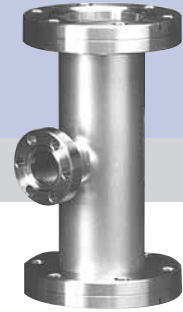


Flanges & Fittings

Section Two



2.1	Chain Clamp Components & Hardware	
2.2	NW Flanges & Fittings	2
2.3	ISO Flanges & Fittings	
2.4	ASA Flanges & Fittings	
2.5	CF Flanges & Fittings	
2.6	Wire Seal Flanges	
2.7	Adapter Fittings	
2.8	Flexible Hoses & Couplings	
2.9	Weld Fittings	

Nor-Cal Products, Inc.
1967 South Oregon Street
Yreka, CA 96097 USA

Tel: **800-824-4166**
or 530-842-4457
Main Fax: 530-842-9130
Sales Fax: 530-841-9189
www.n-c.com



Flanges & Fittings

NW Flange General Information



SPECIFICATIONS

Tube OD sizes: 3/8 to 2 inches (9.53 to 50.8mm)

Materials

Flange: 304 or 316L stainless steel
O-rings: Viton, Buna & silicone

Fittings

Tube finishes: Beadblast standard
(Tumbled & electropolish available)

Fasteners: Wing nut, SureSeal, bulkhead & chain clamps

Vacuum range

Elastomer seal: $\geq 1 \times 10^{-8}$ mbar -High vacuum
Metal seal: $\geq 1 \times 10^{-11}$ mbar - UHV

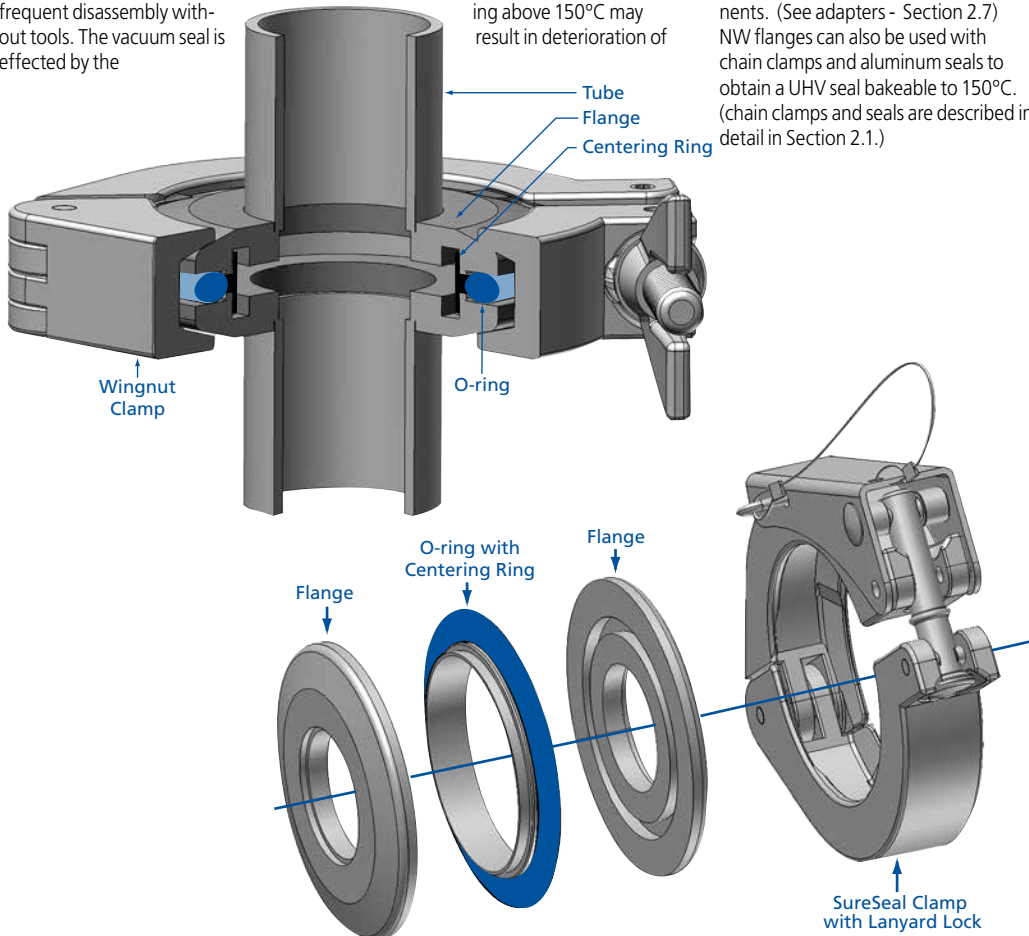
Temperature range

Viton: -20°C to 200°C
Silicone: -50° to 230°C
Buna: -30°C to 110°C
Metal seal: -270°C to 150°C

Nor-Cal NW flanges are designed to ISO 2861 specifications for standard USA tube sizes from 3/8 to 2 inches (9.53 to 50.8mm) OD. They are compatible with other manufacturers' ISO-KF style flanges. NW flanges utilize an aluminum clamp with a single wing nut fastener or a lock-over-center clamp allowing frequent disassembly without tools. The vacuum seal is effected by the

application of uniform pressure from the clamp on the 15° surface of the 304 stainless steel flanges. The mating flange surfaces compress a Viton O-ring held in place by a centering ring. The resultant seal can be used in vacuum applications of up to 10^{-8} mbar and baked to 200°C, however sustained baking above 150°C may result in deterioration of

O-rings. Additionally, NW flanges allow components to be rotated before assembly for ease of component alignment. NW flanges are available on virtually all Nor-Cal components and fittings. Nor-Cal manufactures a full line of NW adapters so you can add to or build an entire system with NW components. (See adapters - Section 2.7) NW flanges can also be used with chain clamps and aluminum seals to obtain a UHV seal bakeable to 150°C. (chain clamps and seals are described in detail in Section 2.1.)



New Products

Trapped Centering Rings



Nor-Cal trapped centering rings for NW flanges feature easy assembly with exact centering and are appropriate for vacuum or pressure by externally supporting the sealing ring. Trapped O-rings are intended for use where pressures range from rough vacuum to above atmosphere. Applications include vacuum pump exhaust lines and abatement tools.

