



VACUUM COMPONENTS CATALOG

KF, ISO, CF FLANGES & FITTINGS

STAINLESS STEEL TUBING

WELD FITTINGS

BALL VALVES

ANGLE VALVES

SANITARY FITTINGS

ISO 9001:2015 CERTIFIED



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5500 Moore Court Hillsboro, OR 97124 USA
(503) 466-2200
www.hisoregon.com | sales@hisoregon.com



ABOUT HIS INNOVATIONS GROUP

HIS Innovations group was established in Portland, Oregon in 1979 as Hydraulic and Instrumentation Supply, but was shortly renamed to Hoffman Instrumentation Supply. Over the last 40 years, HIS has mastered excellence and innovation, and continues to create new technologies serving a wide variety of customers. HIS Innovations Group is an ISO 9001:2015 certified, premier manufacturer and distributor of custom and off-the-shelf stainless steel components and systems. These products are used in high vacuum (HV) and ultra-high vacuum (UHV) systems within the semiconductor, bio-pharmaceutical, national laboratories, food & beverage, and other industries. We offer early-stage R&D, solution-driven engineering services, rapid prototyping, fabrication, and full-scale production of components and weldments.



Hoffman Instrumentation Supply – 1979 Portland, OR

We integrate a wide variety of components and machines into flexible and modular platforms that provide the best value for our customers. We assemble and test against the customer specifications and provide ISO9001:2015 documentation. HIS is here to help your business be more successful by reducing your costs and lead times.

SOLUTION DRIVEN ENGINEERING

Our highly skilled and innovative engineering team has decades of experience in conceptualizing, designing, manufacturing, and delivering quality solutions to the most complex challenges.

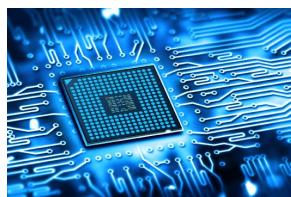
- Mechanical Engineers
- Electrical Engineers
- CAD designers

STATE-OF-THE-ART FAB SHOP

Our stainless steel fabrication shop is staffed with AMSE Section IX Position 6G Certified welders to ensure that your product is of the highest quality and accuracy from start to finish.

- TIG stations
- MIG stations
- Orbital welding
- Robotic welding
- Plastic fabrication

MARKETS & PRODUCTS



SEMICONDUCTOR



BIO-PHARMACEUTICAL



NATIONAL LABS



TUBING & VACUUM
COMPONENTS



INNOVATION & PROCESS
SOLUTIONS



INTEGRATION & CONTRACT
MANUFACTURING

ABOUT HIS

BLM GROUP® TUBE BENDERS



Freedom of shape, radius, bend, and orientation guarantees a perfect fit into your system.

- 1/4" to 6" diameter tubing
- 1.5" diameter bends
- 2.0" diameter bend-to-bend
- Various radius bends

BLM GROUP® FIBER LASER CUTTER



Capabilities to machine nearly any cutout, shape, and design. Machinable materials: mild steel, stainless steel, and galvanized.

- 5' x 10' sheet capabilities
- Round and square tubes up to 120 mm (4.75")

MAZAK® CNC MILLING CENTER



Five machines supporting up to 5-axis manufacturing capabilities that can deliver maximum versatility, high precision, and throughput of complex parts for short lead-times.

DENER® CNC HYDRAULIC PRESS BRAKE



High bending power, quick turnaround times, and 2-axis back-gauge for high precision bends.

MILLER® ROBOTIC WELDING



The large rotation diameter and heavy payload capacity allow for welds to accomplish high precision and accuracy in single, multiple, or progressive fixtures.

FARO® QUANTUM E SCANARM



Our QA/QC department will compare 3D measurements to 3D models to get the most accurate results during the inspection process.

KEYENCE® 3-AXIS LASER MARKER



- Private labeling with QR code capabilities
- Engineering dimensions
- Part numbers

BAND SAWS



With vertical and horizontal band saws, we can deliver a variety of cuts at multiple angles.

COMPLETE POWDER COAT CENTER



Equipped with a hot steam wash station, powder spray booth, and a large powder coat oven.

STRONG COATING

Strong Coating is a corrosion-resistant, anti-fouling, hydrophobic chemical barrier that increases system durability. A sub-micron layer of coating provides optimal coverage that is ideal for laboratories, semiconductor applications, life sciences, oil & gas testing, products with tight tolerances and complex designs, and more.

ADVANTAGES

- Flexibility allows application to bellows without concern of delamination
- Extends the working life of stainless steel
- Corrosion-resistant
- Leak-free under high-pressure conditions
- Lower cost over specialty corrosion-resistant metal alloys
- The coating process uses zero toxic chemicals

INDUSTRIES & USES

LABORATORIES

- Provide a necessary bio-inert surface finish that allows for production and testing without corrosion

SEMICONDUCTOR

- Ideal for use in process chambers, vacuum systems, and exhaust gas abatement systems
- Extends life of corrosion susceptible exhaust line components reducing maintenance calls

LIFE SCIENCES

- Improves corrosion resistance, test quality, and prevents sample contamination

OIL & GAS SERVICES

- Increases the accuracy of testing product



APPLICATIONS

- Tubing
- Flanges & fittings
- Bellows
- Valves performance

COMPATIBLE MATERIALS

- Stainless steel
- Exotic alloys

COATING STRUCTURE

- Functionalized silica-like coating

TEMPERATURE

- 500° C (inert atmosphere)
- 450° C (oxidative)

THICKNESS

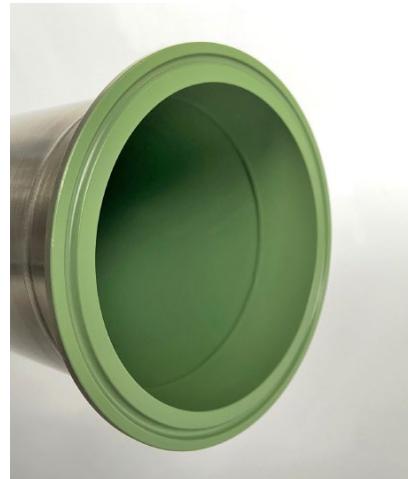
- 400 - 1600 µm

ALLOWABLE PH EXPOSURE

- 0 - 14

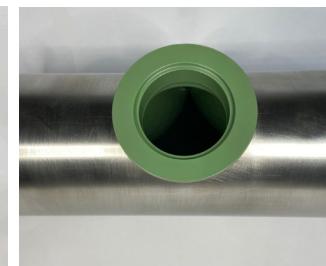
TEFLON® PTFE COATING

Teflon® PTFE (polytetrafluoroethylene) coating provides protection against water, corrosion, friction, UV rays, and extreme temperatures. Its non-reactive properties make this coating great for applications that must hold up against volatile and corrosive chemicals.



ADVANTAGES

- Highest operating temperature of any fluoropolymer
- High-durability thin-film coating typically used in chemical processing
- Non-stick
- Chemical-resistant
- Corrosion-resistant
- Permeable to water vapor and other gases
- Non-wetting
- Superior abrasion
- Dielectric strength
- Low coefficient of friction
- Anti-galling
- Inert



INDUSTRIES & USES

- Semiconductor
- Food and beverage
- Medical equipment
- Aerospace
- Automotive

MATERIALS

- HIS Innovations Group 304 and 316 stainless steel components and tubing.

TEMPERATURE

- Up to 260° C (500° F)

MELTING POINT

- 329° C (625° F)

STANDARD FILM THICKNESS

- Film build per coat: 0.5 - 1.5 mil
- Max total film build: 3.0 mil

COEFFICIENT OF FRICTION

- Kinetic: 0.08 μ 0
- Static: 0.1 μ 0

COLOR

- Green
- Black

TEFLON® PFA COATINGS

Teflon® PFA (perfluoroalkoxy) is a fluorocarbon-based polymer that is chemically inert and solvent resistant at extreme temperatures. PFA has the high-temperature resistance of PTFE coatings with the ability to achieve non-porous, chemical resistant films like FEP. A key advantage of PFA is its melt processability, meaning that when it cures, the level of porosity at the surface is significantly reduced.

ADVANTAGES

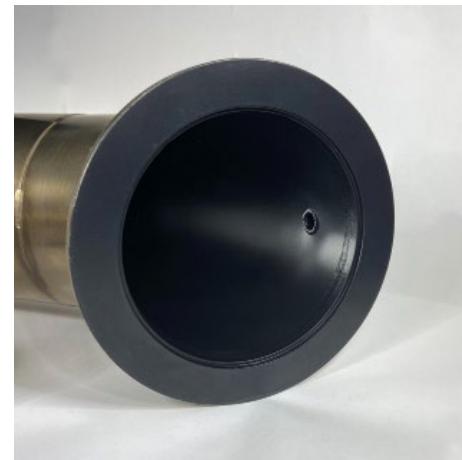
- Uniform coating on complex shapes
- Chemical-resistance
- Corrosion-resistance
- Non-stick
- Superior creep resistance
- Meets FDA 21CFR standards
- High dielectric strength
- Considered tougher than PTFE
- High release capabilities
- Low coefficient of friction

INDUSTRIES & USES

- Semiconductor
- Food and beverage
- Medical equipment
- Aerospace
- Automotive

MATERIALS

- HIS Innovations Group 304 and 316 stainless steel components and tubing.



TEMPERATURE

- Up to 260° C (500° F)

THICKNESS

- Film build per coat: 0.8 - 2.0 mil
- Max total film build: 10.0 mil

DIELECTRIC STRENGTH

- 2000 volts/mil

COEFFICIENT OF FRICTION

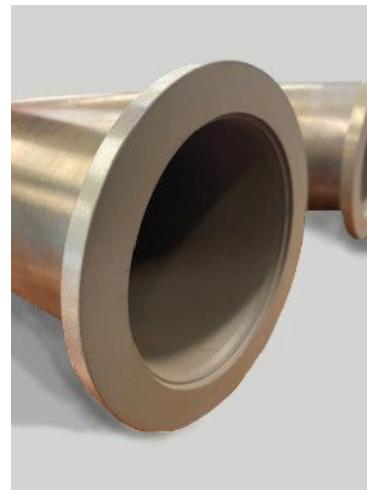
- Kinetic: 0.1 μ 0
- Static: 0.2 μ 0

COLOR

- Gray
- Black

RYTON® COATING

Ryton® polyphenylene sulfide (PPS) is a semi-crystalline, high-heat polymer that offers outstanding chemical resistance and mechanical properties even at elevated temperatures. Complex parts can be coated with very tight tolerances and maintain dimensional stability.



ADVANTAGES

- Great for high temperature, highly corrosive environments
- Outstanding thermal shock stability
- Superior abrasion & wear resistance
- Non-stick
- Creep resistance
- Precision molding to tight tolerances
- Inherent non-flammability without flame retardant additives
- Thin-film that can be built up and used as a primer or topcoat without adding thickness
- Cleans easily with water
- Salt spray resistance
- CT-510 FDA approved

INDUSTRIES & USES

- Semiconductor
- Food and beverage
- Medical equipment
- Aerospace
- Automotive

MATERIALS

- HIS Innovations Group 304 and 316 stainless steel components and tubing.

TEMPERATURE

- Short-term up to 260° C (500° F)
- Long-term up to 200° C (392° F)

THICKNESS

- 1 - 2 mil

DIELECTRIC STRENGTH

- 500 volts/mil

COLOR

- Tan

HALAR® ECTFE COATING

Halar® ECTFE is a partially fluorinated semi-crystalline polymer. It offers purity, surface smoothness, chemical resistance, and fire resistance which are critical characteristics in the semiconductor and photovoltaic markets. Its excellent fire resistance and chemical resistance properties make Halar® ECTFE first-choice in wire and cable applications.

ADVANTAGES

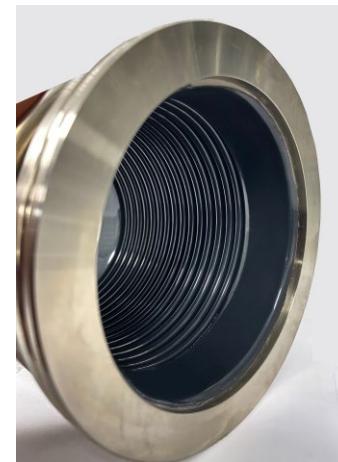
- Melt-process polymer
- Excellent chemical resistance to aqueous caustics, chlorine, strong acids, as well as organic solvents and other corrosive chemicals
- Permeation resistance to carbon dioxide, chlorine gas, and oxygen
- Food safe
- Highly machinable
- Meets FM4922 and FM4910 fire safety standards
- Excellent weatherability
- No contamination of wafers
- Surface hardness and smoothness

INDUSTRIES & USES

- Biopharmaceutical & Extraction
- Semiconductor
- Food and beverage
- Medical equipment
- Aerospace

MATERIALS

- HIS Innovations Group 304 and 316 stainless steel components and tubing.



TEMPERATURE

- Up to 149° C (300° F)

DENSITY

- 1.68

ALLOWABLE PH EXPOSURE

- 1 -14

DIELECTRIC STRENGTH

- 2000 volts/mil in 1mm thickness

THICKNESS

- Up to 30 mil

COEFFICIENT OF FRICTION

- 0.2 μ 0

COLOR

- Dark blue

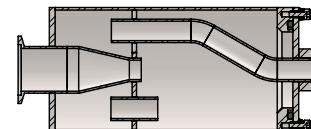
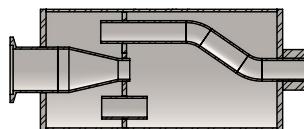
VACUUM PUMP SILENCERS

CLEAN PROCESS & HARSH DUTY SILENCERS

DETAILS

- Fully welded construction made of 304 stainless steel (316 stainless steel available upon request)
- Inlet and outlet are 1.50" (38.1 mm), KF 40 flanges
- OAL is 10.00" (254 mm)
- Helium leak check performed
- Can be disassembled for cleaning (Harsh Duty Silencer only)
- Both bolted & non-bolted options

| Part No. | Description | Finish | Inlet/Outlet Size |
|------------|------------------------|-------------------|-------------------|
| H50416-000 | Clean Process Silencer | Brushed #4 finish | 1.50 (38.1) |
| H50360-000 | Harsh Duty Silencer | Brushed #4 finish | 1.50 (38.1) |



VACUUM PUMP CART

The Pump Trailer securely transports pumps and materials within your factory.

FEATURES

- Up to 2,000 pound towing capacity
- Tows an Edwards iXH6050 with ease
- Floor lock brakes for safety
- Four wheels ensure a smooth and balanced ride
- Multiple tie-down locations to secure your load
- Swiveling front wheels allow for smooth turns
- 304 stainless steel construction

MULTIPLE TOW OPTIONS

Supplied with both a tow handle as well as a hitch hookup, which connects to an electric load mover.

- Handle and hitch lock in place when not in use
- T-handle provides ergonomic benefits, enabling effortless maneuverability



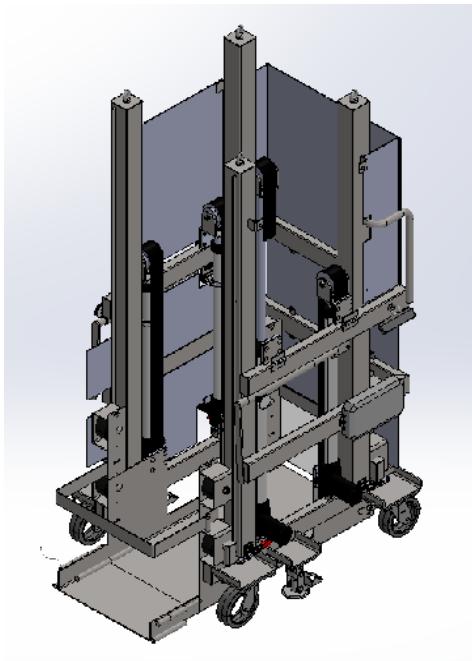
SLOW-FALL HYDRAULIC RAMP

Hydraulic lift support allows for smooth and safe lowering and raising of the ramp.

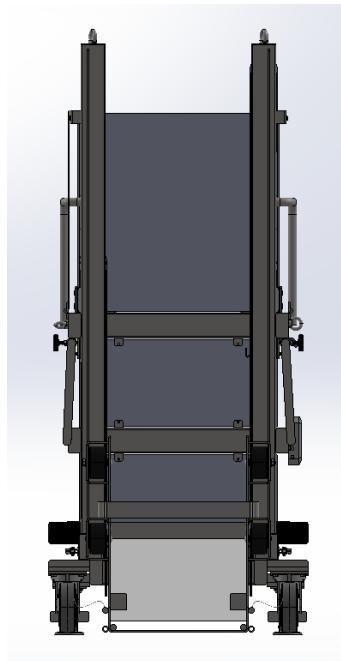
- Built-in handles are helpful to adjust ramp position
- Ramp locks in place when lifted for safe transport

VACUUM PUMP LIFT CART

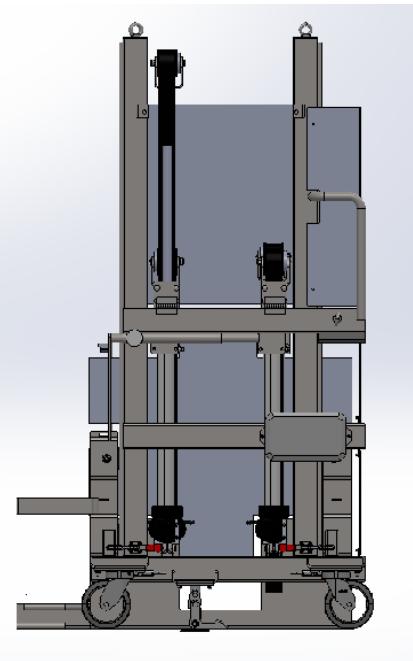
Lifts a 1200 lbs. vacuum pump up from the ground and off an overhead crane.



Isometric View



Front View



Side View

TECHNICAL DETAILS

- Securely lifts pumps from floor level onto pump racks up to 48 inches tall
- Up to 1200 pounds lifting capacity
- Fits pump sizes up to an Edwards iXH1820
- Power requirements: 120 VAC, 5A electrical supply
- 304 stainless steel, welded construction
- 6" (152.4 mm) wheels to handle any grade and threshold

SAFETY FEATURES

- Precision controlled speed to prevent collisions and to accurately position the lifting tray
- Soft Start and Stop with programmable memory for previously used heights
- Transport rests to secure the lifting tray position during transportation to the installation area
- Directional locking casters for efficient maneuvering and positioning
- Two floor locks on either side to hold the pump lift in place during operation
- Multiple strapping locations to secure the pump lift to a pump rack

DIMENSIONS

Measurements are listed in inches (mm).

| | Length | Width | Height |
|--|---|---------------|----------------------------|
| Pump Lift Cart Exterior | 33.50 (850.9) 42.50 (1079.5) with bridge | 31.50 (800.1) | 76.25 (1936.8)* |
| Lifting Tray Interior | 31.50 (800.1) | 16.10 (408.9) | 23.89 (606.8) [#] |
| Lifting Tray Interior with Bridge | 40.50 (1028.7) | 16.10 (408.9) | 23.89 (606.8) [#] |

* = The maximum height of the cart does not change the fully lifted position.

= The lifting tray height does not limit the load height.

V.I.P.E.R. CASES

VALUE-BASED. INNOVATIVE. PROTECTIVE. ERGONOMIC. RUGGED.

CASE FEATURES

- Lockable lid with easy opening latches
- Dustproof interior with continuous airflow. No dust or solid particulates will enter
- Waterproof to IP67 standards
- Watertight at 1 meter for up to 30 minutes
- Chemical resistant
- Shock-proof
- Pressure equalization valve and o-ring creates an airtight and watertight seal
- Unbreakable toughness using glass fiber reinforcement and polypropylene material
- A large, telescoping handle on oversized cases for easy transportation



Large with Wheels VIPER case securing an ISO 63 gate valve

FOAM INSERTS

Full customization of foam inserts to provide the perfect fit for your product(s).

- Custom open cell
- Open cell pick & pull
- Custom closed cell
- No foam option
- Meets ASTM D3575 standards

LABELING

- Customizable tags for high visibility and easy recognition of product status (e.g. clean/dirty)
- Custom exterior product labels with color coordination, barcodes, and any other information necessary to facilitate organization
- Copper/Non-Copper labeling available

DIMENSIONS

Measurements are listed in inches (mm)

| | External | Internal |
|---------------------|---|---|
| MH-VIPER-SML | 16.00 X 13.00 X 6.90 (406.4 X 330.2 X 175.3) | 14.60 X 10.20 X 6.00 (370.8 X 259.1 X 152.4) |
| MH-VIPER-MED | 19.76 X 15.75 X 7.40 (501.9 X 400.1 X 187.9) | 18.07 X 12.87 X 6.70 (458.9 X 326.9 X 170.2) |
| MH-VIPER-LGW | 22.06 X 17.93 X 10.43 (560.3 X 455.4 X 264.9) | 20.37 X 15.43 X 9.00 (517.4 X 391.9 X 228.6) |
| MH-VIPER-XLW | 31.10 X 23.42 X 14.37 (789.9 X 594.9 X 364.9) | 28.34 X 20.47 X 13.00 (719.8 X 519.9 X 330.2) |
| MH-VIPER-LSW | 53.00 X 16.00 X 6.10 (1346.2 X 406.4 X 154.9) | 50.50 X 13.50 X 5.20 (1282.7 X 342.9 X 132.1) |

X-LARGE WITH WHEELS
MH-VIPER-XLW

LONG SLIM WITH WHEELS
MH-VIPER-LSW

LARGE WITH WHEELS
MH-VIPER-LWG

MEDIUM
MH-VIPER-MED

SMALL
MH-VIPER-SML

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FLANGES & FITTINGS

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KF SPECIFICATIONS

OVERVIEW

The KF series of vacuum components is the modular family of small specialty flanges, elbows, tees, crosses, and bellows having interface dimensions defined by the International Standards Organization. The flanges are secured by a clamp acting on the outer flange surface. The letters KF often used in describing the system denote the "small" series. KF is derived from "Kleinflansch", German for "small flange".

ADVANTAGES OF USING HIS VACUUM COMPONENTS

- Complete line of fittings available
- Fast assembly
- Leak-tight
- Cost-effective

MATERIALS

- 304 stainless steel is standard
- 316/316L stainless steel is available

FINISH

- Standard matte finish

TEMPERATURE RANGE

- Viton® seal maximum temperature is 200° C (392° F)
- Buna-N maximum temperature is 100° C (212° F)

PRESSURE RANGE

Limiting pressure is 10^{-8} Torr. Standard components can be used to a slight overpressure of 0-5 psi, with an overpressure ring.

MANUFACTURING & ASSEMBLY

The HIS manufacturing facility is located in Hillsboro, Oregon. HIS uses top-quality equipment and the latest orbital welding techniques. All welding is performed to applicable specifications and accepted industry standards.

PACKAGING AND PROTECTION

QA/QC will verify that all components are suitably packaged and identified per the appropriate specifications.

TECHNICAL APPLICATIONS INFORMATION

The staff at HIS is always ready to discuss your application. In most cases, it is possible to provide literature references for points discussed here.

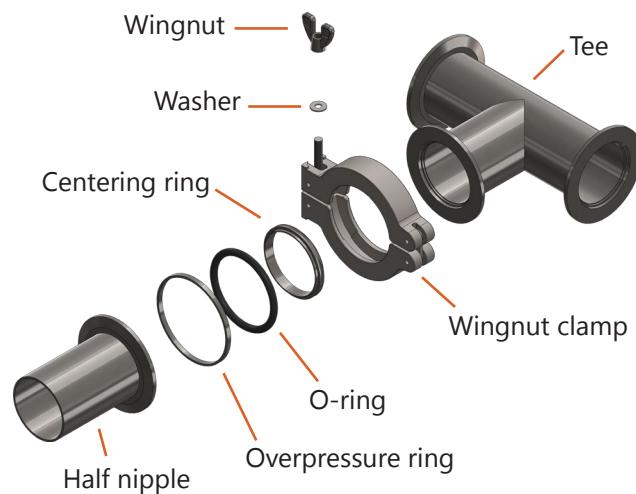
SIZING

| KF | O.D. in. (mm) |
|----|---------------|
| 10 | 0.50 (12.7) |
| 16 | 0.75 (19.1) |
| 25 | 1.00 (25.4) |
| 40 | 1.50 (28.1) |
| 50 | 2.00 (50.8) |

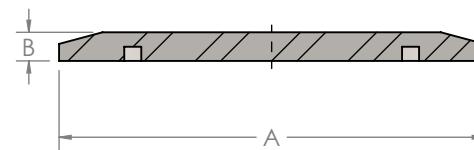
PART NUMBERS

VC - KF - 16 EL90T2
 Flange Series: KF
 Flange Size: 0.75"
 Product: Elbow
 Variation: 90° Type 2

For 316/316L stainless steel, add -316/316L at the end of the part number.

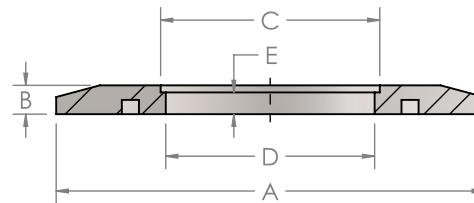


KF BLANK FLANGE



| Part No. | Flange Size | A | B |
|------------|-------------|-----------|------------|
| VC-KF-10BF | 0.50 (12.7) | 1.18 (30) | 0.20 (5.1) |
| VC-KF-16BF | 0.75 (19.1) | 1.18 (30) | 0.20 (5.1) |
| VC-KF-25BF | 1.00 (25.4) | 1.58 (40) | 0.20 (5.1) |
| VC-KF-40BF | 1.50 (28.1) | 2.16 (55) | 0.20 (5.1) |
| VC-KF-50BF | 2.00 (50.8) | 2.95 (75) | 0.20 (5.1) |

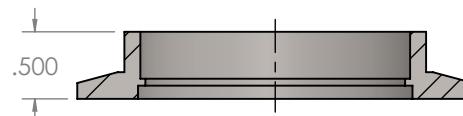
KF BORED FLANGE



| Part No. | Flange Size | A | B | C | D | E |
|-------------------|-------------|-----------|------------|-------------|-------------|------------|
| VC-KF-10BB050BORE | 0.50 (12.7) | 1.18 (30) | 0.20 (5.1) | 0.51 (38.4) | 0.45 (11.4) | 0.15 (3.8) |
| VC-KF-16BB075BORE | 0.75 (19.1) | 1.18 (30) | 0.20 (5.1) | 0.76 (19.2) | 0.64 (16.2) | 0.15 (3.8) |
| VC-KF-25BB100BORE | 1.00 (25.4) | 1.58 (40) | 0.20 (5.1) | 1.01 (25.6) | 0.94 (23.8) | 0.15 (3.8) |
| VC-KF-40BB150BORE | 1.50 (28.1) | 2.16 (55) | 0.20 (5.1) | 1.51 (38.4) | 1.44 (36.6) | 0.15 (3.8) |
| VC-KF-50BB200BORE | 2.00 (50.8) | 2.95 (75) | 0.20 (5.1) | 2.01 (51.1) | 1.94 (49.2) | 0.15 (3.8) |

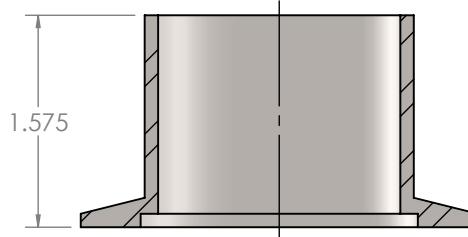
Other bore sizes available upon request.

