Tapped	0.76 (19)	1.57 (40)	100319305	
	NW 40	1/4" Tapped	0.76 (19)	1.57 (40)	100319505	
	NW 50	1/8" Tapped	0.76 (19)	1.57 (40)	100319306	
	NW 50	1/4" Tapped	0.76 (19)	1.57 (40)	100319506	
<ul style="list-style-type: none"> • Available with additional NPT holes • Teflon tape recommended to seal 						

Adapter, ISO-KF to Rubber Hose					in./ (mm)	
	Flange Size (ISO)	Hose Size	A	B	Part Number	Price
	NW 16	1/2" or 5/8"	0.63 (16)	1.65 (42)	100311811	
	NW 16	5/8" or 3/4"	0.75 (19)	1.65 (42)	100311801	
	NW 25	3/4" or 7/8"	0.88 (22)	1.73 (44)	100311803	
	NW 40	1 1/2" or 1 5/8"	1.63 (41)	2.17 (55)	100311805	
	NW 50	1 1/2" or 1 5/8"	1.63 (41)	2.17 (55)	100311806	
<ul style="list-style-type: none"> • Aluminum • Compatible with standard vacuum hose bores 						



Adapter, ISO-KF to VCR®-M						in./ (mm)	
	Flange Size (ISO)	Flange Size (VCR)	A	B	VCR Size	Part Number	Price
	NW 16	4 VCR	1.40 (36)	0.19 (5)	1/4"	100319111	
	NW 16	8 VCR	1.63 (41)	0.41 (10)	1/2"	100319121	
	NW 25	4 VCR	1.40 (36)	0.19 (5)	1/4"	100319113	
	NW 25	8 VCR	1.60 (41)	0.41 (10)	1/2"	100319123	
	NW 25	12 VCR	2.14 (54)	0.62 (16)	3/4"	100319133	
	NW 40	4 VCR	1.40 (36)	0.19 (5)	1/4"	100319115	
	NW 40	8 VCR	1.60 (41)	0.41 (10)	1/2"	100319125	
	NW 40	12 VCR	2.10 (53)	0.62 (16)	3/4"	100319135	
	NW 50	4 VCR	1.40 (36)	0.19 (5)	1/4"	100319116	
NW 50	8 VCR	1.60 (41)	0.41 (10)	1/2"	100319126		
NW 50	12 VCR	2.10 (53)	0.62 (16)	3/4"	100319136		

• Stainless Steel

Adapter, ISO-KF to VCR®-F						in./ (mm)	
	Flange Size (ISO)	Flange Size (VCR)	A	B	VCR Size	Part Number	Price
	NW 16	4 VCR	1.40 (36)	0.19 (5)	1/4"	100319211	
	NW 16	8 VCR	1.63 (41)	0.41 (10)	1/2"	100319221	
	NW 25	4 VCR	1.40 (36)	0.19 (5)	1/4"	100319213	
	NW 25	8 VCR	1.60 (41)	0.41 (10)	1/2"	100319223	
	NW 25	12 VCR	2.14 (54)	0.62 (16)	3/4"	100319233	
	NW 40	4 VCR	1.40 (36)	0.19 (5)	1/4"	100319215	
	NW 40	8 VCR	1.60 (41)	0.41 (10)	1/2"	100319225	
	NW 40	12 VCR	2.10 (53)	0.62 (16)	3/4"	100319235	
	NW 50	4 VCR	1.40 (36)	0.19 (5)	1/4"	100319216	
NW 50	8 VCR	1.60 (41)	0.41 (10)	1/2"	100319226		
NW 50	12 VCR	2.10 (53)	0.62 (16)	3/4"	100319236		

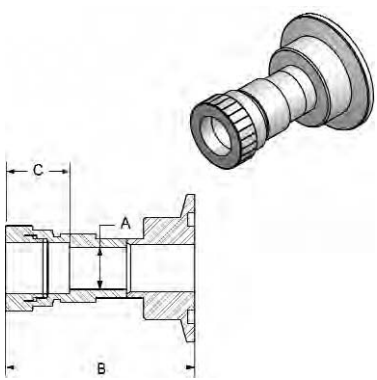
• Stainless Steel

Adapter, ISO-KF to Pyrex® Tube				in./ (mm)		
	Flange Size (ISO)	A	B	Part Number	Price	
	NW 16	5.25 (133)	0.50 (13)	100318501		
	NW 16	5.25 (133)	0.75 (19)	100318511		
	NW 25	5.25 (133)	1.00 (25)	100318503		
	NW 40	5.50 (140)	1.50 (38)	100318505		

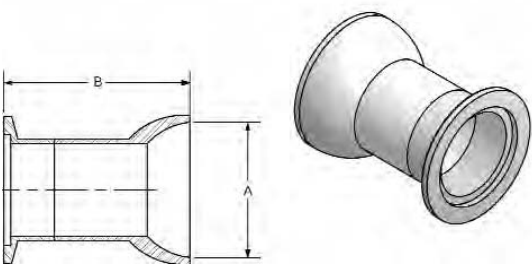
• Stainless Steel Type 304

Adapter, ISO-KF to PVC Hose						in./ (mm)	
	Flange Size (ISO)	Hose Size	A	B	C	Part Number	Price
	NW 10	1/2"	0.50 (13)	1.26 (32)	0.79 (20)	100316400	
	NW 16	1/2"	0.50 (13)	1.26 (32)	0.79 (20)	100316411	
	NW 16	3/4"	0.75 (19)	1.26 (32)	0.79 (20)	100316401	
	NW 25	1"	1.00 (25)	1.50 (38)	1.02 (26)	100316403	
	NW 40	1 1/2"	1.50 (38)	1.97 (50)	1.50 (38)	100316405	
	NW 50	2"	2.00 (51)	2.17 (55)	1.61 (41)	100316406	

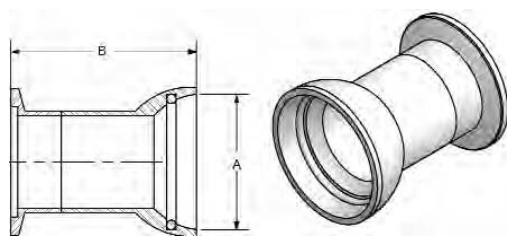
• Stainless Steel Type 304
• Recommend the use of hose clamps

Adapter, ISO-KF to Compression Fitting						in./ (mm)	
	Flange Size (ISO)	For Tubing OD	A	B	C	Part Number	Price
	NW 10	1/2"	0.41 (10)	2.1 (53)	.80 (20)	100316910	
	NW 16	3/4"	0.19 (5)	1.4 (36)	.62 (16)	100316911	
	NW 16	1/2"	0.41 (10)	2.4 (61)	.80 (20)	100316921	
	NW 16	3/4"	0.62 (16)	2.4 (61)	.94 (24)	100316931	
	NW 25	1/2"	0.41 (10)	2.4 (61)	.80 (20)	100316903	
	NW 25	3/4"	0.62 (16)	2.5 (64)	.94 (24)	100316913	
	NW 25	1"	0.88 (22)	2.4 (61)	.94 (24)	100316923	
	NW 40	1/2"	0.41 (10)	2.6 (66)	.80 (20)	100316905	
	NW 40	3/4"	0.62 (16)	2.8 (71)	.94 (24)	100316915	
	NW 40	1"	0.88 (22)	2.8 (71)	.94 (24)	100316925	
	NW 40	1 1/8"	1.14 (29)	2.9 (74)	.94 (24)	100316945	
	NW 40	1 1/2"	1.25 (32)	2.9 (74)	.94 (24)	100316935	
	NW 50	3/4"	0.62 (16)	2.8 (71)	.94 (24)	100316926	
	NW 50	1"	0.88 (22)	2.8 (71)	.94 (24)	100316936	
	NW 50	1 1/8"	1.14 (29)	2.9 (74)	.94 (24)	100316946	
NW 50	1 1/2"	1.25 (32)	3.0 (76)	.94 (24)	100316906		
NW 50	2"	2.01 (51)	3.4 (87)	2.5 (63)	100316916		

- Stainless Steel
- Viton O-Ring
- Compression fitting tightened by hand
- Compression connect for tube insertion


Adapter, ISO-KF to Ball Socket, without Groove						in./ (mm)	
	Flange Size (ISO)	Coupling Size	A	B	Part Number	Price	
	NW 40	50/30	2.00 (50)	2.75 (70)	100318205		
	NW 50	75/50	3.00 (75)	3.25 (83)	100318206		