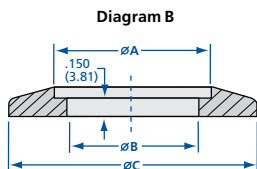
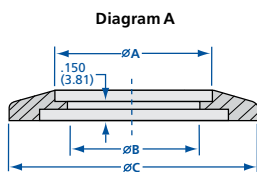
All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.



Flanges & Fittings

NW Bored Blank Flanges & Blank Off Caps

NW Bored Blank Flanges (NWB)



MODEL NUMBER	DIAGRAM	TUBE OD	A	B	C
NW-10B-038	A	3/8 (9.53)	0.38 (9.65)	0.326 (8.28)	1.18 (29.97)
NW-10B-050	A	1/2 (12.70)	0.51 (12.95)	0.451 (11.46)	1.18 (29.97)
NW-16B-038	A	3/8 (9.53)	0.38 (9.65)	0.326 (8.28)	1.18 (29.97)
NW-16B-050	A	1/2 (12.70)	0.51 (12.95)	0.451 (11.46)	1.18 (29.97)
NW-16B-075	B	3/4 (19.05)	0.76 (19.30)	0.68 (17.27)	1.18 (29.97)
NW-25B-038	A	3/8 (9.53)	0.38 (9.65)	0.326 (8.28)	1.575 (40.01)
NW-25B-050	A	1/2 (12.70)	0.51 (12.95)	0.451 (11.46)	1.575 (40.01)
NW-25B-075	A	3/4 (19.05)	0.76 (19.30)	0.715 (18.16)	1.575 (40.01)
NW-25B-100	A	1 (25.40)	1.01 (25.65)	0.938 (23.83)	1.575 (40.01)
NW-40B-038	A	3/8 (9.53)	0.38 (9.65)	.326 (8.28)	2.16 (54.86)
NW-40B-050	A	1/2 (12.70)	0.51 (12.95)	0.451 (11.46)	2.16 (54.86)
NW-40B-075	A	3/4 (19.05)	0.76 (19.30)	0.715 (18.16)	2.16 (54.86)
NW-40B-100	A	1 (25.40)	1.01 (25.65)	0.938 (23.83)	2.16 (54.86)
NW-40B-150	A	1 1/2 (38.10)	1.51 (38.35)	1.438 (36.53)	2.16 (54.86)
NW-50B-038	A	3/8 (9.53)	0.38 (9.65)	.326 (8.28)	2.95 (74.93)
NW-50B-050	A	1/2 (12.70)	0.51 (12.95)	0.451 (11.46)	2.95 (74.93)
NW-50B-075	A	3/4 (19.05)	0.76 (19.30)	0.715 (18.16)	2.95 (74.93)
NW-50B-100	A	1 (25.40)	1.01 (25.65)	0.938 (23.83)	2.95 (74.93)
NW-50B-150	A	1 1/2 (38.10)	1.51 (38.35)	1.438 (36.53)	2.95 (74.93)
NW-50B-200	A	2 (50.80)	2.01 (51.05)	1.938 (49.23)	2.95 (74.93)

NW 316L Stainless Steel Bored Blank Flanges (NWB)

MODEL NUMBER	DIAGRAM	TUBE OD	A	B	C
NW-25B-100-316L	A	1 (25.40)	1.01 (25.65)	0.938 (23.83)	1.575 (40.01)
NW-40B-150-316L	A	1 1/2 (38.10)	1.51 (38.35)	1.438 (36.53)	2.16 (54.86)
NW-50B-200-316L	A	2 (50.80)	2.01 (51.05)	1.938 (49.23)	2.95 (74.93)

SPECIFICATIONS

Tube OD sizes: 3/8 to 2 inches (9.53 to 50.8mm)

Materials

Flange: 304 or 316L stainless steel
O-rings: Viton, Buna & silicone

Fasteners: Wing nut, SureSeal, bulkhead & chain clamps

Vacuum range

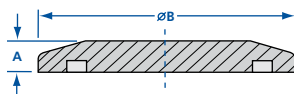
Elastomer seal: $\geq 1 \times 10^{-8}$ mbar - High vacuum
Metal seal: $\geq 1 \times 10^{-11}$ mbar - UHV

Temperature range

Viton: -20°C to 200°C
Silicone: -50° to 230°C
Buna: -30°C to 110°C
Metal seal: -270°C to 150°C

All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.

See Section 2.1 for metal seals



Blank Off Caps

MODEL NUMBER	A	B
NW-10B	0.200 (5.08)	1.18 (29.97)
NW-16B	0.200 (5.08)	1.18 (29.97)
NW-25B	0.200 (5.08)	1.575 (40.01)
NW-40B	0.200 (5.08)	2.16 (54.86)
NW-50B	0.200 (5.08)	2.95 (74.93)

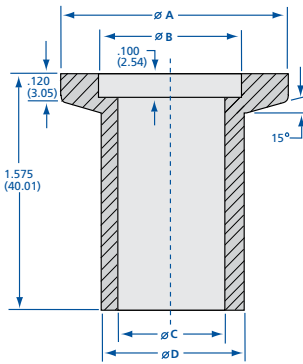
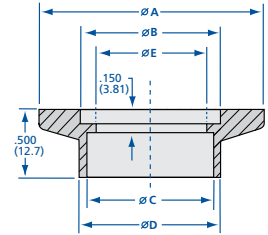
316L Blank Off Caps

MODEL NUMBER	A	B
NW-16B-316L	0.200 (5.08)	1.18 (29.97)
NW-25B-316L	0.200 (5.08)	1.575 (40.01)
NW-40B-316L	0.200 (5.08)	2.16 (54.86)
NW-50B-316L	0.200 (5.08)	2.95 (74.93)