KF SOCKET WELD FLANGE



| Part No. | Tube Size |
|------------|-------------|
| VC-KF-10SW | 0.50 (12.7) |
| VC-KF-16SW | 0.75 (19.1) |
| VC-KF-25SW | 1.00 (25.4) |
| VC-KF-40SW | 1.50 (28.1) |
| VC-KF-50SW | 2.00 (50.8) |

KF LONG NECK WELD FLANGE



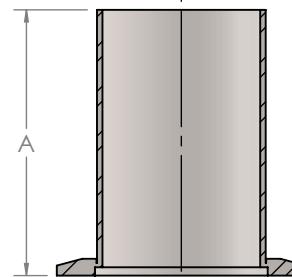
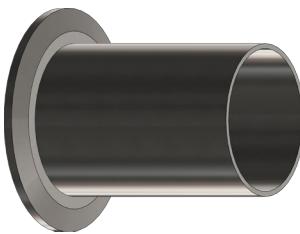
| Part No. | Tube Size |
|------------|-------------|
| VC-KF-10FL | 0.50 (12.7) |
| VC-KF-16FL | 0.75 (19.1) |
| VC-KF-25FL | 1.00 (25.4) |
| VC-KF-40FL | 1.50 (28.1) |
| VC-KF-50FL | 2.00 (50.8) |

IN-HOUSE CNC MACHINING

Five MAZAK[®] machines supporting up to 5-axis manufacturing capabilities that can deliver maximum versatility, high precision and throughput of complex parts for short lead-times.

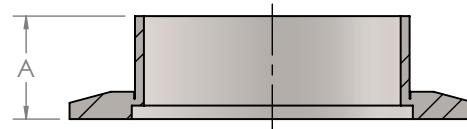


KF HALF NIPPLE



| Part No. | Tube Size | A |
|------------|-------------|-------------|
| VC-KF-10HN | 0.50 (12.7) | 1.25 (31.8) |
| VC-KF-16HN | 0.75 (19.1) | 1.15 (29.2) |
| VC-KF-25HN | 1.00 (25.4) | 2.03 (51.6) |
| VC-KF-40HN | 1.50 (28.1) | 2.40 (60.9) |
| VC-KF-50HN | 2.00 (50.8) | 3.15 (80) |

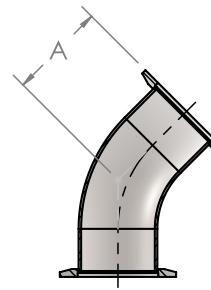
KF SHORT FLANGE



| Part No. | Tube Size | A |
|------------|-------------|-------------|
| VC-KF-10SF | 0.50 (12.7) | 0.50 (12.7) |
| VC-KF-16SF | 0.75 (19.1) | 0.50 (12.7) |
| VC-KF-25SF | 1.00 (25.4) | 0.50 (12.7) |
| VC-KF-40SF | 1.50 (28.1) | 0.75 (19.1) |
| VC-KF-50SF | 2.00 (50.8) | 0.75 (19.1) |

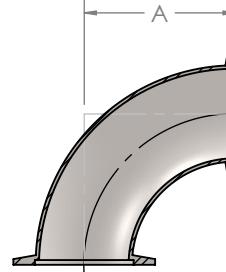
KF FLANGES & FITTINGS

KF 45° ELBOW, TYPE 2



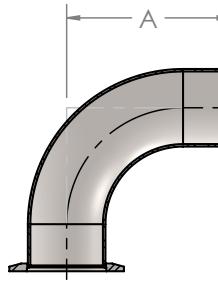
| Part No. | Flange Size | A |
|----------------|-------------|-------------|
| VC-KF-16EL45T2 | 0.75 (19.1) | 2.40 (61) |
| VC-KF-25EL45T2 | 1.00 (25.4) | 1.34 (34) |
| VC-KF-40EL45T2 | 1.50 (28.1) | 1.78 (45.1) |
| VC-KF-50EL45T2 | 2.00 (50.8) | 2.46 (62.5) |

KF 90° ELBOW, TYPE 1



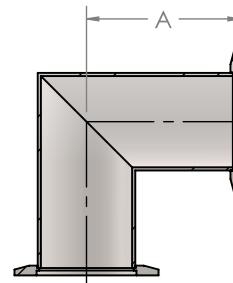
| Part No. | Flange Size | A |
|----------------|-------------|-------------|
| VC-KF-16EL90T1 | 0.75 (19.1) | 1.28 (32.4) |
| VC-KF-25EL90T1 | 1.00 (25.4) | 1.65 (41.9) |
| VC-KF-40EL90T1 | 1.50 (28.1) | 2.40 (61) |
| VC-KF-50EL90T1 | 2.00 (50.8) | 3.15 (80) |

KF 90° ELBOW, TYPE 2



| Part No. | Flange Size | A |
|----------------|-------------|-------------|
| VC-KF-16EL90T2 | 0.75 (19.1) | 3.15 (80) |
| VC-KF-25EL90T2 | 1.00 (25.4) | 2.21 (56.2) |
| VC-KF-40EL90T2 | 1.50 (28.1) | 3.09 (78.4) |
| VC-KF-50EL90T2 | 2.00 (50.8) | 4.21 (107) |

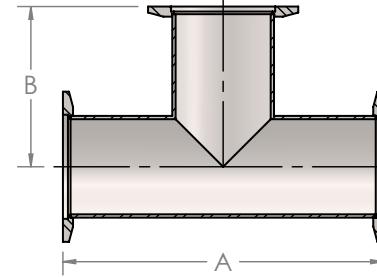
KF 90° ELBOW - MITERED



| Part No. | Flange Size | A |
|-----------------|-------------|-------------|
| VC-KF-16EL90MTR | 0.75 (19.1) | 1.15 (29.2) |
| VC-KF-25EL90MTR | 1.00 (25.4) | 2.03 (51.6) |
| VC-KF-40EL90MTR | 1.50 (28.1) | 2.40 (61) |
| VC-KF-50EL90MTR | 2.00 (50.8) | 3.15 (80) |

Custom lengths and sizes available upon request.

KF TEE



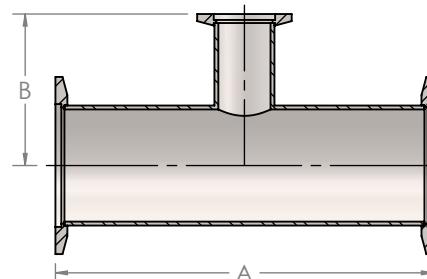
| Part No. | Flange Size | A | B |
|-------------|-------------|--------------|-------------|
| VC-KF-16TEE | 0.75 (19.1) | 4.05 (102.9) | 2.03 (51.4) |
| VC-KF-25TEE | 1.00 (25.4) | 4.05 (102.9) | 2.03 (51.4) |
| VC-KF-40TEE | 1.50 (28.1) | 4.80 (121.9) | 2.41 (61.1) |
| VC-KF-50TEE | 2.00 (50.8) | 6.30 (160) | 3.15 (80) |

ATTENTION TO DETAIL

We take the time and attention on each order to make sure that your components are tested and inspected to the appropriate specifications that you require. Our QA/QC team will verify that all components are suitably packaged and identified.



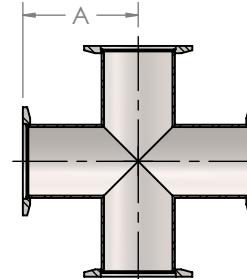
KF REDUCING TEE



| Part No. | Flange Size | A | B |
|---------------|---------------------------|--------------|-------------|
| VC-KF-25X16RT | 1.00 (25.4) X 0.75 (19.1) | 4.05 (102.9) | 2.28 (57.8) |
| VC-KF-40X16RT | 1.50 (38.1) X 0.75 (19.1) | 4.80 (121.9) | 2.40 (61) |
| VC-KF-40X25RT | 1.50 (38.1) X 1.00 (25.4) | 4.80 (121.9) | 2.53 (64.1) |
| VC-KF-50X25RT | 2.00 (50.8) X 1.00 (25.4) | 6.30 (160) | 2.53 (64.1) |
| VC-KF-50X40RT | 2.00 (50.8) X 1.50 (38.1) | 6.30 (160) | 2.65 (67.3) |

Custom sizes available upon request.

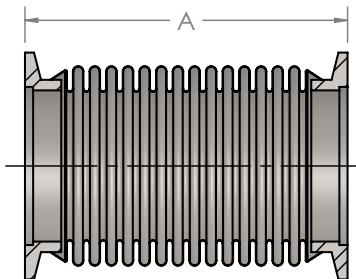
KF 4-WAY CROSS



| Part No. | Flange Size | A |
|------------|---------------------------|-------------|
| VC-KF-16CS | 0.50 (12.7) - 0.75 (19.1) | 2.02 (51.3) |
| VC-KF-25CS | 1.00 (25.4) | 2.02 (51.3) |
| VC-KF-40CS | 1.50 (38.1) | 2.40 (61) |
| VC-KF-50CS | 2.00 (50.8) | 3.15 (80) |

KF FLANGES & FITTINGS

KF FLEXIBLE BELLOWS



KF FLANGES & FITTINGS

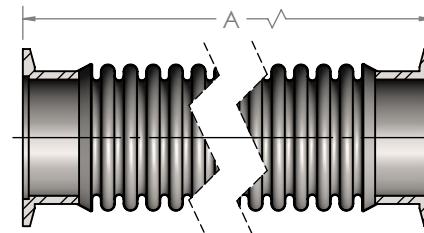
DEFLECTION

- Axial: approximately +15% and -25% of Live Length
- Lateral: approximately 10% of Live Length

| Part No. | Flange Size | Nominal I.D. | Nominal O.D. | Wall | A | Pitch | Working Pressure 70° F | Static Bend Radius 70° F |
|---------------|-------------|--------------|--------------|-------------|--------------|------------|------------------------|--------------------------|
| VC-KF-16FB4.2 | 0.75 (19.1) | 0.80 (20.2) | 1.12 (28.4) | 0.008 (0.2) | 4.20 (106.7) | 0.14 (3.5) | VAC | 1.20 (30.5) |
| VC-KF-25FB4.2 | 1.00 (25.4) | 0.99 (25.2) | 1.39 (35.3) | 0.008 (0.2) | 4.20 (106.7) | 0.15 (3.7) | VAC | 1.50 (38.1) |
| VC-KF-40FB4.2 | 1.50 (28.1) | 1.48 (37.7) | 2.13 (54.1) | 0.008 (0.2) | 4.20 (106.7) | 0.18 (4.6) | VAC | 1.75 (44.5) |
| VC-KF-50FB4.2 | 2.00 (50.8) | 1.96 (49.8) | 2.57 (65.3) | 0.008 (0.2) | 4.20 (106.7) | 0.19 (4.8) | VAC | 2.25 (57.2) |

Custom lengths available upon request.

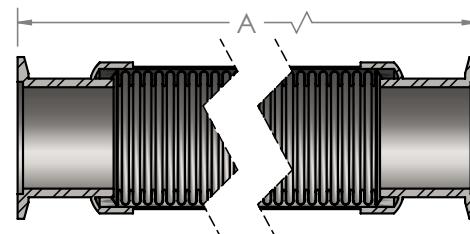
KF FLEXIBLE HOSE



| Part No. | Flange Size | A | Wall |
|--------------|-------------|---------------|-------------|
| VC-KF-16FH12 | 0.75 (19.1) | 12.00 (304.9) | 0.008 (0.2) |
| VC-KF-16FH24 | 0.75 (19.1) | 24.00 (609.6) | 0.008 (0.2) |
| VC-KF-16FH36 | 0.75 (19.1) | 36.00 (914.7) | 0.008 (0.2) |
| VC-KF-25FH12 | 1.00 (25.4) | 12.00 (304.9) | 0.008 (0.2) |
| VC-KF-25FH18 | 1.00 (25.4) | 18.00 (457.2) | 0.008 (0.2) |
| VC-KF-25FH24 | 1.00 (25.4) | 24.00 (609.6) | 0.008 (0.2) |
| VC-KF-25FH36 | 1.00 (25.4) | 36.00 (914.7) | 0.008 (0.2) |
| VC-KF-40FH12 | 1.50 (28.1) | 12.00 (304.9) | 0.008 (0.2) |
| VC-KF-40FH18 | 1.50 (28.1) | 18.00 (457.2) | 0.008 (0.2) |
| VC-KF-40FH24 | 1.50 (28.1) | 24.00 (609.6) | 0.008 (0.2) |
| VC-KF-40FH36 | 1.50 (28.1) | 36.00 (914.7) | 0.008 (0.2) |
| VC-KF-50FH12 | 2.00 (50.8) | 12.00 (304.9) | 0.008 (0.2) |
| VC-KF-50FH18 | 2.00 (50.8) | 18.00 (457.2) | 0.008 (0.2) |
| VC-KF-50FH24 | 2.00 (50.8) | 24.00 (609.6) | 0.008 (0.2) |
| VC-KF-50FH36 | 2.00 (50.8) | 36.00 (914.7) | 0.008 (0.2) |

Custom lengths available upon request.

KF BRAIDED FLEXIBLE HOSE



| Part No. | Tube Size | A | Wall |
|-----------------|-------------|---------------|-------------|
| VC-KF-16FH12BRD | 0.75 (19.1) | 12.00 (304.8) | 0.008 (0.2) |
| VC-KF-16FH24BRD | 0.75 (19.1) | 24.00 (457.2) | 0.008 (0.2) |
| VC-KF-16FH36BRD | 0.75 (19.1) | 36.00 (609.6) | 0.008 (0.2) |
| VC-KF-16FH39BRD | 0.75 (19.1) | 39.00 (990.6) | 0.008 (0.2) |
| VC-KF-25FH12BRD | 1.00 (25.4) | 12.00 (304.8) | 0.008 (0.2) |
| VC-KF-25FH24BRD | 1.00 (25.4) | 24.00 (457.2) | 0.008 (0.2) |
| VC-KF-25FH36BRD | 1.00 (25.4) | 36.00 (609.6) | 0.008 (0.2) |
| VC-KF-25FH39BRD | 1.00 (25.4) | 39.00 (990.6) | 0.008 (0.2) |
| VC-KF-40FH12BRD | 1.50 (28.1) | 12.00 (304.8) | 0.008 (0.2) |
| VC-KF-40FH24BRD | 1.50 (28.1) | 24.00 (457.2) | 0.008 (0.2) |
| VC-KF-40FH36BRD | 1.50 (28.1) | 36.00 (609.6) | 0.008 (0.2) |
| VC-KF-40FH39BRD | 1.50 (28.1) | 39.00 (990.6) | 0.008 (0.2) |
| VC-KF-50FH12BRD | 2.00 (50.8) | 12.00 (304.8) | 0.008 (0.2) |
| VC-KF-50FH24BRD | 2.00 (50.8) | 24.00 (457.2) | 0.008 (0.2) |
| VC-KF-50FH36BRD | 2.00 (50.8) | 36.00 (609.6) | 0.008 (0.2) |
| VC-KF-50FH39BRD | 2.00 (50.8) | 39.00 (990.6) | 0.008 (0.2) |

Custom lengths available upon request.

8-MARK-II VERTICAL TILT-FRAME BAND SAW

Capacities to cut 18" x 22" (457.2 mm x 558.8 mm) stainless steel up to a 45° angle from speeds 50-450 fpm.



VACUUM PVC HOSE KITS

SPECIFICATIONS

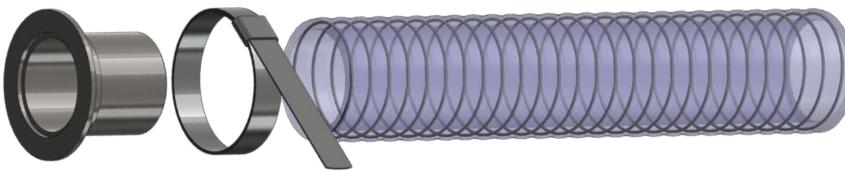
- 3A sanitary standards
- FDA - CFR Title 21 Parts 170 to 199
- USDA
- NFS 51 and 61 standards
- California Proposition 65

MATERIALS

Crystal clear PVC compound reinforced with helically-wound spring steel wire.

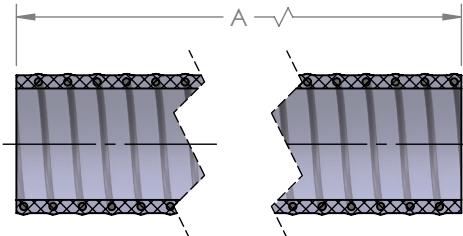
TEMPERATURE RANGE

- -4° C to +65° C (+25° F to 150° F)



FEATURES

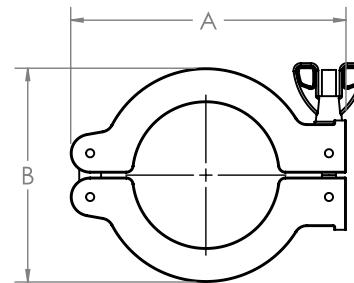
- Custom hose lengths available upon request
- 29.9" HG vacuum rating
- Glass-smooth interior reduces material build up
- Electrogalvanized helical steel wire can be used for static dissipation
- Self-extinguishing
- Non-toxic
- Silicone-free
- Other flange fittings available upon request.



| Part No. | A | Hose Nominal I.D. | Hose Nominal O.D. | Max Working Pressure* | | Minimum Bend Radius @ 70° F |
|-----------------|---------------|-------------------|-------------------|-----------------------|------------------|-----------------------------|
| | | | | @ 20° C (70° F) | @ 50° C (122° F) | |
| VC-KF-16FH12PVC | 12.00 (304.8) | 0.75 (19.1) | 1.03 (26.1) | 70 | 50 | 3.00 (76.2) |
| VC-KF-16FH18PVC | 18.00 (457.2) | 0.75 (19.1) | 1.03 (26.1) | 70 | 50 | 3.00 (76.2) |
| VC-KF-16FH24PVC | 24.00 (609.9) | 0.75 (19.1) | 1.03 (26.1) | 70 | 50 | 3.00 (76.2) |
| VC-KF-16FH36PVC | 36.00 (914.4) | 0.75 (19.1) | 1.03 (26.1) | 70 | 50 | 3.00 (76.2) |
| VC-KF-25FH12PVC | 12.00 (304.8) | 1.00 (25.4) | 1.29 (32.8) | 70 | 35 | 4.00 (101.6) |
| VC-KF-25FH18PVC | 18.00 (457.2) | 1.00 (25.4) | 1.29 (32.8) | 70 | 35 | 4.00 (101.6) |
| VC-KF-25FH24PVC | 24.00 (609.9) | 1.00 (25.4) | 1.29 (32.8) | 70 | 35 | 4.00 (101.6) |
| VC-KF-25FH36PVC | 36.00 (914.4) | 1.00 (25.4) | 1.29 (32.8) | 70 | 35 | 4.00 (101.6) |
| VC-KF-40FH12PVC | 12.00 (304.8) | 1.50 (28.1) | 1.85 (47.1) | 50 | 30 | 6.00 (152.4) |
| VC-KF-40FH18PVC | 18.00 (457.2) | 1.50 (28.1) | 1.85 (47.1) | 50 | 30 | 6.00 (152.4) |
| VC-KF-40FH24PVC | 24.00 (609.9) | 1.50 (28.1) | 1.85 (47.1) | 50 | 30 | 6.00 (152.4) |
| VC-KF-40FH36PVC | 36.00 (914.4) | 1.50 (28.1) | 1.85 (47.1) | 50 | 30 | 6.00 (152.4) |
| VC-KF-50FH12PVC | 12.00 (304.8) | 2.00 (50.8) | 2.39 (60.8) | 50 | 30 | 8.00 (203.2) |
| VC-KF-50FH18PVC | 18.00 (457.2) | 2.00 (50.8) | 2.39 (60.8) | 50 | 30 | 8.00 (203.2) |
| VC-KF-50FH24PVC | 24.00 (609.9) | 2.00 (50.8) | 2.39 (60.8) | 50 | 30 | 8.00 (203.2) |
| VC-KF-50FH36PVC | 36.00 (914.4) | 2.00 (50.8) | 2.39 (60.8) | 50 | 30 | 8.00 (203.2) |

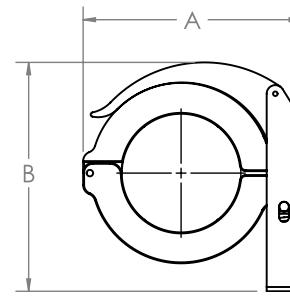
* Working Pressure reduces as temperature increases. Pressure ratings can only be obtained with proper coupling procedures.

KF WINGNUT CLAMP



| Part No. | Flange Size | A | B |
|------------|---------------------------|------------|-----------|
| VC-KF-16CP | 0.50 (12.7) - 0.75 (19.1) | 2.44 (62) | 1.77 (45) |
| VC-KF-25CP | 1.00 (25.4) | 2.95 (75) | 2.17 (55) |
| VC-KF-40CP | 1.50 (38.1) | 3.54 (90) | 2.76 (70) |
| VC-KF-50CP | 2.00 (50.8) | 4.92 (125) | 3.74 (95) |

KF LEVER CLAMP



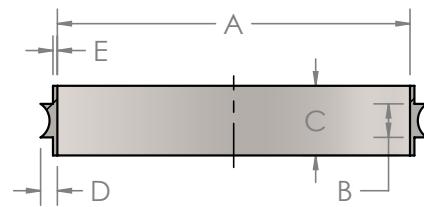
| Part No. | Flange Size | A | B |
|-----------------|---------------------------|---------------|-------------|
| VC-KF-16CPLEVER | 0.50 (12.7) - 0.75 (19.1) | 2.49 (63.3) | 2.05 (52) |
| VC-KF-25CPLEVER | 1.00 (25.4) | 2.87 (73) | 2.37 (60.3) |
| VC-KF-40CPLEVER | 1.50 (38.1) | 3.57 (90.6) | 3.15 (80) |
| VC-KF-50CPLEVER | 2.00 (50.8) | 4.51 (1114.5) | 4.02 (102) |

SEALS & REPAIR KITS

Whether preventative or emergency repair, HIS is your solution. We stock a large variety of components in-house and can create kits tailored to your system.

- Variety of corrosion resistant o-rings
- Lever, claw, and wingnut clamps

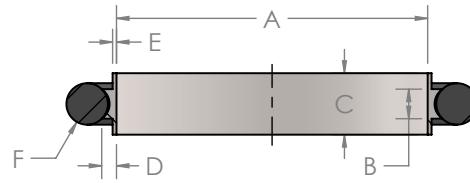
KF CENTERING RING



| Part No. | Flange Size | A | B | C | D | E |
|------------|-------------|-----------|------------|----------|--------------|------------|
| VC-KF-10CR | 0.50 (12.7) | 0.39 (10) | 0.15 (3.9) | 0.31 (8) | 0.09 (2.36) | 0.04 (1) |
| VC-KF-16CR | 0.75 (19.1) | 0.63 (16) | 0.15 (3.9) | 0.31 (8) | 0.065 (1.7) | 0.02 (0.5) |
| VC-KF-25CR | 1.00 (25.4) | 0.98 (25) | 0.15 (3.9) | 0.31 (8) | 0.085 (2.15) | 0.02 (0.5) |
| VC-KF-40CR | 1.50 (28.1) | 1.58 (40) | 0.15 (3.9) | 0.31 (8) | 0.075 (1.9) | 0.02 (0.5) |
| VC-KF-50CR | 2.00 (50.8) | 1.97 (50) | 0.15 (3.9) | 0.31 (8) | 0.13 (3.2) | 0.04 (1) |

316 stainless steel available upon request.

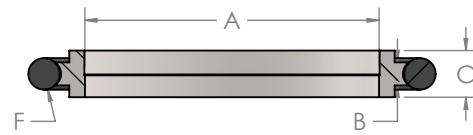
KF CENTERING RING WITH VITON® O-RING



| Part No. | Flange Size | A | B | C | D | E | F |
|---------------|-------------|-----------|------------|----------|--------------|------------|-------------|
| VC-KF-10CRVOR | 0.50 (12.7) | 0.39 (10) | 0.15 (3.9) | 0.31 (8) | 0.09 (2.36) | 0.04 (1) | 0.21 (5.31) |
| VC-KF-16CRVOR | 0.75 (19.1) | 0.63 (16) | 0.15 (3.9) | 0.31 (8) | 0.065 (1.7) | 0.02 (0.5) | 0.21 (5.31) |
| VC-KF-25CRVOR | 1.00 (25.4) | 0.98 (25) | 0.15 (3.9) | 0.31 (8) | 0.085 (2.15) | 0.02 (0.5) | 0.21 (5.31) |
| VC-KF-40CRVOR | 1.50 (28.1) | 1.58 (40) | 0.15 (3.9) | 0.31 (8) | 0.075 (1.9) | 0.02 (0.5) | 0.21 (5.31) |
| VC-KF-50CRVOR | 2.00 (50.8) | 1.97 (50) | 0.15 (3.9) | 0.31 (8) | 0.13 (3.2) | 0.04 (1) | 0.21 (5.31) |

Other o-ring materials and 316 stainless steel available upon request.

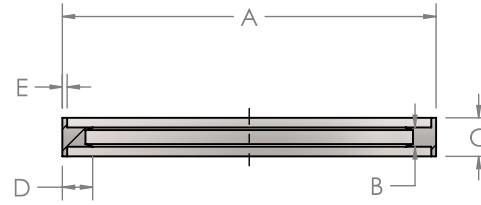
KF MESHED CENTERING RING WITH VITON® O-RING



| Part No. | Flange Size | Mesh/in ² | A | B | C | F |
|------------------|-------------|----------------------|-----------|------------|----------|-------------|
| VC-KF-10CRVORMSH | 0.50 (12.7) | 900 | 0.39 (10) | 0.15 (3.9) | 0.31 (8) | 0.21 (5.31) |
| VC-KF-16CRVORMSH | 0.75 (19.1) | 900 | 0.63 (16) | 0.15 (3.9) | 0.31 (8) | 0.21 (5.31) |
| VC-KF-25CRVORMSH | 1.00 (25.4) | 900 | 0.98 (25) | 0.15 (3.9) | 0.31 (8) | 0.21 (5.31) |
| VC-KF-40CRVORMSH | 1.50 (28.1) | 900 | 1.58 (40) | 0.15 (3.9) | 0.31 (8) | 0.21 (5.31) |
| VC-KF-50CRVORMSH | 2.00 (50.8) | 900 | 1.97 (50) | 0.15 (3.9) | 0.31 (8) | 0.21 (5.31) |

Other o-ring materials and 316 stainless steel available upon request.

