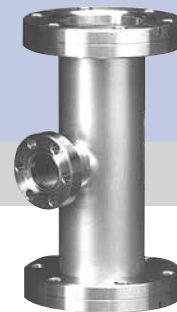


Flanges & Fittings

Section Two



2.1 Chain Clamp Components & Hardware

2.2 NW Flanges & Fittings

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

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





Adapter Fittings

Nor-Cal Products provides a broad range of adapter fittings in order to connect two dissimilar types of components. They are made from 304 or 316L stainless steel and are TIG welded, cleaned and leak checked for vacuum service. Tube finishes are normally bead blasted. However, tumbled or electropolished finish can be provided upon request. Flanges and nipples used to adapt different sizes of the same flange type are called reducers. They are listed in the flanges and fittings section for the particular flange type. For example, CF zero length reducer flanges are listed in the CF section of Flanges and Fittings.

Flange-to-Flange Adapters

Flange-to-flange adapter fittings are used as a transition between two dissimilar flange types. We offer adapter fittings with flange combinations for CF (Conflat), NW (ISO-KF), ISO and ASA (ANSI) components as standards. We frequently provide other flange combinations as specials. These include wire seal, JIS, MESG, and other flanges. Flange-to-flange adapter nipples usually have a short length of straight tubing between the two flanges. Where possible, we offer conical adapters as an option to reduce conductance loss at the opening of the larger flange. Nor-Cal also offers adapter tees and crosses with ISO and NW flanges. ASA to CF adapter flanges are also found in this section.

Flange-to-Fitting Adapters

Flange-to-fitting adapters are commonly used on chamber ports to connect flanges to special fittings. Nor-Cal offers these with CF, NW, ISO and ASA flanges for Swagelok, male and female VCR, quick disconnect, male and female NPT, ball socket and Welch pump fittings as standards. Other combinations can be supplied quickly as specials.

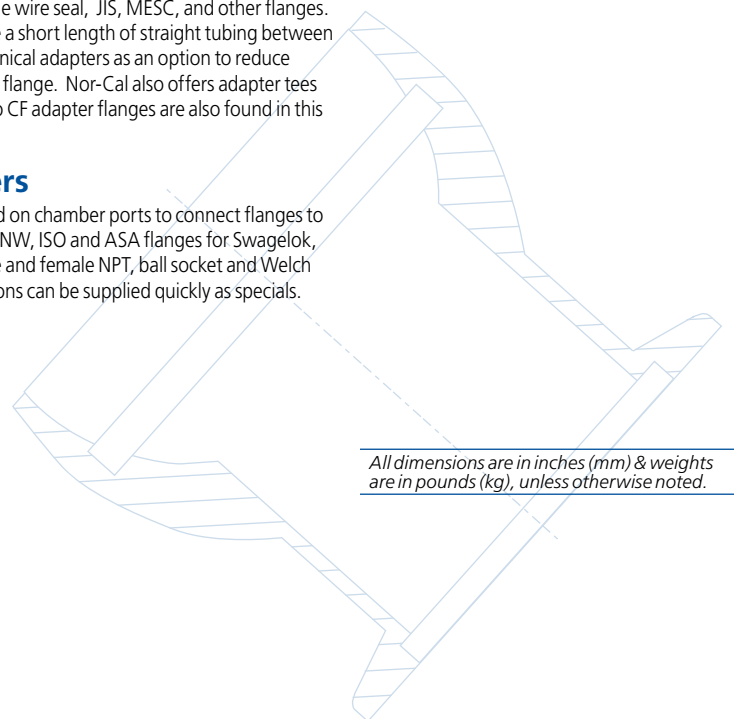


SPECIFICATIONS

Materials: 304 or 316L stainless steel

Vacuum range
 Metal seal: $\geq 1 \times 10^{-13}$ mbar - UHV
 Elastomer seal: $\geq 1 \times 10^{-8}$ mbar - High vacuum

Temperature range
 Metal seal: -200°C to 450°C
 Elastomer seal: -20°C to 150°C



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

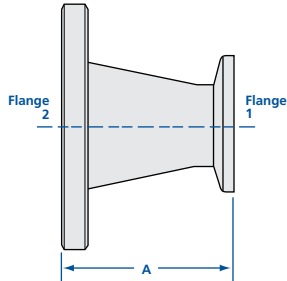
Adapter Fittings

Flange-to-Flange



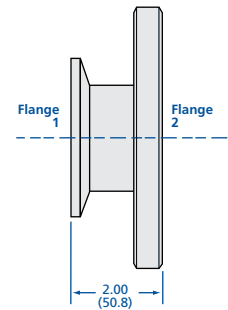
NW to CF Conical Adapter Nipples

MODEL NUMBER	TYPE	FLANGE 1 NOM. TUBE OD	TYPE	FLANGE 2 NOM. TUBE OD	A
ANC-NW-16-212	NW-16	3/4 (19.05)	2.12 CF	1 (25.40)	1.69 (42.93)
ANC-NW-16-275	NW-16	3/4 (19.05)	2.75 CF	1 1/2 (38.10)	2.73 (69.34)
ANC-NW-25-133	NW-25	1 (25.40)	1.33 CF	3/4 (19.05)	2.03 (51.56)
ANC-NW-25-275	NW-25	1 (25.40)	2.75 CF	1 1/2 (38.10)	2.73 (69.34)
ANC-NW-25-338	NW-25	1 (25.40)	3.38 CF	2 (50.80)	2.75 (69.85)
ANC-NW-40-133	NW-40	1 1/2 (38.10)	1.33 CF	3/4 (19.05)	3.03 (76.96)
ANC-NW-40-212	NW-40	1 1/2 (38.10)	2.12 CF	1 (25.40)	2.69 (68.33)
ANC-NW-40-338	NW-40	1 1/2 (38.10)	3.38 CF	2 (50.80)	2.75 (69.85)
ANC-NW-40-450	NW-40	1 1/2 (38.10)	4.50 CF	2 1/2 (63.50)	2.90 (73.66)
ANC-NW-40-462	NW-40	1 1/2 (38.10)	4.62 CF	3 (76.20)	4.06 (103.12)
ANC-NW-50-212	NW-50	2 (50.80)	2.12 CF	1 (25.40)	2.69 (68.33)
ANC-NW-50-275	NW-50	2 (50.80)	2.75 CF	1 1/2 (38.10)	2.73 (69.34)
ANC-NW-50-450	NW-50	2 (50.80)	4.50 CF	2 1/2 (63.50)	2.90 (73.66)
ANC-NW-50-462	NW-50	2 (50.80)	4.62 CF	3 (76.50)	4.06 (103.12)
ANC-NW-50-600	NW-50	2 (50.80)	6.00 CF	4 (101.60)	4.21 (106.93)