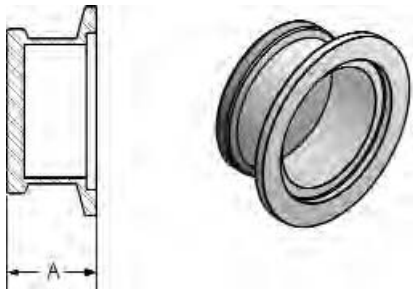
- Stainless Steel Type 304
- Without O-Ring Groove
- Mates to standard quartz ball coupling

Adapter, ISO-KF to Ball Socket, with Groove						in./ (mm)	
	Flange Size (ISO)	Coupling Size	A	B	O-Ring Size	Part Number	Price
	NW 40	50/30	2.00 (50)	2.75 (70)	2-224	100318215	
	NW 50	75/50	3.00 (75)	3.25 (83)	2-232	100318216	

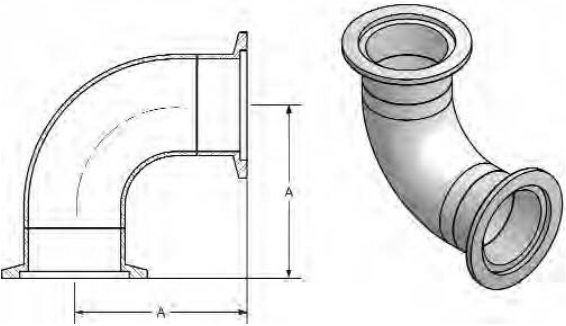
- Stainless Steel Type 304
- With Viton O-ring in Groove
- Mates to standard quartz ball coupling



Ball Socket O-Ring, Viton®			in./(mm)	
	Coupling Size	O-Ring Size	Part Number	Price
	50/30	2-224	100001654	
	75/50	2-232	100001381	

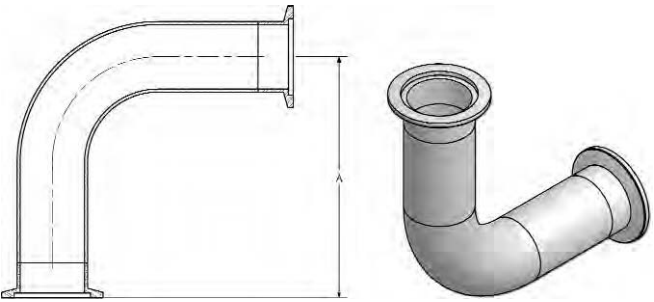
ISO-KF Viewing Port			in./(mm)	
	Flange Size (ISO)	A	Part Number	Price
	NW 40	0.93 (24)	100319005	
	NW 50	1.25 (32)	100319006	

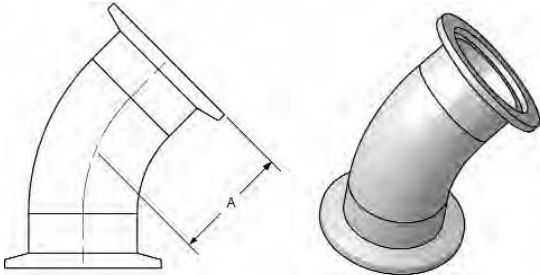
- Stainless Steel Flange
- Max. Temperature 150°C
- Optical quality borosilicate glass

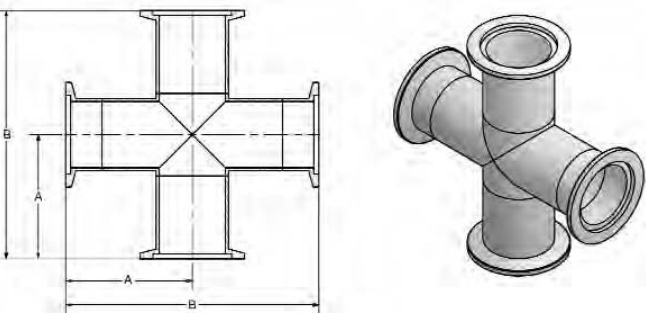
ISO-KF Elbow 90° Smooth Radius			in./(mm)	
	Flange Size (ISO)	A	Part Number	Price
	NW 16	1.57 (40)	100314401	
	NW 25	1.97 (50)	100314403	
	NW 40	2.56 (65)	100314505	
	NW 50	2.76 (70)	100314506	

- Stainless Steel Type 304
- Same Size Flanges Both Ports
- Standard Modulus



ISO-KF Elbow 90° Smooth, Long Radius		in./(mm)		
	Flange Size (ISO)	A	Part Number	Price
	NW 40	5.12 (130)	100314415	
	NW 50	5.51 (140)	100314416	
<ul style="list-style-type: none"> • Stainless Steel Type 304 • Same Size Flanges both Ports • Twice Standard Modulus 				

ISO-KF Elbow 45° Smooth Radius		in./(mm)		
	Flange Size (ISO)	A	Part Number	Price
	NW 16	0.91 (23)	100318701	
	NW 25	1.12 (28)	100318703	
	NW 40	1.68 (43)	100318705	
	NW 50	1.99 (51)	100318706	
<ul style="list-style-type: none"> • Stainless Steel Type 304 • Same Size Flanges Both Ports 				

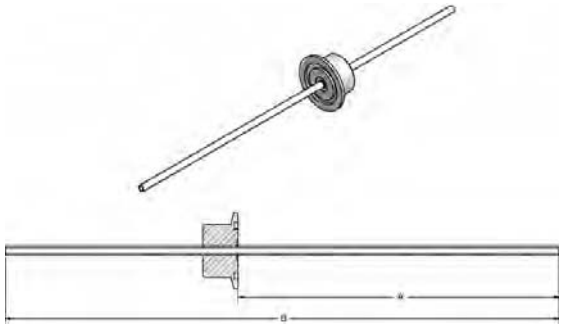
ISO-KF Cross		in./(mm)			
	Flange Size (ISO)	A	B	Part Number	Price
	NW 16	1.57 (40)	3.15 (80)	100314801	
	NW 25	1.97 (50)	3.94 (100)	100314803	
	NW 40	2.56 (65)	5.12 (130)	100314805	
	NW 50	2.76 (70)	5.51 (140)	100314806	
<ul style="list-style-type: none"> • Stainless Steel Type 304 • Same Size Flanges all Ports • Standard Modulus 					

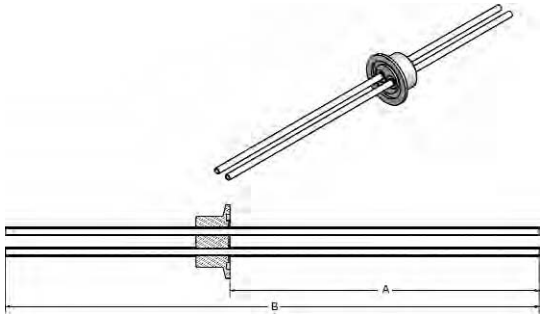


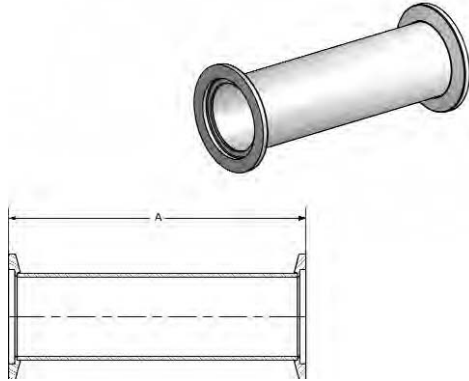
ISO-KF Tee		in./ (mm)			
	Flange Size (ISO)	A	B	Part Number	Price
	NW 16	1.57 (40)	3.15 (80)	100314601	
	NW 25	1.97 (50)	3.94 (100)	100314603	
	NW 40	2.56 (65)	5.12 (130)	100314605	
	NW 50	2.76 (70)	5.51 (140)	100314606	
<ul style="list-style-type: none"> • Stainless Steel Type 304 • Same Size Flanges all Ports • Standard Modulus 					

ISO-KF Tee, Reducing		in./ (mm)					
	Flange Size (ISO)	Flange Size (ISO) Tee	A	B	C	Part Number	Price
	NW 25	NW 16	3.94 (100)	1.08 (27)	1.97 (50)	100318403	
	NW 40	NW 16	5.12 (130)	1.32 (34)	2.56 (65)	100318405	
	NW 50	NW 16	5.51 (140)	1.58 (40)	2.76 (70)	100318406	
	NW 40	NW 25	4.80 (122)	2.40 (61)	2.40 (61)	100319816	
	NW 50	NW 25	6.29 (160)	2.65 (67)	3.15 (80)	100319815	
	NW 50	NW 40	6.29 (160)	2.65 (67)	3.15 (80)	100319814	
<ul style="list-style-type: none"> • Stainless Steel Type 304 • Same Size Flanges Thru Ports 							