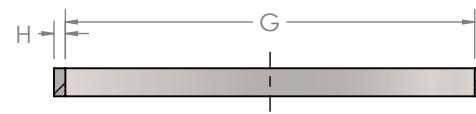
KF CAPTURE RING



| Part No. | Flange Size | A | B | C | D | E |
|--------------|-------------|-------------|------------|----------|------------|----------|
| VC-KF-16COPR | 0.75 (19.1) | 1.28 (32.6) | 0.15 (3.9) | 0.31 (8) | 0.09 (2.2) | 0.04 (1) |
| VC-KF-25COPR | 1.00 (25.4) | 1.67 (42.5) | 0.15 (3.9) | 0.31 (8) | 0.08 (2.1) | 0.04 (1) |
| VC-KF-40COPR | 1.50 (28.1) | 2.26 (57.5) | 0.15 (3.9) | 0.31 (8) | 0.10 (2.6) | 0.04 (1) |
| VC-KF-50COPR | 2.00 (50.8) | 3.05 (7.7) | 0.15 (3.9) | 0.31 (8) | 0.25 (6.3) | 0.04 (1) |

316 stainless steel available upon request.

KF OVERPRESSURE RING

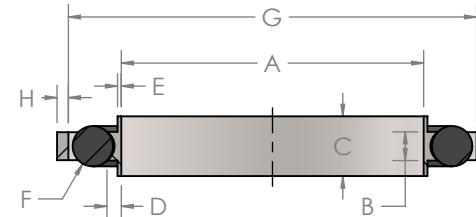


| Part No. | Flange Size | G | H |
|------------|-------------|-------------|------------|
| VC-KF-10PR | 0.50 (12.7) | 0.93 (23.5) | 0.09 (2.2) |
| VC-KF-16PR | 0.75 (19.1) | 1.18 (30) | 0.03 (0.8) |
| VC-KF-25PR | 1.00 (25.4) | 1.54 (34) | 0.03 (0.8) |
| VC-KF-40PR | 1.50 (28.1) | 2.13 (54) | 0.06 (1.5) |
| VC-KF-50PR | 2.00 (50.8) | 2.62 (66.5) | 0.07 (1.5) |

316 stainless steel available upon request.

KF CENTERING RING WITH OVERPRESSURE RING

With Viton® o-ring

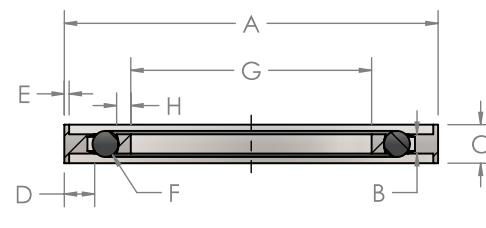


| Part No. | Flange Size | A | B | C | D | E | F | G | H |
|-----------------|-------------|--------------|---------------|-------------|-----------------|---------------|----------------|----------------|---------------|
| VC-KF-10CRVORPR | 0.50 (12.7) | 0.39 (10) | 0.15 (3.9) | 0.31 (8) | 0.09 (2.36) | 0.04 (1) | 0.21 (5.31) | 0.93 (23.5) | 0.09 (2.2) |
| VC-KF-16CRVORPR | 0.75 (19.1) | 0.63 (16) | 0.15 (3.9) | 0.31 (8) | 0.065 (1.7) | 0.02 (0.5) | 0.21 (5.31) | 1.18 (30) | 0.03 (0.8) |
| VC-KF-25CRVORPR | 1.00 (25.4) | 0.98 (25) | 0.15 (3.9) | 0.31 (8) | 0.085 (2.15) | 0.02 (0.5) | 0.21 (5.31) | 1.54 (34) | 0.03 (0.8) |
| VC-KF-40CRVORPR | 1.50 (28.1) | 1.58 (40) | 0.15 (3.9) | 0.31 (8) | 0.075 (1.9) | 0.02 (0.5) | 0.21 (5.31) | 2.13 (54) | 0.06 (1.5) |
| VC-KF-50CRVORPR | 2.00 (50.8) | 1.97 (50) | 0.15 (3.9) | 0.31 (8) | 0.13 (3.2) | 0.04 (1) | 0.21 (5.31) | 2.62 (66.5) | 0.07 (1.5) |

Other o-ring materials and 316 stainless steel available upon request.

KF CENTERING RING WITH CAPTURE RING

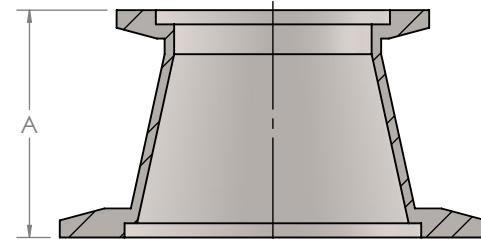
With Viton® o-ring



| Part No. | Flange Size | A | B | C | D | E | F | G | H |
|------------------|-------------|----------------|---------------|-------------|---------------|-------------|----------------|--------------|---------------|
| VC-KF-16CRVOR/CR | 0.75 (19.1) | 1.28 (32.6) | 0.15 (3.9) | 0.31 (8) | 0.09 (2.2) | 0.04 (1) | 0.21 (5.31) | 0.63 (16) | 0.08 (2.1) |
| VC-KF-25CRVOR/CR | 1.00 (25.4) | 1.67 (42.5) | 0.15 (3.9) | 0.31 (8) | 0.08 (2.1) | 0.04 (1) | 0.21 (5.31) | 0.98 (25) | 0.10 (2.6) |
| VC-KF-40CRVOR/CR | 1.50 (28.1) | 2.26 (57.5) | 0.15 (3.9) | 0.31 (8) | 0.10 (2.6) | 0.04 (1) | 0.21 (5.31) | 1.56 (40) | 0.09 (2.2) |
| VC-KF-50CRVOR/CR | 2.00 (50.8) | 3.05 (7.7) | 0.15 (3.9) | 0.31 (8) | 0.25 (6.3) | 0.04 (1) | 0.21 (5.31) | 1.97 (50) | 0.13 (3.2) |

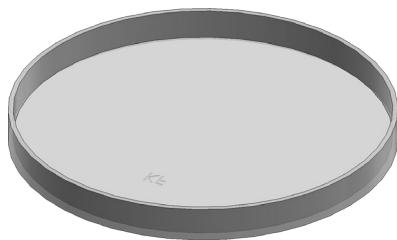
Other o-ring materials and 316 stainless steel available upon request.

KF CONCENTRIC REDUCER, LOW PROFILE



| Part No. | Flange Size | Flange 1 | Flange 2 | A |
|---------------|---------------------------|----------|----------|-------------|
| VC-KF-25X16RC | 1.00 (25.4) X 0.75 (19.1) | KF 25 | KF 16 | 1.57 (39.9) |
| VC-KF-40X16RC | 1.50 (38.1) X 0.75 (19.1) | KF 40 | KF 16 | 1.57 (39.9) |
| VC-KF-40X25RC | 1.50 (38.1) X 1.00 (25.4) | KF 40 | KF 25 | 1.57 (39.9) |
| VC-KF-50X16RC | 2.00 (50.8) X 0.75 (19.1) | KF 50 | KF 16 | 1.57 (39.9) |
| VC-KF-50X25RC | 2.00 (50.8) X 1.00 (25.4) | KF 50 | KF 25 | 1.57 (39.9) |
| VC-KF-50X40RC | 2.00 (50.8) X 1.50 (38.1) | KF 50 | KF 40 | 1.57 (39.9) |

KF PLASTIC DUST CAP



| Part No. | Material | Fits Flange |
|-----------------|--------------|---------------------------|
| VC-KF-16DUSTCAP | Polyethylene | 0.50 (12.7) - 0.75 (19.1) |
| VC-KF-25DUSTCAP | Polyethylene | 1.00 (25.4) |
| VC-KF-40DUSTCAP | Polyethylene | 1.50 (38.1) |
| VC-KF-50DUSTCAP | Polyethylene | 2.00 (50.8) |

CUSTOM FABRICATED SPOOLS

Work with our engineering team to create custom spools with the flange and size of your choice. A custom spool can reduce the number of welds on your current system and save on manufacturing costs.

MATERIALS

- 304L stainless steel
- 316L stainless steel

SIZING

- 1/2" - 4" (12.7 mm x 101.6 mm) Tube O.D.
- Lengths up to 20' (6.1 m)

END CONNECTIONS

- Sanitary tri-clamp flange (3A compliant)
- Tube ends
- KF/ISO/CF flanges

ISO SPECIFICATIONS

OVERVIEW

The ISO series of flanges and fittings include large vacuum components having interface dimensions defined by the International Standards Organization.

ADVANTAGES OF USING HIS VACUUM COMPONENTS

- Complete line of fittings available
- Fast assembly
- Leak-tight
- Cost-effective

MATERIALS

- 304 stainless steel is standard
- 316/316L stainless steel is available

FINISH

- Standard matte finish

TEMPERATURE RANGE

- Viton® seal maximum temperature is 200° C (392° F)
- Buna-N maximum temperature is 100° C (212° F)

PRESSURE RANGE

Limiting pressure is 10^{-8} Torr. Standard components can be used to a slight overpressure of 0-5 psi, with an overpressure ring.

MANUFACTURING & ASSEMBLY

The HIS manufacturing facility is located in Hillsboro, Oregon. HIS uses top-quality equipment and the latest orbital welding techniques. All welding is performed to applicable specifications and accepted industry standards.

PACKAGING AND PROTECTION

QA/QC will verify that all components are suitably packaged and identified per the appropriate specifications.

TECHNICAL APPLICATIONS INFORMATION

The staff at HIS is always ready to discuss your application. In most cases, it is possible to provide literature references for the points discussed here.

SIZING

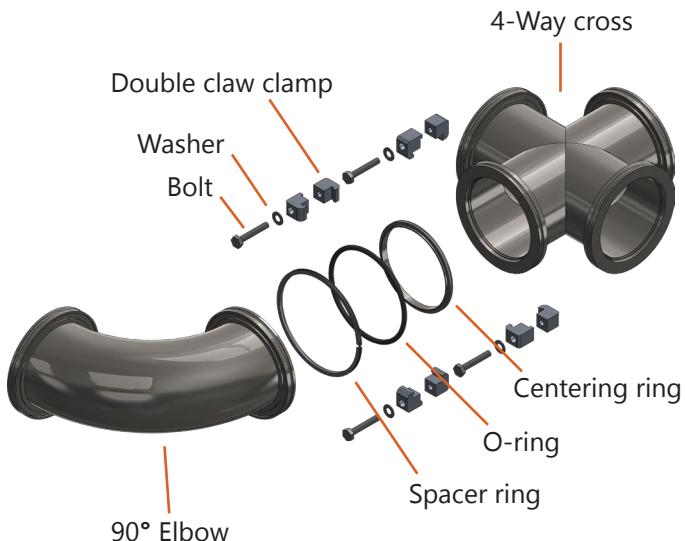
| ISO | O.D. in. (mm) |
|-----|---------------|
| 63 | 2.50 (63.5) |
| 80 | 3.00 (76.2) |
| 100 | 4.00 (101.6) |
| 160 | 6.00 (152.4) |
| 200 | 8.00 (203.2) |
| 250 | 10.00 (254) |
| 320 | 12.00 (304.8) |
| 400 | 16.00 (406.4) |
| 500 | 20.00 (508) |

PART NUMBERS

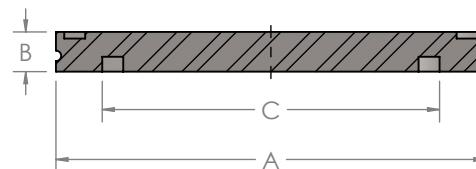
VC-IS-63EL45T2

Flange Series: ISO
 Flange Size: 2.50"
 Product: Elbow
 Variation: 45° Type 2

For 316/316L stainless steel, add -316/316L at the end of the part number.

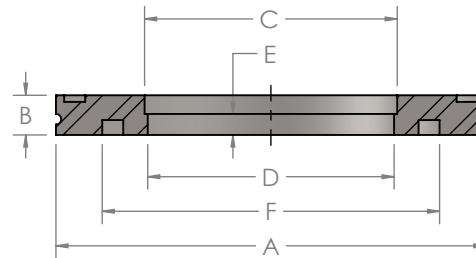


ISO BLANK FLANGE



| Part No. | Flange Size | A | B | C |
|-------------|---------------|-------------|-----------|-------------|
| VC-IS-63BF | 2.50 (63.5) | 3.74 (95) | 0.47 (12) | 2.76 (70) |
| VC-IS-80BF | 3.00 (76.2) | 4.33 (110) | 0.47 (12) | 3.27 (83) |
| VC-IS-100BF | 4.00 (101.6) | 5.12 (130) | 0.47 (12) | 4.02 (102) |
| VC-IS-160BF | 6.00 (152.4) | 7.09 (180) | 0.47 (12) | 6.02 (153) |
| VC-IS-200BF | 8.00 (203.2) | 9.45 (240) | 0.47 (12) | 8.39 (213) |
| VC-IS-250BF | 10.00 (254) | 11.42 (290) | 0.47 (12) | 10.28 (261) |
| VC-IS-320BF | 12.00 (304.8) | 14.57 (370) | 0.67 (17) | 12.52 (318) |
| VC-IS-400BF | 16.00 (406.4) | 17.72 (450) | 0.67 (17) | 15.75 (400) |
| VC-IS-500BF | 20.00 (508) | 21.65 (550) | 0.67 (17) | 19.72 (501) |

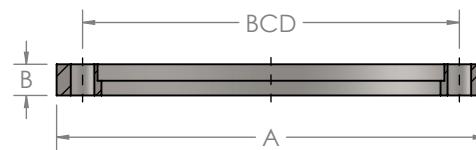
ISO BORED FLANGE



| Part No. | Flange Size | A | B | C | D | E | F |
|-----------------|---------------|-------------|-----------|---------------|---------------|------------|-------------|
| VC-IS-63WF250 | 2.50 (63.5) | 3.74 (95) | 0.47 (12) | 2.51 (63.8) | 2.44 (61.9) | 0.25 (6.4) | 2.76 (70) |
| VC-IS-80WF300 | 3.00 (76.2) | 4.33 (110) | 0.47 (12) | 3.01 (76.4) | 2.93 (74.5) | 0.25 (6.4) | 3.27 (83) |
| VC-IS-100WF400 | 4.00 (101.6) | 5.12 (130) | 0.47 (12) | 4.01 (101.8) | 3.91 (99.3) | 0.25 (6.4) | 4.02 (102) |
| VC-IS-160WF600 | 6.00 (152.4) | 7.09 (180) | 0.47 (12) | 6.02 (152.9) | 5.84 (148.4) | 0.25 (6.4) | 6.02 (153) |
| VC-IS-200WF800 | 8.00 (203.2) | 9.45 (240) | 0.47 (12) | 8.02 (203.6) | 7.87 (200) | 0.38 (9.5) | 8.39 (213) |
| VC-IS-250WF1000 | 10.00 (254) | 11.42 (290) | 0.47 (12) | 10.01 (254.3) | 9.87 (250.7) | 0.38 (9.5) | 10.28 (261) |
| VC-IS-320WF1200 | 12.00 (304.8) | 14.57 (370) | 0.67 (17) | 12.02 (305.3) | 11.73 (298) | 0.38 (9.5) | 12.52 (318) |
| VC-IS-400WF1600 | 16.00 (406.4) | 17.72 (450) | 0.67 (17) | 16.02 (407) | 16.01 (406.7) | 0.38 (9.5) | 15.75 (400) |
| VC-IS-500WF2000 | 20.00 (508) | 21.65 (550) | 0.67 (17) | 19.63 (498.5) | 18.45 (468.7) | 0.38 (9.5) | 19.72 (501) |

Custom bore sizes available upon request.

ISO ROTATABLE BOLT FLANGE



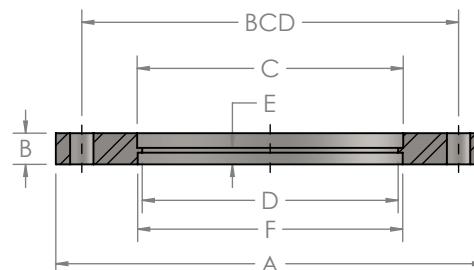
| Part No. | Flange Size | Bolt No. | A | B | BCD | Hole Dia. |
|-------------------|---------------|----------|-------------|-----------|-------------|-------------|
| VC-IS-63WF250BR | 2.50 (63.5) | 4 | 5.12 (130) | 0.47 (12) | 4.33 (110) | 0.36 (9) |
| VC-IS-80WF300BR | 3.00 (76.2) | 8 | 5.71 (145) | 0.47 (12) | 4.92 (125) | 0.36 (9) |
| VC-IS-100WF400BR | 4.00 (101.6) | 8 | 6.50 (165) | 0.47 (12) | 5.71 (145) | 0.36 (9) |
| VC-IS-160WF600BR | 6.00 (152.4) | 8 | 8.86 (225) | 0.63 (16) | 7.87 (200) | 0.44 (11) |
| VC-IS-200WF800BR | 8.00 (203.2) | 12 | 11.22 (285) | 0.63 (16) | 10.24 (260) | 0.44 (11) |
| VC-IS-250WF1000BR | 10.00 (254) | 12 | 13.19 (335) | 0.63 (16) | 12.20 (310) | 0.44 (11) |
| VC-IS-320WF1200BR | 12.00 (304.8) | 12 | 16.73 (425) | 0.79 (20) | 15.55 (395) | 0.52 (13.5) |
| VC-IS-400WF1600BR | 16.00 (406.4) | 16 | 20.08 (510) | 0.79 (20) | 18.90 (480) | 0.52 (13.5) |
| VC-IS-500WF2000BR | 20.00 (508) | 16 | 24.02 (610) | 0.79 (20) | 22.83 (580) | 0.52 (13.5) |

ISO RETAINING RING



| Part No. | For Flange Size |
|-------------|-----------------|
| VC-IS-63RR | 2.50 (63.5) |
| VC-IS-80RR | 3.00 (76.2) |
| VC-IS-100RR | 4.00 (101.6) |
| VC-IS-160RR | 6.00 (152.4) |
| VC-IS-200RR | 8.00 (203.2) |
| VC-IS-250RR | 10.00 (254) |
| VC-IS-320RR | 12.00 (304.8) |
| VC-IS-400RR | 16.00 (406.4) |
| VC-IS-500RR | 20.00 (508) |

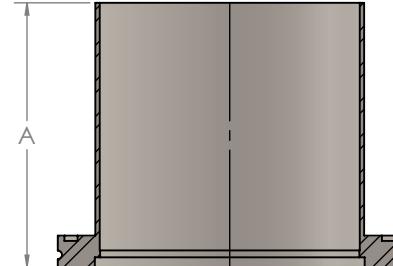
ISO BOLTED FLANGE



| Part No. | Flange Size | Bolt No. | A | B | C | D | E | F | BCD | Hole Dia. |
|------------------|---------------|----------|-------------|-------------|---------------|---------------|------------|-------------|-------------|-------------|
| VC-IS-63WF250B | 2.50 (63.5) | 4 | 5.12 (130) | 0.47 (12) | 2.51 (63.8) | 2.44 (61.9) | 0.25 (6.4) | 2.76 (70) | 4.33 (110) | 0.36 (9) |
| VC-IS-80WF300B | 3.00 (76.2) | 8 | 5.71 (145) | 0.47 (12) | 3.01 (76.4) | 2.93 (74.5) | 0.25 (6.4) | 3.27 (83) | 4.92 (125) | 0.36 (9) |
| VC-IS-100WF400B | 4.00 (101.6) | 8 | 6.50 (165) | 0.47 (12) | 4.01 (101.8) | 3.91 (99.3) | 0.25 (6.4) | 4.02 (102) | 5.71 (145) | 0.36 (9) |
| VC-IS-160WF600B | 6.00 (152.4) | 8 | 8.86 (225) | 0.63 (16) | 6.02 (152.9) | 5.88 (149.2) | 0.25 (6.4) | 6.02 (153) | 7.87 (200) | 0.44 (11) |
| VC-IS-200WF800B | 8.00 (203.2) | 12 | 11.22 (285) | 0.63 (16) | 8.02 (203.6) | 7.88 (200) | 0.38 (9.5) | 8.39 (213) | 10.24 (260) | 0.44 (11) |
| VC-IS-250WF1000B | 10.00 (254) | 12 | 13.19 (335) | 0.63 (16) | 10.02 (254.5) | 9.88 (250.8) | 0.38 (9.5) | 10.28 (261) | 12.20 (310) | 0.44 (11) |
| VC-IS-320WF1200B | 12.00 (304.8) | 12 | 16.73 (425) | 0.79 (20.1) | 12.02 (305.3) | 11.76 (298.7) | 0.38 (9.5) | 12.52 (318) | 15.55 (395) | 0.52 (13.5) |
| VC-IS-400WF1600B | 16.00 (406.4) | 16 | 20.08 (510) | 0.79 (20.1) | 16.02 (407) | 15.81 (401.6) | 0.38 (9.5) | 15.75 (400) | 18.90 (480) | 0.52 (13.5) |
| VC-IS-500WF2000B | 20.00 (508) | 16 | 24.02 (610) | 0.79 (20.1) | 20.02 (508.5) | 19.81 (503) | 0.38 (9.5) | 19.72 (501) | 22.83 (580) | 0.52 (13.5) |

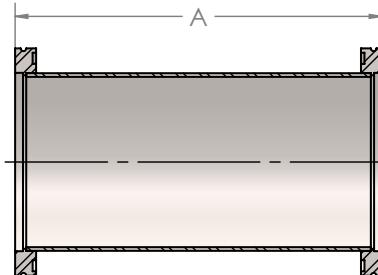
Reduced port available upon request.

ISO HALF NIPPLE



| Part No. | Flange Size | A |
|-------------|---------------|--------------|
| VC-IS-63HN | 2.50 (63.5) | 3.94 (100.1) |
| VC-IS-80HN | 3.00 (76.2) | 3.94 (100.1) |
| VC-IS-100HN | 4.00 (101.6) | 3.94 (100.1) |
| VC-IS-160HN | 6.00 (152.4) | 3.94 (100.1) |
| VC-IS-200HN | 8.00 (203.2) | 7.38 (187.5) |
| VC-IS-250HN | 10.00 (254) | 9.88 (250.9) |
| VC-IS-320HN | 12.00 (304.8) | 9.88 (250.9) |
| VC-IS-400HN | 16.00 (406.4) | 9.88 (250.9) |
| VC-IS-500HN | 20.00 (508) | 9.88 (250.9) |

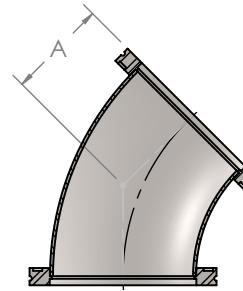
ISO FULL NIPPLE



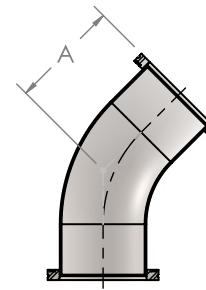
| Part No. | Flange Size | A |
|-------------|---------------|---------------|
| VC-IS-63FN | 2.50 (63.5) | 6.50 (165.1) |
| VC-IS-80FN | 3.00 (76.2) | 7.00 (177.8) |
| VC-IS-100FN | 4.00 (101.6) | 8.26 (209.8) |
| VC-IS-160FN | 6.00 (152.4) | 10.76 (273.3) |
| VC-IS-200FN | 8.00 (203.2) | 14.76 (374.9) |
| VC-IS-250FN | 10.00 (254) | 19.76 (501.9) |
| VC-IS-320FN | 12.00 (304.8) | 19.76 (501.9) |
| VC-IS-400FN | 16.00 (406.4) | 19.76 (501.9) |
| VC-IS-500FN | 20.00 (508) | 19.76 (501.9) |

Custom lengths available upon request.

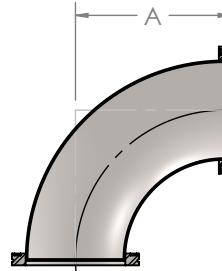
ISO 45° ELBOW, TYPE 1



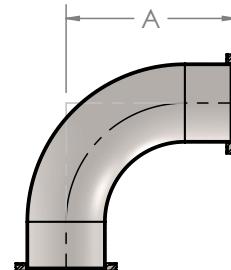
| Part No. | Flange Size | A |
|-----------------|--------------|-------------|
| VC-IS-63EL45T1 | 2.50 (63.5) | 1.81 (46.1) |
| VC-IS-80EL45T1 | 3.00 (76.2) | 2.13 (53.9) |
| VC-IS-100EL45T1 | 4.00 (101.6) | 2.75 (69.8) |

ISO 45° ELBOW, TYPE 2

| Part No. | Flange Size | A |
|-----------------|--------------|--------------|
| VC-IS-63EL45T2 | 2.50 (63.5) | 3.25 (82.4) |
| VC-IS-80EL45T2 | 3.00 (76.2) | 3.94 (100) |
| VC-IS-100EL45T2 | 4.00 (101.6) | 5.06 (128.6) |

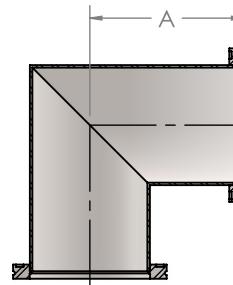
ISO 90° ELBOW, TYPE 1

| Part No. | Flange Size | A |
|-----------------|--------------|--------------|
| VC-IS-63EL90T1 | 2.50 (63.5) | 4.00 (102.9) |
| VC-IS-80EL90T1 | 3.00 (76.2) | 4.75 (120.7) |
| VC-IS-100EL90T1 | 4.00 (101.6) | 6.25 (158.8) |
| VC-IS-160EL90T1 | 6.00 (152.4) | 9.25 (234.9) |

ISO 90° ELBOW, TYPE 2

| Part No. | Flange Size | A |
|-----------------|--------------|--------------|
| VC-IS-63EL90T2 | 2.50 (63.5) | 5.44 (138.1) |
| VC-IS-80EL90T2 | 3.00 (76.2) | 6.56 (166.7) |
| VC-IS-100EL90T2 | 4.00 (101.6) | 8.57 (217.7) |
| VC-IS-160EL90T2 | 6.00 (152.4) | 9.25 (234.9) |

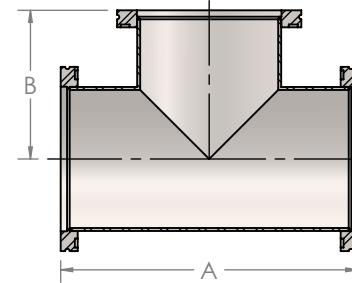
ISO 90° ELBOW, MITERED



| Part No. | Flange Size | A |
|------------------|--------------|-------------|
| VC-IS-63EL90MTR | 2.50 (63.5) | 3.25 (82.6) |
| VC-IS-80EL90MTR | 3.00 (76.2) | 3.50 (88.9) |
| VC-IS-100EL90MTR | 4.00 (101.6) | 5.12 (130) |
| VC-IS-160EL90MTR | 6.00 (152.4) | 5.25 (133) |

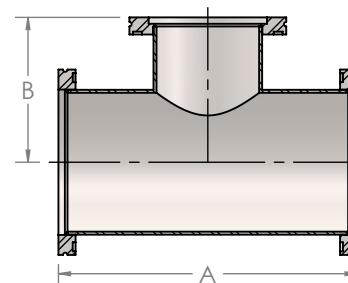
Custom lengths and sizes available upon request.