NW Socket Weld Flanges

MODEL NUMBER	TUBE OD	A	B	C	D	E
NW-10-SW	1/2 (12.70)	1.18 (29.97)	0.48 (12.19)	0.51 (12.95)	0.61 (15.49)	-
NW-16-SW	3/4 (19.05)	1.18 (29.97)	0.68 (17.27)	0.76 (19.30)	0.798 (20.27)	-
NW-25-SW	1 (25.40)	1.575 (40.01)	1.031 (26.19)	1.01 (25.65)	1.14 (28.96)	0.938 (23.83)
NW-40-SW	1 1/2 (38.10)	2.16 (54.86)	1.62 (41.15)	1.51 (38.35)	1.64 (41.66)	1.438 (36.53)
NW-50-SW	2 (50.80)	2.95 (74.93)	2.06 (52.32)	2.01 (51.05)	2.14 (54.36)	1.938 (49.23)



NW Long Weld Neck Flanges

MODEL NUMBER	A	B	C	D
NW-10FL	1.18 (29.97)	0.48 (12.19)	0.38 (9.65)	1/2 (12.70)
NW-16FL	1.18 (29.97)	0.68 (17.27)	0.625 (15.88)	3/4 (19.05)
NW-25FL	1.575 (40.01)	1.031 (26.19)	0.87 (22.10)	1 (25.40)
NW-40FL	2.16 (54.86)	1.62 (41.15)	1.37 (34.80)	1 1/2 (38.10)
NW-50FL	2.95 (74.93)	2.06 (52.32)	1.87 (47.50)	2 (50.80)

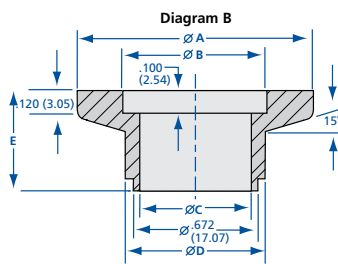
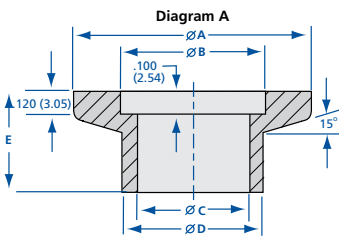
NW 316L Stainless Steel Long Weld Neck Flanges

MODEL NUMBER	A	B	C	D
NW-25FL-316L	1.575 (40.01)	1.031 (26.19)	0.87 (22.10)	1 (25.40)
NW-40FL-316L	2.16 (54.86)	1.62 (41.15)	1.37 (34.80)	1 1/2 (38.10)
NW-50FL-316L	2.95 (74.93)	2.06 (52.32)	1.87 (47.50)	2 (50.80)



NW Short Weld Neck Flanges

MODEL NUMBER	DIAGRAM	TUBE OD	A	B	C	D	E
NW-10F	A	1/2 (12.70)	1.18 (29.97)	0.48 (12.19)	0.38 (9.65)	1/2 (12.70)	0.5 (12.70)
NW-16F	B	3/4 (19.05)	1.18 (29.97)	0.68 (17.27)	0.625 (15.88)	3/4 (19.05)	0.56 (14.22)
NW-16FB	A	3/4 (19.05)	1.18 (29.97)	0.68 (17.27)	0.625 (15.88)	3/4 (19.05)	0.5 (12.70)
NW-25F	A	1 (25.40)	1.575 (40.01)	1.031 (26.19)	0.87 (22.10)	1 (25.40)	0.5 (12.70)
NW-40F	A	1 1/2 (38.10)	2.16 (54.86)	1.62 (41.15)	1.37 (34.80)	1 1/2 (38.10)	0.75 (19.05)
NW-50F	A	2 (50.80)	2.95 (74.93)	2.06 (52.32)	1.87 (47.50)	2 (50.80)	0.75 (19.05)



SPECIFICATIONS

Tube OD sizes: 3/8 to 2 inches (9.53 to 50.8mm)

Materials

Flange: 304 or 316L stainless steel
O-rings: Viton, Buna & silicone

Fasteners: Wing nut, SureSeal, bulkhead & chain clamps

Vacuum range

Elastomer seal: $\geq 1 \times 10^{-8}$ mbar - High vacuum
Metal seal: $\geq 1 \times 10^{-11}$ mbar - UHV

Temperature range

Viton: -20°C to 200°C
Silicone: -50° to 230°C
Buna: -30°C to 110°C
Metal seal: -270°C to 150°C

All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.

See Section 2.1 for metal seals

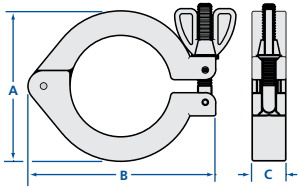
Flanges & Fittings

NW Assembly Hardware



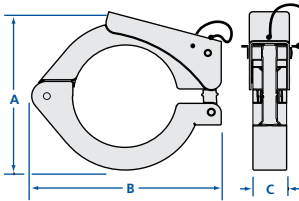
Nor-Cal Wing Nut and SureSeal NW Clamps feature special centering ribs and evenly distributed clamping force to assure uniform O-ring compression and reduce the probability of failure under loads. Additional hinge knuckles and tighter manufacturing tolerances result in precise alignment and reduced side play. Clamp opening is limited to facilitate one-handed installation in hard-to-reach spaces. In addition to the above features, the SureSeal clamp provides instant closure with a fixed geometry to attain optimal O-ring compression. All Nor-Cal NW clamps are designed and manufactured to meet Pneurop specifications for ISO-KF 10 through 50 flanges, so you can be confident of universal compatibility. We also provide chain clamps and metal seals for ISO-KF components to transform them from high vacuum to ultra-high vacuum connections.