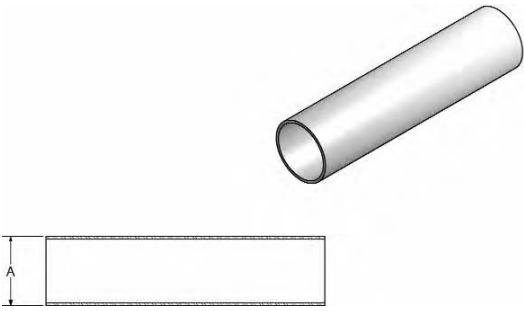
ISO-KF Feedthrough, Base Plate		in./ (mm)					
	Flange Size (ISO)	Plate Hole Diameter	A	B	C	Part Number	Price
	NW 25	1"	0.75 (19)	1.62 (41)	2.88 (73)	100317903	
	NW 40	1"	0.75 (19)	1.62 (41)	3.12 (79)	100317905	
<ul style="list-style-type: none"> • Stainless Steel • Suitable for plates up to 1" thickness • Stainless steel washer, nut and Viton® O-ring seal (2-216) provided 							

ISO-KF Feedthrough, Liquid/Gas Single Tube						in./(mm)	
	Flange Size (ISO)	Feed-through Tubing OD	A	B	Tube Wall	Part Number	Price
	NW 25	0.25 (6)	9.10 (230)	15.70 (400)	0.035 (0.9)	100317203	
	NW 40	0.25 (6)	9.10 (230)	15.70 (400)	0.035 (0.9)	100317205	
<ul style="list-style-type: none"> Stainless steel type 304 							

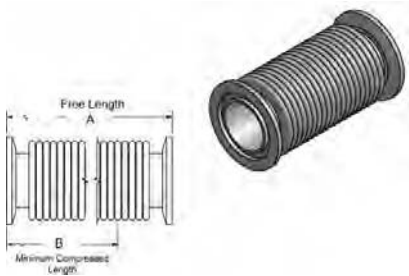
ISO-KF Feedthrough, Liquid/Gas Double Tube						in./(mm)	
	Flange Size (ISO)	Feed-through Tubing OD	A	B	Tube Wall	Part Number	Price
	NW 25	0.25 (6)	9.10 (230)	15.70 (400)	0.035 (0.9)	100317213	
	NW 40	0.25 (6)	9.10 (230)	15.70 (400)	0.035 (0.9)	100317215	
<ul style="list-style-type: none"> Stainless steel type 304 							

ISO-KF Straight Section				in./(mm)	
	Flange Size (ISO)	A	Part Number	Price	
	NW 16	3.15 (80)	100315101		
	NW 16	12.60 (320)	100315111		
	NW 25	3.94 (100)	100315103		
	NW 25	12.60 (320)	100315113		
	NW 40	5.12 (130)	100315105		
	NW 40	12.60 (320)	100315115		
	NW 50	5.51 (140)	100315106		
	NW 50	12.60 (320)	100315116		
<ul style="list-style-type: none"> Stainless steel type 304 Special lengths to order 					

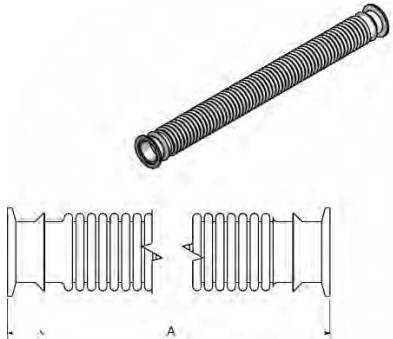


Tubing		in./ (mm)			
	Flange Size (ISO)	A	Tube Wall	Part Number	Price
	NW 10	0.50 (13)	0.065 (1.7)	100314300	
	NW 16	0.75 (19)	0.065 (1.7)	100314301	
	NW 25	1.00 (25)	0.065 (1.7)	100314303	
	NW 40	1.50 (38)	0.065 (1.7)	100314305	
	NW 50	2.00 (51)	0.065 (1.7)	100314306	
	NW 80	3.00 (76)	0.065 (1.7)	100764508	
	NW 100	4.00 (102)	0.065 (1.7)	100764510	
	NW 100	4.00 (102)	0.083 (2.1)	100764511	

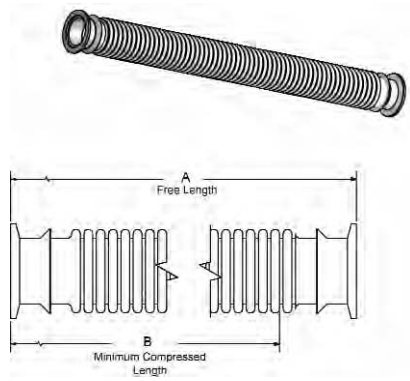
- Tube ends deburred
- Stainless Steel
- Add \$50.00 per cut to the per foot price
- Lengths are cut to customer specifications

ISO-KF Bellows Section		in./ (mm)						
	Flange Size (ISO)	Static Bend Radius	Hose Wall	A	B	Spring Rate	Part Number	Price
	NW 16	1 1/8"	.006 (0.15)	3.94 (100)	3.07 (78)	56 lb/in	100314911	
	NW 25	1 3/8"	.006 (0.15)	3.94 (100)	3.07 (78)	44 lb/in	100314913	
	NW 40	2 1/2"	.006 (0.15)	3.94 (100)	2.93 (74)	32 lb/in	100314915	
	NW 50	3 1/4"	.006 (0.15)	3.94 (100)	3.11 (79)	32 lb/in	100314916	

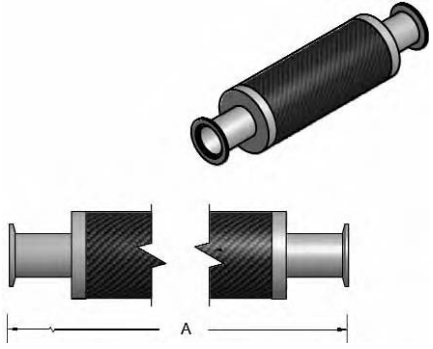
- Stainless Steel Type 321

ISO-KF Thick Wall Metal Hose		in./ (mm)					
	Flange Size (ISO)	Static Bend Radius	Hose Wall	A	Spring Rate	Part Number	Price
	NW 16	2 1/8"	.012 (0.30)	9.84 (250)	256 lb/in	100315901	
	NW 16	2 1/8"	.012 (0.30)	19.69 (500)	128 lb/in	100316001	
	NW 16	2 1/8"	.012 (0.30)	39.40 (1000)	64 lb/in	100316111	
	NW 25	2 7/8"	.012 (0.30)	9.84 (250)	224 lb/in	100315903	
	NW 25	2 7/8"	.012 (0.30)	19.69 (500)	112 lb/in	100316003	
	NW 25	2 7/8"	.012 (0.30)	39.40 (1000)	56 lb/in	100316113	
	NW 40	3 1/2"	.012 (0.30)	9.84 (250)	220 lb/in	100315905	
	NW 40	3 1/2"	.012 (0.30)	19.69 (500)	110 lb/in	100316005	
	NW 40	3 1/2"	.012 (0.30)	39.40 (1000)	55 lb/in	100316115	
	NW 50	5 1/4"	.012 (0.30)	9.84 (250)	220 lb/in	100315906	
	NW 50	5 1/4"	.012 (0.30)	19.69 (500)	110 lb/in	100316006	
	NW 50	5 1/4"	.012 (0.30)	39.40 (1000)	55 lb/in	100316116	

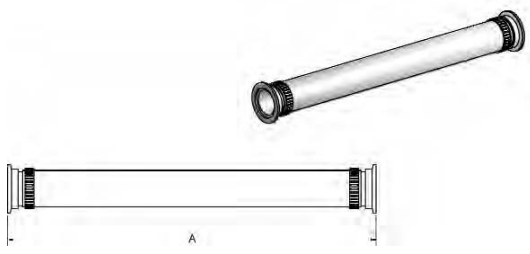
- Stainless Steel
- Unsheathed
- Butt Welded
- Special Lengths to Order
- Thick wall hose static bend radius is to point of permanent deformation