ISO TEE



| Part No. | Flange Size | A | B |
|--------------|--------------|---------------|--------------|
| VC-IS-63TEE | 2.50 (63.5) | 6.50 (165.1) | 3.25 (82.6) |
| VC-IS-80TEE | 3.00 (76.2) | 7.00 (177.8) | 3.50 (88.9) |
| VC-IS-100TEE | 4.00 (101.6) | 8.25 (209.6) | 4.13 (104.8) |
| VC-IS-160TEE | 6.00 (152.4) | 10.50 (266.7) | 5.25 (133) |

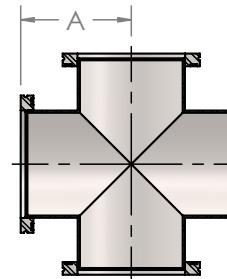
ISO REDUCING TEE



| Part No. | Flange Size | A | B |
|-----------------|-----------------------------|---------------|--------------|
| VC-IS-80X63RT | 3.00 (76.2) X 2.50 (63.5) | 7.00 (177.8) | 3.50 (88.9) |
| VC-IS-100X63RT | 4.00 (101.6) X 2.50 (63.5) | 8.00 (203.2) | 4.13 (104.9) |
| VC-IS-100X80RT | 4.00 (101.6) X 3.00 (76.2) | 8.00 (203.2) | 4.13 (104.9) |
| VC-IS-160X63RT | 6.00 (152.4) X 2.50 (63.5) | 10.00 (254) | 5.38 (136.7) |
| VC-IS-160X80RT | 6.00 (152.4) X 3.00 (76.2) | 10.00 (254) | 5.38 (136.7) |
| VC-IS-160X100RT | 6.00 (152.4) X 4.00 (101.6) | 10.26 (260.6) | 5.38 (136.7) |
| VC-IS-200X63RT | 8.00 (203.2) X 2.50 (63.5) | 12.00 (304.8) | 7.38 (187.5) |
| VC-IS-200X80RT | 8.00 (203.2) X 3.00 (76.2) | 12.00 (304.8) | 7.38 (187.5) |
| VC-IS-200X100RT | 8.00 (203.2) X 4.00 (101.6) | 12.26 (311.4) | 7.38 (187.5) |
| VC-IS-200X160RT | 8.00 (203.2) X 6.00 (152.4) | 12.74 (323.6) | 7.38 (187.5) |

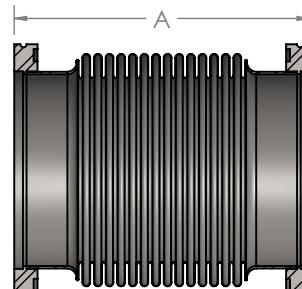
Custom sizes available upon request.

ISO 4-WAY CROSS



| Part No. | Flange Size | A |
|-------------|--------------|--------------|
| VC-IS-63CS | 2.50 (63.5) | 3.20 (81.3) |
| VC-IS-80CS | 3.00 (76.2) | 3.50 (88.9) |
| VC-IS-100CS | 4.00 (101.6) | 4.12 (104.6) |
| VC-IS-160CS | 6.00 (152.4) | 5.25 (133.4) |

ISO FLEXIBLE BELLOWS



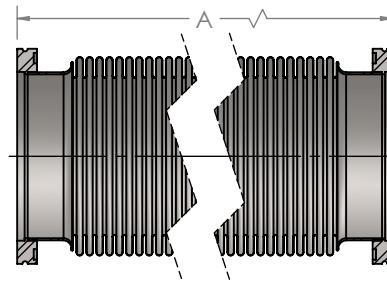
| Part No. | Flange Size | Nominal I.D. | Nominal O.D. | Wall | A | Pitch | Working Pressure 70° F | Static Bend Radius 70° F |
|--------------|--------------|--------------|--------------|--------------|--------------|-------------|------------------------|--------------------------|
| VC-IS-63FB4 | 2.50 (63.5) | 2.45 (62.2) | 3.15 (80) | 0.006 (0.15) | 4.00 (101.6) | 0.22 (5.6) | VAC | 2.75 (69.9) |
| VC-IS-63FB6 | 2.50 (63.5) | 2.45 (62.2) | 3.15 (80) | 0.006 (0.15) | 6.00 (152.4) | 0.22 (5.6) | VAC | 2.75 (69.9) |
| VC-IS-63FB8 | 2.50 (63.5) | 2.45 (62.2) | 3.15 (80) | 0.006 (0.15) | 8.00 (203.2) | 0.22 (5.6) | VAC | 2.75 (69.9) |
| VC-IS-80FB4 | 3.00 (76.2) | 3.07 (78.1) | 3.97 (100.8) | 0.008 (0.2) | 4.00 (101.6) | 0.29 (7.5) | VAC | 3.00 (76.2) |
| VC-IS-80FB6 | 3.00 (76.2) | 3.07 (78.1) | 3.97 (100.8) | 0.008 (0.2) | 6.00 (152.4) | 0.29 (7.5) | VAC | 3.00 (76.2) |
| VC-IS-80FB8 | 3.00 (76.2) | 3.07 (78.1) | 3.97 (100.8) | 0.008 (0.2) | 8.00 (203.2) | 0.29 (7.5) | VAC | 3.00 (76.2) |
| VC-IS-100FB4 | 4.00 (101.6) | 3.95 (100.3) | 4.97 (126.2) | 0.008 (0.2) | 4.00 (101.6) | 0.32 (8) | VAC | 3.50 (88.9) |
| VC-IS-100FB6 | 4.00 (101.6) | 3.95 (100.3) | 4.97 (126.2) | 0.008 (0.2) | 6.00 (152.4) | 0.32 (8) | VAC | 3.50 (88.9) |
| VC-IS-100FB8 | 4.00 (101.6) | 3.95 (100.3) | 4.97 (126.2) | 0.008 (0.2) | 8.00 (203.2) | 0.32 (8) | VAC | 3.50 (88.9) |
| VC-IS-160FB4 | 6.00 (152.4) | 5.85 (148.7) | 6.90 (175.3) | 0.01 (0.25) | 4.00 (101.6) | 0.45 (11.5) | VAC | 5.25 (133.4) |
| VC-IS-160FB6 | 6.00 (152.4) | 5.85 (148.7) | 6.90 (175.3) | 0.01 (0.25) | 6.00 (152.4) | 0.45 (11.5) | VAC | 5.25 (133.4) |
| VC-IS-160FB8 | 6.00 (152.4) | 5.85 (148.7) | 6.90 (175.3) | 0.01 (0.25) | 8.00 (203.2) | 0.45 (11.5) | VAC | 5.25 (133.4) |

Custom lengths available upon request.

DEFLECTION

- Axial: approximately +15% and -25% of Live Length
- Lateral: approximately 10% of Live Length

ISO FLEXIBLE HOSE



| Part No. | Flange Size | A | Wall |
|---------------|--------------|---------------|--------------|
| VC-IS-63FH12 | 2.50 (63.5) | 12.00 (304.8) | 0.006 (0.15) |
| VC-IS-63FH18 | 2.50 (63.5) | 18.00 (457.2) | 0.006 (0.15) |
| VC-IS-63FH24 | 2.50 (63.5) | 24.00 (309.6) | 0.006 (0.15) |
| VC-IS-63FH36 | 2.50 (63.5) | 36.00 (914.4) | 0.006 (0.15) |
| VC-IS-63FH40 | 2.50 (63.5) | 40.00 (1016) | 0.006 (0.15) |
| VC-IS-80FH12 | 3.00 (76.2) | 12.00 (304.8) | 0.008 (0.2) |
| VC-IS-80FH18 | 3.00 (76.2) | 18.00 (457.2) | 0.008 (0.2) |
| VC-IS-80FH24 | 3.00 (76.2) | 24.00 (309.6) | 0.008 (0.2) |
| VC-IS-80FH36 | 3.00 (76.2) | 36.00 (914.4) | 0.008 (0.2) |
| VC-IS-80FH40 | 3.00 (76.2) | 40.00 (1016) | 0.008 (0.2) |
| VC-IS-100FH12 | 4.00 (101.6) | 12.00 (304.8) | 0.008 (0.2) |
| VC-IS-100FH18 | 4.00 (101.6) | 18.00 (457.2) | 0.008 (0.2) |
| VC-IS-100FH24 | 4.00 (101.6) | 24.00 (309.6) | 0.008 (0.2) |
| VC-IS-100FH36 | 4.00 (101.6) | 36.00 (914.4) | 0.008 (0.2) |
| VC-IS-100FH40 | 4.00 (101.6) | 40.00 (1016) | 0.008 (0.2) |

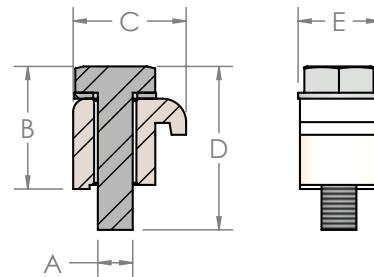
Custom lengths available upon request.

DID YOU KNOW...

With 89,000 square feet of combined space, we house the latest state-of-the-art manufacturing, tooling, and CNC equipment including a fiber laser cutter, press brake, 5-axis milling, robotic welding, band saws, tube benders, and more. We also have on-site engineering and project management staff to assist at any point during the process.



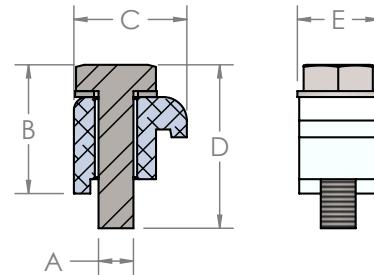
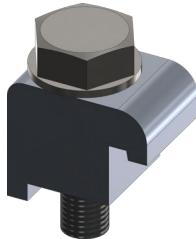
ISO SINGLE CLAW CLAMP, 316



| Part No. | A | B | C | D | E | Fits Flange |
|------------------|-----|-------------|-------------|-------------|-------------|-------------------------------|
| VC-IS-100SC-316Z | M8 | 1.09 (27.8) | 0.05 (1.1) | 1.57 (39.8) | 0.67 (17) | ISO 63 ISO 80 ISO 100 |
| VC-IS-250SC-316Z | M10 | 1.09 (27.8) | 1.08 (27.5) | 1.57 (39.8) | 0.78 (19.9) | ISO 160 ISO 200 ISO 250 |
| VC-IS-500SC-316Z | M12 | 1.41 (35.8) | 1.34 (34) | 2.19 (55.8) | 0.93 (23.6) | ISO 320 ISO 400 ISO 500 |

Includes a zinc plated nut.

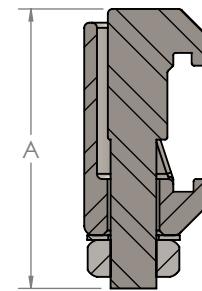
ISO SINGLE CLAW CLAMP, ALUMINUM



| Part No. | A | B | C | D | E | Fits Flange |
|-------------|-----|-------------|-------------|-------------|-------------|-------------------------------|
| VC-IS-100SC | M8 | 1.11 (28.3) | 0.95 (21.5) | 1.57 (39.8) | 0.67 (17) | ISO 63 ISO 80 ISO 100 |
| VC-IS-250SC | M10 | 1.11 (28.3) | 1.08 (27.5) | 1.57 (39.8) | 0.78 (19.9) | ISO 160 ISO 200 ISO 250 |
| VC-IS-500SC | M12 | 1.41 (37.8) | 1.34 (34) | 2.19 (55.8) | 0.93 (23.6) | ISO 320 ISO 400 ISO 500 |

Not recommended for use on heated lines.

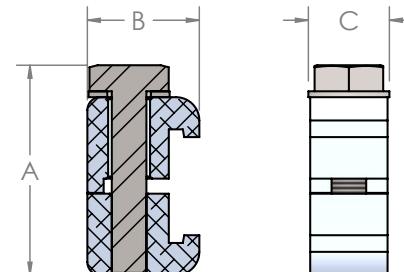
ISO DOUBLE CLAW CLAMP, 316



| Part No. | A | Bolt | QTY Recommended | Fits Flange |
|------------------|-------------|------|---|--|
| VC-IS-100DC-316Z | 2.42 (64.5) | M8 | 4 each 4 each 4 each 6 each 8 each 10 each | ISO 63 ISO 80 ISO 100 ISO 160 ISO 200 ISO 250 |
| VC-IS-500DC-316Z | 2.99 (75.9) | M12 | 12 each 16 each 20 each | ISO 320 ISO 400 ISO 500 |

Includes a zinc plated nut.

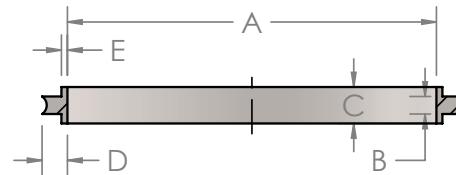
ISO DOUBLE CLAW CLAMP, ALUMINUM



| Part No. | A | B | C | QTY Recommended | Fits Flange |
|-------------|-------------|-------------|-------------|-------------------------------|-------------------------------|
| VC-IS-100DC | 1.98 (50.2) | 0.95 (24) | 0.67 (17) | 4 each 4 each 4 each | ISO 63 ISO 80 ISO 100 |
| VC-IS-250DC | 2.03 (51.5) | 1.08 (27.5) | 0.78 (19.8) | 6 each 8 each 10 each | ISO 160 ISO 200 ISO 250 |
| VC-IS-500DC | 2.59 (66) | 1.34 (34) | 0.93 (23.6) | 12 each 16 each 20 each | ISO 320 ISO 400 ISO 500 |

Not recommended for use on heated lines.

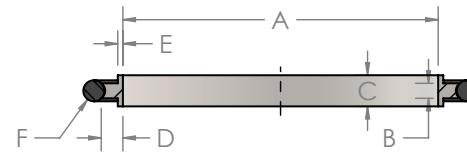
ISO CENTERING RING



| Part No. | Flange Size | A | B | C | D | E |
|-------------|---------------|---------------|------------|------------|-------------|------------|
| VC-IS-63CR | 2.50 (63.5) | 2.64 (67) | 0.15 (3.8) | 0.31 (7.9) | 0.22 (5.5) | 0.05 (1.3) |
| VC-IS-80CR | 3.00 (76.2) | 3.15 (80) | 0.15 (3.8) | 0.31 (7.9) | 0.22 (5.5) | 0.05 (1.3) |
| VC-IS-100CR | 4.00 (101.6) | 3.90 (99.1) | 0.15 (3.8) | 0.31 (7.9) | 0.22 (5.5) | 0.05 (1.3) |
| VC-IS-160CR | 6.00 (152.4) | 5.91 (150) | 0.15 (3.8) | 0.31 (7.9) | 0.21 (5.4) | 0.05 (1.3) |
| VC-IS-200CR | 8.00 (203.2) | 8.27 (210) | 0.15 (3.8) | 0.31 (7.9) | 0.21 (5.4) | 0.05 (1.3) |
| VC-IS-250CR | 10.00 (254) | 10.12 (257) | 0.15 (3.8) | 0.31 (7.9) | 0.24 (6.12) | 0.07 (1.8) |
| VC-IS-320CR | 12.00 (304.8) | 12.26 (311.4) | 0.22 (5.5) | 0.47 (12) | 0.19 (5) | 0.11 (2.7) |
| VC-IS-400CR | 16.00 (406.4) | 15.51 (394) | 0.22 (5.5) | 0.47 (12) | 0.40 (10.2) | 0.11 (2.7) |
| VC-IS-500CR | 20.00 (508) | 19.45 (494) | 0.22 (5.5) | 0.47 (12) | 0.28 (7.2) | 0.11 (2.7) |

316 stainless steel available upon request.

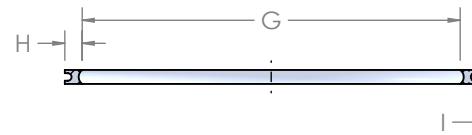
ISO CENTERING RING WITH VITON® O-RING



| Part No. | Flange Size | A | B | C | D | E | F |
|----------------|---------------|---------------|------------|------------|-------------|------------|------------|
| VC-IS-63CRVOR | 2.50 (63.5) | 2.64 (67) | 0.15 (3.8) | 0.31 (7.9) | 0.22 (5.5) | 0.05 (1.3) | 0.21 (5.3) |
| VC-IS-80CRVOR | 3.00 (76.2) | 3.15 (80) | 0.15 (3.8) | 0.31 (7.9) | 0.22 (5.5) | 0.05 (1.3) | 0.21 (5.3) |
| VC-IS-100CRVOR | 4.00 (101.6) | 3.90 (99.1) | 0.15 (3.8) | 0.31 (7.9) | 0.22 (5.5) | 0.05 (1.3) | 0.21 (5.3) |
| VC-IS-160CRVOR | 6.00 (152.4) | 5.91 (150) | 0.15 (3.8) | 0.31 (7.9) | 0.21 (5.4) | 0.05 (1.3) | 0.21 (5.3) |
| VC-IS-200CRVOR | 8.00 (203.2) | 8.27 (210) | 0.15 (3.8) | 0.31 (7.9) | 0.21 (5.4) | 0.05 (1.3) | 0.21 (5.3) |
| VC-IS-250CRVOR | 10.00 (254) | 10.12 (257) | 0.15 (3.8) | 0.31 (7.9) | 0.24 (6.12) | 0.07 (1.8) | 0.28 (6.9) |
| VC-IS-320CRVOR | 12.00 (304.8) | 12.26 (311.4) | 0.22 (5.5) | 0.47 (12) | 0.19 (5) | 0.11 (2.7) | 0.28 (6.9) |
| VC-IS-400CRVOR | 16.00 (406.4) | 15.51 (394) | 0.22 (5.5) | 0.47 (12) | 0.40 (10.2) | 0.11 (2.7) | 0.28 (6.9) |
| VC-IS-500CRVOR | 20.00 (508) | 19.45 (494) | 0.22 (5.5) | 0.47 (12) | 0.28 (7.2) | 0.11 (2.7) | 0.28 (6.9) |

Other o-ring materials and 316 stainless steel available upon request.

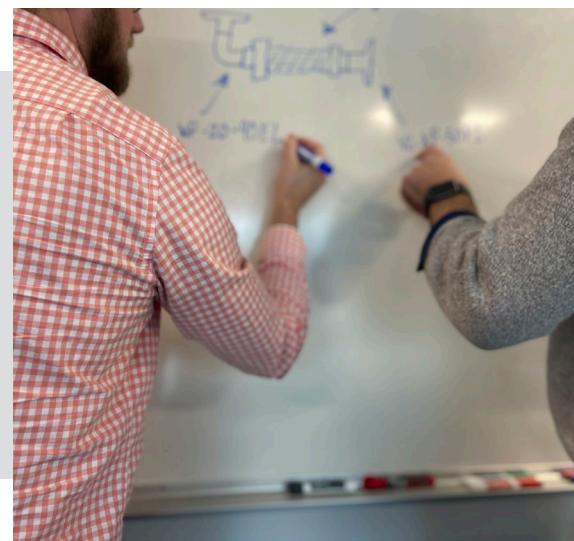
ISO SPACER RING, ALUMINUM



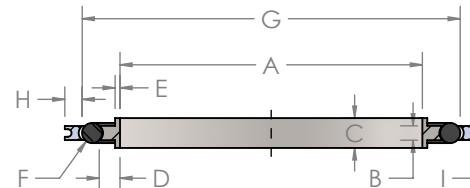
| Part No. | Flange Size | G | H | I |
|-------------|---------------|---------------|------------|------------|
| VC-IS-63SR | 2.50 (63.5) | 3.41 (86.5) | 0.14 (3.5) | 0.15 (3.7) |
| VC-IS-80SR | 3.00 (76.2) | 3.95 (100.4) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-100SR | 4.00 (101.6) | 4.68 (118.8) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-160SR | 6.00 (152.4) | 6.69 (169.9) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-200SR | 8.00 (203.2) | 9.09 (230.8) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-250SR | 10.00 (254) | 10.98 (278.8) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-320SR | 12.00 (304.8) | 13.06 (331.7) | 0.21 (5.3) | 0.22 (5.6) |
| VC-IS-400SR | 16.00 (406.4) | 16.82 (427.2) | 0.37 (9.4) | 0.22 (5.6) |
| VC-IS-500SR | 20.00 (508) | 20.56 (522.2) | 0.25 (6.4) | 0.22 (5.6) |

NEED CUSTOM WORK? HIS IS YOUR SOLUTION

Our highly skilled and innovative engineering team has decades of experience in conceptualizing, designing, manufacturing, and delivering quality solutions to the most complex challenges. We can also do rapid prototyping with our in-house R&D team.



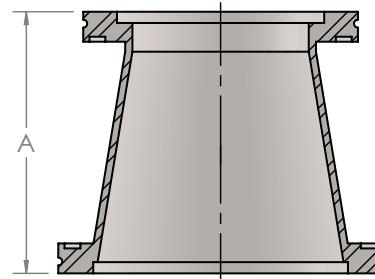
ISO CENTERING RING WITH VITON® O-RING & SPACER ASSEMBLY



| Part No. | Flange Size | A | B | C | D | E | F | G | H | I |
|------------------|---------------|---------------|------------|------------|-------------|------------|------------|---------------|------------|------------|
| VC-IS-63CRVORSR | 2.50 (63.5) | 2.64 (67) | 0.15 (3.8) | 0.31 (7.9) | 0.22 (5.5) | 0.05 (1.3) | 0.21 (5.3) | 3.41 (86.5) | 0.14 (3.5) | 0.15 (3.7) |
| VC-IS-80CRVORSR | 3.00 (76.2) | 3.15 (80) | 0.15 (3.8) | 0.31 (7.9) | 0.22 (5.5) | 0.05 (1.3) | 0.21 (5.3) | 3.95 (100.4) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-100CRVORSR | 4.00 (101.6) | 3.90 (99.1) | 0.15 (3.8) | 0.31 (7.9) | 0.22 (5.5) | 0.05 (1.3) | 0.21 (5.3) | 4.68 (118.8) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-160CRVORSR | 6.00 (152.4) | 5.91 (150) | 0.15 (3.8) | 0.31 (7.9) | 0.21 (5.4) | 0.05 (1.3) | 0.21 (5.3) | 6.69 (169.9) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-200CRVORSR | 8.00 (203.2) | 8.27 (210) | 0.15 (3.8) | 0.31 (7.9) | 0.21 (5.4) | 0.05 (1.3) | 0.21 (5.3) | 9.09 (230.8) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-250CRVORSR | 10.00 (254) | 10.12 (257) | 0.15 (3.8) | 0.31 (7.9) | 0.24 (6.12) | 0.07 (1.8) | 0.28 (6.9) | 10.98 (278.8) | 0.18 (4.6) | 0.15 (3.7) |
| VC-IS-320CRVORSR | 12.00 (304.8) | 12.26 (311.4) | 0.22 (5.5) | 0.47 (12) | 0.19 (5) | 0.11 (2.7) | 0.28 (6.9) | 13.06 (331.7) | 0.21 (5.3) | 0.22 (5.6) |
| VC-IS-400CRVORSR | 16.00 (406.4) | 15.51 (394) | 0.22 (5.5) | 0.47 (12) | 0.40 (10.2) | 0.11 (2.7) | 0.28 (6.9) | 16.82 (427.2) | 0.37 (9.4) | 0.22 (5.6) |
| VC-IS-500CRVORSR | 20.00 (508) | 19.45 (494) | 0.22 (5.5) | 0.47 (12) | 0.28 (7.2) | 0.11 (2.7) | 0.28 (6.9) | 20.56 (522.2) | 0.25 (6.4) | 0.22 (5.6) |

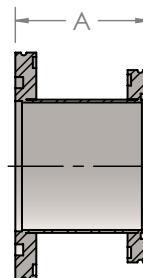
Other o-ring materials and 316 stainless steel available upon request.

ISO CONICAL REDUCER, TYPE 4



| Part No. | Flange Size | Flange 1 | Flange 2 | A |
|-------------------|-----------------------------|----------|----------|--------------|
| VC-IS-80X63RCT4 | 3.00 (76.2) X 2.50 (63.5) | ISO 80 | ISO 63 | 4.13 (104.8) |
| VC-IS-100X63RCT4 | 4.00 (101.6) X 2.50 (63.5) | ISO 100 | ISO 63 | 4.13 (104.8) |
| VC-IS-100X80RCT4 | 4.00 (101.6) X 3.00 (76.2) | ISO 100 | ISO 80 | 4.13 (104.8) |
| VC-IS-160X80RCT4 | 6.00 (152.4) X 3.00 (76.2) | ISO 160 | ISO 80 | 6.00 (152.4) |
| VC-IS-160X100RCT4 | 6.00 (152.4) X 4.00 (101.6) | ISO 160 | ISO 100 | 6.00 (152.4) |

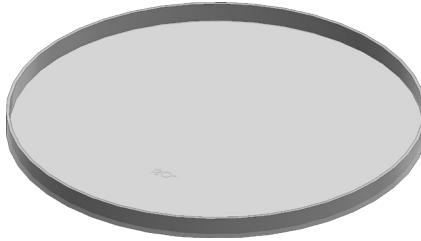
ISO STRAIGHT REDUCER



| Part No. | Flange Size | Flange 1 | Flange 2 | A |
|-----------------|-----------------------------|----------|----------|-------------|
| VC-IS-80X63RS | 3.00 (76.2) X 2.50 (63.5) | ISO 80 | ISO 63 | 3.00 (76.2) |
| VC-IS-100X63RS | 4.00 (101.6) X 2.50 (63.5) | ISO 100 | ISO 63 | 3.00 (76.2) |
| VC-IS-100X80RS | 4.00 (101.6) X 3.00 (76.2) | ISO 100 | ISO 80 | 3.00 (76.2) |
| VC-IS-160X80RS | 6.00 (152.4) X 3.00 (76.2) | ISO 160 | ISO 80 | 3.00 (76.2) |
| VC-IS-160X100RS | 6.00 (152.4) X 4.00 (101.6) | ISO 160 | ISO 100 | 3.00 (76.2) |

Custom sizes and lengths available upon request.

ISO PLASTIC DUST CAP



| Part No. | Material | Fits Flange |
|------------------|--------------|---------------|
| VC-IS-63DUSTCAP | Polyethylene | 2.50 (63.5) |
| VC-IS-80DUSTCAP | Polyethylene | 3.00 (76.2) |
| VC-IS-100DUSTCAP | Polyethylene | 4.00 (101.6) |
| VC-IS-160DUSTCAP | Polyethylene | 6.00 (152.4) |
| VC-IS-200DUSTCAP | Polyethylene | 8.00 (203.2) |
| VC-IS-250DUSTCAP | Polyethylene | 10.00 (254) |
| VC-IS-320DUSTCAP | Polyethylene | 12.00 (304.8) |
| VC-IS-400DUSTCAP | Polyethylene | 16.00 (406.4) |
| VC-IS-500DUSTCAP | Polyethylene | 20.00 (508) |

CF SPECIFICATIONS

OVERVIEW

HIS manufactures a complete line of knife-edge CF style flanges. These flanges are made to the industry standards using CNC lathes and are interchangeable with all other CF style flanges.