NW Wing Nut Clamps



MODEL NUMBER	A	B	C
NW-10-CP	1.69 (42.93)	2.392 (60.76)	0.625 (15.88)
NW-16-CP	1.69 (42.93)	2.392 (60.76)	0.625 (15.88)
NW-25-CP	2.14 (54.36)	2.796 (71.02)	0.625 (15.88)
NW-40-CP	2.75 (69.85)	3.437 (87.30)	0.625 (15.88)
NW-50-CP	3.50 (88.90)	4.245 (107.82)	0.710 (18.03)

NW SureSeal Clamps



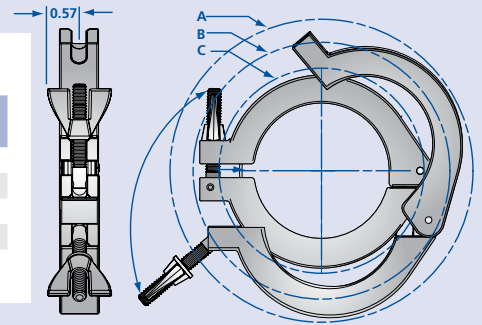
MODEL NUMBER	A	B	C
NW-10-SSC	1.750 (44.45)	2.392 (60.76)	0.741 (18.82)
NW-16-SSC	1.750 (44.45)	2.392 (60.76)	0.741 (18.82)
NW-40-SSC	2.947 (74.85)	3.437 (87.30)	0.741 (18.82)
NW-50-SSC	3.784 (96.11)	4.245 (107.82)	0.836 (21.23)

NW SureSeal Clamps with Lanyard

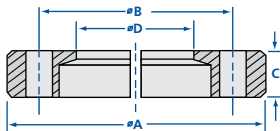
MODEL NUMBER	A	B	C
NW-10-SSC-L	1.750 (44.45)	2.392 (60.76)	0.741 (18.82)
NW-16-SSC-L	1.750 (44.45)	2.392 (60.76)	0.741 (18.82)
NW-40-SSC-L	2.947 (74.85)	3.437 (87.30)	0.741 (18.82)
NW-50-SSC-L	3.784 (96.11)	4.245 (107.82)	0.836 (21.23)

NW Clamp Clearance Details

CLAMP	FLANGE	MIN. DIA. TO INSTALL A	MAX. DIA. CLOSED B	MIN. DIA. CLOSED C
NW-10-CP	NW-10B	2.86 (72.64)	2.65 (67.31)	1.75 (44.45)
NW-16-CP	NW-16B	2.86 (72.64)	2.65 (67.31)	1.75 (44.45)
NW-25-CP	NW-25B	3.32 (84.33)	3.00 (76.20)	2.24 (56.90)
NW-40-CP	NW-40B	4.00 (101.60)	3.72 (94.49)	2.90 (73.66)
NW-50-CP	NW-50B	5.45 (138.43)	4.62 (117.35)	3.69 (93.73)



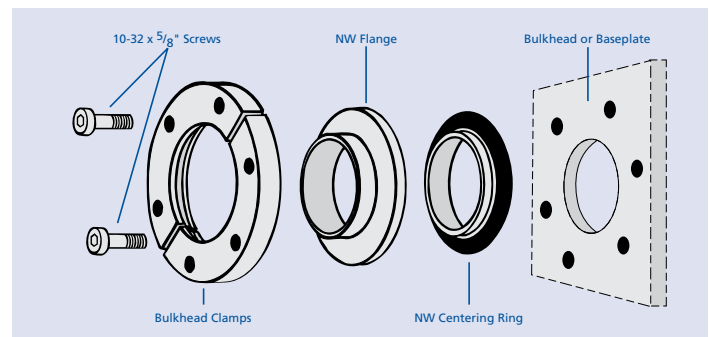
NW Bulkhead Clamps



MODEL NUMBER	A	B	C	NUMBER OF SCREWS	THROUGH HOLE D
NW-16-BCP	2.00 (50.80)	1.50 (38.10)	0.361 (9.17)	6	0.90 (22.86)
NW-25-BCP	2.37 (60.20)	1.89 (48.01)	.0387 (9.83)	6	1.26 (32.00)
NW-40-BCP	2.94 (74.68)	2.44 (61.98)	0.366 (9.30)	6	1.84(46.74)
NW-50-BCP	3.75 (95.25)	3.25 (82.55)	0.404 (10.26)	8	2.35 (59.69)

Add "-MS" for metric bolts

Bulkhead clamps provide a simple means of fastening an NW flange to a baseplate. Each aluminum clamp is sold with stainless steel socket head cap screws and washers for attachment. Leave 0.075 inch (2mm) minimum between the bottom of the tapped hole and the inside of the chamber wall.



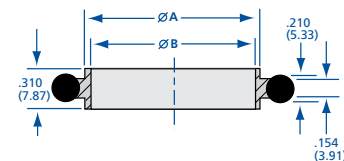
All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.



Nor-Cal offers aluminum and stainless steel centering rings for NW and ISO flanges. Buna, silicone and Viton O-rings are available for NW, while Buna and Viton are stocked for ISO centering rings. Aluminum ISO centering rings are provided with an aluminum spacer ring. Stainless steel ISO centering rings are also provided with aluminum spacer rings as an option.

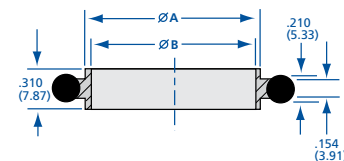
NW Aluminum Centering Rings with O-ring

MODEL NUMBER	O-RING MATERIAL	A	B
NW-10-CR-AV	Viton	0.478 (12.14)	0.456 (11.58)
NW-10-CR-AB	Buna	0.478 (12.14)	0.456 (11.58)
NW-16-CR-AV	Viton	0.669 (16.99)	0.625 (15.88)
NW-16-CR-AB	Buna	0.669 (16.99)	0.625 (15.88)
NW-25-CR-AV	Viton	1.024 (26.01)	0.984 (24.99)
NW-25-CR-AB	Buna	1.024 (26.01)	0.984 (24.99)
NW-40-CR-AV	Viton	1.614 (41.00)	1.57 (39.88)
NW-40-CR-AB	Buna	1.614 (41.00)	1.57 (39.88)
NW-50-CR-AV	Viton	2.047 (51.99)	1.967 (49.96)
NW-50-CR-AB	Buna	2.047 (51.99)	1.967 (49.96)



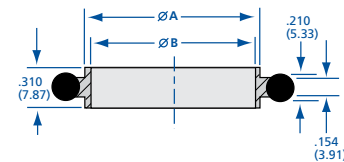
NW Stainless Steel Centering Rings with O-ring