ISO-KF Thin Wall Metal Hose		in./ (mm)							
		Flange Size (ISO)	Static Bend Radius	Hose Wall	A	B	Spring Rate	Part Number	Price
		NW 16	1 ⁵ / ₈ "	.006 (0.15)	9.84 (250)	6.41 (163)	27 lb/in	100317411	
		NW 16	1 ⁵ / ₈ "	.006 (0.15)	12.02 (305)	7.82 (199)	21 lb/in	100319805	
		NW 16	1 ⁵ / ₈ "	.006 (0.15)	19.69 (500)	12.30 (313)	12 lb/in	100317421	
		NW 16	1 ⁵ / ₈ "	.006 (0.15)	24.09 (612)	18.12 (460)	9 lb/in	100319808	
		NW 16	1 ⁵ / ₈ "	.006 (0.15)	39.40 (1000)	24.10 (613)	5.8 lb/in	100317441	
		NW 25	1 ³ / ₈ "	.006 (0.15)	9.84 (250)	6.41 (163)	16 lb/in	100317413	
		NW 25	1 ³ / ₈ "	.006 (0.15)	11.99 (305)	7.82 (199)	14 lb/in	100319806	
		NW 25	1 ³ / ₈ "	.006 (0.15)	19.69 (500)	12.30 (313)	7.3 lb/in	100317423	
		NW 25	1 ³ / ₈ "	.006 (0.15)	24.00 (610)	18.12 (460)	6.5 lb/in	100319809	
		NW 25	1 ³ / ₈ "	.006 (0.15)	39.40 (1000)	24.10 (613)	3.4 lb/in	100317443	
		NW 40	2 ¹ / ₂ "	.006 (0.15)	9.84 (250)	6.23 (158)	8.6 lb/in	100317415	
		NW 40	2 ¹ / ₂ "	.006 (0.15)	12.12 (308)	7.88 (200)	7 lb/in	100319807	
		NW 40	2 ¹ / ₂ "	.006 (0.15)	19.69 (500)	11.70 (297)	3.9 lb/in	100317425	
		NW 40	2 ¹ / ₂ "	.006 (0.15)	24.05 (611)	18.12 (460)	3 lb/in	100319810	
		NW 40	2 ¹ / ₂ "	.006 (0.15)	39.40 (1000)	22.50 (571)	1.9 lb/in	100317445	
		NW 50	3 ¹ / ₄ "	.006 (0.15)	9.84 (250)	7.05 (179)	13 lb/in	100317416	
		NW 50	3 ¹ / ₄ "	.006 (0.15)	11.93 (303)	8.64 (219)	12 lb/in	100319817	
		NW 50	3 ¹ / ₄ "	.006 (0.15)	19.69 (500)	13.50 (342)	5.9 lb/in	100317426	
		NW 50	3 ¹ / ₄ "	.006 (0.15)	24.08 (612)	18.12 (460)	5 lb/in	100319811	
		NW 50	3 ¹ / ₄ "	.006 (0.15)	39.40 (1000)	26.30 (667)	2.9 lb/in	100317446	

- Stainless Steel
- Unsheathed
- Butt Welded
- Special Lengths to Order

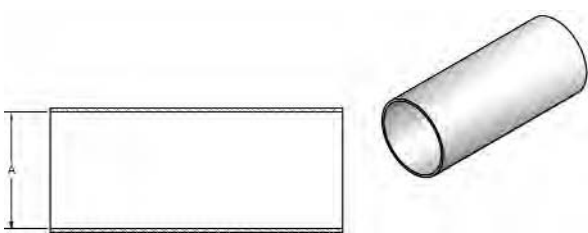
ISO-KF Braided Metal Hose		in./ (mm)				
		Flange Size (ISO)	Static Bend Radius	A	Part Number	Price
		NW 16	2 ¹ / ₂ "	10.23 (259)	100313201	
		NW 16	2 ¹ / ₂ "	20.23 (514)	100313301	
		NW 16	2 ¹ / ₂ "	40.23 (1022)	100313401	
		NW 25	3"	10.27 (261)	100313203	
		NW 25	3"	20.27 (515)	100313303	
		NW 25	3"	40.27 (1023)	100313403	
		NW 40	5"	10.28 (261)	100313205	
		NW 40	5"	20.28 (515)	100313305	
		NW 40	5"	40.28 (1023)	100313405	
		NW 50	6"	10.53 (268)	100313206	
		NW 50	6"	20.53 (522)	100313306	
		NW 50	6"	40.53 (1030)	100313406	

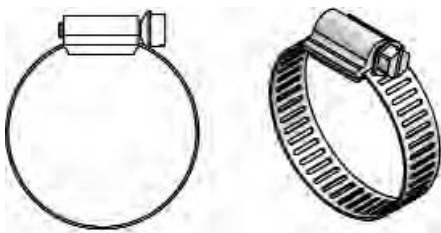
- Ideal for rough pumping lines
- Stainless Steel
- Flexible, yet resistant to contraction

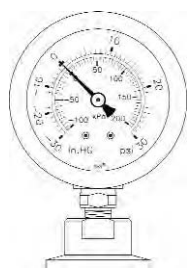
ISO-KF PVC Tubing, Flanged		in./ (mm)			
		Flange Size (ISO)	A	Part Number	Price
		NW 10	19.69 (500)	100316500	
		NW 10	39.40 (1000)	100316510	
		NW 16	19.69 (500)	100316501	
		NW 16	39.40 (1000)	100316511	
		NW 25	19.69 (500)	100316503	
		NW 25	39.40 (1000)	100316513	
		NW 40	19.69 (500)	100316505	
		NW 40	39.40 (1000)	100316515	
		NW 50	19.69 (500)	100316506	
		NW 50	39.40 (1000)	100316516	

- Flanges, Stainless Steel Type 304
- Hose Clamped on Flange
- Good for exhaust Lines
- Special Lengths on Request
- Wire molded in tube wall for reinforcement



PVC Hose		in./ (mm)		
	Flange Size (ISO)	A	Part Number	Price
	NW 10	0.50 (13)	100317500	
	NW 16	0.75 (19)	100317501	
	NW 25	1.00 (25)	100317503	
	NW 40	1.50 (38)	100317505	
	NW 50	2.00 (51)	100317506	
<ul style="list-style-type: none"> • Cut to length. Add the length (in feet) to the end of the part number. For example, a 6-foot long piece of the 2.0" OD tube would be 100317506-6. • Good for exhaust lines • Wire molded in tube wall for reinforcement • Larger OD PVC has limited flexibility in short lengths 				

PVC Hose Clamps		in./ (mm)		
	Flange Size (ISO)	Hose Size	Part Number	Price
	NW 10	1/2"	100000797	
	NW 16	3/4"	100000935	
	NW 25	1"	100000936	
	NW 40	1 1/2"	100000937	
	NW 50	2"	100000938	

Bourdon Vacuum/Pressure Gauge		in./ (mm)	
	Flange Size (ISO)	Part Number	Price
	NW 10	100318000	
	NW 16	100318001	
	NW 25	100318003	
	NW 40	100318005	
	NW 50	100318006	
<ul style="list-style-type: none"> • Stainless steel tube and connections • 30" Hg - 30 psig • Easy to read dial 			

Flange Protector Caps		in./ (mm)	
<ul style="list-style-type: none"> • Protects Flange Faces • Plastic 	Flange Size (ISO)	Part Number	Price
	NW 16	100310001	
	NW 25	100310003	
	NW 40	100310005	
	NW 50	100310006	