ADVANTAGES OF USING HIS VACUUM COMPONENTS

- Complete line of valves and fittings available
- Rotatable joints
- Fast assembly
- Leak-tight
- Cost-effective

MATERIALS

- 304 stainless steel is standard
- 316/316L stainless steel is available

FINISH

- Assemblies are finished to a #5 polish
- #7 polish O.D./I.D. and electropolish are available upon request

OPERATIONS

HIS CF flanges are guaranteed leak-free to 1×10^{-13} Torr and in temperature ranges from -196° C to +500° C (-320° F to 932° F).

MANUFACTURING & ASSEMBLY

The HIS manufacturing facility is located in Hillsboro, Oregon. HIS uses top-quality equipment and the latest orbital welding techniques. All welding is performed to applicable specifications and accepted industry standards.

PACKAGING AND PROTECTION

QA/QC will verify that all components are suitably packaged and identified per the customer's specifications.

TECHNICAL APPLICATIONS INFORMATION

The staff at HIS is always ready to discuss your application. In most cases, it is possible to provide literature references for the points discussed above.

SIZING

| CF | Nominal O.D. in. (mm) | Torque (in./lbs.) |
|------|-----------------------|-------------------|
| 133 | 1.33 (33.9) | 28 |
| 212 | 2.13 (53.9) | 110 |
| 275 | 2.75 (69.9) | 110 |
| 338 | 3.38 (85.7) | 190 |
| 450 | 4.50 (114.3) | 190 |
| 462 | 4.63 (117.5) | 190 |
| 600 | 6.00 (152.4) | 190 |
| 675 | 6.75 (171.5) | 190 |
| 800 | 8.00 (203.2) | 190 |
| 1000 | 10.00 (254) | 190 |
| 1200 | 12.00 (304.8) | 190 |
| 1325 | 13.25 (336.6) | 345 |
| 1400 | 14.00 (355.6) | 345 |
| 1450 | 14.50 (368.3) | 345 |
| 1650 | 16.50 (419.1) | 345 |

PART NUMBERS

VC-CF-133000N

Flange Series: CF
 Flange Size: 1.33"
 Bore Size: 0.000 (blank)
 Product: Non-Rotatable Flange

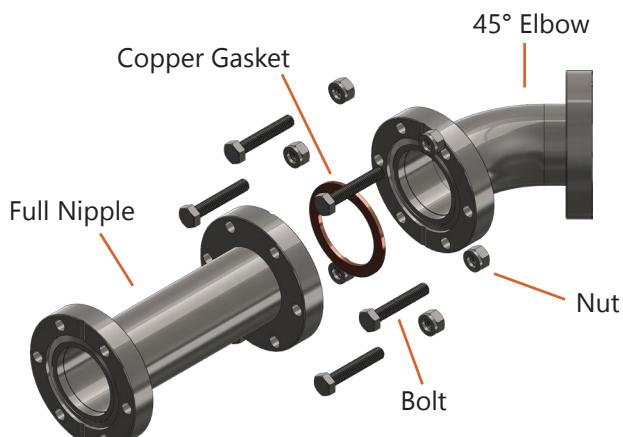
N = Non-Rotatable

R = Rotatable

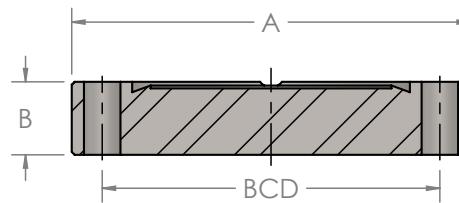
T = Tapped Bolt Holes

W = Weld Neck

WP = 0.060" Weld Prep



CF BLANK, NON-ROTATABLE

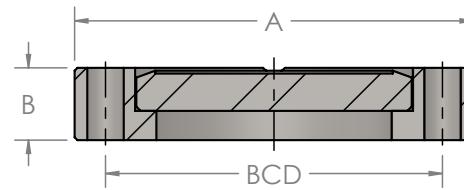


| Part No. | Flange Size | Bolt No. | Hole Dia. | A | B | BCD |
|----------------|---------------|----------|------------|---------------|-------------|---------------|
| VC-CF-133000N | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | 1.06 (27) |
| VC-CF-212000N | 2.13 (53.9) | 4 | 0.27 (6.7) | 2.12 (53.8) | 0.47 (11.9) | 1.63 (41.3) |
| VC-CF-275000N | 2.75 (69.9) | 6 | 0.27 (6.7) | 2.73 (69.3) | 0.50 (12.7) | 2.31 (58.7) |
| VC-CF-338000N | 3.38 (85.7) | 8 | 0.33 (8.4) | 3.36 (85.3) | 0.69 (17.4) | 2.85 (72.4) |
| VC-CF-450000N | 4.50 (114.3) | 8 | 0.33 (8.4) | 4.47 (113.5) | 0.69 (17.4) | 3.63 (92.2) |
| VC-CF-462000N | 4.63 (117.5) | 10 | 0.33 (8.4) | 4.61 (117.1) | 0.81 (20.6) | 4.03 (102.4) |
| VC-CF-600000N | 6.00 (152.4) | 16 | 0.33 (8.4) | 5.97 (151.6) | 0.78 (19.8) | 5.13 (130.3) |
| VC-CF-675000N | 6.75 (171.5) | 18 | 0.33 (8.4) | 6.73 (170.9) | 0.84 (21.4) | 5.97 (151.6) |
| VC-CF-800000N | 8.00 (203.2) | 20 | 0.33 (8.4) | 7.97 (202.4) | 0.88 (22.2) | 7.13 (181.1) |
| VC-CF-1000000N | 10.00 (254) | 24 | 0.33 (8.4) | 9.97 (253.2) | 0.97 (24.6) | 9.13 (231.9) |
| VC-CF-1200000N | 12.00 (304.8) | 32 | 0.33 (8.4) | 11.97 (304) | 1.13 (28.6) | 11.18 (284) |
| VC-CF-1325000N | 13.25 (336.6) | 30 | 0.39 (9.9) | 13.25 (336.6) | 1.13 (28.6) | 12.06 (306.3) |
| VC-CF-1400000N | 14.00 (355.6) | 30 | 0.39 (9.9) | 14.00 (355.6) | 1.13 (28.6) | 12.81 (325.4) |
| VC-CF-1450000N | 14.50 (368.3) | 32 | 0.39 (9.9) | 14.50 (368.3) | 1.13 (28.6) | 13.31 (338.1) |
| VC-CF-1650000N | 16.50 (419.1) | 36 | 0.39 (9.9) | 16.50 (419.1) | 1.13 (28.6) | 15.31 (388.9) |

CF BLANK, NON-ROTATABLE, TAPPED

| | | | | | | |
|-----------------|---------------|----|---------|---------------|-------------|---------------|
| VC-CF-133000NT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | 1.06 (27) |
| VC-CF-212000NT | 2.13 (53.9) | 4 | 1/4-28 | 2.12 (53.8) | 0.47 (11.9) | 1.63 (41.3) |
| VC-CF-275000NT | 2.75 (69.9) | 6 | 1/4-28 | 2.73 (69.3) | 0.50 (12.7) | 2.31 (58.7) |
| VC-CF-338000NT | 3.38 (85.7) | 8 | 5/16-24 | 3.36 (85.3) | 0.69 (17.4) | 2.85 (72.4) |
| VC-CF-450000NT | 4.50 (114.3) | 8 | 5/16-24 | 4.47 (113.5) | 0.69 (17.4) | 3.63 (92.2) |
| VC-CF-462000NT | 4.63 (117.5) | 10 | 5/16-24 | 4.61 (117.1) | 0.81 (20.6) | 4.03 (102.4) |
| VC-CF-600000NT | 6.00 (152.4) | 16 | 5/16-24 | 5.97 (151.6) | 0.78 (19.8) | 5.13 (130.3) |
| VC-CF-675000NT | 6.75 (171.5) | 18 | 5/16-24 | 6.73 (170.9) | 0.84 (21.4) | 5.97 (151.6) |
| VC-CF-800000NT | 8.00 (203.2) | 20 | 5/16-24 | 7.97 (202.4) | 0.88 (22.2) | 7.13 (181.1) |
| VC-CF-1000000NT | 10.00 (254) | 24 | 5/16-24 | 9.97 (253.2) | 0.97 (24.6) | 9.13 (231.9) |
| VC-CF-1200000NT | 12.00 (304.8) | 32 | 5/16-24 | 11.97 (304) | 1.13 (28.6) | 11.18 (284) |
| VC-CF-1325000NT | 13.25 (336.6) | 30 | 3/8-24 | 13.25 (336.6) | 1.13 (28.6) | 12.06 (306.3) |
| VC-CF-1400000NT | 14.00 (355.6) | 30 | 3/8-24 | 14.00 (355.6) | 1.13 (28.6) | 12.81 (325.4) |
| VC-CF-1450000NT | 14.50 (368.3) | 32 | 3/8-24 | 14.50 (368.3) | 1.13 (28.6) | 13.31 (338.1) |
| VC-CF-1650000NT | 16.50 (419.1) | 36 | 3/8-24 | 16.50 (419.1) | 1.13 (28.6) | 15.31 (388.9) |

CF BLANK, ROTATABLE

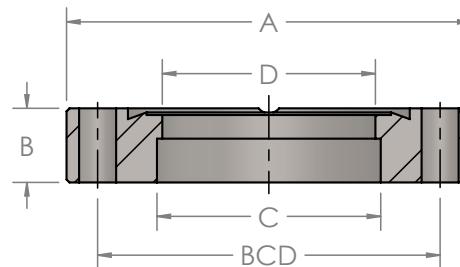


| Part No. | Flange Size | Bolt No. | Hole Dia. | A | B | BCD |
|----------------|---------------|----------|------------|---------------|-------------|---------------|
| VC-CF-133000R | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | 1.06 (27) |
| VC-CF-212000R | 2.13 (53.9) | 4 | 0.27 (6.7) | 2.12 (53.8) | 0.47 (11.9) | 1.63 (41.3) |
| VC-CF-275000R | 2.75 (69.9) | 6 | 0.27 (6.7) | 2.73 (69.3) | 0.50 (12.7) | 2.31 (58.7) |
| VC-CF-338000R | 3.38 (85.7) | 8 | 0.33 (8.4) | 3.36 (85.3) | 0.69 (17.4) | 2.85 (72.4) |
| VC-CF-450000R | 4.50 (114.3) | 8 | 0.33 (8.4) | 4.47 (113.5) | 0.75 (19.1) | 3.63 (92.2) |
| VC-CF-462000R | 4.63 (117.5) | 10 | 0.33 (8.4) | 4.61 (117.1) | 0.81 (20.6) | 4.03 (102.4) |
| VC-CF-600000R | 6.00 (152.4) | 16 | 0.33 (8.4) | 5.97 (151.6) | 0.84 (21.4) | 5.13 (130.3) |
| VC-CF-675000R | 6.75 (171.5) | 18 | 0.33 (8.4) | 6.73 (170.9) | 0.84 (21.4) | 5.97 (151.6) |
| VC-CF-800000R | 8.00 (203.2) | 20 | 0.33 (8.4) | 7.97 (202.4) | 0.94 (23.9) | 7.13 (181.1) |
| VC-CF-1000000R | 10.00 (254) | 24 | 0.33 (8.4) | 9.97 (253.2) | 0.97 (24.6) | 9.13 (231.9) |
| VC-CF-1200000R | 12.00 (304.8) | 32 | 0.33 (8.4) | 11.97 (304) | 1.13 (28.6) | 11.18 (284) |
| VC-CF-1325000R | 13.25 (336.6) | 30 | 0.39 (9.9) | 13.25 (336.6) | 1.13 (28.6) | 12.06 (306.3) |
| VC-CF-1400000R | 14.00 (355.6) | 30 | 0.39 (9.9) | 14.00 (355.6) | 1.13 (28.6) | 12.81 (325.4) |
| VC-CF-1450000R | 14.50 (368.3) | 32 | 0.39 (9.9) | 14.50 (368.3) | 1.13 (28.6) | 13.31 (338.1) |
| VC-CF-1650000R | 16.50 (419.1) | 36 | 0.39 (9.9) | 16.50 (419.1) | 1.13 (28.6) | 15.31 (388.9) |

CF BLANK, ROTATABLE, TAPPED

| | | | | | | |
|-----------------|---------------|----|---------|---------------|-------------|---------------|
| VC-CF-133000RT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | 1.06 (27) |
| VC-CF-212000RT | 2.13 (53.9) | 4 | 1/4-28 | 2.12 (53.8) | 0.47 (11.9) | 1.63 (41.3) |
| VC-CF-275000RT | 2.75 (69.9) | 6 | 1/4-28 | 2.73 (69.3) | 0.50 (12.7) | 2.31 (58.7) |
| VC-CF-338000RT | 3.38 (85.7) | 8 | 5/16-24 | 3.36 (85.3) | 0.69 (17.4) | 2.85 (72.4) |
| VC-CF-450000RT | 4.50 (114.3) | 8 | 5/16-24 | 4.47 (113.5) | 0.75 (19.1) | 3.63 (92.2) |
| VC-CF-462000RT | 4.63 (117.5) | 10 | 5/16-24 | 4.61 (117.1) | 0.81 (20.6) | 4.03 (102.4) |
| VC-CF-600000RT | 6.00 (152.4) | 16 | 5/16-24 | 5.97 (151.6) | 0.84 (21.4) | 5.13 (130.3) |
| VC-CF-675000RT | 6.75 (171.5) | 18 | 5/16-24 | 6.73 (170.9) | 0.84 (21.4) | 5.97 (151.6) |
| VC-CF-800000RT | 8.00 (203.2) | 20 | 5/16-24 | 7.97 (202.4) | 0.94 (23.9) | 7.13 (181.1) |
| VC-CF-1000000RT | 10.00 (254) | 24 | 5/16-24 | 9.97 (253.2) | 0.97 (24.6) | 9.13 (231.9) |
| VC-CF-1200000RT | 12.00 (304.8) | 32 | 5/16-24 | 11.97 (304) | 1.13 (28.6) | 11.18 (284) |
| VC-CF-1325000RT | 13.25 (336.6) | 30 | 3/8-24 | 13.25 (336.6) | 1.13 (28.6) | 12.06 (306.3) |
| VC-CF-1400000RT | 14.00 (355.6) | 30 | 3/8-24 | 14.00 (355.6) | 1.13 (28.6) | 12.81 (325.4) |
| VC-CF-1450000RT | 14.50 (368.3) | 32 | 3/8-24 | 14.50 (368.3) | 1.13 (28.6) | 13.31 (338.1) |
| VC-CF-1650000RT | 16.50 (419.1) | 36 | 3/8-24 | 16.50 (419.1) | 1.13 (28.6) | 15.31 (388.9) |

CF BORED BLANK, NON-ROTATABLE

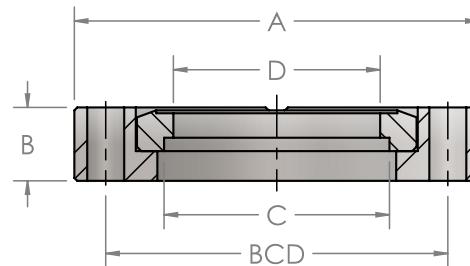


| Part No. | Flange Size | Bolt No. | Hole Dia. | A | B | C | D | BCD |
|-----------------|---------------|----------|------------|---------------|-------------|---------------|---------------|---------------|
| VC-CF-133075N | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | 0.76 (19.2) | 0.63 (16) | 1.06 (27) |
| VC-CF-212100N | 2.13 (53.9) | 4 | 0.27 (6.7) | 2.12 (53.8) | 0.47 (11.9) | 1.01 (25.7) | 0.94 (23.8) | 1.63 (41.3) |
| VC-CF-275150N | 2.75 (69.9) | 6 | 0.27 (6.7) | 2.73 (69.3) | 0.50 (12.7) | 1.51 (38.4) | 1.44 (36.5) | 2.31 (58.7) |
| VC-CF-338200N | 3.38 (85.7) | 8 | 0.33 (8.4) | 3.36 (85.3) | 0.69 (17.4) | 2.01 (51.1) | 1.94 (49.2) | 2.85 (72.4) |
| VC-CF-450250N | 4.50 (114.3) | 8 | 0.33 (8.4) | 4.47 (113.5) | 0.69 (17.4) | 2.51 (63.8) | 2.44 (61.9) | 3.63 (92.2) |
| VC-CF-462300N | 4.63 (117.5) | 10 | 0.33 (8.4) | 4.61 (117.1) | 0.81 (20.6) | 3.01 (76.5) | 2.94 (74.6) | 4.03 (102.4) |
| VC-CF-600400N | 6.00 (152.4) | 16 | 0.33 (8.4) | 5.97 (151.6) | 0.78 (19.8) | 4.01 (101.9) | 3.91 (99.3) | 5.13 (130.3) |
| VC-CF-675500N | 6.75 (171.5) | 18 | 0.33 (8.4) | 6.73 (170.9) | 0.84 (21.4) | 5.01 (127.3) | 4.88 (123.9) | 5.97 (151.6) |
| VC-CF-800600N | 8.00 (203.2) | 20 | 0.33 (8.4) | 7.97 (202.4) | 0.88 (22.2) | 6.02 (152.9) | 5.88 (149.2) | 7.13 (181.1) |
| VC-CF-1000800N | 10.00 (254) | 24 | 0.33 (8.4) | 9.97 (253.2) | 0.97 (24.6) | 8.02 (203.7) | 7.88 (200) | 9.13 (231.9) |
| VC-CF-12001000N | 12.00 (304.8) | 32 | 0.33 (8.4) | 11.97 (304) | 1.13 (28.6) | 10.03 (254.8) | 9.88 (250.8) | 11.18 (284) |
| VC-CF-13251000N | 13.25 (336.6) | 30 | 0.39 (9.9) | 13.25 (336.6) | 1.13 (28.6) | 10.03 (254.8) | 9.88 (250.8) | 12.06 (306.3) |
| VC-CF-14001200N | 14.00 (355.6) | 30 | 0.39 (9.9) | 14.00 (355.6) | 1.13 (28.6) | 12.03 (305.6) | 11.88 (301.6) | 12.81 (325.4) |
| VC-CF-14501200N | 14.50 (368.3) | 32 | 0.39 (9.9) | 14.50 (368.3) | 1.13 (28.6) | 12.03 (305.6) | 11.88 (301.6) | 13.31 (338.1) |
| VC-CF-16501400N | 16.50 (419.1) | 36 | 0.39 (9.9) | 16.50 (419.1) | 1.13 (28.6) | 14.03 (356.4) | 13.75 (349.3) | 15.31 (388.9) |

CF BORED BLANK, NON-ROTATABLE, TAPPED

| | | | | | | | | |
|------------------|---------------|----|---------|---------------|-------------|---------------|---------------|---------------|
| VC-CF-133075NT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | 0.76 (19.2) | 0.63 (16) | 1.06 (27) |
| VC-CF-212100NT | 2.13 (53.9) | 4 | 1/4-28 | 2.12 (53.8) | 0.47 (11.9) | 1.01 (25.7) | 0.94 (23.8) | 1.63 (41.3) |
| VC-CF-275150NT | 2.75 (69.9) | 6 | 1/4-28 | 2.73 (69.3) | 0.50 (12.7) | 1.51 (38.4) | 1.44 (36.5) | 2.31 (58.7) |
| VC-CF-338200NT | 3.38 (85.7) | 8 | 5/16-24 | 3.36 (85.3) | 0.69 (17.4) | 2.01 (51.1) | 1.94 (49.2) | 2.85 (72.4) |
| VC-CF-450250NT | 4.50 (114.3) | 8 | 5/16-24 | 4.47 (113.5) | 0.69 (17.4) | 2.51 (63.8) | 2.44 (61.9) | 3.63 (92.2) |
| VC-CF-462300NT | 4.63 (117.5) | 10 | 5/16-24 | 4.61 (117.1) | 0.81 (20.6) | 3.01 (76.5) | 2.94 (74.6) | 4.03 (102.4) |
| VC-CF-600400NT | 6.00 (152.4) | 16 | 5/16-24 | 5.97 (151.6) | 0.78 (19.8) | 4.01 (101.9) | 3.91 (99.3) | 5.13 (130.3) |
| VC-CF-675500NT | 6.75 (171.5) | 18 | 5/16-24 | 6.73 (170.9) | 0.84 (21.4) | 5.01 (127.3) | 4.88 (123.9) | 5.97 (151.6) |
| VC-CF-800600NT | 8.00 (203.2) | 20 | 5/16-24 | 7.97 (202.4) | 0.88 (22.2) | 6.02 (152.9) | 5.88 (149.2) | 7.13 (181.1) |
| VC-CF-1000800NT | 10.00 (254) | 24 | 5/16-24 | 9.97 (253.2) | 0.97 (24.6) | 8.02 (203.7) | 7.88 (200) | 9.13 (231.9) |
| VC-CF-12001000NT | 12.00 (304.8) | 32 | 5/16-24 | 11.97 (304) | 1.13 (28.6) | 10.03 (254.8) | 9.88 (250.8) | 11.18 (284) |
| VC-CF-13251000NT | 13.25 (336.6) | 30 | 3/8-24 | 13.25 (336.6) | 1.13 (28.6) | 10.03 (254.8) | 9.88 (250.8) | 12.06 (306.3) |
| VC-CF-14001200NT | 14.00 (355.6) | 30 | 3/8-24 | 14.00 (355.6) | 1.13 (28.6) | 12.03 (305.6) | 11.88 (301.6) | 12.81 (325.4) |
| VC-CF-14501200NT | 14.50 (368.3) | 32 | 3/8-24 | 14.50 (368.3) | 1.13 (28.6) | 12.03 (305.6) | 11.88 (301.6) | 13.31 (338.1) |
| VC-CF-16501400NT | 16.50 (419.1) | 36 | 3/8-24 | 16.50 (419.1) | 1.13 (28.6) | 14.03 (356.4) | 13.75 (349.3) | 15.31 (388.9) |

CF BORED BLANK, ROTATABLE

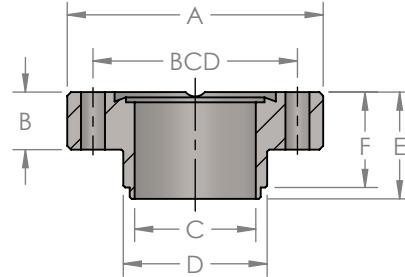


| Part No. | Flange Size | Bolt No. | Hole Dia. | A | B | C | D | BCD |
|-----------------|---------------|----------|------------|---------------|-------------|---------------|---------------|---------------|
| VC-CF-133075R | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | 0.76 (19.2) | 0.63 (16) | 1.06 (27) |
| VC-CF-212100R | 2.13 (53.9) | 4 | 0.27 (6.7) | 2.12 (53.8) | 0.47 (11.9) | 1.01 (25.7) | 0.94 (23.8) | 1.63 (41.3) |
| VC-CF-275150R | 2.75 (69.9) | 6 | 0.27 (6.7) | 2.73 (69.3) | 0.50 (12.7) | 1.51 (38.4) | 1.44 (36.5) | 2.31 (58.7) |
| VC-CF-338200R | 3.38 (85.7) | 8 | 0.33 (8.4) | 3.36 (85.3) | 0.69 (17.4) | 2.01 (51.1) | 1.94 (49.2) | 2.85 (72.4) |
| VC-CF-450250R | 4.50 (114.3) | 8 | 0.33 (8.4) | 4.47 (113.5) | 0.75 (19.1) | 2.51 (63.8) | 2.44 (61.9) | 3.63 (92.2) |
| VC-CF-462300R | 4.63 (117.5) | 10 | 0.33 (8.4) | 4.61 (117.1) | 0.81 (20.6) | 3.01 (76.5) | 2.94 (74.6) | 4.03 (102.4) |
| VC-CF-600400R | 6.00 (152.4) | 16 | 0.33 (8.4) | 5.97 (151.6) | 0.84 (21.4) | 4.01 (101.9) | 3.91 (99.3) | 5.13 (130.3) |
| VC-CF-675500R | 6.75 (171.5) | 18 | 0.33 (8.4) | 6.73 (170.9) | 0.84 (21.4) | 5.01 (127.3) | 4.88 (123.9) | 5.97 (151.6) |
| VC-CF-800600R | 8.00 (203.2) | 20 | 0.33 (8.4) | 7.97 (202.4) | 0.94 (23.9) | 6.02 (152.9) | 5.88 (149.2) | 7.13 (181.1) |
| VC-CF-1000800R | 10.00 (254) | 24 | 0.33 (8.4) | 9.97 (253.2) | 0.97 (24.6) | 8.02 (203.7) | 7.88 (200) | 9.13 (231.9) |
| VC-CF-12001000R | 12.00 (304.8) | 32 | 0.33 (8.4) | 11.97 (304) | 1.13 (28.6) | 10.03 (254.8) | 9.88 (250.8) | 11.18 (284) |
| VC-CF-13251000R | 13.25 (336.6) | 30 | 0.39 (9.9) | 13.25 (336.6) | 1.13 (28.6) | 10.03 (254.8) | 9.88 (250.8) | 12.06 (306.3) |
| VC-CF-14001200R | 14.00 (355.6) | 30 | 0.39 (9.9) | 14.00 (355.6) | 1.13 (28.6) | 12.03 (305.6) | 11.88 (301.6) | 12.81 (325.4) |
| VC-CF-14501200R | 14.50 (368.3) | 32 | 0.39 (9.9) | 14.50 (368.3) | 1.13 (28.6) | 12.03 (305.6) | 11.88 (301.6) | 13.31 (338.1) |
| VC-CF-16501400R | 16.50 (419.1) | 36 | 0.39 (9.9) | 16.50 (419.1) | 1.13 (28.6) | 14.03 (356.4) | 13.75 (349.3) | 15.31 (388.9) |