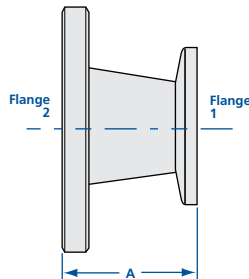
NW to CF Adapter Nipples

MODEL NUMBER	FLANGE 1 TYPE	FLANGE 2 TYPE	NOM. TUBE OD
AN-NW-10-133	NW-10	1.33 CF	1/2 (12.70)
AN-NW-16-133	NW-16	1.33 CF	3/4 (19.05)
AN-NW-25-212	NW-25	2.12 CF	1 (25.40)
AN-NW-40-275	NW-40	2.75 CF	1 1/2 (38.10)
AN-NW-50-133	NW-50	1.33 CF	3/4 (19.05)
AN-NW-50-338	NW-50	3.38 CF	2 (50.80)



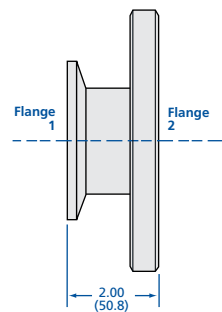
NW to ASA Conical Adapter Nipples

MODEL NUMBER	TYPE	FLANGE 1 NOM. TUBE OD	FLANGE 2 TYPE NOM. TUBE OD	A
ANC-NW-25-ASA-5	NW-25	1 (25.40)	ASA-5 2 (50.80)	2.78 (70.61)
ANC-NW-40-ASA-5	NW-40	1 1/2 (38.10)	ASA-5 2 1/2 (63.50)	2.78 (70.61)
ANC-NW-40-ASA-6	NW-40	1 1/2 (38.10)	ASA-6 3 (76.20)	4.03 (102.36)
ANC-NW-50-ASA-5	NW-50	2 (50.80)	ASA-5 2 1/2 (63.50)	2.78 (70.61)
ANC-NW-50-ASA-6	NW-50	2 (50.80)	ASA-6 3 (76.20)	4.03 (102.36)
ANC-NW-50-ASA-7.5	NW-50	2 (50.80)	ASA-7.5 4 (101.60)	4.03 (102.36)



NW to ASA Adapter Nipples

MODEL NUMBER	FLANGE 1 TYPE	FLANGE 2 TYPE	NOM. TUBE OD
AN-NW-16-ASA-5	NW-16	ASA-5	3/4 (19.05)
AN-NW-16-ASA-6	NW-16	ASA-6	3/4 (19.05)
AN-NW-16-ASA-7.5	NW-16	ASA-7.5	3/4 (19.05)
AN-NW-16-ASA-9	NW-16	ASA-9	3/4 (19.05)
AN-NW-16-ASA-11	NW-16	ASA-11	3/4 (19.05)
AN-NW-25-ASA-6	NW-25	ASA-6	1 (25.40)
AN-NW-25-ASA-7.5	NW-25	ASA-7.5	1 (25.40)
AN-NW-25-ASA-9	NW-25	ASA-9	1 (25.40)
AN-NW-25-ASA-11	NW-25	ASA-11	1 (25.40)
AN-NW-40-ASA-7.5	NW-40	ASA-7.5	1 1/2 (38.10)
AN-NW-40-ASA-9	NW-40	ASA-9	1 1/2 (38.10)
AN-NW-40-ASA-11	NW-40	ASA-11	1 1/2 (38.10)
AN-NW-50-ASA-9	NW-50	ASA-9	2 (50.80)
AN-NW-50-ASA-11	NW-50	ASA-11	2 (50.80)



SPECIFICATIONS

Materials: 304 stainless steel
(316L available upon request)

Vacuum range: $\geq 1 \times 10^{-8}$ mbar - High vacuum

Temperature range: -20°C to 150°C

Note: Add suffix "-G" to model number if O-Ring Groove is required on ASA flange.
Call for ASA groove prices.

Adapter Fittings

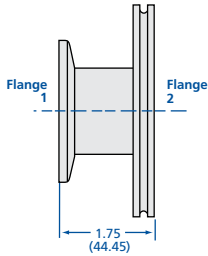
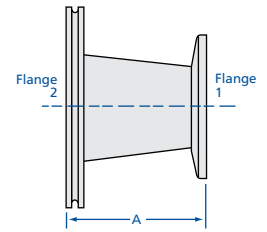
Flange-to-Flange

SECTION 2.7



NW to ISO Conical Adapter Nipples

MODEL NUMBER	FLANGE 1 TYPE	FLANGE 1 NOM. TUBE OD	FLANGE 2 TYPE	FLANGE 2 NOM. TUBE OD	A
ANC-NW-40-ISO-63	NW-40	1½ (38.10)	ISO-63	2½ (63.50)	2.78 (70.61)
ANC-NW-40-ISO-80	NW-40	1½ (38.10)	ISO-80	3 (76.20)	4.03 (102.36)
ANC-NW-50-ISO-63	NW-50	2 (50.80)	ISO-63	2½ (63.50)	2.78 (70.61)
ANC-NW-50-ISO-80	NW-50	2 (50.80)	ISO-80	3 (76.20)	4.03 (102.36)
ANC-NW-50-ISO-100	NW-50	2 (50.80)	ISO-100	4 (101.60)	4.03 (102.36)



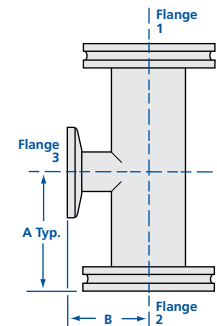
NW to ISO Adapter Nipples

MODEL NUMBER	FLANGE 1 TYPE	FLANGE 2 TYPE	NOM. TUBE OD
AN-NW-16-ISO-63-OF	NW-16	ISO-63	¾ (19.05)
AN-NW-25-ISO-63-OF	NW-25	ISO-63	1 (25.40)
AN-NW-25-ISO-80-OF	NW-25	ISO-80	1 (25.40)
AN-NW-25-ISO-100-OF	NW-25	ISO-100	1 (25.40)
AN-NW-40-ISO-100-OF	NW-40	ISO-100	1½ (38.10)
AN-NW-50-ISO-160-OF	NW-50	ISO-160	2 (50.80)