Numerical Listing

100000797	PVC Hose Clamp, NW 10, 1/2"	100311603	Flange, Blank-Off, NW 25, Aluminum
100000935	PVC Hose Clamp, NW 16, 3/4"	100311605	Flange, Blank-Off, NW 40, Aluminum
100000936	PVC Hose Clamp, NW 25 1"	100311606	Flange, Blank-Off, NW 50, Aluminum
100000937	PVC Hose Clamp, NW 40 1 1/2"		
100000938	PVC Hose Clamp, NW 50 2"	100311700	Flange, Blank-Off, NW 10, 304 Stainless Steel
		100311701	Flange, Blank-Off, NW 16, 304 Stainless Steel
100001380	Seal, ASA O-ring, 2-231, 1 1/2", Viton	100311703	Flange, Blank-Off, NW 25, 304 Stainless Steel
100001381	Seal, Ball Socket O-Ring, 2-232, 75/50, Viton	100311705	Flange, Blank-Off, NW 40, 304 Stainless Steel
100001654	Seal, Ball Socket O-Ring, 2-224, 50/30, Viton	100311706	Flange, Blank-Off, NW 50, 304 Stainless Steel
100006098	Seal, ASA O-ring, 2-237, 2", Viton		
100006099	Seal, ASA O-ring, 2-247, 3", Viton	100311801	Adapter, Hose , NW 16 to 5/8" or 3/4", Aluminum
		100311803	Adapter, Hose , NW 25 to 3/4" or 7/8", Aluminum
100310001	Flange Protector Caps, NW 16, Plastic	100311805	Adapter, Hose , NW 40 to 1 1/2" or 1 5/8", Aluminum
100310003	Flange Protector Caps, NW 25, Plastic	100311806	Adapter, Hose , NW 50 to 1 1/2" or 1 5/8", Aluminum
100310005	Flange Protector Caps, NW 40, Plastic	100311811	Adapter, Hose , NW 16 to 1/2" or 5/8", Aluminum
100310006	Flange Protector Caps, NW 50, Plastic		
		100312000	Adapter Pipe, NW 10 to 1/8" NPT, female, Aluminum
100310101	Flange, Short Weld Stub, NW 16, Aluminum	100312001	Adapter Pipe, NW 16 to 1/8" NPT, female, Aluminum
100310103	Flange, Short Weld Stub, NW 25, Aluminum	100312003	Adapter Pipe, NW 25 to 1/8" NPT, female, Aluminum
100310105	Flange, Short Weld Stub, NW 40, Aluminum	100312005	Adapter Pipe, NW 40 to 1/8" NPT, female, Aluminum
100310106	Flange, Short Weld Stub, NW 50, Aluminum	100312006	Adapter Pipe, NW 50 to 1/8" NPT, female, Aluminum
100310111	Flange, Short Weld Stub, NW 16, Aluminum		
		100312100	Adapter Pipe, NW 10 to 1/8" NPT, female, SS
100310201	Flange, Long Weld Stub, NW 16, Aluminum	100312101	Adapter Pipe, NW 16 to 1/8" NPT, female, SS
100310203	Flange, Long Weld Stub, NW 25, Aluminum	100312103	Adapter Pipe, NW 25 to 1/8" NPT, female, SS
100310205	Flange, Long Weld Stub, NW 40, Aluminum	100312105	Adapter Pipe, NW 40 to 1/8" NPT, female, SS
100310206	Flange, Long Weld Stub, NW 50, Aluminum	100312106	Adapter Pipe, NW 50 to 1/8" NPT, female, SS
100310211	Flange, Long Weld Stub, NW 16, Aluminum		
		100312200	Adapter Pipe, NW 10 to 1/4" NPT-F, Aluminum
100310300	Flange, Short Weld Stub, NW 10, 304 SS	100312201	Adapter Pipe, NW 16 to 1/4" NPT-F, Aluminum
100310301	Flange, Short Weld Stub, NW 16, 304 SS	100312203	Adapter Pipe, NW 25 to 1/4" NPT-F, Aluminum
100310303	Flange, Short Weld Stub, NW 25, 304 SS	100312205	Adapter Pipe, NW 40 to 1/4" NPT-F, Aluminum
100310305	Flange, Short Weld Stub, NW 40, 304 SS	100312206	Adapter Pipe, NW 50 to 1/4" NPT-F, Aluminum
100310306	Flange, Short Weld Stub, NW 50, 304 SS		
100310311	Flange, Short Weld Stub, NW 16, 304 SS	100312300	Adapter Pipe, NW 10 to 1/4" NPT-F, SS
		100312301	Adapter Pipe, NW 16 to 1/4" NPT-F, SS
100311100	Flange, Unbored, NW 10, Aluminum	100312303	Adapter Pipe, NW 25 to 1/4" NPT-F, SS
100311101	Flange, Unbored, NW 16, Aluminum	100312305	Adapter Pipe, NW 40 to 1/4" NPT-F, SS
100311103	Flange, Unbored, NW 25, Aluminum	100312306	Adapter Pipe, NW 50 to 1/4" NPT-F, SS
100311105	Flange, Unbored, NW 40, Aluminum		
100311106	Flange, Unbored, NW 50, Aluminum	100312500	Centering Ring Assy, NW 10, Alum./Buna-N O-ring
		100312501	Centering Ring Assy, NW 16, Alum./Buna-N O-ring
100311300	Flange, Unbored, NW 10, 304 Stainless Steel	100312503	Centering Ring Assy, NW 25, Alum./Buna-N O-ring
100311301	Flange, Unbored, NW 16, 304 Stainless Steel	100312505	Centering Ring Assy, NW 40, Alum./Buna-N O-ring
100311303	Flange, Unbored, NW 25, 304 Stainless Steel	100312506	Centering Ring Assy, NW 50, Alum./Buna-N O-ring
100311305	Flange, Unbored, NW 40, 304 Stainless Steel		
100311306	Flange, Unbored, NW 50, 304 Stainless Steel	100312600	Centering Ring Assy, NW 10, Alum./Viton O-ring
		100312601	Centering Ring Assy, NW 16, Alum./Viton O-ring
100311401	Flange, Unbored, NW 16, Brass	100312603	Centering Ring Assy, NW 25, Alum./Viton O-ring
100311403	Flange, Unbored, NW 25, Brass	100312605	Centering Ring Assy, NW 40, Alum./Viton O-ring
100311405	Flange, Unbored, NW 40, Brass	100312606	Centering Ring Assy, NW 50, Alum./Viton O-ring
100311406	Flange, Unbored, NW 50, Brass		
		100312700	Centering Ring Assy, NW 10, SS/Viton O-ring
100311600	Flange, Blank-Off, NW 10, Aluminum	100312701	Centering Ring Assy, NW 16, SS/Viton O-ring
100311601	Flange, Blank-Off, NW 16, Aluminum	100312703	Centering Ring Assy, NW 25, SS/Viton O-ring