CF BORED BLANK, ROTATABLE, TAPPED

| | | | | | | | | |
|------------------|---------------|----|---------|---------------|-------------|---------------|---------------|---------------|
| VC-CF-133075RT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | 0.76 (19.2) | 0.63 (16) | 1.06 (27) |
| VC-CF-212100RT | 2.13 (53.9) | 4 | 1/4-28 | 2.12 (53.8) | 0.47 (11.9) | 1.01 (25.7) | 0.94 (23.8) | 1.63 (41.3) |
| VC-CF-275150RT | 2.75 (69.9) | 6 | 1/4-28 | 2.73 (69.3) | 0.50 (12.7) | 1.51 (38.4) | 1.44 (36.5) | 2.31 (58.7) |
| VC-CF-338200RT | 3.38 (85.7) | 8 | 5/16-24 | 3.36 (85.3) | 0.69 (17.4) | 2.01 (51.1) | 1.94 (49.2) | 2.85 (72.4) |
| VC-CF-450250RT | 4.50 (114.3) | 8 | 5/16-24 | 4.47 (113.5) | 0.75 (19.1) | 2.51 (63.8) | 2.44 (61.9) | 3.63 (92.2) |
| VC-CF-462300RT | 4.63 (117.5) | 10 | 5/16-24 | 4.61 (117.1) | 0.81 (20.6) | 3.01 (76.5) | 2.94 (74.6) | 4.03 (102.4) |
| VC-CF-600400RT | 6.00 (152.4) | 16 | 5/16-24 | 5.97 (151.6) | 0.84 (21.4) | 4.01 (101.9) | 3.91 (99.3) | 5.13 (130.3) |
| VC-CF-675500RT | 6.75 (171.5) | 18 | 5/16-24 | 6.73 (170.9) | 0.84 (21.4) | 5.01 (127.3) | 4.88 (123.9) | 5.97 (151.6) |
| VC-CF-800600RT | 8.00 (203.2) | 20 | 5/16-24 | 7.97 (202.4) | 0.94 (23.9) | 6.02 (152.9) | 5.88 (149.2) | 7.13 (181.1) |
| VC-CF-1000800RT | 10.00 (254) | 24 | 5/16-24 | 9.97 (253.2) | 0.97 (24.6) | 8.02 (203.7) | 7.88 (200) | 9.13 (231.9) |
| VC-CF-12001000RT | 12.00 (304.8) | 32 | 5/16-24 | 11.97 (304) | 1.13 (28.6) | 10.03 (254.8) | 9.88 (250.8) | 11.18 (284) |
| VC-CF-13251000RT | 13.25 (336.6) | 30 | 3/8-24 | 13.25 (336.6) | 1.13 (28.6) | 10.03 (254.8) | 9.88 (250.8) | 12.06 (306.3) |
| VC-CF-14001200RT | 14.00 (355.6) | 30 | 3/8-24 | 14.00 (355.6) | 1.13 (28.6) | 12.03 (305.6) | 11.88 (301.6) | 12.81 (325.4) |
| VC-CF-14501200RT | 14.50 (368.3) | 32 | 3/8-24 | 14.50 (368.3) | 1.13 (28.6) | 12.03 (305.6) | 11.88 (301.6) | 13.31 (338.1) |
| VC-CF-16501400RT | 16.50 (419.1) | 36 | 3/8-24 | 16.50 (419.1) | 1.13 (28.6) | 14.03 (356.4) | 13.75 (349.3) | 15.31 (388.9) |

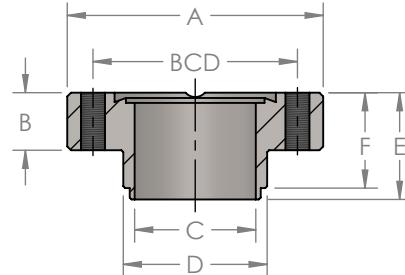
CF BORED BLANK WITH NECK, NON-ROTATABLE



| Part No. | Flange Size | Bolt No. | Hole Dia. | A | B | C | D | BCD |
|------------------|-------------|----------|------------|-------------|------------|-----------|-------------|-----------|
| VC-CF-133000NK | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | blank | - | 1.06 (27) |
| VC-CF-133075NK | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) | 0.75 (19.1) | 1.06 (27) |
| VC-CF-133000NKWP | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | blank | - | 1.06 (27) |
| VC-CF-133075NKWP | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) | 0.75 (19.1) | 1.06 (27) |

WP = 0.060" Weld Prep included (pictured)

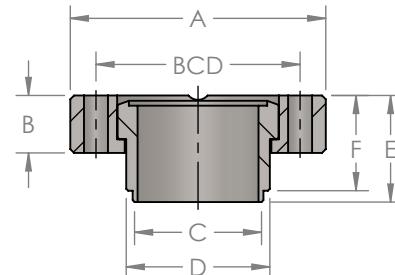
CF BORED BLANK WITH NECK, NON-ROTATABLE, TAPPED



| Part No. | Flange Size | Bolt No. | Hole Dia. | A | B | C | D | BCD |
|-------------------|-------------|----------|-----------|-------------|------------|-----------|-------------|-----------|
| VC-CF-133000NKT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | blank | - | 1.06 (27) |
| VC-CF-133075NKT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) | 0.75 (19.1) | 1.06 (27) |
| VC-CF-133000NKWPT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | blank | - | 1.06 (27) |
| VC-CF-133075NKWPT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) | 0.75 (19.1) | 1.06 (27) |

WP = 0.060" Weld Prep included (pictured)

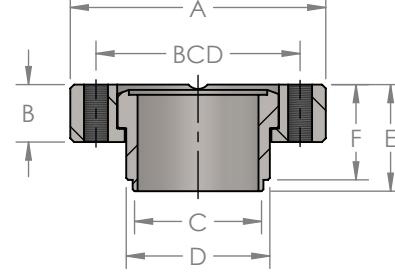
CF BORED BLANK WITH NECK, ROTATABLE



| Part No. | Flange Size | Bolt No. | Hole Dia. | A | B | C | D | BCD |
|------------------|-------------|----------|------------|-------------|------------|-----------|-------------|-----------|
| VC-CF-133000RK | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | blank | - | 1.06 (27) |
| VC-CF-133075RK | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) | 0.75 (19.1) | 1.06 (27) |
| VC-CF-133000RKWP | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | blank | - | 1.06 (27) |
| VC-CF-133075RKWP | 1.33 (33.9) | 6 | 0.17 (4.4) | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) | 0.75 (19.1) | 1.06 (27) |

WP = 0.060" Weld Prep included (pictured)

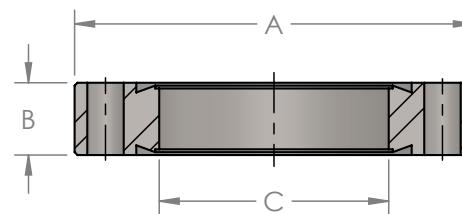
CF BORED BLANK WITH NECK, ROTATABLE, TAPPED



| Part No. | Flange Size | Bolt No. | Hole Dia. | A | B | C | D | BCD |
|-------------------|-------------|----------|-----------|-------------|------------|-----------|-------------|-----------|
| VC-CF-133000RKT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | blank | - | 1.06 (27) |
| VC-CF-133075RKT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) | 0.75 (19.1) | 1.06 (27) |
| VC-CF-133000RKWPT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | blank | - | 1.06 (27) |
| VC-CF-133075RKWPT | 1.33 (33.9) | 6 | 8-32 | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) | 0.75 (19.1) | 1.06 (27) |

WP = 0.060" Weld Prep included (pictured)

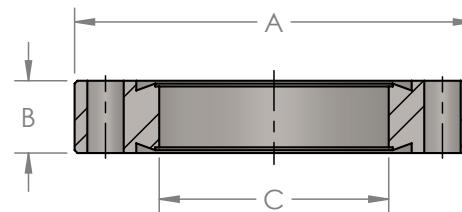
CF DOUBLE-SIDED FLANGE



| Part No. | Flange Size | A | B | C |
|---------------|--------------|--------------|-------------|--------------|
| VC-CF-133000D | 1.33 (33.9) | 1.33 (33.9) | 0.30 (7.6) | blank |
| VC-CF-133025D | 1.33 (33.9) | 1.33 (33.9) | 0.30 (7.6) | 0.26 (6.5) |
| VC-CF-133038D | 1.33 (33.9) | 1.33 (33.9) | 0.30 (7.6) | 0.38 (9.7) |
| VC-CF-133050D | 1.33 (33.9) | 1.33 (33.9) | 0.30 (7.6) | 0.51 (12.8) |
| VC-CF-133075D | 1.33 (33.9) | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) |
| VC-CF-133000D | 1.33 (33.9) | 1.33 (33.9) | 0.30 (7.6) | blank |
| VC-CF-133075D | 1.33 (33.9) | 1.33 (33.9) | 0.30 (7.6) | 0.63 (16) |
| VC-CF-212000D | 2.13 (53.9) | 2.12 (53.8) | 0.47 (11.9) | blank |
| VC-CF-212100D | 2.13 (53.9) | 2.12 (53.8) | 0.47 (11.9) | 1.01 (25.7) |
| VC-CF-275000D | 2.75 (69.9) | 2.73 (69.3) | 0.50 (12.7) | blank |
| VC-CF-275025D | 2.75 (69.9) | 2.73 (69.3) | 0.50 (12.7) | 0.26 (6.5) |
| VC-CF-275050D | 2.75 (69.9) | 2.73 (69.3) | 0.50 (12.7) | 0.51 (12.8) |
| VC-CF-275075D | 2.75 (69.9) | 2.73 (69.3) | 0.50 (12.7) | 0.76 (19.3) |
| VC-CF-275100D | 2.75 (69.9) | 2.73 (69.3) | 0.50 (12.7) | 1.01 (25.7) |
| VC-CF-275125D | 2.75 (69.9) | 2.73 (69.3) | 0.50 (12.7) | 1.26 (32) |
| VC-CF-275150D | 2.75 (69.9) | 2.73 (69.3) | 0.50 (12.7) | 1.51 (38.4) |
| VC-CF-275000D | 2.75 (69.9) | 2.73 (69.3) | 0.50 (12.7) | blank |
| VC-CF-275150D | 2.75 (69.9) | 2.73 (69.3) | 0.50 (12.7) | 1.51 (38.4) |
| VC-CF-338000D | 3.38 (85.7) | 3.36 (85.3) | 0.69 (17.5) | blank |
| VC-CF-338150D | 3.38 (85.7) | 3.36 (85.3) | 0.69 (17.5) | 1.51 (38.4) |
| VC-CF-338200D | 3.38 (85.7) | 3.36 (85.3) | 0.69 (17.5) | 2.01 (51.1) |
| VC-CF-450000D | 4.50 (114.3) | 4.47 (113.5) | 0.75 (19.1) | blank |
| VC-CF-450150D | 4.50 (114.3) | 4.47 (113.5) | 0.75 (19.1) | 1.51 (38.4) |
| VC-CF-450200D | 4.50 (114.3) | 4.47 (113.5) | 0.75 (19.1) | 2.01 (51.1) |
| VC-CF-450250D | 4.50 (114.3) | 4.47 (113.5) | 0.75 (19.1) | 2.51 (63.8) |
| VC-CF-462000D | 4.63 (117.5) | 4.61 (117.1) | 0.81 (20.6) | blank |
| VC-CF-462300D | 4.63 (117.5) | 4.61 (117.1) | 0.81 (20.6) | 3.01 (76.5) |
| VC-CF-600000D | 6.00 (152.4) | 5.97 (151.6) | 0.78 (19.8) | blank |
| VC-CF-600400D | 6.00 (152.4) | 5.97 (151.6) | 0.78 (19.8) | 4.01 (101.9) |
| VC-CF-675000D | 6.75 (171.5) | 6.73 (170.9) | 0.84 (21.4) | blank |
| VC-CF-675400D | 6.75 (171.5) | 6.73 (170.9) | 0.84 (21.4) | 4.01 (101.9) |

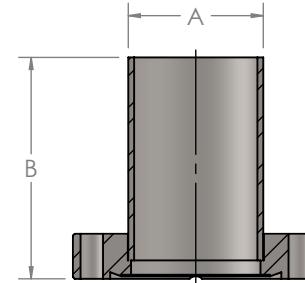
CF double-sided flanges continue on next page.

CF DOUBLE-SIDED FLANGE CONT.



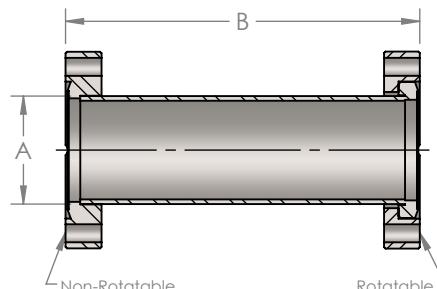
| Part No. | Flange Size | A | B | C |
|-----------------|---------------|---------------|-------------|---------------|
| VC-CF-800000D | 8.00 (203.2) | 7.97 (202.4) | 0.88 (22.2) | blank |
| VC-CF-800600D | 8.00 (203.2) | 7.97 (202.4) | 0.88 (22.2) | 6.02 (152.9) |
| VC-CF-1000000D | 10.00 (254) | 9.97 (253.2) | 0.97 (24.6) | blank |
| VC-CF-1000800D | 10.00 (254) | 9.97 (253.2) | 0.97 (24.6) | 8.02 (203.7) |
| VC-CF-1325000D | 13.25 (336.6) | 13.25 (336.6) | 1.13 (28.6) | blank |
| VC-CF-13251000D | 13.25 (336.6) | 13.25 (336.6) | 1.13 (28.6) | 10.03 (254.8) |
| VC-CF-1400000D | 14.00 (355.6) | 14.00 (355.6) | 1.13 (28.6) | blank |
| VC-CF-14001200D | 14.00 (355.6) | 14.00 (355.6) | 1.13 (28.6) | 12.03 (305.6) |

CF HALF NIPPLE



| Part No. | Flange Size | A | B |
|--------------|---------------|---------------|---------------|
| VC-CF-133HN | 1.33 (33.9) | 0.75 (19.1) | 1.50 (28.1) |
| VC-CF-212HN | 2.13 (53.9) | 1.00 (25.4) | 2.05 (52.1) |
| VC-CF-275HN | 2.75 (69.9) | 1.50 (28.1) | 2.46 (62.5) |
| VC-CF-338HN | 3.38 (85.7) | 2.00 (50.8) | 3.22 (81.8) |
| VC-CF-450HN | 4.50 (114.3) | 2.50 (63.5) | 3.38 (85.9) |
| VC-CF-462HN | 4.63 (117.5) | 3.00 (76.2) | 3.53 (89.6) |
| VC-CF-600HN | 6.00 (152.4) | 4.00 (101.6) | 4.32 (109.7) |
| VC-CF-675HN | 6.75 (171.5) | 5.00 (127) | 5.00 (127) |
| VC-CF-800HN | 8.00 (203.2) | 6.00 (152.4) | 5.50 (139.7) |
| VC-CF-1000HN | 10.00 (254) | 8.00 (203.2) | 7.50 (190.5) |
| VC-CF-1200HN | 12.00 (304.8) | 10.00 (254) | 9.00 (228.6) |
| VC-CF-1325HN | 13.25 (336.6) | 10.00 (254) | 10.00 (254) |
| VC-CF-1400HN | 14.00 (355.6) | 12.00 (304.8) | 10.00 (254) |
| VC-CF-1450HN | 14.50 (368.3) | 12.00 (304.8) | 12.00 (304.8) |
| VC-CF-1650HN | 16.50 (419.1) | 14.00 (355.6) | 12.00 (304.8) |

CF FULL NIPPLE



| Part No. | Flange Size | A | B |
|--------------|---------------|---------------|---------------|
| VC-CF-133FN | 1.33 (33.9) | 0.75 (19.1) | 3.00 (76.2) |
| VC-CF-212FN | 2.13 (53.9) | 1.00 (25.4) | 4.10 (104.1) |
| VC-CF-275FN | 2.75 (69.9) | 1.50 (38.1) | 4.92 (125) |
| VC-CF-338FN | 3.38 (85.7) | 2.00 (50.8) | 6.44 (163.6) |
| VC-CF-450FN | 4.50 (114.3) | 2.50 (63.5) | 6.76 (171.7) |
| VC-CF-462FN | 4.63 (117.5) | 3.00 (76.2) | 7.06 (179.3) |
| VC-CF-600FN | 6.00 (152.4) | 4.00 (101.6) | 8.64 (219.5) |
| VC-CF-675FN | 6.75 (171.5) | 5.00 (127) | 10.00 (254) |
| VC-CF-800FN | 8.00 (203.2) | 6.00 (152.4) | 11.00 (279.4) |
| VC-CF-1000FN | 10.00 (254) | 8.00 (203.2) | 15.00 (381) |
| VC-CF-1200FN | 12.00 (304.8) | 10.00 (254) | 18.00 (457.2) |
| VC-CF-1325FN | 13.25 (336.6) | 10.00 (254) | 20.00 (508) |
| VC-CF-1400FN | 14.00 (355.6) | 12.00 (304.8) | 20.00 (508) |
| VC-CF-1450FN | 14.50 (368.3) | 12.00 (304.8) | 24.00 (609.6) |
| VC-CF-1650FN | 16.50 (419.1) | 14.00 (355.6) | 24.00 (609.6) |

Custom lengths available upon request.

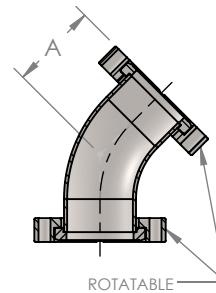
SHEET & TUBE FIBER LASER CUTTER

Capabilities to machine nearly any cutout, shape, and design. The faster speed of nitrogen fiber laser cutting on thin walled more than doubles machine productivity compared to CO₂.

- 5' x 10' sheet capabilities
- Round and square tubes up to 120 mm (4.75")
- Machinable materials: mild steel, stainless steel, and galvanized.



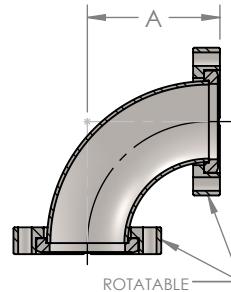
CF 45° ELBOW, WITH TANGENTS



| Part No. | Flange Size | A |
|---------------|--------------|-------------|
| VC-CF-133EL45 | 1.33 (33.9) | 0.65 (16.5) |
| VC-CF-212EL45 | 2.13 (53.9) | 0.80 (20.2) |
| VC-CF-275EL45 | 2.75 (69.9) | 1.15 (29.1) |
| VC-CF-338EL45 | 3.38 (85.7) | 1.48 (37.5) |
| VC-CF-450EL45 | 4.50 (114.3) | 1.94 (49.2) |
| VC-CF-462EL45 | 4.63 (117.5) | 2.25 (57.2) |
| VC-CF-600EL45 | 6.00 (152.4) | 2.94 (74.6) |

Custom lengths available upon request.

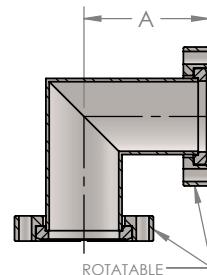
CF 90° ELBOW



| Part No. | Flange Size | A |
|----------------|---------------|---------------|
| VC-CF-133EL90 | 1.33 (33.9) | 1.31 (33.2) |
| VC-CF-212EL90 | 2.13 (53.9) | 1.67 (42.4) |
| VC-CF-275EL90 | 2.75 (69.9) | 2.46 (62.5) |
| VC-CF-338EL90 | 3.38 (85.7) | 3.23 (81.9) |
| VC-CF-450EL90 | 4.50 (114.3) | 4.13 (104.8) |
| VC-CF-462EL90 | 4.63 (117.5) | 4.88 (123.8) |
| VC-CF-600EL90 | 6.00 (152.4) | 6.44 (163.5) |
| VC-CF-800EL90 | 8.00 (203.2) | 9.50 (241.3) |
| VC-CF-1000EL90 | 10.00 (254) | 12.50 (317.5) |
| VC-CF-1325EL90 | 13.25 (336.6) | 15.50 (393.7) |

Custom lengths available upon request.

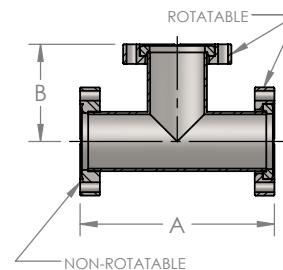
CF 90° ELBOW, MITERED



| Part No. | Flange Size | A |
|-------------------|---------------|--------------|
| VC-CF-133EL90MTR | 1.33 (33.9) | 1.50 (38.1) |
| VC-CF-212EL90MTR | 2.13 (53.9) | 2.05 (52.1) |
| VC-CF-275EL90MTR | 2.75 (69.9) | 2.46 (62.5) |
| VC-CF-338EL90MTR | 3.38 (85.7) | 3.22 (81.8) |
| VC-CF-450EL90MTR | 4.50 (114.3) | 3.34 (84.8) |
| VC-CF-462EL90MTR | 4.63 (117.5) | 3.53 (89.7) |
| VC-CF-600EL90MTR | 6.00 (152.4) | 4.32 (109.7) |
| VC-CF-800EL90MTR | 8.00 (203.2) | 5.50 (139.7) |
| VC-CF-1000EL90MTR | 10.00 (254) | 7.50 (190.5) |
| VC-CF-1325EL90MTR | 13.25 (336.6) | 10.00 (254) |

Custom lengths and sizes available upon request.

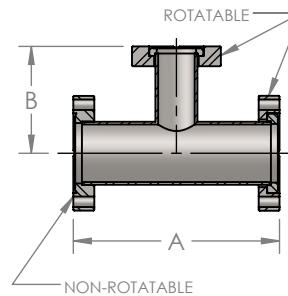
CF TEE



| Part No. | Flange Size | A | B |
|---------------|---------------|---------------|--------------|
| VC-CF-133TEE | 1.33 (33.9) | 4.87 (123.7) | 1.50 (38.1) |
| VC-CF-212TEE | 2.13 (53.9) | 4.08 (103.7) | 2.05 (52.1) |
| VC-CF-275TEE | 2.75 (69.9) | 4.92 (125) | 2.46 (62.5) |
| VC-CF-338TEE | 3.38 (85.7) | 6.44 (163.6) | 3.22 (81.8) |
| VC-CF-450TEE | 4.50 (114.3) | 8.24 (209.3) | 4.12 (106.9) |
| VC-CF-462TEE | 4.63 (117.5) | 7.06 (179.3) | 3.53 (89.7) |
| VC-CF-600TEE | 6.00 (152.4) | 8.64 (219.5) | 4.32 (109.7) |
| VC-CF-675TEE | 6.75 (171.5) | 9.42 (239.3) | 4.71 (119.6) |
| VC-CF-800TEE | 8.00 (203.2) | 11.00 (279.4) | 5.50 (139.7) |
| VC-CF-1000TEE | 10.00 (254) | 15.00 (381) | 7.50 (190.5) |
| VC-CF-1325TEE | 13.25 (336.6) | 20.00 (508) | 10.00 (254) |

Custom lengths available upon request.

CF REDUCING TEE



| Part No. | Flange Size | A | B |
|------------------|-----------------------------|---------------|--------------|
| VC-CF-275X133RT | 2.75 (69.9) X 1.33 (33.9) | 4.92 (125) | 1.87 (47.5) |
| VC-CF-275X212RT | 2.75 (69.9) X 2.13 (53.9) | 4.92 (125) | 2.29 (58.2) |
| VC-CF-338X133RT | 3.38 (85.7) X 1.33 (33.9) | 6.44 (163.6) | 2.13 (54.1) |
| VC-CF-338X275RT | 3.38 (85.7) X 2.75 (69.9) | 6.44 (163.6) | 2.71 (68.8) |
| VC-CF-450X275RT | 4.50 (114.3) X 2.75 (69.9) | 6.76 (171.7) | 2.96 (75.2) |
| VC-CF-450X338RT | 4.50 (114.3) X 3.38 (85.7) | 6.76 (171.7) | 3.48 (88.4) |
| VC-CF-462X338RT | 4.63 (117.5) X 3.38 (85.7) | 7.06 (179.3) | 3.73 (94.7) |
| VC-CF-462X450RT | 4.63 (117.5) X 4.50 (114.3) | 7.06 (179.3) | 3.63 (92.2) |
| VC-CF-600X275RT | 6.00 (152.4) X 2.75 (69.9) | 8.64 (219.5) | 3.71 (94.2) |
| VC-CF-600X338RT | 6.00 (152.4) X 3.38 (85.7) | 8.64 (219.5) | 4.23 (107.4) |
| VC-CF-600X450RT | 6.00 (152.4) X 4.50 (114.3) | 8.64 (219.5) | 4.13 (104.9) |
| VC-CF-600X462RT | 6.00 (152.4) X 4.63 (117.5) | 8.64 (219.5) | 4.03 (102.4) |
| VC-CF-675X600RT | 6.75 (171.5) X 6.00 (152.4) | 9.42 (239.3) | 4.82 (122.4) |
| VC-CF-800X275RT | 8.00 (203.2) X 2.75 (69.9) | 11.00 (279.4) | 4.71 (199.6) |
| VC-CF-800X338RT | 8.00 (203.2) X 3.38 (85.7) | 11.00 (279.4) | 5.23 (132.8) |
| VC-CF-800X450RT | 8.00 (203.2) X 4.50 (114.3) | 11.00 (279.4) | 5.13 (130.3) |
| VC-CF-800X600RT | 8.00 (203.2) X 6.00 (152.4) | 11.00 (279.4) | 5.32 (135.1) |
| VC-CF-1000X800RT | 10.00 (254) X 8.00 (203.2) | 15.00 (381) | 6.50 (165.1) |

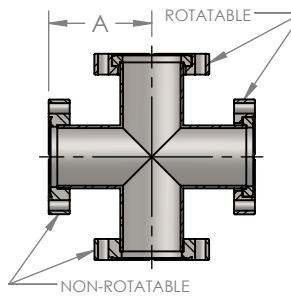
Custom sizes available upon request.

CNC TUBE BENDING

Freedom of shape, radius, bend and orientation guarantees a perfect fit into your system. Bends tubing from 1/4" to 6" (6.4 mm x 152.4 mm) O.D.



CF 4-WAY CROSS



| Part No. | Flange Size | A |
|--------------|---------------|--------------|
| VC-CF-133CS | 1.33 (33.9) | 1.50 (38.1) |
| VC-CF-212CS | 2.13 (53.9) | 2.05 (52.1) |
| VC-CF-275CS | 2.75 (69.9) | 2.46 (62.5) |
| VC-CF-338CS | 3.38 (85.7) | 3.22 (81.8) |
| VC-CF-450CS | 4.50 (114.3) | 3.38 (85.9) |
| VC-CF-462CS | 4.63 (117.5) | 3.53 (89.7) |
| VC-CF-600CS | 6.00 (152.4) | 4.32 (109.7) |
| VC-CF-675CS | 6.75 (171.5) | 4.71 (119.6) |
| VC-CF-800CS | 8.00 (203.2) | 5.50 (139.7) |
| VC-CF-1000CS | 10.00 (254) | 7.50 (190.5) |
| VC-CF-1325CS | 13.25 (336.6) | 10.00 (254) |

Custom lengths and configurations available upon request.

CUSTOM FABRICATED SPOOLS

Work with our engineering team to create custom spools with the flange and size of your choice. A custom spool can reduce the number of welds on your current system and save on manufacturing costs.