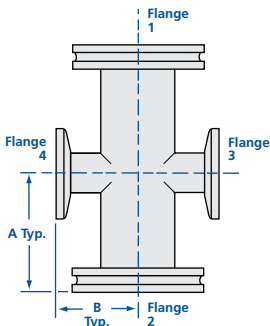
NW to ISO Adapter Tees

MODEL NUMBER	FLANGE 1 TYPE	FLANGE 1 NOM. TUBE OD	FLANGE 2 TYPE	FLANGE 2 NOM. TUBE OD	A	B
3TA-NW-40-ISO-63-OF	ISO-63	2½ (63.50)	NW-40	1½ (38.10)	3.25 (82.55)	2.90 (73.66)
3TA-NW-40-ISO-80-OF	ISO-80	3 (76.20)	NW-40	1½ (38.10)	3.50 (88.90)	3.15 (80.01)
3TA-NW-40-ISO-100-OF	ISO-100	4 (101.60)	NW-40	1½ (38.10)	4.13 (104.90)	3.65 (92.71)
3TA-NW-40-ISO-160-OF	ISO-160	6 (152.40)	NW-40	1½ (38.10)	5.38 (136.65)	4.65 (118.11)
3TA-NW-50-ISO-63-OF	ISO-63	2½ (63.50)	NW-50	2 (50.80)	3.25 (82.55)	3.40 (86.36)
3TA-NW-50-ISO-80-OF	ISO-80	3 (76.20)	NW-50	2 (50.80)	3.50 (88.90)	3.65 (92.71)
3TA-NW-50-ISO-100-OF	ISO-100	4 (101.60)	NW-50	2 (50.80)	4.13 (104.90)	4.15 (105.41)
3TA-NW-50-ISO-160-OF	ISO-160	6 (152.40)	NW-50	2 (50.80)	5.38 (136.65)	5.15 (130.81)



NW to ISO Adapter Crosses

MODEL NUMBER	FLANGE 1 TYPE	FLANGE 1 NOM. TUBE OD	FLANGE 2 TYPE	FLANGE 2 NOM. TUBE OD	A	B
4CA-NW-40-ISO-63-OF	ISO-63	2½ (63.50)	NW-40	1½ (38.10)	3.25 (82.55)	2.90 (73.66)
4CA-NW-40-ISO-80-OF	ISO-80	3 (76.20)	NW-40	1½ (38.10)	3.50 (88.90)	3.15 (80.01)
4CA-NW-40-ISO-100-OF	ISO-100	4 (101.60)	NW-40	1½ (38.10)	4.13 (104.90)	3.65 (92.71)
4CA-NW-40-ISO-160-OF	ISO-160	6 (152.40)	NW-40	1½ (38.10)	5.38 (136.65)	4.65 (118.11)
4CA-NW-50-ISO-63-OF	ISO-63	2½ (63.50)	NW-50	2 (50.80)	3.25 (82.55)	3.40 (86.36)
4CA-NW-50-ISO-80-OF	ISO-80	3 (76.20)	NW-50	2 (50.80)	3.50 (88.90)	3.65 (92.71)
4CA-NW-50-ISO-100-OF	ISO-100	4 (101.60)	NW-50	2 (50.80)	4.13 (104.90)	4.15 (105.41)
4CA-NW-50-ISO-160-OF	ISO-160	6 (152.40)	NW-50	2 (50.80)	5.38 (136.65)	5.15 (130.81)



SPECIFICATIONS

Materials: 304 stainless steel
(316L available upon request)

Vacuum range: ≥ 1 x 10⁻⁸ mbar - High vacuum

Temperature range: -20°C to 150°C

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

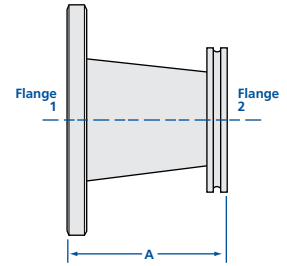
Adapter Fittings

Flange-to-Flange



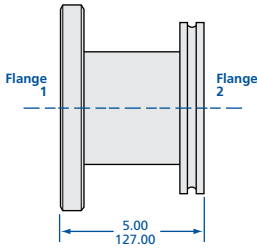
CF to ISO Conical Adapter Nipples

MODEL NUMBER	FLANGE 1		FLANGE 2		A
	TYPE	NOM. TUBE OD	TYPE	NOM. TUBE OD	
ANC-275-ISO-63-OF	2.75 CF	1½ (40)	ISO-63-OF	2½ (63)	2.83 (71.88)
ANC-275-ISO-80-OF	2.75 CF	1½ (40)	ISO-80-OF	3 (75)	4.08 (103.63)
ANC-338-ISO-63-OF	3.38 CF	2 (50)	ISO-63-OF	2½ (63)	2.85 (72.39)
ANC-338-ISO-80-OF	3.38 CF	2 (50)	ISO-80-OF	3 (75)	4.10 (104.14)
ANC-338-ISO-100-OF	3.38 CF	2 (50)	ISO-100-OF	4 (100)	4.10 (104.14)
ANC-450-ISO-80-OF	4.50 CF	2½ (63)	ISO-80-OF	3 (75)	4.25 (107.95)
ANC-450-ISO-100-OF	4.50 CF	2½ (63)	ISO-100-OF	4 (100)	4.25 (107.95)
ANC-462-ISO-63-OF	4.62 CF	3 (75)	ISO-63-OF	2½ (63)	4.16 (105.66)
ANC-462-ISO-100-OF	4.62 CF	3 (75)	ISO-100-OF	4 (100)	4.16 (105.66)
ANC-600-ISO-63-OF	6.00 CF	4 (100)	ISO-63-OF	2½ (63)	4.31 (109.47)
ANC-600-ISO-80-OF	6.00 CF	4 (100)	ISO-80-OF	3 (75)	4.31 (109.47)



CF to ISO Adapter Nipples

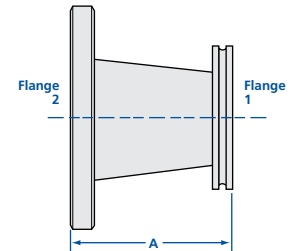
MODEL NUMBER	FLANGE 1 TYPE	FLANGE 2 TYPE	NOM. TUBE OD
AN-450-ISO-63-OF	4.50 CF	ISO-63-OF	2½ (63.50)
AN-462-ISO-80-OF	4.62 CF	ISO-80-OF	3 (76.20)
AN-600-ISO-100-OF	6.00 CF	ISO-100-OF	4 (101.60)
AN-800-ISO-160-OF	8.00 CF	ISO-160-OF	6 (152.40)
AN-1000-ISO-200-OF	10.00 CF	ISO-200-OF	8 (203.20)