100312705	Centering Ring Assy, NW 40, SS/Viton O-ring	100314401	90° Elbow, Smooth Radius, NW 16, 304 SS
100312706	Centering Ring Assy, NW 50, SS/Viton O-ring	100314403	90° Elbow, Smooth Radius, NW 25, 304 SS
		100314415	90° Elbow, Long Radius, NW 40, 304 SS
100312800	Centering Ring Assy, NW 10, SS/Buna-N O-ring	100314416	90° Elbow, Long Radius, NW 50, 304 SS
100312801	Centering Ring Assy, NW 16, SS/Buna-N O-ring	100314505	90° Elbow, Smooth Radius, NW 40, 304 SS
100312803	Centering Ring Assy, NW 25, SS/Buna-N O-ring	100314506	90° Elbow, Smooth Radius, NW 50, 304 SS
100312805	Centering Ring Assy, NW 40, SS/Buna-N O-ring		
100312806	Centering Ring Assy, NW 50, SS/Buna-N O-ring	100314601	Tee, NW 16, 304 Stainless Steel
		100314603	Tee, NW 25, 304 Stainless Steel
100312901	Wing Nut Clamp, NW 16, fits 16/10, Aluminum	100314605	Tee, NW 40, 304 Stainless Steel
100312903	Wing Nut Clamp, NW 25, fits 25/20, Aluminum	100314606	Tee, NW 50, 304 Stainless Steel
100312905	Wing Nut Clamp, NW 40, fits 40/32, Aluminum		
100312906	Wing Nut Clamp, NW 50, fits 50, Aluminum	100314801	Cross, NW 16, 304 Stainless Steel
		100314803	Cross, NW 25, 304 Stainless Steel
100313201	Braided Metal Hose, 10", NW 16, Stainless Steel	100314805	Cross, NW 40, 304 Stainless Steel
100313203	Braided Metal Hose, 10", NW 25, Stainless Steel	100314806	Cross, NW 50, 304 Stainless Steel
100313205	Braided Metal Hose, 10", NW 40, Stainless Steel		
100313206	Braided Metal Hose, 10", NW 50, Stainless Steel	100314911	Bellows, NW 16, Stainless Steel
100313301	Braided Metal Hose, 20", NW 16, Stainless Steel	100314913	Bellows, NW 25, Stainless Steel
100313303	Braided Metal Hose, 20", NW 25, Stainless Steel	100314915	Bellows, NW 40, Stainless Steel
100313305	Braided Metal Hose, 20", NW 40, Stainless Steel	100314916	Bellows, NW 50, Stainless Steel
100313306	Braided Metal Hose, 20", NW 50, Stainless Steel		
100313401	Braided Metal Hose, 40", NW 16, Stainless Steel	100315101	Straight Section, NW 16, 304 Stainless Steel
100313403	Braided Metal Hose, 40", NW 25, Stainless Steel	100315103	Straight Section, NW 25, 304 Stainless Steel
100313405	Braided Metal Hose, 40", NW 40, Stainless Steel	100315105	Straight Section, NW 40, 304 Stainless Steel
100313406	Braided Metal Hose, 40", NW 50, Stainless Steel	100315106	Straight Section, NW 50, 304 Stainless Steel
		100315111	Straight Section, NW 16, 304 Stainless Steel
100313511	Conical Reducer, NW 16 to NW 25, Aluminum	100315113	Straight Section, NW 25, 304 Stainless Steel
100313512	Conical Reducer, NW 16 to NW 40, Aluminum	100315115	Straight Section, NW 40, 304 Stainless Steel
100313513	Conical Reducer, NW 16 to NW 50, Aluminum	100315116	Straight Section, NW 50, 304 Stainless Steel
100313514	Conical Reducer, NW 25 to NW 40, Aluminum		
100313515	Conical Reducer, NW 25 to NW 50, Aluminum	100315301	Flange, Braze Socket, NW 16, Brass
100313516	Conical Reducer, NW 40 to NW 50, Aluminum	100315303	Flange, Braze Socket, NW 25, Brass
		100315305	Flange, Braze Socket, NW 40, Brass
100313711	Conical Reducer, NW 16 to NW 25, 304 SS	100315306	Flange, Braze Socket, NW 50, Brass
100313712	Conical Reducer, NW 16 to NW 40, 304 SS	100315311	Flange, Braze Socket, NW 16, Brass
100313713	Conical Reducer, NW 16 to NW 50, 304 SS	100315313	Flange, Braze Socket, NW 25, Brass
100313714	Conical Reducer, NW 25 to NW 40, 304 SS	100315316	Flange, Braze Socket, NW 50, Brass
100313715	Conical Reducer, NW 25 to NW 50, 304 SS	100315321	Flange, Braze Socket, NW 16, Brass
100313716	Conical Reducer, NW 40 to NW 50, 304 SS		
		100315401	Flange, Braze Stub, NW 16, Brass
100313900	O-Ring, standard size 2-312, NW 10, Buna-N	100315403	Flange, Braze Stub, NW 25, Brass
100313901	O-Ring, standard size 2-314, NW 16, Buna-N	100315405	Flange, Braze Stub, NW 40, Brass
100313903	O-Ring, standard size 2-320, NW 25, Buna-N	100315406	Flange, Braze Stub, NW 50, Brass
100313905	O-Ring, standard size 2-326, NW 40, Buna-N	100315411	Flange, Braze Stub, NW 16, Brass
100313906	O-Ring, standard size 2-330, NW 50, Buna-N	100315413	Flange, Braze Stub, NW 25, Brass
		100315416	Flange, Braze Stub, NW 50, Brass
100314000	O-Ring, standard size 2-312, NW 10, Viton®	100315421	Flange, Braze Stub, NW 16, Brass
100314001	O-Ring, standard size 2-314, NW 16, Viton®		
100314003	O-Ring, standard size 2-320, NW 25, Viton®	100315501	Flange, Blank-Off, NW 16, Brass
100314005	O-Ring, standard size 2-326, NW 40, Viton®	100315503	Flange, Blank-Off, NW 25, Brass
100314006	O-Ring, standard size 2-330, NW 50, Viton®	100315505	Flange, Blank-Off, NW 40, Brass
		100315506	Flange, Blank-Off, NW 50, Brass
100314300	Tube (price per foot), NW 10, 0.50" O.D., SS		
100314301	Tube (price per foot), NW 16, 0.75" O.D., SS	100315601	Adapter, ISO-KF to CF, NW 16 to 1-1/3" CF, SS
100314303	Tube (price per foot), NW 25, 1.00" O.D., SS	100315603	Adapter, ISO-KF to CF, NW 25 to 2-3/4" CF, SS
100314305	Tube (price per foot), NW 40, 1.50" O.D., SS	100315605	Adapter, ISO-KF to CF, NW 40 to 2-3/4" CF, SS
100314306	Tube (price per foot), NW 50, 2" O.D., SS	100315606	Adapter, ISO-KF to CF, NW 50 to 4-1/2" CF, SS
		100315611	Adapter, ISO-KF to CF, NW 16 to 2-3/4" CF, SS

100315700	Flange, Long Weld Stub, NW 10, 304 SS	100316615	Adapter, ISO-KF to Welch Pump, NW 40, 304 SS
100315701	Flange, Long Weld Stub, NW 16, 304 SS	100316621	Adapter, ISO-KF to Welch Pump, NW 16, 304 SS
100315703	Flange, Long Weld Stub, NW 25, 304 SS		
100315705	Flange, Long Weld Stub, NW 40, 304 SS	100316705	Adapter, NW 40 to 2" ASA, w/out groove, 304 SS
100315706	Flange, Long Weld Stub, NW 50, 304 SS	100316706	Adapter, NW 50 to 2" ASA, w/out groove, 304 SS
100315711	Flange, Long Weld Stub, NW 16, 304 SS	100316715	Adapter, NW 40 to 3" ASA, w/out groove, 304 SS
		100316716	Adapter, NW 50 to 3" ASA, w/out groove, 304 SS
100315801	Seal Assembly, NW 16 to NW 10, Alum./Buna		
100315803	Seal Assembly, NW 25 to NW 20, Alum./Buna	100316725	Adapter, NW 40 to 2" ASA with groove, 304 SS
100315805	Seal Assembly, NW 40 to NW 32, Alum./Buna	100316726	Adapter, NW 50 to 2" ASA with groove, 304 SS
		100316735	Adapter, NW 40 to 3" ASA with groove, 304 SS
100315811	Seal Assembly, NW 16 to NW 10, Alum./Viton O-ring	100316736	Adapter, NW 50 to 3" ASA with groove, 304 SS
100315813	Seal Assembly, NW 25 to NW 20, Alum./Viton		
100315815	Seal Assembly, NW 40 to NW 32, Alum./Viton	100316755	Adapter, NW 40 to 1.5" ASA, w/out groove, 304 SS
		100316756	Adapter, NW 50 to 1.5" ASA, w/out groove, 304 SS
100315821	Seal Assembly, NW 16 to NW 10, SS/Viton		
100315823	Seal Assembly, NW 25 to NW 20, SS/Viton	100316775	Adapter, NW 40 to 1.5" ASA with groove, 304 SS
100315825	Seal Assembly, NW 40 to NW 32, SS/Viton	100316776	Adapter, NW 50 to 1.5" ASA with groove, 304 SS
100315901	Metal Hose, Thick Wall, 10", NW 16, SS	100316801	Adapter, NW 16 to 1/8" NPT-M, 304 SS
100315903	Metal Hose, Thick Wall, 10", NW 25, SS	100316803	Adapter, NW 25 to 1/8" NPT-M, 304 SS
100315905	Metal Hose, Thick Wall, 10", NW 40, SS	100316805	Adapter, NW 40 to 1/4" NPT-M, 304 SS
100315906	Metal Hose, Thick Wall, 10", NW 50, SS	100316806	Adapter, NW 50 to 1/4" NPT-M, 304 SS
100316001	Metal Hose, Thick Wall, 20", NW 16, SS	100316811	Adapter, NW 16 to 1/4" NPT-M, 304 SS
100316003	Metal Hose, Thick Wall, 20", NW 25, SS	100316813	Adapter, NW 25 to 1/4" NPT-M, 304 SS
100316005	Metal Hose, Thick Wall, 20", NW 40, SS	100316815	Adapter, NW 40 to 1/2" NPT-M, 304 SS
100316006	Metal Hose, Thick Wall, 20", NW 50, SS	100316816	Adapter, NW 50 to 1/2" NPT-M, 304 SS
100316111	Metal Hose, Thick Wall, 40", NW 16, SS	100316823	Adapter, NW 25 to 1/2" NPT-M, 304 SS
100316113	Metal Hose, Thick Wall, 40", NW 25, SS	100316825	Adapter, NW 40 to 3/4" NPT-M, 304 SS
100316115	Metal Hose, Thick Wall, 40", NW 40, SS	100316826	Adapter, NW 50 to 3/4" NPT-M, 304 SS
100316116	Metal Hose, Thick Wall, 40", NW 50, SS	100316833	Adapter, NW 25 to 3/4" NPT-M, 304 SS
		100316835	Adapter, NW 40 to 1" NPT-M, 304 SS
100316300	Overpressure Ring, NW 10, 304 SS/Silicone	100316836	Adapter, NW 50 to 1" NPT-M, 304 SS
100316301	Overpressure Ring, NW 16, 304 SS/Silicone	100316844	Adapter, NW 40 to 1.25" NPT-M, 304 SS
100316303	Overpressure Ring, NW 25, 304 SS/Silicone	100316845	Adapter, NW 40 to 1.5" NPT-M, 304 SS
100316305	Overpressure Ring, NW 40, 304 SS/Silicone	100316846	Adapter, NW 50 to 2" NPT-M, 304 SS
100316306	Overpressure Ring, NW 50, 304 SS/Silicone		
		100316903	Adapter Tubing, NW 25 to 1/2", SS, Viton O-Ring
100316400	Adapter, NW 10 to 1/2" PVC Tubing, 304 SS	100316905	Adapter Tubing, NW 40 to 1/2", SS, Viton O-Ring
100316401	Adapter, NW 16 to 3/4" PVC Tubing, 304 SS	100316906	Adapter Tubing, NW 50 to 1 1/2", SS, Viton O-Ring
100316403	Adapter, NW 25 to 1" PVC Tubing, 304 SS	100316910	Adapter Tubing, NW 10 to 1/2", SS, Viton O-Ring
100316405	Adapter, NW 40 to 1 1/2" PVC Tubing, 304 SS	100316911	Adapter Tubing, NW 16 to 1/4", SS, Viton O-Ring
100316406	Adapter, NW 50 to 2" PVC Tubing, 304 SS	100316913	Adapter Tubing, NW 25 to 3/4", SS, Viton O-Ring
100316411	Adapter, NW 16 to 1/2" PVC Tubing, 304 SS	100316915	Adapter Tubing, NW 40 to 3/4", SS, Viton O-Ring
		100316916	Adapter Tubing, NW 50 to 2", SS, Viton O-Ring
100316500	PVC Tubing, Flanged, 20", NW 10, 304 SS	100316921	Adapter Tubing, NW 16 to 1/2", SS, Viton O-Ring
100316501	PVC Tubing, Flanged, 20", NW 16, 304 SS	100316923	Adapter Tubing, NW 25 to 1", SS, Viton O-Ring
100316503	PVC Tubing, Flanged, 20", NW 25, 304 SS	100316925	Adapter Tubing, NW 40 to 1", SS, Viton O-Ring
100316505	PVC Tubing, Flanged, 20", NW 40, 304 SS	100316926	Adapter Tubing, NW 50 to 3/4", SS, Viton O-Ring
100316506	PVC Tubing, Flanged, 20", NW 50, 304 SS	100316931	Adapter Tubing, NW 16 to 3/4", SS, Viton O-Ring
100316510	PVC Tubing, Flanged, 40", NW 10, 304 SS	100316935	Adapter Tubing, NW 40 to 1 1/2", SS, Viton O-Ring
100316511	PVC Tubing, Flanged, 40", NW 16, 304 SS	100316936	Adapter Tubing, NW 50 to 1", SS, Viton O-Ring
100316513	PVC Tubing, Flanged, 40", NW 25, 304 SS	100316945	Adapter Tubing, NW 40 to 1 1/8", SS, Viton O-Ring
100316515	PVC Tubing, Flanged, 40", NW 40, 304 SS	100316946	Adapter Tubing, NW 50 to 1 1/8", SS, Viton O-Ring
100316516	PVC Tubing, Flanged, 40", NW 50, 304 SS		
		100317203	Feedthrough, Liquid/Gas Single Tube, NW 25
100316601	Adapter, ISO-KF to Welch Pump, NW 16, 304 SS	100317205	Feedthrough, Liquid/Gas Single Tube, NW 40
100316603	Adapter, ISO-KF to Welch Pump, NW 25, 304 SS	100317213	Feedthrough, Liquid/Gas Double Tube, NW 25
100316605	Adapter, ISO-KF to Welch Pump, NW 40, 304 SS	100317215	Feedthrough, Liquid/Gas Double Tube, NW 40