MATERIALS

- 304L stainless steel
- 316L stainless steel

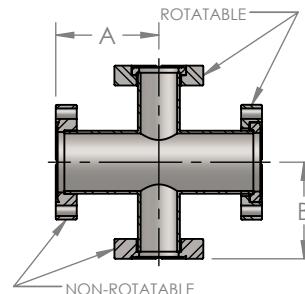
SIZING

- 1/2" - 4" (12.7 mm x 101.6 mm) Tube O.D.
- Lengths up to 20' (6.1 m)

END CONNECTIONS

- Sanitary tri-clamp flange (3A compliant)
- Tube ends
- KF/ISO/CF flanges

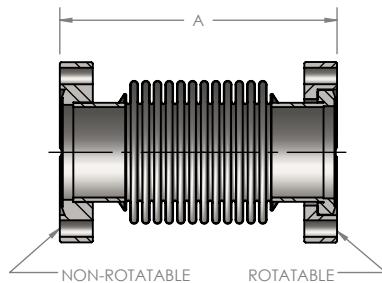
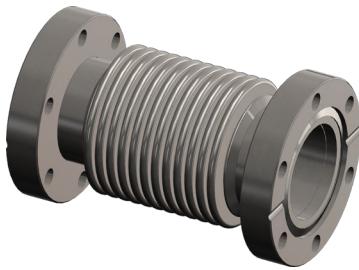
CF 4-WAY REDUCING CROSS



| Part No. | Flange Size | A | B |
|------------------|-----------------------------|--------------|--------------|
| VC-CF-275X133CS | 2.75 (69.9) X 1.33 (33.9) | 2.46 (62.5) | 1.87 (47.5) |
| VC-CF-275X212CS | 2.75 (69.9) X 2.13 (53.9) | 2.46 (62.5) | 2.29 (58.2) |
| VC-CF-338X133CS | 3.38 (85.7) X 1.33 (33.9) | 3.22 (81.8) | 2.13 (54.1) |
| VC-CF-338X275CS | 3.38 (85.7) X 2.75 (69.9) | 3.22 (81.8) | 2.71 (68.8) |
| VC-CF-450X275CS | 4.50 (114.3) X 2.75 (69.9) | 3.38 (85.9) | 2.96 (75.2) |
| VC-CF-450X338CS | 4.50 (114.3) X 3.38 (85.7) | 3.38 (85.9) | 3.48 (88.4) |
| VC-CF-462X338CS | 4.63 (117.5) X 3.38 (85.7) | 3.53 (89.7) | 3.73 (94.7) |
| VC-CF-462X450CS | 4.63 (117.5) X 4.50 (114.3) | 3.53 (89.7) | 3.63 (92.2) |
| VC-CF-600X275CS | 6.00 (152.4) X 2.75 (69.9) | 4.32 (109.7) | 3.71 (94.2) |
| VC-CF-600X338CS | 6.00 (152.4) X 3.38 (85.7) | 4.32 (109.7) | 4.23 (107.4) |
| VC-CF-600X450CS | 6.00 (152.4) X 4.50 (114.3) | 4.32 (109.7) | 4.13 (104.9) |
| VC-CF-600X462CS | 6.00 (152.4) X 4.63 (117.5) | 4.32 (109.7) | 4.03 (102.4) |
| VC-CF-675X600CS | 6.75 (171.5) X 6.00 (152.4) | 4.71 (119.6) | 4.82 (122.4) |
| VC-CF-800X275CS | 8.00 (203.2) X 2.75 (69.9) | 5.50 (139.7) | 4.71 (119.6) |
| VC-CF-800X338CS | 8.00 (203.2) X 3.38 (85.7) | 5.50 (139.7) | 5.23 (132.8) |
| VC-CF-800X450CS | 8.00 (203.2) X 4.50 (114.3) | 5.50 (139.7) | 5.13 (130.3) |
| VC-CF-800X600CS | 8.00 (203.2) X 6.00 (152.4) | 5.50 (139.7) | 5.32 (135.1) |
| VC-CF-1000X800CS | 10.00 (254) X 8.00 (203.2) | 7.50 (190.5) | 6.50 (165.1) |

Custom lengths available upon request.

CF FLEXIBLE BELLOWS



| Part No. | Flange Size | A | Wall |
|----------------|---------------|--------------|-------------|
| VC-CF-133FB4.2 | 1.33 (33.9) | 4.20 (106.7) | 0.008 (0.2) |
| VC-CF-212FB4.2 | 2.13 (53.9) | 4.20 (106.7) | 0.008 (0.2) |
| VC-CF-275FB4.2 | 2.75 (69.9) | 4.20 (106.7) | 0.008 (0.2) |
| VC-CF-338FB4.2 | 3.38 (85.7) | 4.20 (106.7) | 0.008 (0.2) |
| VC-CF-450FB6 | 4.50 (114.3) | 6.00 (152.4) | 0.008 (0.2) |
| VC-CF-462FB6 | 4.63 (117.5) | 6.00 (152.4) | 0.008 (0.2) |
| VC-CF-600FB6 | 6.00 (152.4) | 6.00 (152.4) | 0.008 (0.2) |
| VC-CF-675FB6 | 6.75 (171.5) | 6.00 (152.4) | 0.008 (0.2) |
| VC-CF-800FB6 | 8.00 (203.2) | 6.00 (152.4) | 0.01 (0.3) |
| VC-CF-1000FB6 | 10.00 (254) | 6.00 (152.4) | 0.01 (0.3) |
| VC-CF-1200FB6 | 12.00 (304.8) | 6.00 (152.4) | 0.01 (0.3) |
| VC-CF-1325FB6 | 13.25 (336.6) | 6.00 (152.4) | 0.01 (0.3) |
| VC-CF-1400FB6 | 14.00 (355.6) | 6.00 (152.4) | 0.01 (0.3) |
| VC-CF-1450FB6 | 14.50 (368.3) | 6.00 (152.4) | 0.01 (0.3) |
| VC-CF-1650FB6 | 16.50 (419.1) | 6.00 (152.4) | 0.01 (0.3) |

Custom lengths available upon request.

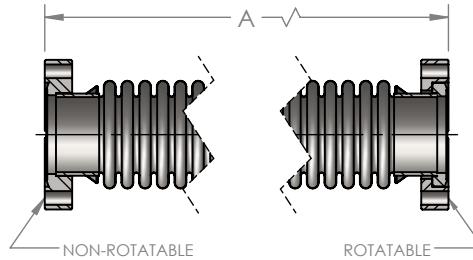
DEFLECTION

- Axial: approximately +15% and -20% of Live Length
- Lateral: approximately 10% of Live Length

CLEANING & PACKAGING

Once a component has completed the manufacturing process, it gets thoroughly cleaned and packaged to the specifications you require. The staff at HIS is always ready to discuss your application.

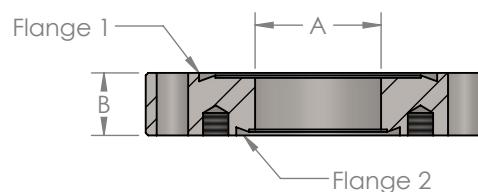
CF FLEXIBLE HOSE



| Part No. | Flange Size | A | Wall |
|---------------|--------------|---------------|-------------|
| VC-CF-133FH12 | 1.33 (33.9) | 12.00 (304.8) | 0.008 (0.2) |
| VC-CF-133FH24 | 1.33 (33.9) | 24.00 (609.6) | 0.008 (0.2) |
| VC-CF-133FH36 | 1.33 (33.9) | 36.00 (914.4) | 0.008 (0.2) |
| VC-CF-212FH12 | 2.13 (53.9) | 12.00 (304.8) | 0.008 (0.2) |
| VC-CF-212FH24 | 2.13 (53.9) | 24.00 (609.6) | 0.008 (0.2) |
| VC-CF-212FH36 | 2.13 (53.9) | 36.00 (914.4) | 0.008 (0.2) |
| VC-CF-275FH12 | 2.75 (69.9) | 12.00 (304.8) | 0.008 (0.2) |
| VC-CF-275FH24 | 2.75 (69.9) | 24.00 (609.6) | 0.008 (0.2) |
| VC-CF-275FH36 | 2.75 (69.9) | 36.00 (914.4) | 0.008 (0.2) |
| VC-CF-338FH12 | 3.38 (85.7) | 12.00 (304.8) | 0.008 (0.2) |
| VC-CF-338FH24 | 3.38 (85.7) | 24.00 (609.6) | 0.008 (0.2) |
| VC-CF-338FH36 | 3.38 (85.7) | 36.00 (914.4) | 0.008 (0.2) |
| VC-CF-450FH12 | 4.50 (114.3) | 12.00 (304.8) | 0.008 (0.2) |
| VC-CF-450FH24 | 4.50 (114.3) | 24.00 (609.6) | 0.008 (0.2) |
| VC-CF-450FH36 | 4.50 (114.3) | 36.00 (914.4) | 0.008 (0.2) |
| VC-CF-462FH12 | 4.63 (117.5) | 12.00 (304.8) | 0.008 (0.2) |
| VC-CF-462FH24 | 4.63 (117.5) | 24.00 (609.6) | 0.008 (0.2) |
| VC-CF-462FH36 | 4.63 (117.5) | 36.00 (914.4) | 0.008 (0.2) |
| VC-CF-600FH12 | 6.00 (152.4) | 12.00 (304.8) | 0.008 (0.2) |
| VC-CF-600FH24 | 6.00 (152.4) | 24.00 (609.6) | 0.008 (0.2) |
| VC-CF-600FH36 | 6.00 (152.4) | 36.00 (914.4) | 0.008 (0.2) |
| VC-CF-675FH12 | 6.75 (171.5) | 12.00 (304.8) | 0.008 (0.2) |
| VC-CF-675FH24 | 6.75 (171.5) | 24.00 (609.6) | 0.008 (0.2) |
| VC-CF-675FH36 | 6.75 (171.5) | 36.00 (914.4) | 0.008 (0.2) |
| VC-CF-800FH12 | 8.00 (203.2) | 12.00 (304.8) | 0.01 (0.3) |
| VC-CF-800FH24 | 8.00 (203.2) | 24.00 (609.6) | 0.01 (0.3) |
| VC-CF-800FH36 | 8.00 (203.2) | 36.00 (914.4) | 0.01 (0.3) |

Custom lengths available upon request.

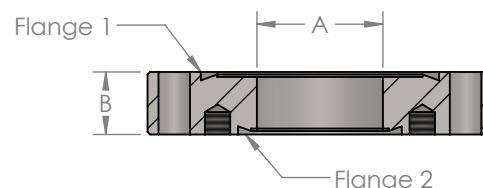
CF ZERO LENGTH REDUCER



| Part No. | Flange 1 | Flange 2 | A | B |
|------------------|--------------|-----------|--------------|-------------|
| VC-CF-212X133ZLR | 2.13 (53.9) | 133-075NT | 0.63 (15.9) | 0.47 (11.9) |
| VC-CF-275X133ZLR | 2.75 (69.9) | 133-075NT | 0.63 (15.9) | 0.50 (12.7) |
| VC-CF-275X212ZLR | 2.75 (69.9) | 212-100NT | 1.00 (25.4) | 0.50 (12.7) |
| VC-CF-338X133ZLR | 3.38 (85.9) | 133-075NT | 0.63 (15.9) | 0.69 (17.4) |
| VC-CF-338X212ZLR | 3.38 (85.9) | 212-100NT | 1.00 (25.4) | 0.69 (17.4) |
| VC-CF-338X275ZLR | 3.38 (85.9) | 275-150NT | 1.50 (38.1) | 0.69 (17.4) |
| VC-CF-450X133ZLR | 4.50 (114.3) | 133-075NT | 0.63 (15.9) | 0.69 (17.4) |
| VC-CF-450X212ZLR | 4.50 (114.3) | 212-100NT | 1.00 (25.4) | 0.69 (17.4) |
| VC-CF-450X275ZLR | 4.50 (114.3) | 275-150NT | 1.50 (38.1) | 0.69 (17.4) |
| VC-CF-450X338ZLR | 4.50 (114.3) | 338-200NT | 2.00 (50.8) | 0.69 (17.4) |
| VC-CF-462X133ZLR | 4.62 (117.3) | 133-075NT | 0.63 (15.9) | 0.81 (20.6) |
| VC-CF-462X212ZLR | 4.62 (117.3) | 212-100NT | 1.00 (25.4) | 0.81 (20.6) |
| VC-CF-462X275ZLR | 4.62 (117.3) | 275-150NT | 1.50 (38.1) | 0.81 (20.6) |
| VC-CF-462X338ZLR | 4.62 (117.3) | 338-200NT | 2.00 (50.8) | 0.81 (20.6) |
| VC-CF-600X133ZLR | 6.00 (152.4) | 133-075NT | 0.63 (15.9) | 0.78 (19.8) |
| VC-CF-600X212ZLR | 6.00 (152.4) | 212-100NT | 1.00 (25.4) | 0.78 (19.8) |
| VC-CF-600X275ZLR | 6.00 (152.4) | 275-150NT | 1.50 (38.1) | 0.78 (19.8) |
| VC-CF-600X338ZLR | 6.00 (152.4) | 338-200NT | 2.00 (50.8) | 0.78 (19.8) |
| VC-CF-600X450ZLR | 6.00 (152.4) | 450-250NT | 2.50 (63.5) | 0.78 (19.8) |
| VC-CF-600X462ZLR | 6.00 (152.4) | 462-300NT | 3.00 (76.2) | 0.78 (19.8) |
| VC-CF-675X133ZLR | 6.75 (171.5) | 133-075NT | 0.63 (15.9) | 0.84 (21.4) |
| VC-CF-675X212ZLR | 6.75 (171.5) | 212-100NT | 1.00 (25.4) | 0.84 (21.4) |
| VC-CF-675X275ZLR | 6.75 (171.5) | 275-150NT | 1.50 (38.1) | 0.84 (21.4) |
| VC-CF-675X338ZLR | 6.75 (171.5) | 338-200NT | 2.00 (50.8) | 0.84 (21.4) |
| VC-CF-675X450ZLR | 6.75 (171.5) | 450-250NT | 2.50 (63.5) | 0.84 (21.4) |
| VC-CF-675X462ZLR | 6.75 (171.5) | 462-300NT | 3.00 (76.2) | 0.84 (21.4) |
| VC-CF-675X600ZLR | 6.75 (171.5) | 600-400NT | 4.00 (101.6) | 0.84 (21.4) |
| VC-CF-800X133ZLR | 8.00 (203.2) | 133-075NT | 0.63 (15.9) | 0.88 (22.2) |
| VC-CF-800X212ZLR | 8.00 (203.2) | 212-100NT | 1.00 (25.4) | 0.88 (22.2) |
| VC-CF-800X275ZLR | 8.00 (203.2) | 275-150NT | 1.50 (38.1) | 0.88 (22.2) |

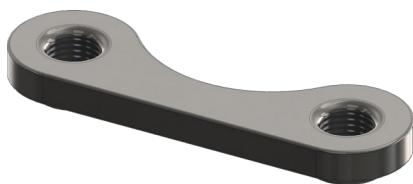
Continues on the next page.

CF ZERO LENGTH REDUCER CONT.



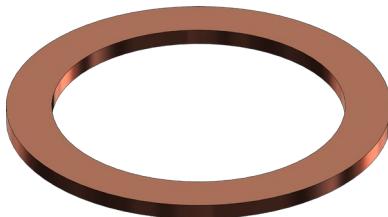
| Part No. | Flange 1 | Flange 2 | A | B |
|--------------------|---------------|------------|--------------|-------------|
| VC-CF-800X338ZLR | 8.00 (203.2) | 338-200NT | 2.00 (50.8) | 0.88 (22.2) |
| VC-CF-800X450ZLR | 8.00 (203.2) | 450-250NT | 2.50 (63.5) | 0.88 (22.2) |
| VC-CF-800X462ZLR | 8.00 (203.2) | 462-300NT | 3.00 (76.2) | 0.88 (22.2) |
| VC-CF-800X600ZLR | 8.00 (203.2) | 600-400NT | 4.00 (101.6) | 0.88 (22.2) |
| VC-CF-800X675ZLR | 8.00 (203.2) | 675-500NT | 5.00 (127) | 0.88 (22.2) |
| VC-CF-1000X133ZLR | 10.00 (254) | 133-075NT | 0.63 (15.9) | 0.97 (24.6) |
| VC-CF-1000X212ZLR | 10.00 (254) | 212-100NT | 1.00 (25.4) | 0.97 (24.6) |
| VC-CF-1000X275ZLR | 10.00 (254) | 275-150NT | 1.50 (38.1) | 0.97 (24.6) |
| VC-CF-1000X338ZLR | 10.00 (254) | 338-200NT | 2.00 (50.8) | 0.97 (24.6) |
| VC-CF-1000X450ZLR | 10.00 (254) | 450-250NT | 2.50 (63.5) | 0.97 (24.6) |
| VC-CF-1000X462ZLR | 10.00 (254) | 462-300NT | 3.00 (76.2) | 0.97 (24.6) |
| VC-CF-1000X600ZLR | 10.00 (254) | 600-400NT | 4.00 (101.6) | 0.97 (24.6) |
| VC-CF-1000X675ZLR | 10.00 (254) | 675-500NT | 5.00 (127) | 0.97 (24.6) |
| VC-CF-1000X800ZLR | 10.00 (254) | 800-600NT | 6.00 (152.4) | 0.97 (24.6) |
| VC-CF-1325X133ZLR | 13.25 (336.6) | 133-075NT | 0.63 (15.9) | 1.13 (28.6) |
| VC-CF-1325X212ZLR | 13.25 (336.6) | 212-100NT | 1.00 (25.4) | 1.13 (28.6) |
| VC-CF-1325X275ZLR | 13.25 (336.6) | 275-150NT | 1.50 (38.1) | 1.13 (28.6) |
| VC-CF-1325X338ZLR | 13.25 (336.6) | 338-200NT | 2.00 (50.8) | 1.13 (28.6) |
| VC-CF-1325X450ZLR | 13.25 (336.6) | 450-250NT | 2.50 (63.5) | 1.13 (28.6) |
| VC-CF-1325X462ZLR | 13.25 (336.6) | 462-300NT | 3.00 (76.2) | 1.13 (28.6) |
| VC-CF-1325X600ZLR | 13.25 (336.6) | 600-400NT | 4.00 (101.6) | 1.13 (28.6) |
| VC-CF-1325X675ZLR | 13.25 (336.6) | 675-500NT | 5.00 (127) | 1.13 (28.6) |
| VC-CF-1325X800ZLR | 13.25 (336.6) | 800-600NT | 6.00 (152.4) | 1.13 (28.6) |
| VC-CF-1325X1000ZLR | 13.25 (336.6) | 1000-800NT | 8.00 (203.2) | 1.13 (28.6) |

CF PLATE NUT



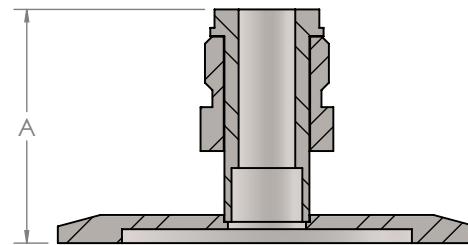
| Part No. | For Flange Size |
|-----------|-----------------|
| VC-PN-133 | CF 133 |
| VC-PN-212 | CF 212 |
| VC-PN-275 | CF 275 |
| VC-PN-338 | CF 338 |
| VC-PN-450 | CF 450 |
| VC-PN-462 | CF 462 |
| VC-PN-600 | CF 600 |
| VC-PN-800 | CF 800 |

COPPER GASKET



| Part No. | For Flange Size |
|------------|-----------------|
| VC-CG-133 | CF 133 |
| VC-CG-212 | CF 212 |
| VC-CG-275 | CF 275 |
| VC-CG-338 | CF 338 |
| VC-CG-450 | CF 450 |
| VC-CG-462 | CF 462 |
| VC-CG-600 | CF 600 |
| VC-CG-675 | CF 675 |
| VC-CG-800 | CF 800 |
| VC-CG-1000 | CF 1000 |
| VC-CG-1200 | CF 1200 |
| VC-CG-1325 | CF 1325 |
| VC-CG-1400 | CF 1400 |
| VC-CG-1450 | CF 1450 |
| VC-CG-1650 | CF 1650 |

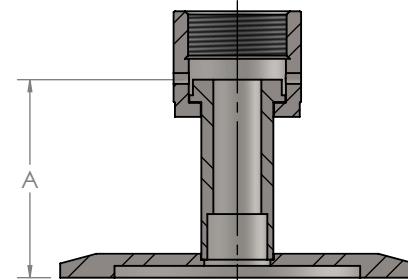
KF FACE SEAL MALE ADAPTER



| Part No. | Flange Size | Face Seal Size | A |
|-----------------|-------------|----------------|-------------|
| VC-KF-16BB04FSM | 0.75 (19.1) | 0.25 (6.4) | 1.46 (37.1) |
| VC-KF-16BB08FSM | 0.75 (19.1) | 0.50 (12.7) | 1.65 (41.9) |
| VC-KF-25BB04FSM | 1.00 (25.4) | 0.25 (6.4) | 1.46 (37.1) |
| VC-KF-25BB08FSM | 1.00 (25.4) | 0.50 (12.7) | 1.65 (41.9) |
| VC-KF-40BB04FSM | 1.50 (38.1) | 0.25 (6.4) | 1.46 (37.1) |
| VC-KF-40BB08FSM | 1.50 (38.1) | 0.50 (12.7) | 1.65 (41.9) |
| VC-KF-50BB04FSM | 2.00 (50.8) | 0.25 (6.4) | 1.46 (37.1) |
| VC-KF-50BB08FSM | 2.00 (50.8) | 0.50 (12.7) | 1.65 (41.9) |

Custom sizes available upon request.

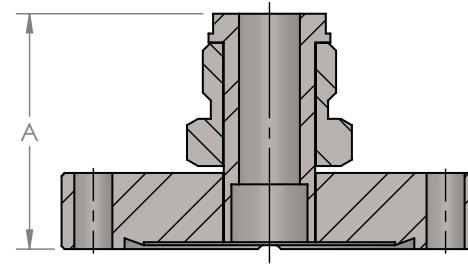
KF FACE SEAL FEMALE ADAPTER



| Part No. | Flange Size | Face Seal Size | A |
|-----------------|-------------|----------------|-------------|
| VC-KF-16BB04FSF | 0.75 (19.1) | 0.25 (6.4) | 1.46 (37.1) |
| VC-KF-16BB08FSF | 0.75 (19.1) | 0.50 (12.7) | 1.65 (41.9) |
| VC-KF-25BB04FSF | 1.00 (25.4) | 0.25 (6.4) | 1.46 (37.1) |
| VC-KF-25BB08FSF | 1.00 (25.4) | 0.50 (12.7) | 1.65 (41.9) |
| VC-KF-40BB04FSF | 1.50 (38.1) | 0.25 (6.4) | 1.46 (37.1) |
| VC-KF-40BB08FSF | 1.50 (38.1) | 0.50 (12.7) | 1.65 (41.9) |
| VC-KF-50BB04FSF | 2.00 (50.8) | 0.25 (6.4) | 1.46 (37.1) |
| VC-KF-50BB08FSF | 2.00 (50.8) | 0.50 (12.7) | 1.65 (41.9) |

Custom sizes available upon request.

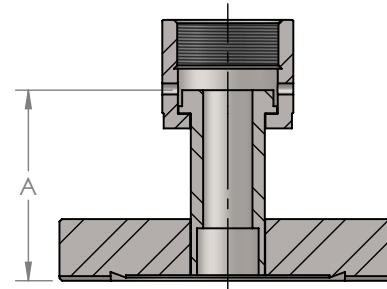
CF FACE SEAL MALE ADAPTER



| Part No. | Flange Size | Face Seal Size | A |
|------------------|-------------|----------------|-------------|
| VC-CF-133X1/4FSM | 1.33 (33.9) | 0.25 (6.4) | 1.37 (34.8) |
| VC-CF-133X1/2FSM | 1.33 (33.9) | 0.50 (12.7) | 1.53 (38.9) |
| VC-CF-275X1/4FSM | 2.75 (69.9) | 0.25 (6.4) | 1.37 (34.8) |
| VC-CF-275X1/2FSM | 2.75 (69.9) | 0.50 (12.7) | 1.54 (39.1) |

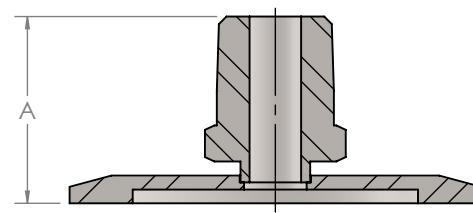
Custom configurations available upon request.

CF FACE SEAL FEMALE ADAPTER



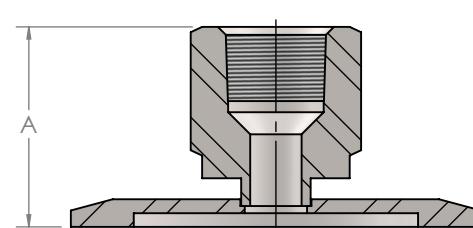
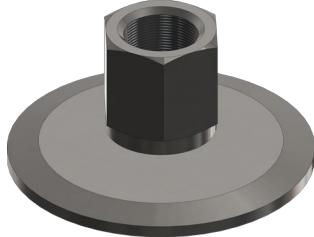
| Part No. | Flange Size | Face Seal Size | A |
|------------------|-------------|----------------|-------------|
| VC-CF-133X1/4FSF | 1.33 (33.9) | 0.25 (6.4) | 1.37 (34.8) |
| VC-CF-133X1/2FSF | 1.33 (33.9) | 0.50 (12.7) | 1.53 (38.9) |
| VC-CF-275X1/4FSF | 2.75 (69.9) | 0.25 (6.4) | 1.37 (34.8) |
| VC-CF-275X1/2FSF | 2.75 (69.9) | 0.50 (12.7) | 1.54 (39.1) |

Custom configurations available upon request.

KF-NPT MALE ADAPTER

| Part No. | Flange Size | NPT | A |
|------------------|-------------|-------------|-------------|
| VC-KF-16BB02MNPT | 0.75 (19.1) | 0.13 (3.2) | 0.88 (22.4) |
| VC-KF-16BB04MNPT | 0.75 (19.1) | 0.25 (6.4) | 1.09 (27.7) |
| VC-KF-25BB04MNPT | 1.00 (25.4) | 0.25 (6.4) | 1.09 (27.7) |
| VC-KF-40BB04MNPT | 1.50 (38.1) | 0.25 (6.4) | 1.09 (27.7) |
| VC-KF-40BB08MNPT | 1.50 (38.1) | 0.50 (12.7) | 1.34 (34) |
| VC-KF-50BB04MNPT | 2.00 (50.8) | 0.25 (6.4) | 1.09 (27.7) |
| VC-KF-50BB08MNPT | 2.00 (50.8) | 0.50 (12.7) | 1.34 (34) |

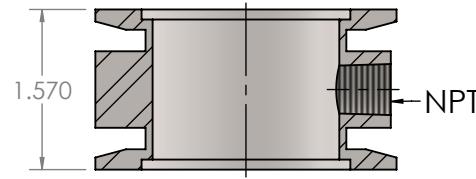
Custom sizes available upon request.

KF-NPT FEMALE ADAPTER

| Part No. | Flange Size | NPT | A |
|------------------|-------------|-------------|-------------|
| VC-KF-16BB02FNPT | 0.75 (19.1) | 0.13 (3.2) | 0.95 (24.1) |
| VC-KF-16BB04FNPT | 0.75 (19.1) | 0.25 (6.4) | 1.10 (27.9) |
| VC-KF-25BB04FNPT | 1.00 (25.4) | 0.25 (6.4) | 1.10 (27.9) |
| VC-KF-40BB04FNPT | 1.50 (38.1) | 0.25 (6.4) | 1.10 (27.9) |
| VC-KF-40BB08FNPT | 1.50 (38.1) | 0.50 (12.7) | 1.44 (36.6) |
| VC-KF-50BB04FNPT | 2.00 (50.8) | 0.25 (6.4) | 1.10 (27.9) |
| VC-KF-50BB08FNPT | 2.00 (50.8) | 0.50 (12.7) | 1.44 (36.6) |

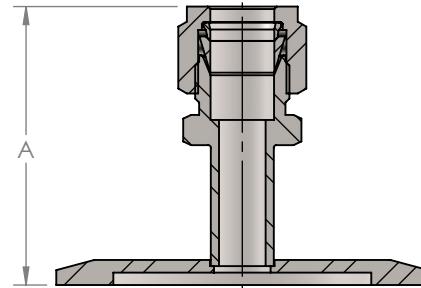
Custom sizes available upon request.