ISO to ASA Conical Adapter Nipples

MODEL NUMBER	FLANGE 1 TYPE	NOM. TUBE OD	FLANGE 2 TYPE	NOM. TUBE OD	A
ANC-ISO-63-OF-ASA-5	ISO-63	2½ (63.50)	ASA-5	2 (50.80)	2.88 (73.15)
ANC-ISO-63-OF-ASA-6	ISO-63	2½ (63.50)	ASA-6	3 (76.20)	4.13 (104.90)
ANC-ISO-63-OF-ASA-7.5	ISO-63	2½ (63.50)	ASA-7.5	4 (101.60)	4.13 (104.90)
ANC-ISO-80-OF-ASA-5	ISO-80	3 (76.20)	ASA-5	2 (50.80)	4.13 (104.90)
ANC-ISO-80-OF-ASA-7.5	ISO-80	3 (76.20)	ASA-7.5	4 (101.60)	4.13 (104.90)
ANC-ISO-100-OF-ASA-5	ISO-100	4 (101.60)	ASA-5	2 (50.80)	4.13 (104.90)
ANC-ISO-100-OF-ASA-6	ISO-100	4 (101.60)	ASA-6	3 (76.20)	4.13 (104.90)

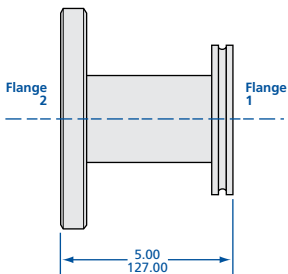
Note: Add suffix "-G" to model number if O-ring groove is required on ASA flange.
Call for groove prices.



ISO to ASA Adapter Nipples

MODEL NUMBER	FLANGE 1 TYPE	FLANGE 2 TYPE	NOM. TUBE OD
AN-ISO-63-OF-ASA-11	ISO-63	ASA-11	2½ (63.50)
AN-ISO-80-OF-ASA-6	ISO-80	ASA-6	3 (76.20)
AN-ISO-80-OF-ASA-11	ISO-80	ASA-11	3 (76.20)
AN-ISO-100-OF-ASA-7.5	ISO-100	ASA-7.5	4 (101.60)
AN-ISO-100-OF-ASA-9	ISO-100	ASA-9	4 (101.60)
AN-ISO-100-OF-ASA-11	ISO-100	ASA-11	4 (101.60)
AN-ISO-160-OF-ASA-9	ISO-160	ASA-9	6 (152.40)
AN-ISO-160-OF-ASA-11	ISO-160	ASA-11	6 (152.40)
AN-ISO-200-OF-ASA-11	ISO-200	ASA-11	8 (203.20)
AN-ISO-200-OF-ASA-13.5	ISO-200	ASA-13.5	8 (203.20)

Note: Add suffix "-G" to model number if O-ring groove is required on ASA flange.
Call for groove prices.



SPECIFICATIONS

Materials: 304 or stainless steel
(316L available upon request)

Vacuum range: $\geq 1 \times 10^{-8}$ mbar - High vacuum

Temperature range: -20°C to 150°C

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

Adapter Fittings

Flange-to-Flange

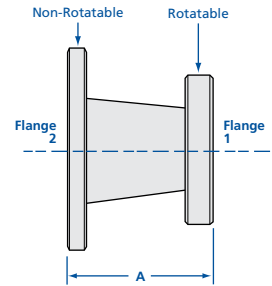


CF to ASA Conical Adapter Nipples

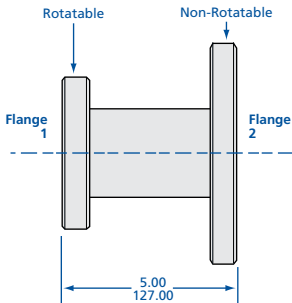


MODEL NUMBER	TYPE	FLANGE 1 NOM. TUBE OD	TYPE	FLANGE 2 NOM. TUBE OD	A
ANC-212-ASA-5	2.12 CF	1 (25.40)	ASA-5	2 (50.80)	2.79 (70.87)
ANC-275-ASA-5	2.75 CF	1½ (38.10)	ASA-5	2 (50.80)	2.83 (71.88)
ANC-275-ASA-6	2.75 CF	1½ (38.10)	ASA-6	3 (76.20)	4.08 (103.63)
ANC-338-ASA-5	3.38 CF	2 (50.80)	ASA-5	2½ (63.50)	2.85 (72.38)
ANC-338-ASA-6	3.38 CF	2 (50.80)	ASA-6	3 (76.20)	4.10 (104.14)
ANC-338-ASA-7.5	3.38 CF	2 (50.80)	ASA-7.5	4 (101.60)	4.10 (104.14)
ANC-450-ASA-5	4.50 CF	2 (50.80)	ASA-5	2 (50.80)	3.00 (76.20)
ANC-450-ASA-6	4.50 CF	2½ (63.50)	ASA-6	3 (76.20)	4.25 (107.95)
ANC-450-ASA-7.5	4.50 CF	2½ (63.50)	ASA-7.5	4 (101.60)	4.25 (107.95)
ANC-462-ASA-5	4.62 CF	3 (76.20)	ASA-5	2 (50.80)	4.16 (105.66)
ANC-462-ASA-7.5	4.62 CF	3 (76.20)	ASA-7.5	4 (101.60)	4.16 (105.66)
ANC-600-ASA-5	6.00 CF	4 (101.60)	ASA-5	2 (50.80)	4.31 (109.47)
ANC-600-ASA-6	6.00 CF	4 (101.60)	ASA-6	3 (76.20)	4.31 (109.47)

Note: Add suffix "-G" to model number if O-ring groove is required on ASA flange.
Call for ASA groove prices.