MODEL NUMBER	O-RING MATERIAL	A	B
NW-10-CR-SV	Viton	0.478 (12.14)	0.456 (11.58)
NW-10-CR-SS	Silicone	0.478 (12.14)	0.456 (11.58)
NW-10-CR-SB	Buna	0.478 (12.14)	0.456 (11.58)
NW-16-CR-SV	Viton	0.669 (16.99)	0.625 (15.88)
NW-16-CR-SS	Silicone	0.669 (16.99)	0.625 (15.88)
NW-16-CR-SB	Buna	0.669 (16.99)	0.625 (15.88)
NW-25-CR-SV	Viton	1.024 (26.01)	0.984 (24.99)
NW-25-CR-SS	Silicone	1.024 (26.01)	0.984 (24.99)
NW-25-CR-SB	Buna	1.024 (26.01)	0.984 (24.99)
NW-40-CR-SV	Viton	1.614 (41.00)	1.570 (39.88)
NW-40-CR-SS	Silicone	1.614 (41.00)	1.570 (39.88)
NW-40-CR-SB	Buna	1.614 (41.00)	1.570 (39.88)
NW-50-CR-SV	Viton	2.047 (51.99)	1.967 (49.96)
NW-50-CR-SS	Silicone	2.047 (51.99)	1.967 (49.96)
NW-50-CR-SB	Buna	2.047 (51.99)	1.967 (49.96)



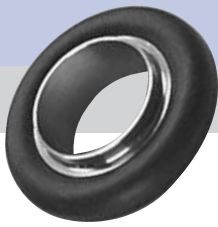
NW 316L Stainless Steel Centering Rings with O-ring

MODEL NUMBER	O-RING MATERIAL	A	B
NW-25-CR-SV-316L	Viton	1.024 (26.01)	0.984 (24.99)
NW-40-CR-SV-316L	Viton	1.614 (41.00)	1.570 (39.88)
NW-50-CR-SV-316L	Viton	2.047 (51.99)	1.967 (49.96)



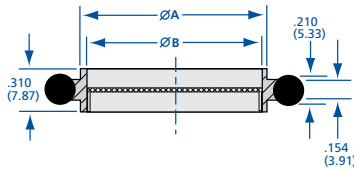
All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.

See page 26 for replacement O-rings



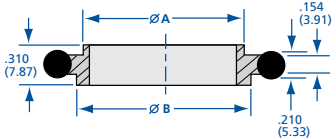
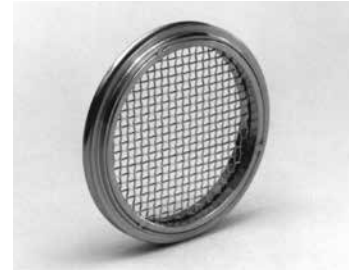
Flanges & Fittings

NW Centering Rings & Replacement O-rings



NW Screened Stainless Steel Centering Rings with Viton O-ring

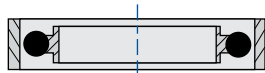
MODEL NUMBER	O-RING MATERIAL	A	B	MESH
NW-25-CR-SV-74	Viton	1.024 (26.01)	0.984 (24.99)	74
NW-40-CR-SV-74	Viton	1.614 (41.00)	1.570 (39.88)	74
NW-50-CR-SV-74	Viton	2.047 (51.99)	1.967 (49.96)	74



NW Reducer Stainless Steel Centering Rings with Viton O-ring

MODEL NUMBER	O-RING MATERIAL	A	B
NW-10/16-CR	Viton	0.48 (12.19)	0.67 (17.02)
NW-20/25-CR	Viton	0.87 (22.10)	1.02 (25.91)
NW-32/40-CR	Viton	1.34 (34.04)	1.61 (40.89)

Buna and Silicone O-rings available. Call for pricing.

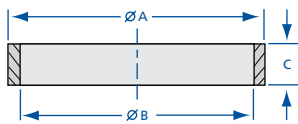


For dimensions refer to the centering ring/O-ring assembly drawing on the previous page and the overpressure ring diagram this page.

NW Stainless Steel Centering Rings with Viton O-ring and Over Pressure Ring

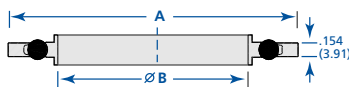
MODEL NUMBER	DESCRIPTION
NW-10-CR-SV-PR	Contains model numbers NW-10-PR and NW-10-CR-SV
NW-16-CR-SV-PR	Contains model numbers NW-16-PR and NW-16-CR-SV
NW-25-CR-SV-PR	Contains model numbers NW-25-PR and NW-25-CR-SV
NW-40-CR-SV-PR	Contains model numbers NW-40-PR and NW-40-CR-SV
NW-50-CR-SV-PR	Contains model numbers NW-50-PR and NW-50-CR-SV

Buna and Silicone O-rings available. Call for pricing.



NW Stainless Steel Over Pressure Rings

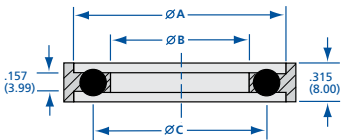
MODEL NUMBER	A	B	C	MAXIMUM PSIG
NW-10-PR	1.25 (31.75)	1.186 (30.12)	0.346 (8.79)	100
NW-16-PR	1.25 (31.75)	1.186 (30.12)	0.346 (8.79)	100
NW-25-PR	1.66 (42.16)	1.583 (40.21)	0.346 (8.79)	100
NW-40-PR	2.25 (57.15)	2.169 (55.09)	0.346 (8.79)	75
NW-50-PR	2.75 (69.85)	2.620 (66.55)	0.145 (3.68)	50



NW Stainless Steel Captured Centering Rings with Viton O-ring

MODEL NUMBER	O-RING MATERIAL	A	B	MAXIMUM PSIG
NW-16-CRC-SV	Viton	1.25 (31.75)	0.625 (15.88)	100
NW-25-CRC-SV	Viton	1.66 (42.16)	0.984 (24.99)	100
NW-40-CRC-SV	Viton	2.25 (57.15)	1.570 (39.88)	75
NW-50-CRC-SV	Viton	2.75 (69.85)	1.967 (49.96)	50

Buna and Silicone O-rings available. Call for pricing.