100317300	Centering Ring Assy, NW 10, SS/Silicone O-ring	100318511	Adapter, Pyrex Tube, NW 16 to 3/4" OD
100317301	Centering Ring Assy, NW 16, SS/Silicone O-ring	100318601	Seal Assembly w/ Screen, NW 16, SS/Viton O-ring
100317303	Centering Ring Assy, NW 25, SS/Silicone O-ring	100318603	Seal Assembly w/ Screen, NW 25, SS/Viton O-ring
100317305	Centering Ring Assy, NW 40, SS/Silicone O-ring	100318605	Seal Assembly w/ Screen, NW 40, SS/Viton O-ring
100317306	Centering Ring Assy, NW 50, SS/Silicone O-ring	100318606	Seal Assembly w/ Screen, NW 50, SS/Viton O-ring
100317310	O-Ring, standard size 2-312, NW 10, Silicone 604	100318701	45° Elbow, Smooth Radius, NW 16, 304 SS
100317311	O-Ring, standard size 2-314, NW 16, Silicone 604	100318703	45° Elbow, Smooth Radius, NW 25, 304 SS
100317313	O-Ring, standard size 2-320, NW 25, Silicone 604	100318705	45° Elbow, Smooth Radius, NW 40, 304 SS
100317315	O-Ring, standard size 2-326, NW 40, Silicone 604	100318706	45° Elbow, Smooth Radius, NW 50, 304 SS
100317316	O-Ring, standard size 2-330, NW 50, Silicone 604		
100317411	Metal Hose, Thin Wall, 10", NW 16, SS	100318801	Toggle Clamp, NW 16, fits 16/10, Aluminum
100317413	Metal Hose, Thin Wall, 10", NW 25, SS	100318803	Toggle Clamp, NW 25, fits 25/20, Aluminum
100317415	Metal Hose, Thin Wall, 10", NW 40, SS	100318805	Toggle Clamp, NW 40, fits 40/32, Aluminum
100317416	Metal Hose, Thin Wall, 10", NW 50, SS	100318806	Toggle Clamp, NW 50, fits 50, Aluminum
100317421	Metal Hose, Thin Wall, 20", NW 16, SS	100318801-L	Toggle Clamp w/ Lanyard, NW 16, 16/10, Aluminum
100317423	Metal Hose, Thin Wall, 20", NW 25, SS	100318803-L	Toggle Clamp w/ Lanyard, NW 25, 25/20, Aluminum
100317425	Metal Hose, Thin Wall, 20", NW 40, SS	100318805-L	Toggle Clamp w/ Lanyard, NW 40, 40/32, Aluminum
100317426	Metal Hose, Thin Wall, 20", NW 50, SS	100318806-L	Toggle Clamp w/ Lanyard, NW 50, 50, Aluminum
100317441	Metal Hose, Thin Wall, 40", NW 16, SS		
100317443	Metal Hose, Thin Wall, 40", NW 25, SS	100318901	Bulkhead Clamp, 6 Bolts, NW 16, Aluminum
100317445	Metal Hose, Thin Wall, 40", NW 40, SS	100318903	Bulkhead Clamp, 6 Bolts, NW 25, Aluminum
100317446	Metal Hose, Thin Wall, 40", NW 50, SS	100318905	Bulkhead Clamp, 6 Bolts, NW 40, Aluminum
		100318906	Bulkhead Clamp, 8 Bolts, NW 50, Aluminum
100317500	PVC Hose (price per foot), NW 10, PVC		
100317501	PVC Hose (price per foot), NW 16, PVC	100319005	Bonded Viewport, NW 40, SS, Borosilicate Glass
100317503	PVC Hose (price per foot), NW 25, PVC	100319006	Bonded Viewport, NW 50, SS, Borosilicate Glass
100317505	PVC Hose (price per foot), NW 40, PVC		
100317506	PVC Hose (price per foot), NW 50, PVC		
100317903	Feedthrough, Base Plate, NW 25, SS, Viton O-ring	100319111	Adapter, VCR-M, NW 16 to 4 VCR, SS
100317905	Feedthrough, Base Plate, NW 40, SS, Viton O-ring	100319113	Adapter, VCR-M, NW 25 to 4 VCR, SS
		100319115	Adapter, VCR-M, NW 40 to 4 VCR, SS
100318000	Bourdon Vacuum/Pressure Gauge , NW 10	100319116	Adapter, VCR-M, NW 50 to 4 VCR, SS
100318001	Bourdon Vacuum/Pressure Gauge , NW 16	100319121	Adapter, VCR-M, NW 16 to 8 VCR, SS
100318003	Bourdon Vacuum/Pressure Gauge , NW 25	100319123	Adapter, VCR-M, NW 25 to 8 VCR, SS
100318005	Bourdon Vacuum/Pressure Gauge , NW 40	100319125	Adapter, VCR-M, NW 40 to 8 VCR, SS
100318006	Bourdon Vacuum/Pressure Gauge , NW 50	100319126	Adapter, VCR-M, NW 50 to 8 VCR, SS
		100319133	Adapter, VCR-M, NW 25 to 12 VCR, SS
100318205	Adapter, Ball Socket w/out groove, NW 40 to 50/30	100319135	Adapter, VCR-M, NW 40 to 12 VCR, SS
100318206	Adapter, Ball Socket w/out groove, NW 50 to 75/50	100319136	Adapter, VCR-M, NW 50 to 12 VCR, SS
100318215	Adapter, Ball Socket w/ groove, NW 40 to 50/30	100319211	Adapter, VCR-F, NW 16 to 4 VCR, SS
100318216	Adapter, Ball Socket, w/ groove, NW 50 to 75/50		
		100319213	Adapter, VCR-F, NW 25 to 4 VCR, SS
100318301	Weld Socket Flange, NW 16, 304 SS	100319215	Adapter, VCR-F, NW 40 to 4 VCR, SS
100318303	Weld Socket Flange, NW 25, 304 SS	100319216	Adapter, VCR-F, NW 50 to 4 VCR, SS
100318305	Weld Socket Flange, NW 40, 304 SS	100319221	Adapter, VCR-F, NW 16 to 8 VCR, SS
100318306	Weld Socket Flange, NW 50, 304 SS	100319223	Adapter, VCR-F, NW 25 to 8 VCR, SS
100318311	Weld Socket Flange, NW 16, 304 SS	100319225	Adapter, VCR-F, NW 40 to 8 VCR, SS
100318321	Weld Socket Flange, NW 16, 304 SS	100319226	Adapter, VCR-F, NW 50 to 8 VCR, SS
		100319233	Adapter, VCR-F, NW 25 to 12 VCR, SS
100318403	Reducing Tee, NW 25 to NW 16, 304 SS	100319235	Adapter, VCR-F, NW 40 to 12 VCR, SS
100318405	Reducing Tee, NW 40 to NW 16, 304 SS	100319236	Adapter, VCR-F, NW 50 to 12 VCR, SS
100318406	Reducing Tee, NW 50 to NW 16, 304 SS		
		100319301	Adapter Tee, NW 16 to 1/8" NPT-F, Aluminum
100318501	Adapter, Pyrex Tube, NW 16 to 1/2" OD	100319303	Adapter Tee, NW 25 to 1/8" NPT-F, Aluminum
100318503	Adapter, Pyrex Tube, NW 25 to 1" OD	100319305	Adapter Tee, NW 40 to 1/8" NPT-F, Aluminum
100318505	Adapter, Pyrex Tube, NW 40 to 1 1/2" OD	100319306	Adapter Tee, NW 50 to 1/8" NPT-F, Aluminum