CF to ASA Adapter Nipples



MODEL NUMBER	FLANGE 1 TYPE	FLANGE 2 TYPE	NOMINAL TUBE OD
AN-133-ASA-5	1.33 CF	ASA-5	¾ (19.05)
AN-133-ASA-6	1.33 CF	ASA-6	¾ (19.05)
AN-212-ASA-6	2.12 CF	ASA-6	1 (25.40)
AN-462-ASA-6	4.62 CF	ASA-6	3 (76.20)
AN-133-ASA-7.5	1.33 CF	ASA-7.5	¾ (19.05)
AN-212-ASA-7.5	2.12 CF	ASA-7.5	1 (25.40)
AN-275-ASA-7.5	2.75 CF	ASA-7.5	1½ (38.10)
AN-133-ASA-9	1.33 CF	ASA-9	¾ (19.05)
AN-212-ASA-9	2.12 CF	ASA-9	1 (25.40)
AN-275-ASA-9	2.75 CF	ASA-9	1½ (38.10)
AN-338-ASA-9	3.38 CF	ASA-9	2 (50.80)
AN-450-ASA-9	4.50 CF	ASA-9	2½ (63.50)
AN-462-ASA-9	4.62 CF	ASA-9	3 (76.20)
AN-600-ASA-9	6.00 CF	ASA-9	4 (101.60)
AN-133-ASA-11	1.33 CF	ASA-11	¾ (19.05)
AN-212-ASA-11	2.12 CF	ASA-11	1 (25.40)
AN-275-ASA-11	2.75 CF	ASA-11	1½ (38.10)
AN-338-ASA-11	3.38 CF	ASA-11	2 (50.80)
AN-450-ASA-11	4.50 CF	ASA-11	2½ (63.50)
AN-462-ASA-11	4.62 CF	ASA-11	3 (76.20)
AN-600-ASA-11	6.00 CF	ASA-11	4 (101.60)
AN-800-ASA-11	8.00 CF	ASA-11	6 (152.40)
AN-133-ASA-13.5	1.33 CF	ASA-13.5	¾ (19.05)
AN-212-ASA-13.5	2.12 CF	ASA-13.5	1 (25.40)
AN-275-ASA-13.5	2.75 CF	ASA-13.5	1½ (38.10)
AN-338-ASA-13.5	3.38 CF	ASA-13.5	2 (50.80)
AN-450-ASA-13.5	4.50 CF	ASA-13.5	2½ (63.50)
AN-462-ASA-13.5	4.62 CF	ASA-13.5	3 (76.20)
AN-600-ASA-13.5	6.00 CF	ASA-13.5	4 (101.60)
AN-800-ASA-13.5	8.00 CF	ASA-13.5	6 (152.40)
AN-1000-ASA-13.5	10.00 CF	ASA-13.5	8 (203.20)
AN-133-ASA-16	1.33 CF	ASA-16	¾ (19.05)
AN-212-ASA-16	2.12 CF	ASA-16	1 (25.40)
AN-275-ASA-16	2.75 CF	ASA-16	1½ (38.01)
AN-338-ASA-16	3.38 CF	ASA-16	2 (50.80)
AN-450-ASA-16	4.50 CF	ASA-16	2½ (63.50)
AN-462-ASA-16	4.62 CF	ASA-16	3 (76.20)
AN-600-ASA-16	6.00 CF	ASA-16	4 (101.60)
AN-800-ASA-16	8.00 CF	ASA-16	6 (152.40)
AN-1000-ASA-16	10.00 CF	ASA-16	8 (203.20)
AN-1325-ASA-16	13.25 CF	ASA-16	10 (254.00)

Note: Add suffix "-G" to model number if O-ring groove is required on ASA flange.
Call for groove prices.



SPECIFICATIONS

Materials: 304 or stainless steel
(316L available upon request)

Vacuum range: ≥ 1 x 10⁻⁸ mbar - High vacuum

Temperature range: -20°C to 150°C

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



Adapter Fittings

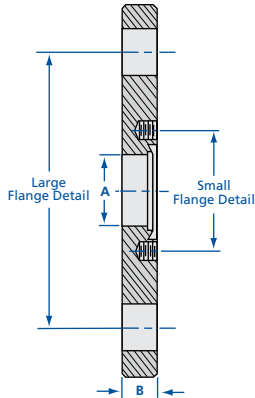
Adapter Flange and Flange-to-Fitting

SPECIFICATIONS

Materials: 304 stainless steel

Vacuum range: $\geq 1 \times 10^{-8}$ mbar - High vacuum

Temperature range: -20°C to 150°C



CF to ASA Adapter Flanges

MODEL NUMBER	SMALL FLANGE	LARGE FLANGE	A	B
ASA-5-133-075Z	133-000NT	ASA-5-000N	0.63 (16.00)	0.50 (12.70)
ASA-5-212-100Z	212-000NT	ASA-5-000N	1.00 (25.40)	0.50 (12.70)
ASA-5-275-150Z	275-000NT	ASA-5-000N	1.50 (38.10)	0.50 (12.70)
ASA-6-133-075Z	133-000NT	ASA-6-000N	0.63 (16.00)	0.50 (12.70)
ASA-6-212-100Z	212-000NT	ASA-6-000N	1.00 (25.40)	0.50 (12.70)
ASA-6-275-150Z	275-000NT	ASA-6-000N	1.50 (38.10)	0.50 (12.70)
ASA-6-338-200Z	338-000NT	ASA-6-000N	2.00 (50.80)	0.75 (19.05)
ASA-7.5-133-075Z	133-000NT	ASA-7.5-000N	0.63 (16.00)	0.50 (12.70)
ASA-7.5-212-100Z	212-000NT	ASA-7.5-000N	1.00 (25.40)	0.50 (12.70)
ASA-7.5-275-150Z	275-000NT	ASA-7.5-000N	1.50 (38.10)	0.50 (12.70)
ASA-7.5-338-200Z	338-000NT	ASA-7.5-000N	2.00 (50.80)	0.75 (19.05)
ASA-7.5-450-250Z	450-000NT	ASA-7.5-000N	2.50 (63.50)	0.75 (19.05)
ASA-9-133-075Z	133-000NT	ASA-9-000N	0.63 (16.00)	0.75 (19.05)
ASA-9-212-100Z	212-000NT	ASA-9-000N	1.00 (25.40)	0.75 (19.05)
ASA-9-275-150Z	275-000NT	ASA-9-000N	1.50 (38.10)	0.75 (19.05)
ASA-9-338-200Z	338-000NT	ASA-9-000N	2.00 (50.80)	0.75 (19.05)
ASA-9-450-250Z	450-000NT	ASA-9-000N	2.50 (63.50)	0.75 (19.05)
ASA-9-462-300Z	462-000NT	ASA-9-000N	3.00 (76.20)	0.75 (19.05)
ASA-9-600-400Z	600-000NT	ASA-9-000N	4.00 (101.60)	0.75 (19.05)
ASA-11-133-075Z	133-000NT	ASA-11-000N	0.63 (16.00)	0.75 (19.05)
ASA-11-212-100Z	212-000NT	ASA-11-000N	1.00 (25.40)	0.75 (19.05)
ASA-11-275-150Z	275-000NT	ASA-11-000N	1.50 (38.10)	0.75 (19.05)
ASA-11-338-200Z	338-000NT	ASA-11-000N	2.00 (50.80)	0.75 (19.05)
ASA-11-450-250Z	450-000NT	ASA-11-000N	2.50 (63.50)	0.75 (19.05)
ASA-11-462-300Z	462-000NT	ASA-11-000N	3.00 (76.20)	0.75 (19.05)
ASA-11-600-400Z	600-000NT	ASA-11-000N	4.00 (101.60)	0.75 (19.05)
ASA-11-800-600Z	800-000NT	ASA-11-000N	6.00 (152.40)	0.75 (19.05)