NW trapped centering rings are composed of an aluminum outer ring, Viton O-ring, and stainless steel centering ring

NW Stainless Steel Trapped Centering Rings with O-ring

MODEL NUMBER	O-RING MATERIAL	A	B	C
NW-10/16-CRT-SV	Viton	1.18 (29.97)	0.63 (16.00)	0.91 (23.11)
NW-25-CRT-SV	Viton	1.58 (40.13)	0.95 (24.13)	1.3 (33.02)
NW-40-CRT-SV	Viton	2.17 (55.12)	1.58 (40.13)	1.89 (48.01)
NW-50-CRT-SV	Viton	2.95 (74.93)	1.97 (50.04)	2.32 (58.93)

Buna and Silicone O-rings available. Call for pricing.

Viton O-Rings

MODEL NUMBER	FLANGE TYPE
NW-10-OR-V	NW-10
NW-16-OR-V	NW-16
NW-25-OR-V	NW-25
NW-40-OR-V	NW-40
NW-50-OR-V	NW-50

Silicone O-Rings

MODEL NUMBER	FLANGE TYPE
NW-10-OR-S	NW-10
NW-16-OR-S	NW-16
NW-25-OR-S	NW-25
NW-40-OR-S	NW-40
NW-50-OR-S	NW-50

Buna O-Rings

MODEL NUMBER	FLANGE TYPE
NW-10-OR-B	NW-10
NW-16-OR-B	NW-16
NW-25-OR-B	NW-25
NW-40-OR-B	NW-40
NW-50-OR-B	NW-50

All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.



SPECIFICATIONS

Tube OD sizes: 1/2 to 2 inches (12.7 to 50.8mm)

Materials

Flange: 304 stainless steel
(316L available upon request)
O-rings: Viton, Buna & silicone

Fittings

Tube finishes: Beadblast standard
(Tumbled & electropolish available)

Fasteners: Wing nut, SureSeal,
bulkhead & chain clamps

Vacuum range

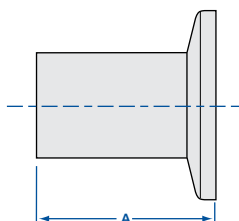
Elastomer seal: $\geq 1 \times 10^{-8}$ mbar -High vacuum
Metal seal: $\geq 1 \times 10^{-11}$ mbar - UHV

Temperature range

Viton: -20°C to 200°C
Silicone: -50° to 230°C
Buna: -30°C to 110°C
Metal seal: -270°C to 150°C

See Section 2.1 for metal seals

Nor-Cal manufactures a complete line of NW vacuum fittings. The tube portions are fabricated from 304 stainless steel. 316L stainless steel can be supplied on request. Nor-Cal makes its own elbows, and all tees and crosses are made with the pulled-port technique. This allows smooth, crevice-free butt welds to provide the maximum in cleanliness for UHV applications. Bakeout range is up to 200°C. Nor-Cal fittings are also available with CF, ISO and ASA flanges. Standard finish is bead blasted. Electropolished finish can also be provided as an option. Call for pricing.



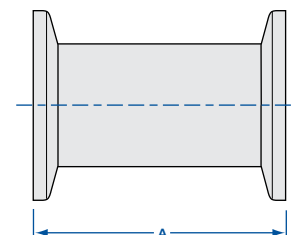
NW Half Nipples

MODEL NUMBER	TUBE OD	A
1N-NW-10	1/2 (12.70)	1.25 (31.75)
1N-NW-16B	3/4 (19.05)	1.15 (29.21)
1N-NW-25B	1 (25.40)	2.03 (51.56)
1N-NW-40B	1 1/2 (38.10)	2.40 (60.96)
1N-NW-50B	2 (50.80)	3.15 (80.01)



NW Full Nipples

MODEL NUMBER	TUBE OD	A
2N-NW-10	1/2 (12.70)	2.50 (63.50)
2N-NW-16B	3/4 (19.05)	2.30 (58.42)
2N-NW-25B	1 (25.40)	4.06 (103.12)
2N-NW-40B	1 1/2 (38.10)	4.80 (121.92)
2N-NW-50B	2 (50.80)	6.30 (160.02)

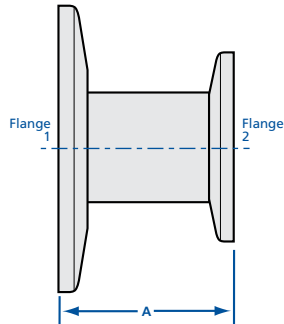


All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.



Flanges & Fittings

NW Fittings



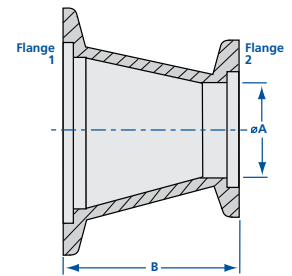
NW Reducer Nipples

MODEL NUMBER	FLANGE 1	FLANGE 2	TUBE OD	A
2NR-NW-16-10	NW-16	NW-10	1/2 (12.70)	1.40 (35.56)
2NR-NW-25-10	NW-25	NW-10	1/2 (12.70)	1.40 (35.56)
2NR-NW-25-16	NW-25	NW-16	3/4 (19.05)	1.30 (33.02)
2NR-NW-40-10	NW-40	NW-10	1/2 (12.70)	1.40 (35.56)
2NR-NW-40-16	NW-40	NW-16	3/4 (19.05)	1.30 (33.02)
2NR-NW-40-25	NW-40	NW-25	1 (25.40)	2.18 (55.37)
2NR-NW-50-10	NW-50	NW-10	1/2 (12.70)	1.40 (35.56)
2NR-NW-50-16	NW-50	NW-16	3/4 (19.05)	1.30 (33.02)
2NR-NW-50-25	NW-50	NW-25	1 (25.40)	2.18 (55.37)
2NR-NW-50-40	NW-50	NW-40	1 1/2 (38.10)	2.55 (64.77)