100319401	Adapter Tee, NW 16 to 1/8" NPT-F, 304 SS	100319816	Reducing Tee, NW 40 to NW 25, 304 SS
100319403	Adapter Tee, NW 25 to 1/8" NPT-F, 304 SS		
100319405	Adapter Tee, NW 40 to 1/8" NPT-F, 304 SS	100319817	Metal Hose, Thin Wall, 12", NW 50, SS
100319406	Adapter Tee, NW 50 to 1/8" NPT-F, 304 SS		
		100760508	Seal Assembly, NW 80, SS/Viton O-ring
100319501	Adapter Tee, NW 16 to 1/4" NPT-F, Aluminum	100760510	Seal Assembly, NW 100, SS/Viton O-ring
100319503	Adapter Tee, NW 25 to 1/4" NPT-F, Aluminum	100760608	Seal Assembly, NW 80, Aluminum/Viton O-ring
100319505	Adapter Tee, NW 40 to 1/4" NPT-F, Aluminum	100760610	Seal Assembly, NW 100, Aluminum/Viton O-ring
100319506	Adapter Tee, NW 50 to 1/4" NPT-F, Aluminum	100760708	Seal Assembly, NW 80, Aluminum/Buna-N O-ring
		100760710	Seal Assembly, NW 100, Aluminum/Buna-N O-ring
100319601	Adapter Tee, NW 16 to 1/4" NPT-F, 304 SS		
100319603	Adapter Tee, NW 25 to 1/4" NPT-F, 304 SS	100761908	O-Ring, standard size 2-340, NW 80, Buna-N
100319605	Adapter Tee, NW 40 to 1/4" NPT-F, 304 SS	100761910	O-Ring, standard size 2-346, NW 100, Buna-N
100319606	Adapter Tee, NW 50 to 1/4" NPT-F, 304 SS	100762008	O-Ring, standard size 2-340, NW 80, Viton®
100319700	Flange, Blank with Bore, NW 10, 304 SS	100762010	O-Ring, standard size 2-346, NW 100, Viton®
100319701	Flange, Blank with Bore, NW 16, 304 SS	100762606	Step Adapter, NW 63 to NW 40, SS
100319703	Flange, Blank with Bore, NW 25, 304 SS	100762608	Step Adapter, NW 80 to NW 50, SS
100319705	Flange, Blank with Bore, NW 40, 304 SS	100762616	Step Adapter, NW 80 to NW 40, SS
100319706	Flange, Blank with Bore, NW 50, 304 SS	100762617	Step Adapter, NW 63 to NW 50, SS
100319710	Flange, Blank with Bore, NW 10, 304 SS	100762618	Step Adapter, NW 100 to NW 50, SS
100319711	Flange, Blank with Bore, NW 16, 304 SS		
100319713	Flange, Blank with Bore, NW 25, 304 SS	100764508	Tube (price per foot), NW 80, 3" O.D., SS
100319715	Flange, Blank with Bore, NW 40, 304 SS	100764510	Tube (price per foot), NW 100, 4" O.D., SS
100319716	Flange, Blank with Bore, NW 50, 304 SS	100764511	Tube (price per foot), NW 100, 4" O.D., SS
100319720	Flange, Blank with Bore, NW 10, 304 SS		
100319721	Flange, Blank with Bore, NW 16, 304 SS	100765006	Conical Adapter, NW 63 to NW 40, SS
100319723	Flange, Blank with Bore, NW 25, 304 SS	100765008	Conical Adapter, NW 80 to NW 50, SS
100319725	Flange, Blank with Bore, NW 40, 304 SS	100765016	Conical Adapter, NW 80 to NW 40, SS
100319726	Flange, Blank with Bore, NW 50, 304 SS	100765017	Conical Adapter, NW 63 to NW 50, SS
100319731	Flange, Blank with Bore, NW 16, 304 SS	100765018	Conical Adapter, NW 100 to NW 50, SS
100319733	Flange, Blank with Bore, NW 25, 304 SS		
100319735	Flange, Blank with Bore, NW 40, 304 SS	100936523	Overpressure Seal Assy, NW 50, SS/Viton
100319736	Flange, Blank with Bore, NW 50, 304 SS	100936524	Overpressure Seal Assy, NW 40, SS/Viton
100319743	Flange, Blank with Bore, NW 25, 304 SS	100936525	Overpressure Seal Assy, NW 25, SS/Viton
100319745	Flange, Blank with Bore, NW 40, 304 SS		
100319746	Flange, Blank with Bore, NW 50, 304 SS	100993460	Chain Clamp, NW 80, Aluminum
100319755	Flange, Blank with Bore, NW 40, 304 SS	100994717	Chain Clamp, NW 100, Aluminum
100319756	Flange, Blank with Bore, NW 50, 304 SS		
100319766	Flange, Blank with Bore, NW 50, 304 SS		
100319801	Flange, Blank with Bore, NW 80, 304 SS		
100319802	Flange, Blank-Off, NW 80, 304 SS		
100319803	Flange, Blank with Bore, NW 100, 304 SS		
100319804	Flange, Blank-Off, NW 100, 304 SS		
100319805	Metal Hose, Thin Wall, 12", NW 16, SS		
100319806	Metal Hose, Thin Wall, 12", NW 25, SS		
100319807	Metal Hose, Thin Wall, 12", NW 40, SS		
100319808	Metal Hose, Thin Wall, 24", NW 16, SS		
100319809	Metal Hose, Thin Wall, 24", NW 25, SS		
100319810	Metal Hose, Thin Wall, 24", NW 40, SS		
100319811	Metal Hose, Thin Wall, 24", NW 50, SS		
100319812	Adapter, NW 25 to 2 1/8" CF, 304 SS		
100319813	Adapter, NW 50 to 2 3/4" CF, 304 SS		
100319814	Reducing Tee, NW 50 to NW 40, 304 SS		
100319815	Reducing Tee, NW 50 to NW 25, 304 SS		





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