SPECIFICATIONS

Materials: 304 stainless steel

Vacuum range: $\geq 1 \times 10^{-8}$ mbar - High vacuum

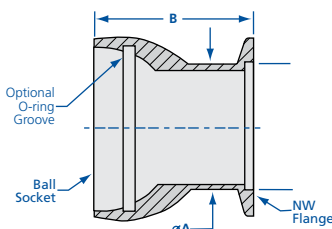
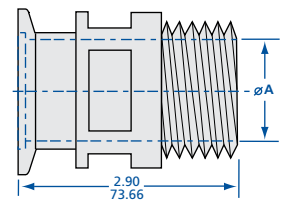
Temperature range: -20°C to 150°C



NW Welch Pump Adapters

MODEL NUMBER	USE WITH WELCH PUMP MODEL NUMBER	THREAD	TUBE ID A
AN-NW-16-1400	1399, 1400, 1410	3/8-18 NPSM x 1.00	0.450 (11.43)
AN-NW-16-1405	1405	3/4-20 NPSM x 1.00	0.562 (14.28)
AN-NW-25-1405	1405	3/4-20 NPSM x 1.00	0.562 (14.28)
AN-NW-25-1402	1380, 1402, 1403, 8806, 8811, 8816, 8821	1-20 NPSM x 1.00	0.750 (19.05)
AN-NW-40-1402	1380, 1402, 1403, 8806, 8811, 8816, 8821	1-20 NPSM x 1.00	0.750 (19.05)
AN-NW-40-1376	1373, 1376, 8831	1 1/2-12 NPSM x 1.00	1.125 (28.58)
AN-NW-40-1397	1374, 1397	1 1/4-20 NPSM x 1.00	1.375 (34.93)
AN-NW-50-1397	1374, 1397	1 3/4-20 NPSM x 1.00	1.375 (34.93)

Note: Includes aluminum gasket



NW Ball Socket Adapters

MODEL NUMBER	BALL SOCKET	FLANGE TYPE	TUBE OD A	B	O-RING SIZE
BS-50/30-NW	50/30	NW-40	1 1/2 (38.10)	1.90 (48.26)	-
BS-50/30G-NW	50/30	NW-40	1 1/2 (38.10)	1.90 (48.26)	2-224
BS-75/50-NW	75/50	NW-50	2 (50.80)	2.65 (67.31)	-
BS-75/50G-NW	75/50	NW-50	2 (50.80)	2.65 (67.31)	2-232

Note: "G" in model number indicates O-ring and O-ring groove.



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

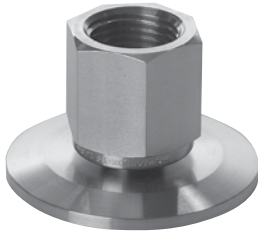
Adapter Fittings

Flange-to-Fitting

SECTION 2.7



NW Female Pipe Adapters



MODEL NUMBER	NPT	A
NW-10-1/8 FPT	1/8 (3.18)	0.92 (23.37)
NW-16-1/8 FPT	1/8 (3.18)	0.92 (23.37)
NW-25-1/8 FPT	1/8 (3.18)	0.92 (23.37)
NW-40-1/8 FPT	1/8 (3.18)	0.92 (23.37)
NW-50-1/8 FPT	1/8 (3.18)	0.92 (23.37)
NW-10-1/4 FPT	1/4 (6.35)	1.07 (27.18)
NW-16-1/4 FPT	1/4 (6.35)	1.07 (27.18)
NW-25-1/4 FPT	1/4 (6.35)	1.07 (27.18)
NW-40-1/4 FPT	1/4 (6.35)	1.07 (27.18)
NW-50-1/4 FPT	1/4 (6.35)	1.07 (27.18)
NW-16-1/2 FPT	1/2 (12.70)	1.44 (36.58)
NW-25-1/2 FPT	1/2 (12.70)	1.39 (35.31)
NW-40-1/2 FPT	1/2 (12.70)	1.39 (35.31)
NW-50-1/2 FPT	1/2 (12.70)	1.39 (35.31)
NW-25-3/4 FPT	3/4 (19.05)	1.45 (36.83)
NW-40-3/4 FPT	3/4 (19.05)	1.45 (36.83)
NW-50-3/4 FPT	3/4 (19.05)	1.45 (36.83)
NW-25-1 FPT	1 (25.40)	1.57 (39.88)
NW-40-1 FPT	1 (25.40)	1.57 (39.88)
NW-50-1 FPT	1 (25.40)	1.57 (39.88)

SPECIFICATIONS

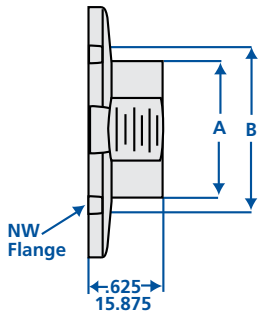
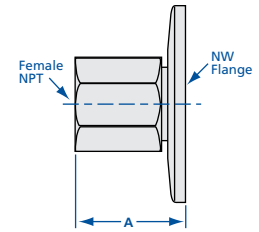
Materials

Flanges: 304 stainless steel

NPT Fittings: 316L stainless steel

Vacuum range: $\geq 1 \times 10^{-6}$ mbar - High vacuum

Temperature range: -20°C to 150°C

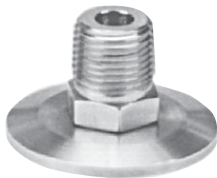


Machined NW Female Pipe Adapters

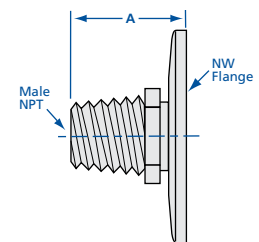
MODEL NUMBER	NPT	A FLAT	B OD
NW-16-1/8-FPTM	1/8 (3.18)	.625 (15.88)	0.75 (19.05)
NW-16-1/4-FPTM	1/4 (6.35)	.625 (15.88)	0.75 (19.05)
NW-25-1/8-FPTM	1/8 (3.18)	.875 (22.23)	1.00 (25.40)
NW-25-1/4-FPTM	1/4 (6.35)	.875 (22.23)	1.00 (25.40)
NW-40-1/8-FPTM	1/8 (3.18)	1.25 (31.75)	1.50 (38.10)
NW-40-1/4-FPTM	1/4 (6.35)	1.25 (31.75)	1.50 (38.10)