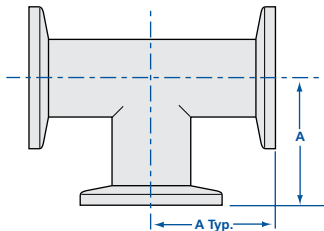
NW Conical Reducer Nipples

MODEL NUMBER	FLANGE 1	FLANGE 2	A	B
2NRC-NW-25-16	NW-25	NW-16	0.62 (15.75)	1.57 (39.88)
2NRC-NW-40-16	NW-40	NW-16	0.62 (15.75)	1.57 (39.88)
2NRC-NW-50-16	NW-50	NW-16	0.62 (15.75)	1.57 (39.88)
2NRC-NW-40-25	NW-40	NW-25	0.87 (22.10)	1.57 (39.88)
2NRC-NW-50-25	NW-50	NW-25	0.87 (22.10)	1.57 (39.88)
2NRC-NW-50-40	NW-50	NW-40	1.38 (35.05)	1.57 (39.88)



NW 316L Conical Reducer Nipples

MODEL NUMBER	FLANGE 1	FLANGE 2	A	B
2NRC-NW-40-25-316L	NW-40	NW-25	0.87 (22.10)	1.57 (39.88)
2NRC-NW-50-40-316L	NW-50	NW-40	0.87 (22.10)	1.57 (39.88)



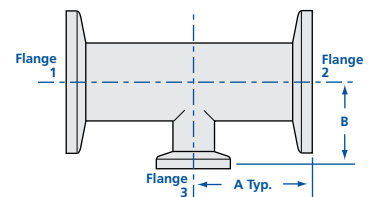
NW Tees

MODEL NUMBER	TUBE OD	A
3T-NW-10	1/2 (12.70)	1.25 (31.75)
3T-NW-16B	3/4 (19.05)	1.15 (29.21)
3T-NW-25B	1 (25.40)	2.03 (51.56)
3T-NW-40B	1 1/2 (38.10)	2.40 (60.96)
3T-NW-40H	1 1/2 (38.10)	2.56 (65.02)
3T-NW-50B	2 (50.80)	3.15 (80.01)
3T-NW-50H	2 (50.80)	2.76 (70.10)



NW Reducer Tees

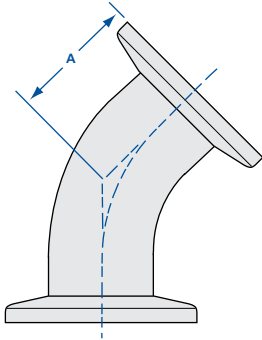
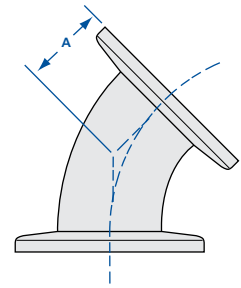
MODEL NUMBER	TUBE 1 & 2 ARM OD	TUBE 3 LEG OD	A	B
3TR-NW-25-16B	1 (25.40)	3/4 (19.05)	2.03 (51.56)	1.27 (32.26)
3TR-NW-40-16B	1 1/2 (38.10)	3/4 (19.05)	2.40 (60.96)	1.53 (38.86)
3TR-NW-40-25B	1 1/2 (38.10)	1 (25.40)	2.40 (60.96)	2.28 (57.91)
3TR-NW-50-16B	2 (50.80)	3/4 (19.05)	3.15 (80.01)	1.78 (45.21)
3TR-NW-50-40B	2 (50.80)	1 1/2 (38.10)	3.15 (80.01)	2.65 (67.31)





NW 45° Radius Elbows

MODEL NUMBER	TUBE OD	A
2K-NW-25	1 (25.40)	0.77 (19.56)
2K-NW-40	1½ (38.10)	1.08 (27.43)
2K-NW-50	2 (50.80)	1.39 (35.31)



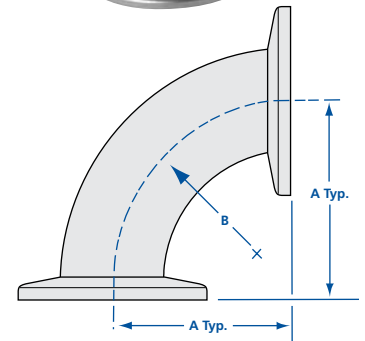
NW 45° Radius Elbows with Tangents

MODEL NUMBER	TUBE OD	A
2KL-NW-16	¾ (19.05)	0.91 (23.11)
2KL-NW-25	1 (25.40)	1.12 (28.45)
2KL-NW-40	1½ (38.10)	1.68 (42.67)
2KL-NW-50	2 (50.80)	1.99 (50.55)



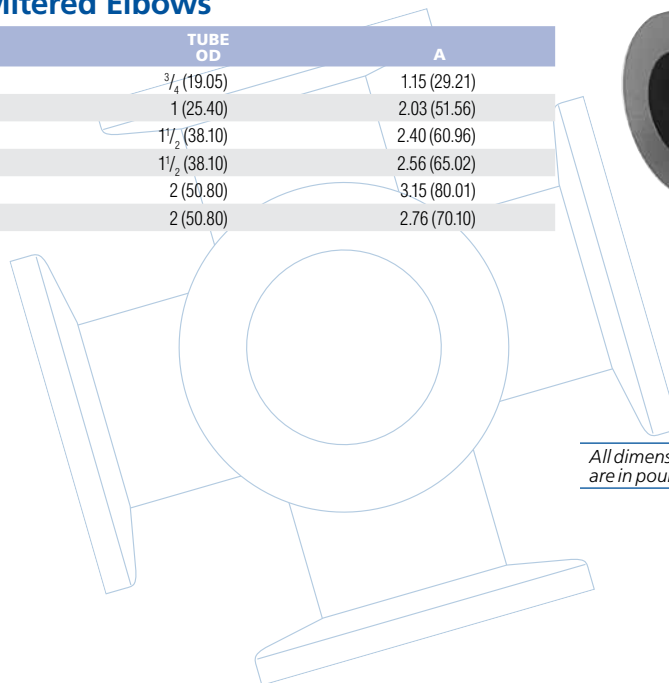
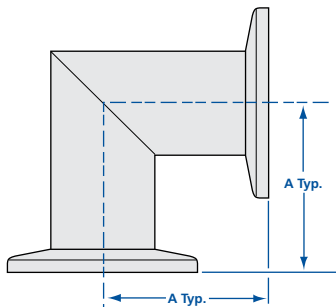
NW 90° Radius Elbows