NW Male Pipe Adapters



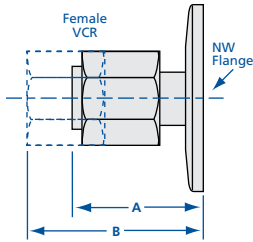
MODEL NUMBER	NPT	A
NW-10-1/8 MPT	1/8 (3.18)	0.89 (22.61)
NW-16-1/8 MPT	1/8 (3.18)	0.89 (22.61)
NW-25-1/8 MPT	1/8 (3.18)	0.89 (22.61)
NW-40-1/8 MPT	1/8 (3.18)	0.89 (22.61)
NW-50-1/8 MPT	1/8 (3.18)	0.89 (22.61)
NW-10-1/4 MPT	1/4 (6.35)	1.10 (27.94)
NW-16-1/4 MPT	1/4 (6.35)	1.10 (27.94)
NW-25-1/4 MPT	1/4 (6.35)	1.10 (27.94)
NW-40-1/4 MPT	1/4 (6.35)	1.10 (27.94)
NW-50-1/4 MPT	1/4 (6.35)	1.10 (27.94)
NW-16-1/2 MPT	1/2 (12.70)	1.35 (34.29)
NW-25-1/2 MPT	1/2 (12.70)	1.35 (34.29)
NW-40-1/2 MPT	1/2 (12.70)	1.35 (34.29)
NW-50-1/2 MPT	1/2 (12.70)	1.35 (34.29)
NW-25-3/4 MPT	3/4 (19.05)	1.35 (34.29)
NW-40-3/4 MPT	3/4 (19.05)	1.35 (34.29)
NW-50-3/4 MPT	3/4 (19.05)	1.35 (34.29)
NW-25-1 MPT	1 (25.40)	1.64 (41.66)
NW-40-1 MPT	1 (25.40)	1.64 (41.66)
NW-50-1 MPT	1 (25.40)	1.64 (41.66)



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

Adapter Fittings

Flange-to-Fitting



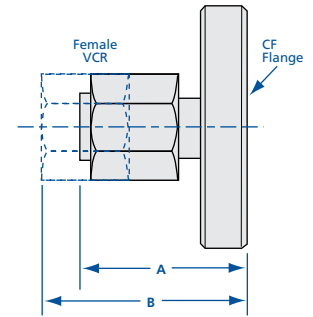
NW Female VCR Adapters

MODEL NUMBER	FLANGE TYPE	VCR SIZE	A	B
NW-10-1/4 FVCR	NW-10	1/4 (6.35)	1.46 (37.08)	1.96 (49.78)
NW-16-1/4 FVCR	NW-16	1/4 (6.35)	1.46 (37.08)	1.96 (49.78)
NW-25-1/4 FVCR	NW-25	1/4 (6.35)	1.46 (37.08)	1.96 (49.78)
NW-40-1/4 FVCR	NW-40	1/4 (6.35)	1.46 (37.08)	1.96 (49.78)
NW-50-1/4 FVCR	NW-50	1/4 (6.35)	1.46 (37.08)	1.96 (49.78)
NW-16-3/8 FVCR	NW-16	3/8 (9.53)	1.65 (41.91)	2.20 (55.88)
NW-25-3/8 FVCR	NW-25	3/8 (9.53)	1.65 (41.91)	2.20 (55.88)
NW-40-3/8 FVCR	NW-40	3/8 (9.53)	1.65 (41.91)	2.20 (55.88)
NW-50-3/8 FVCR	NW-50	3/8 (9.53)	1.65 (41.91)	2.20 (55.88)
NW-16-1/2 FVCR	NW-16	1/2 (12.70)	1.65 (41.91)	2.20 (55.88)
NW-25-1/2 FVCR	NW-25	1/2 (12.70)	1.65 (41.91)	2.20 (55.88)
NW-40-1/2 FVCR	NW-40	1/2 (12.70)	1.65 (41.91)	2.20 (55.88)
NW-50-1/2 FVCR	NW-50	1/2 (12.70)	1.65 (41.91)	2.20 (55.88)



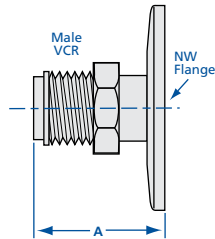
CF Female VCR Adapters

MODEL NUMBER	FLANGE TYPE	VCR SIZE	A	B
133-1/4 FVCR	1.33 CF	1/4 (6.35)	1.36 (34.54)	1.88 (47.75)
133-3/8 FVCR	1.33 CF	3/8 (9.53)	1.55 (39.37)	2.13 (54.10)
275-1/4 FVCR	2.75 CF	1/4 (6.35)	1.36 (34.54)	1.88 (47.75)
275-3/8 FVCR	2.75 CF	3/8 (9.53)	1.55 (39.37)	2.13 (54.10)



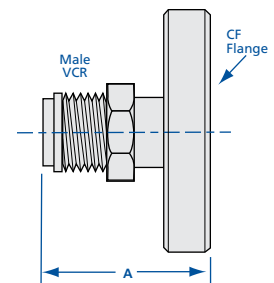
NW Male VCR Adapters

MODEL NUMBER	FLANGE TYPE	VCR SIZE	A
NW-10-1/4 MVCR	NW-10	1/4 (6.35)	1.46 (37.08)
NW-16-1/4 MVCR	NW-16	1/4 (6.35)	1.46 (37.08)
NW-25-1/4 MVCR	NW-25	1/4 (6.35)	1.46 (37.08)
NW-40-1/4 MVCR	NW-40	1/4 (6.35)	1.46 (37.08)
NW-50-1/4 MVCR	NW-50	1/4 (6.35)	1.46 (37.08)
NW-16-3/8 MVCR	NW-16	3/8 (9.53)	1.65 (41.91)
NW-25-3/8 MVCR	NW-25	3/8 (9.53)	1.65 (41.91)
NW-40-3/8 MVCR	NW-40	3/8 (9.53)	1.65 (41.91)
NW-50-3/8 MVCR	NW-50	3/8 (9.53)	1.65 (41.91)
NW-16-1/2 MVCR	NW-16	1/2 (12.70)	1.65 (41.91)
NW-25-1/2 MVCR	NW-25	1/2 (12.70)	1.65 (41.91)
NW-40-1/2 MVCR	NW-40	1/2 (12.70)	1.65 (41.91)
NW-50-1/2 MVCR	NW-50	1/2 (12.70)	1.65 (41.91)



CF Male VCR Adapters

MODEL NUMBER	FLANGE TYPE	VCR SIZE	A
133-1/4 MVCR	1.33 CF	1/4 (6.35)	1.46 (37.08)
133-3/8 MVCR	1.33 CF	3/8 (9.53)	1.65 (41.91)
275-1/4 MVCR	2.75 CF	1/4 (6.35)	1.46 (37.08)
275-3/8 MVCR	2.75 CF	3/8 (9.53)	1.65 (41.91)



SPECIFICATIONS

Materials

Flanges: 304 stainless steel
VCR Fittings: 316L stainless steel

Vacuum range:

NW Flange: $\geq 1 \times 10^{-8}$ mbar - High vacuum
CF Flange: $\geq 1 \times 10^{-10}$ mbar - UHV

Temperature range: -20°C to 200°C

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

Adapter Fittings

Flange-to-Fitting



NW Quick Disconnect Adapters

MODEL NUMBER	FLANGE TYPE	ID A	ID B	C
NW-10-1/4 QD	NW-10	1/4 (6.35)	0.187 (4.75)	1.48 (37.59)
NW-16-1/4 QD	NW-16	1/4 (6.35)	0.187 (4.75)	1.48 (37.59)
NW-25-1/4 QD	NW-25	1/4 (6.35)	0.187 (4.75)	1.48 (37.59)
NW-40-1/4 QD	NW-40	1/4 (6.35)	0.187 (4.75)	1.48 (37.59)
NW-10-3/8 QD	NW-10	3/8 (9.53)	0.281 (7.14)	1.62 (41.15)
NW-16-3/8 QD	NW-16	3/8 (9.53)	0.281 (7.14)	1.62 (41.15)
NW-25-3/8 QD	NW-25	3/8 (9.53)	0.281 (7.14)	1.62 (41.15)
NW-40-3/8 QD	NW-40	3/8 (9.53)	0.281 (7.14)	1.62 (41.15)
NW-16-1/2 QD	NW-16	1/2 (12.70)	0.406 (10.31)	1.79 (45.47)
NW-25-1/2 QD	NW-25	1/2 (12.70)	0.406 (10.31)	1.79 (45.47)
NW-40-1/2 QD	NW-40	1/2 (12.70)	0.406 (10.31)	1.79 (45.47)
NW-50-1/2 QD	NW-50	1/2 (12.70)	0.406 (10.31)	1.79 (45.47)
NW-25-3/4 QD	NW-25	3/4 (19.05)	0.625 (15.88)	1.93 (49.02)
NW-40-3/4 QD	NW-40	3/4 (19.05)	0.625 (15.88)	1.93 (49.02)
NW-50-3/4 QD	NW-50	3/4 (19.05)	0.625 (15.88)	1.93 (49.02)
NW-40-1 QD	NW-40	1 (25.40)	0.875 (22.23)	1.95 (49.53)
NW-50-1 QD	NW-50	1 (25.40)	0.875 (22.23)	1.95 (49.53)

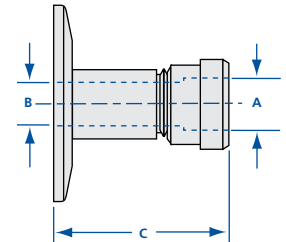
Note: On request, NW Quick Disconnects can be provided bored through for the tube OD. Add "-BT" suffix to the part number and call for price. Example: NW-10-1/4 QD-BT

SPECIFICATIONS

Materials
 Flanges: 304 stainless steel
 QD Fittings: 316L stainless steel

Vacuum range: $\geq 1 \times 10^{-8}$ mbar - High vacuum

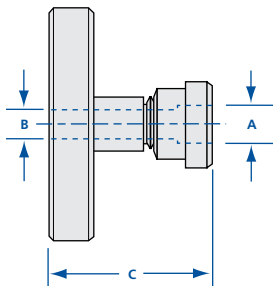
Temperature range: -20°C to 150°C



CF Quick Disconnect Adapters

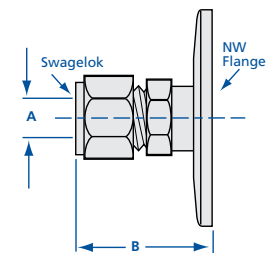
MODEL NUMBER	FLANGE OD	ID A	ID B	C
133-1/4 QD	1.33 CF	1/4 (6.35)	3/16 (4.76)	1.39 (35.31)
133-3/8 QD	1.33 CF	3/8 (9.53)	9/32 (7.14)	1.53 (38.86)
133-1/2 QD	1.33 CF	1/2 (12.70)	13/32 (10.32)	1.70 (43.18)
275-1/4 QD	2.75 CF	1/4 (6.35)	3/16 (4.76)	1.39 (35.31)
275-3/8 QD	2.75 CF	3/8 (9.53)	9/32 (7.14)	1.53 (38.86)
275-1/2 QD	2.75 CF	1/2 (12.70)	13/32 (10.32)	1.70 (43.18)
275-3/4 QD	2.75 CF	3/4 (19.05)	5/8 (15.88)	1.99 (50.55)
275-1 QD	2.75 CF	1 (25.40)	7/8 (22.23)	2.01 (51.05)

Note: On request, CF Quick Disconnects can be provided bored through for the tube OD. Add "-BT" suffix to the part number and call for price. Example: 133-1/4 QD-BT



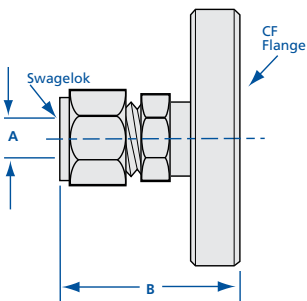
NW Swagelok Adapters

MODEL NUMBER	FLANGE TYPE	ID A	ID B
NW-10-1/4 SWAG	NW-10	1/4 (6.35)	1.47 (37.34)
NW-16-1/4 SWAG	NW-16	1/4 (6.35)	1.47 (37.34)
NW-25-1/4 SWAG	NW-25	1/4 (6.35)	1.47 (37.34)
NW-40-1/4 SWAG	NW-40	1/4 (6.35)	1.47 (37.34)
NW-50-1/4 SWAG	NW-50	1/4 (6.35)	1.47 (37.34)
NW-10-3/8 SWAG	NW-10	3/8 (9.53)	1.63 (41.40)
NW-16-3/8 SWAG	NW-16	3/8 (9.53)	1.63 (41.40)
NW-25-3/8 SWAG	NW-25	3/8 (9.53)	1.63 (41.40)
NW-40-3/8 SWAG	NW-40	3/8 (9.53)	1.63 (41.40)
NW-50-3/8 SWAG	NW-50	3/8 (9.53)	1.63 (41.40)



CF Swagelok Adapters

MODEL NUMBER	FLANGE TYPE	ID A	ID B
133-1/4 SWAG	1.33 CF	1/4 (6.35)	1.37 (34.80)
133-3/8 SWAG	1.33 CF	3/8 (9.53)	1.58 (40.13)
275-1/4 SWAG	2.75 CF	1/4 (6.35)	1.37 (34.80)
275-3/8 SWAG	2.75 CF	3/8 (9.53)	1.54 (39.12)



SPECIFICATIONS

Materials
 Flanges: 304 stainless steel
 Swagelok Fittings: 316L stainless steel

Vacuum range: $\geq 1 \times 10^{-6}$ mbar - High vacuum

Temperature range
 NW Flange: -20°C to 200°C
 CF Flange: -200°C to 450°C

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