MODEL NUMBER	TUBE OD	A	B
2E-NW-10	½ (12.70)	1.25 (31.75)	0.75 (19.05)
2E-NW-16B	¾ (19.05)	1.15 (29.21)	1.00 (25.40)
2E-NW-25B	1 (25.40)	1.65 (41.91)	1.50 (38.10)
2E-NW-40B	1½ (38.10)	2.40 (60.96)	2.25 (57.15)
2E-NW-40H	1½ (38.10)	2.56 (65.02)	2.25 (57.15)
2E-NW-40HL	1½ (38.10)	5.12 (130.05)	2.25 (57.15)
2E-NW-50B	2 (50.80)	3.15 (80.01)	3.00 (76.20)
2E-NW-50HL	2 (50.80)	5.51 (139.95)	3.00 (76.20)



NW 90° Mitered Elbows

MODEL NUMBER	TUBE OD	A
2E-NW-16MB	¾ (19.05)	1.15 (29.21)
2E-NW-25MB	1 (25.40)	2.03 (51.56)
2E-NW-40MB	1½ (38.10)	2.40 (60.96)
2E-NW-40MH	1½ (38.10)	2.56 (65.02)
2E-NW-50MB	2 (50.80)	3.15 (80.01)
2E-NW-50MH	2 (50.80)	2.76 (70.10)

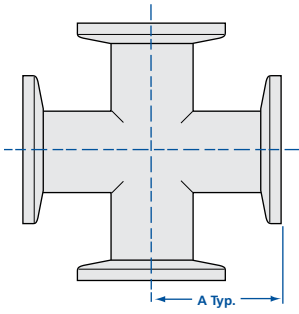


All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.



Flanges & Fittings

NW Fittings



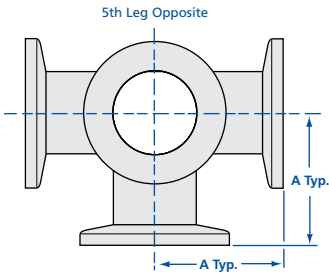
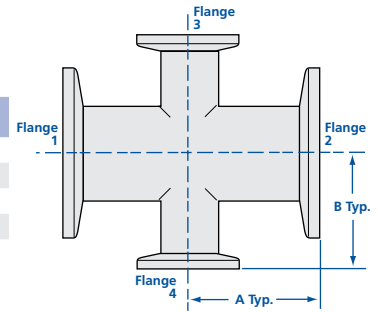
NW 4-Way Crosses

MODEL NUMBER	TUBE OD	A
4C-NW-10	1/2 (12.70)	1.25 (31.75)
4C-NW-16B	3/4 (19.05)	1.15 (29.21)
4C-NW-25B	1 (25.40)	2.03 (51.56)
4C-NW-40B	1 1/2 (38.10)	2.40 (60.96)
4C-NW-40H	1 1/2 (38.10)	2.56 (65.02)
4C-NW-50B	2 (50.80)	3.15 (80.01)
4C-NW-50H	2 (50.80)	2.76 (70.10)



NW Reducer Crosses

MODEL NUMBER	TUBE 1 & 2 OD	TUBE 3 & 4 OD	A	B
4CR-NW-25-16B	1 (25.40)	3/4 (19.05)	2.03 (51.56)	1.27 (32.26)
4CR-NW-40-16B	1 1/2 (38.10)	3/4 (19.05)	2.40 (60.96)	1.53 (38.86)
4CR-NW-40-25B	1 1/2 (38.10)	1 (25.40)	2.40 (60.96)	2.28 (57.91)
4CR-NW-50-16B	2 (50.80)	3/4 (19.05)	3.15 (80.01)	1.78 (45.21)
4CR-NW-50-40B	2 (50.80)	1 1/2 (38.10)	3.15 (80.01)	2.65 (67.31)



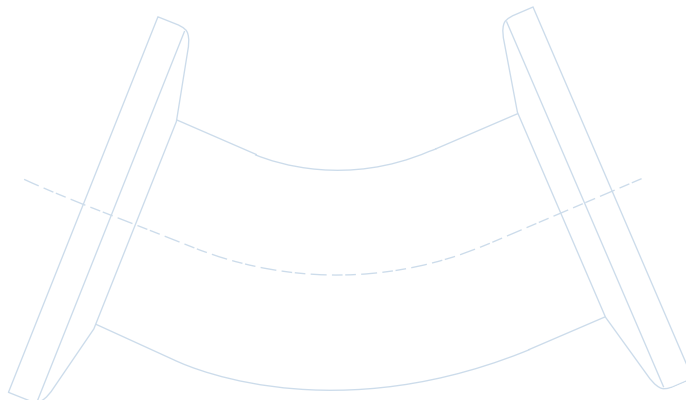
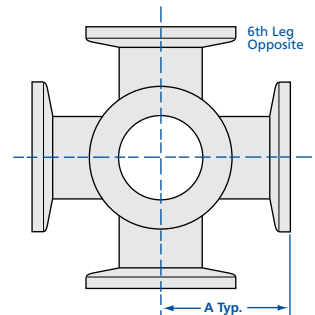
NW 5-Way Crosses

MODEL NUMBER	TUBE OD	A
5C-NW-16	3/4 (19.05)	1.50 (38.10)
5C-NW-25B	1 (25.40)	2.03 (51.56)
5C-NW-40B	1 1/2 (38.10)	2.40 (60.96)
5C-NW-50B	2 (50.80)	3.15 (80.01)



NW 6-Way Crosses

MODEL NUMBER	TUBE OD	A
6C-NW-16	3/4 (19.05)	1.50 (38.10)
6C-NW-25B	1 (25.40)	2.03 (51.56)
6C-NW-40B	1 1/2 (38.10)	2.40 (60.96)
6C-NW-50B	2 (50.80)	3.15 (80.01)



All dimensions are in inches (mm) & weights are in pounds (kg), unless otherwise noted.