KF GAUGE TEE ADAPTER



| Part No. | Flange Size | NPT |
|------------------|-------------|------------|
| VC-KF-16TE02FNPT | 0.75 (19.1) | 0.13 (3.2) |
| VC-KF-16TE04FNPT | 0.75 (19.1) | 0.25 (6.4) |
| VC-KF-25TE02FNPT | 1.00 (25.4) | 0.13 (3.2) |
| VC-KF-25TE04FNPT | 1.50 (38.1) | 0.25 (6.4) |
| VC-KF-40TE02FNPT | 1.50 (38.1) | 0.13 (3.2) |
| VC-KF-40TE04FNPT | 2.00 (50.8) | 0.25 (6.4) |
| VC-KF-50TE02FNPT | 2.00 (50.8) | 0.13 (3.2) |
| VC-KF-50TE04FNPT | 2.00 (50.8) | 0.25 (6.4) |

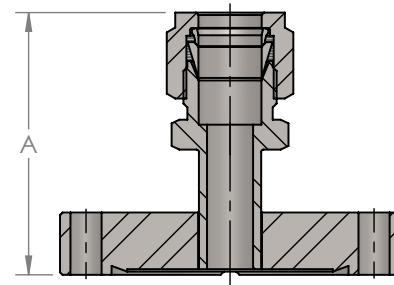
KF COMPRESSION ADAPTER



| Part No. | Flange Size | Compression Size | A |
|------------------|-------------|------------------|-------------|
| VC-KF-16BB04COMP | 0.75 (19.1) | 0.25 (6.4) | 1.47 (37.3) |
| VC-KF-16BB08COMP | 0.75 (19.1) | 0.50 (12.7) | 1.63 (41.4) |
| VC-KF-25BB04COMP | 1.00 (25.4) | 0.25 (6.4) | 1.47 (37.3) |
| VC-KF-25BB08COMP | 1.00 (25.4) | 0.50 (12.7) | 1.63 (41.4) |
| VC-KF-40BB04COMP | 1.50 (38.1) | 0.25 (6.4) | 1.47 (37.3) |
| VC-KF-40BB08COMP | 1.50 (38.1) | 0.50 (12.7) | 1.63 (41.4) |
| VC-KF-50BB04COMP | 2.00 (50.8) | 0.25 (6.4) | 1.47 (37.3) |
| VC-KF-50BB08COMP | 2.00 (50.8) | 0.50 (12.7) | 1.63 (41.4) |

Custom sizes available upon request.

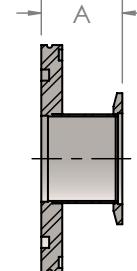
CF COMPRESSION ADAPTER



| Part No. | Flange Size | Compression Size | A |
|-------------------|-------------|------------------|-------------|
| VC-CF-133X1/4COMP | 1.33 (33.9) | 0.25 (6.4) | 1.33 (33.8) |
| VC-CF-133X1/2COMP | 1.33 (33.9) | 0.50 (12.7) | 2.13 (54.1) |
| VC-CF-275X1/4COMP | 2.75 (69.9) | 0.25 (6.4) | 1.88 (47.8) |
| VC-CF-275X1/2COMP | 2.75 (69.9) | 0.50 (12.7) | 2.13 (54.1) |

Custom configurations available upon request.

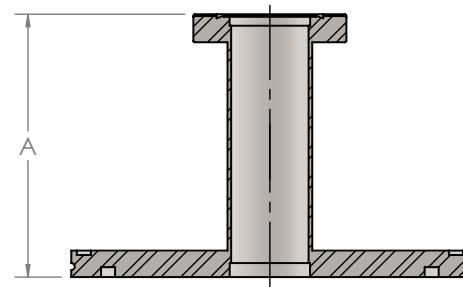
ISO-KF STRAIGHT REDUCER



| Part No. | Flange Size | Flange 1 | Flange 2 | A |
|------------------|----------------------------|----------|----------|-------------|
| VC-IS-63XKF25RS | 2.50 (63.5) X 1.00 (25.4) | ISO 63 | KF 25 | 1.83 (46.4) |
| VC-IS-63XKF50RS | 2.50 (63.5) X 2.00 (50.8) | ISO 63 | KF 50 | 1.83 (46.4) |
| VC-IS-80XKF25RS | 3.00 (76.2) X 1.00 (25.4) | ISO 80 | KF 25 | 1.83 (46.4) |
| VC-IS-80XKF40RS | 3.00 (76.2) X 1.50 (38.1) | ISO 80 | KF 40 | 1.83 (46.4) |
| VC-IS-80XKF50RS | 3.00 (76.2) X 2.00 (50.8) | ISO 80 | KF 50 | 1.83 (46.4) |
| VC-IS-100XKF25RS | 4.00 (101.6) X 1.00 (25.4) | ISO 100 | KF 25 | 1.83 (46.4) |
| VC-IS-100XKF40RS | 4.00 (101.6) X 1.50 (38.1) | ISO 100 | KF 40 | 1.83 (46.4) |
| VC-IS-100XKF50RS | 4.00 (101.6) X 2.00 (50.8) | ISO 100 | KF 50 | 1.83 (46.4) |
| VC-IS-160XKF40RS | 6.00 (152.4) X 1.50 (38.1) | ISO 160 | KF 40 | 1.83 (46.4) |

Custom sizes and lengths available upon request.

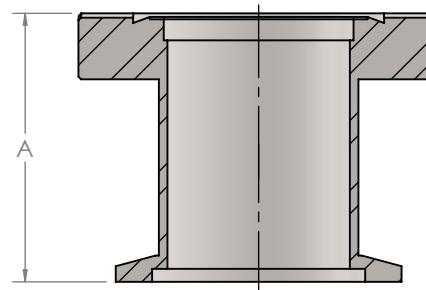
CF-ISO STRAIGHT REDUCER



| Part No. | Flange Size | Flange 1 | Flange 2 | A |
|--------------------|-----------------------------|----------|----------|------------|
| VC-CF-450XISO63RS | 4.50 (114.3) X 2.50 (63.5) | CF 450 | ISO 63 | 5.00 (127) |
| VC-CF-462XISO80RS | 4.63 (117.5) X 3.00 (76.2) | CF 462 | ISO 80 | 5.00 (127) |
| VC-CF-600XISO100RS | 6.00 (152.4) X 4.00 (101.6) | CF 600 | ISO 100 | 5.00 (127) |
| VC-CF-800XISO160RS | 8.00 (203.2) X 6.00 (152.4) | CF 800 | ISO 160 | 5.00 (127) |

Custom sizes and lengths available upon request.

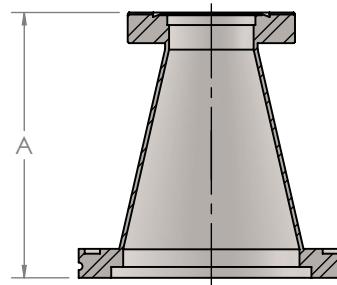
CF-KF STRAIGHT REDUCER



| Part No. | Flange Size | Flange 1 | Flange 2 | A |
|------------------|---------------------------|----------|----------|-------------|
| VC-CF-133XKF10RS | 1.33 (33.9) X 0.50 (12.7) | CF 133 | KF 10 | 1.75 (44.5) |
| VC-CF-133XKF16RS | 1.33 (33.9) X 0.75 (19.1) | CF 133 | KF 16 | 1.75 (44.5) |
| VC-CF-212XKF25RS | 2.13 (54) X 1.00 (25.4) | CF 212 | KF 25 | 1.74 (44.2) |
| VC-CF-275XKF40RS | 2.75 (69.9) X 1.50 (38.1) | CF 275 | KF 40 | 1.78 (45.3) |
| VC-CF-133XKF50RS | 1.33 (33.9) X 2.00 (50.8) | CF 133 | KF 50 | 1.75 (44.5) |
| VC-CF-338XKF50RS | 3.38 (85.7) X 2.00 (50.8) | CF 338 | KF 50 | 1.80 (45.7) |

Custom sizes and lengths available upon request.

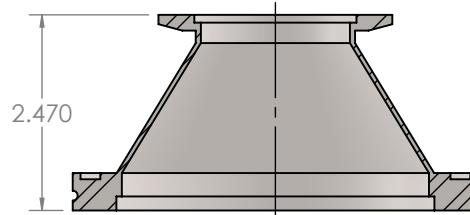
CF-ISO CONICAL REDUCER



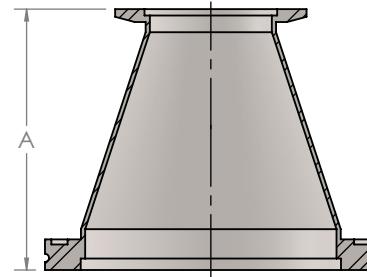
| Part No. | Flange Size | Flange 1 | Flange 2 | A |
|-------------------|-----------------------------|----------|----------|--------------|
| VC-CF-275XIS63AC | 2.75 (69.9) X 2.50 (63.5) | CF 275 | ISO 63 | 2.83 (71.9) |
| VC-CF-275XIS80AC | 2.75 (69.9) X 3.00 (76.2) | CF 275 | ISO 80 | 4.08 (103.6) |
| VC-CF-338XIS63AC | 3.38 (85.7) X 2.50 (63.5) | CF 338 | ISO 63 | 2.85 (72.4) |
| VC-CF-338XIS80AC | 3.38 (85.7) X 3.00 (76.2) | CF 338 | ISO 80 | 4.10 (104.1) |
| VC-CF-338XIS100AC | 3.38 (85.7) X 4.00 (101.6) | CF 338 | ISO 100 | 4.10 (104.1) |
| VC-CF-450XIS80AC | 4.50 (114.3) X 3.00 (76.2) | CF 450 | ISO 80 | 4.25 (108) |
| VC-CF-450XIS100AC | 4.50 (114.3) X 4.00 (101.6) | CF 450 | ISO 100 | 4.25 (108) |
| VC-CF-462XIS63AC | 4.63 (117.5) X 2.50 (63.5) | CF 462 | ISO 63 | 4.16 (105.6) |
| VC-CF-462XIS100AC | 4.63 (117.5) X 4.00 (101.6) | CF 462 | ISO 100 | 4.16 (105.6) |
| VC-CF-600XIS63AC | 6.00 (152.4) X 2.50 (63.5) | CF 600 | ISO 63 | 4.31 (109.5) |
| VC-CF-600XIS80AC | 6.00 (152.4) X 3.00 (76.2) | CF 600 | ISO 80 | 4.31 (109.5) |

Custom sizes and lengths available upon request.

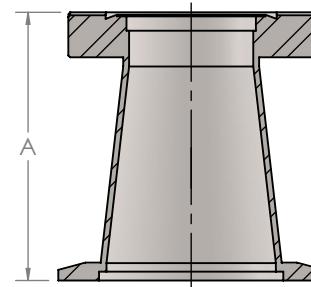
ISO-KF CONCENTRIC ADAPTER, LOW PROFILE



| Part No. | Flange Size | Flange 1 | Flange 2 |
|------------------|----------------------------|----------|----------|
| VC-IS-63XKF25AC | 2.50 (63.5) X 1.00 (25.4) | ISO 63 | KF 25 |
| VC-IS-63XKF40AC | 2.50 (63.5) X 1.50 (38.1) | ISO 63 | KF 40 |
| VC-IS-63XKF50AC | 2.50 (63.5) X 2.00 (50.8) | ISO 63 | KF 50 |
| VC-IS-80XKF40AC | 3.00 (76.2) X 1.50 (38.1) | ISO 80 | KF 40 |
| VC-IS-80XKF50AC | 3.00 (76.2) X 2.00 (50.8) | ISO 80 | KF 50 |
| VC-IS-100XKF40AC | 4.00 (101.6) X 1.50 (38.1) | ISO 100 | KF 40 |
| VC-IS-100XKF50AC | 4.00 (101.6) X 2.00 (50.8) | ISO 100 | KF 50 |

ISO-KF CONCENTRIC ADAPTER, TYPE 4

| Part No. | Flange Size | Flange 1 | Flange 2 | A |
|--------------------|----------------------------|----------|----------|--------------|
| VC-IS-63XKF40ACT4 | 2.50 (63.5) X 1.50 (38.1) | ISO 63 | KF 40 | 2.78 (70.5) |
| VC-IS-63XKF50ACT4 | 2.50 (63.5) X 2.00 (50.8) | ISO 63 | KF 50 | 4.03 (102.2) |
| VC-IS-80XKF40ACT4 | 3.00 (76.2) X 1.50 (38.1) | ISO 80 | KF 40 | 2.78 (70.5) |
| VC-IS-80XKF50ACT4 | 3.00 (76.2) X 2.00 (50.8) | ISO 80 | KF 50 | 4.03 (102.2) |
| VC-IS-100XKF40ACT4 | 4.00 (101.6) X 1.50 (38.1) | ISO 100 | KF 40 | 5.68 (144.3) |
| VC-IS-100XKF50ACT4 | 4.00 (101.6) X 2.00 (50.8) | ISO 100 | KF 50 | 4.03 (102.2) |

CF-KF CONICAL REDUCER

| Part No. | Flange Size | Flange 1 | Flange 2 | A |
|------------------|----------------------------|----------|----------|--------------|
| VC-CF-133XKF25AC | 1.33 (33.9) X 1.00 (25.4) | CF 133 | KF 25 | 2.70 (68.6) |
| VC-CF-133XKF40AC | 1.33 (33.9) X 1.50 (38.1) | CF 133 | KF 40 | 2.70 (68.6) |
| VC-CF-212XKF16AC | 2.13 (54) X 0.75 (19.1) | CF 212 | KF 16 | 2.69 (68.3) |
| VC-CF-212XKF40AC | 2.13 (54) X 1.50 (38.1) | CF 212 | KF 40 | 2.69 (68.3) |
| VC-CF-212XKF50AC | 2.13 (54) X 2.00 (50.8) | CF 212 | KF 50 | 2.69 (68.3) |
| VC-CF-275XKF16AC | 2.75 (69.9) X 0.75 (19.1) | CF 275 | KF 16 | 2.73 (69.3) |
| VC-CF-275XKF25AC | 2.75 (69.9) X 1.00 (25.4) | CF 275 | KF 25 | 2.73 (69.3) |
| VC-CF-275XKF50AC | 2.75 (69.9) X 2.00 (50.8) | CF 275 | KF 50 | 2.73 (69.3) |
| VC-CF-338XKF25AC | 3.38 (85.7) X 1.00 (25.4) | CF 338 | KF 25 | 2.75 (69.9) |
| VC-CF-338XKF40AC | 3.38 (85.7) X 1.50 (38.1) | CF 338 | KF 40 | 2.75 (69.9) |
| VC-CF-450XKF40AC | 4.50 (114.3) X 1.50 (38.1) | CF 450 | KF 40 | 2.90 (73.7) |
| VC-CF-450XKF50AC | 4.50 (114.3) X 2.00 (50.8) | CF 450 | KF 50 | 2.90 (73.7) |
| VC-CF-462XKF40AC | 4.63 (117.5) X 1.50 (38.1) | CF 462 | KF 40 | 4.15 (105.4) |
| VC-CF-462XKF50AC | 4.63 (117.5) X 2.00 (50.8) | CF 462 | KF 50 | 4.15 (105.4) |
| VC-CF-600XKF50AC | 6.00 (152.4) X 2.00 (50.8) | CF 600 | KF 50 | 4.15 (105.4) |

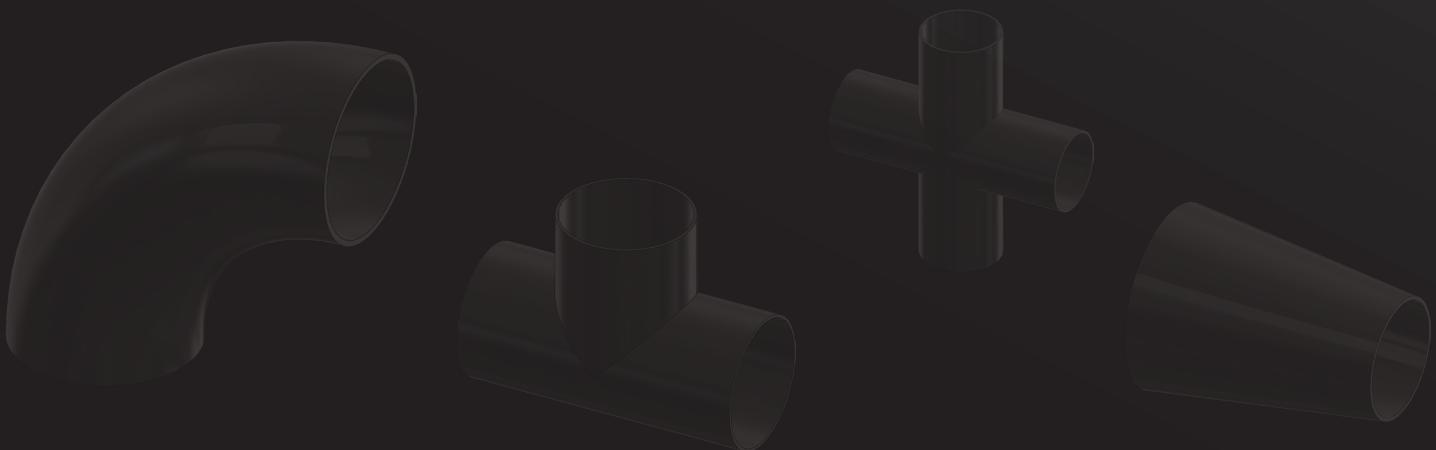
2 WELD FITTINGS & TUBING

1.1 WELD FITTINGS

| | |
|----------------|-------|
| Specifications | 76 |
| Elbows | 77-80 |
| Tees & Crosses | 80-84 |
| Reducers | 85-86 |
| Weld Cap | 87 |

2.2 TUBING

| | |
|--------------------------------------|-------|
| A249/A269 Stainless Steel Tubing | 88-89 |
| A270 Sanitary Stainless Steel Tubing | 90-91 |



WELD FITTINGS SPECIFICATIONS

OVERVIEW

HIS Innovations Group provides a full line of weldable tube components. Standard and custom sizes, lengths and finishes are available. Tubing sizes are specified by the outside diameter (O.D.) in inches.

SPECIFICATIONS

HIS weld fittings conform to ASTM A-269, A-262 Practice "E" requirements, and ASME standards unless otherwise specified.

MATERIALS

- 304 stainless steel
- 316/316L available upon request

PRESSURE RANGE

- $\geq 1 \times 10^{-13}$

TEMPERATURE RANGE

- -200° C to 450° C (-328° F to 842° F)

FINISH

Standard finish for fittings is Mill Finish; other finishes available upon request. Add number/letter to the end of the part number to specify the finish.

- M = Mill finish
- 7 = #7 polish O.D./I.D.

WALL THICKNESS

Thickness may vary by the allowable limits of the ASTM/ASME standards. All measurements in inches unless otherwise noted.

WELDING

All welding is done with cryogenic source inert gas welding methods. HIS uses ASME qualified welders and ASME procedures designed to provide the best possible welds. Automatic or semi-automatic positioning fixtures are used on tubing and fittings. Interior surfaces are smooth, even, and uniform.

MARKING

Laser engraving and special marking, as requested by the customer, is available.

TEST REPORTS

Material test reports will be furnished upon request at the time of order.

PACKAGING

All tube, fittings, and fabrications will be securely packaged. Special packaging as required by the customer is available.

QUALITY

The HIS quality program incorporates both non-destructive and destructive testing, statistical process control, and operator auditing on products. We welcome on-site inspections or surveys by your company prior to shipment.

SIZING

| Part Number | Tube O.D. in. (mm) |
|-------------|--------------------|
| 08 | 0.50 (12.7) |
| 12 | 0.75 (19.1) |
| 16 | 1.00 (25.4) |
| 18 | 1.50 (38.1) |
| 20 | 2.00 (50.8) |
| 25 | 2.50 (63.5) |
| 30 | 3.00 (76.2) |
| 40 | 4.00 (101.6) |
| 60 | 6.00 (152.4) |
| 80 | 8.00 (203.2) |
| 100 | 10.00 (254) |
| 120 | 12.00 (304.8) |

PART NUMBERS

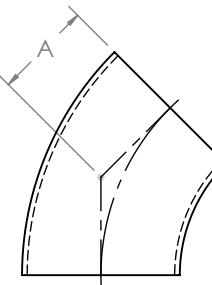
WF - 12 - 45 EL 304 T1 M

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WF - 12 - 45 EL 304 T1 M
|   |   |   |   |
Weld Fitting   Tube Size: 0.75"   Product: 45° Elbow   Material: 304 Stainless Steel   Variation: Type 1   Finish: Mill

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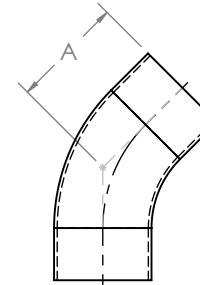
45° ELBOW, TYPE 1



| Part No. | Tube O.D. | A | Wall |
|-------------------|---------------|--------------|-------------|
| WF-08-45EL304T1M | 0.50 (12.7) | 0.47 (11.8) | 0.049 (1.2) |
| WF-12-45EL304T1M | 0.75 (19.1) | 0.47 (11.8) | 0.065 (1.7) |
| WF-16-45EL304T1M | 1.00 (25.4) | 0.63 (15.9) | 0.065 (1.7) |
| WF-18-45EL304T1M | 1.50 (38.1) | 0.94 (23.8) | 0.065 (1.7) |
| WF-20-45EL304T1M | 2.00 (50.8) | 1.25 (31.8) | 0.065 (1.7) |
| WF-25-45EL304T1M | 2.50 (63.5) | 1.56 (39.7) | 0.065 (1.7) |
| WF-30-45EL304T1M | 3.00 (76.2) | 1.88 (47.6) | 0.065 (1.7) |
| WF-40-45EL304T1M | 4.00 (101.6) | 2.50 (63.5) | 0.083 (2.1) |
| WF-60-45EL304T1M | 6.00 (152.4) | 3.75 (95.3) | 0.083 (2.1) |
| WF-80-45EL304T1M | 8.00 (203.2) | 5.00 (127) | 0.12 (3) |
| WF-100-45EL304T1M | 10.00 (254) | 6.25 (158.8) | 0.12 (3) |
| WF-120-45EL304T1M | 12.00 (304.8) | 7.50 (190.5) | 0.12 (3) |

316 stainless steel and #7 polish available upon request.

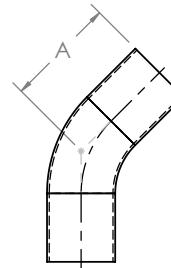
45° ELBOW WITH TANGENTS, TYPE 2



| Part No. | Tube O.D. | A | Wall |
|------------------|--------------|--------------|-------------|
| WF-08-45EL304T2M | 0.50 (12.7) | 2.25 (57.2) | 0.049 (1.2) |
| WF-12-45EL304T2M | 0.75 (19.1) | 2.25 (57.2) | 0.065 (1.7) |
| WF-16-45EL304T2M | 1.00 (25.4) | 1.19 (30.2) | 0.065 (1.7) |
| WF-18-45EL304T2M | 1.50 (38.1) | 1.63 (41.3) | 0.065 (1.7) |
| WF-20-45EL304T2M | 2.00 (50.8) | 2.31 (58.7) | 0.065 (1.7) |
| WF-25-45EL304T2M | 2.50 (63.5) | 3.00 (76.2) | 0.065 (1.7) |
| WF-30-45EL304T2M | 3.00 (76.2) | 3.69 (93.7) | 0.065 (1.7) |
| WF-40-45EL304T2M | 4.00 (101.6) | 4.81 (122.2) | 0.083 (2.1) |
| WF-60-45EL304T2M | 6.00 (152.4) | 6.25 (158.8) | 0.083 (2.1) |

316 stainless steel and #7 polish available upon request.

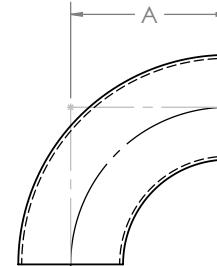
45° ELBOW WITH EXTENDED TANGENTS, TYPE 3



| Part No. | Tube O.D. | A | Wall |
|------------------|--------------|--------------|-------------|
| WF-08-45EL316T3M | 0.50 (12.7) | 2.25 (57.2) | 0.049 (1.2) |
| WF-12-45EL316T3M | 0.75 (19.1) | 2.25 (57.2) | 0.065 (1.7) |
| WF-16-45EL316T3M | 1.00 (25.4) | 2.25 (57.2) | 0.065 (1.7) |
| WF-18-45EL316T3M | 1.50 (38.1) | 3.00 (76.2) | 0.065 (1.7) |
| WF-20-45EL316T3M | 2.00 (50.8) | 3.25 (82.6) | 0.065 (1.7) |
| WF-25-45EL316T3M | 2.50 (63.5) | 3.63 (92.1) | 0.065 (1.7) |
| WF-30-45EL316T3M | 3.00 (76.2) | 3.69 (93.7) | 0.065 (1.7) |
| WF-40-45EL316T3M | 4.00 (101.6) | 4.81 (122.2) | 0.083 (2.1) |

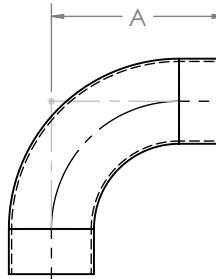
Only available in 316 stainless steel.

90° ELBOW, TYPE 1



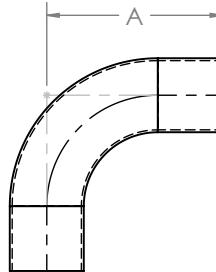
| Part No. | Tube O.D. | A | Wall |
|-------------------|---------------|---------------|-------------|
| WF-08-90EL304T1M | 0.50 (12.7) | 1.13 (28.6) | 0.049 (1.2) |
| WF-12-90EL304T1M | 0.75 (19.1) | 1.13 (28.6) | 0.065 (1.7) |
| WF-16-90EL304T1M | 1.00 (25.4) | 1.50 (38.1) | 0.065 (1.7) |
| WF-18-90EL304T1M | 1.50 (38.1) | 2.25 (57.2) | 0.065 (1.7) |
| WF-20-90EL304T1M | 2.00 (50.8) | 3.00 (76.2) | 0.065 (1.7) |
| WF-25-90EL304T1M | 2.50 (63.5) | 3.75 (95.3) | 0.065 (1.7) |
| WF-30-90EL304T1M | 3.00 (76.2) | 4.50 (114.3) | 0.065 (1.7) |
| WF-40-90EL304T1M | 4.00 (101.6) | 6.00 (152.4) | 0.083 (2.1) |
| WF-60-90EL304T1M | 6.00 (152.4) | 9.00 (228.6) | 0.083 (2.1) |
| WF-80-90EL304T1M | 8.00 (203.2) | 12.00 (304.8) | 0.12 (3) |
| WF-100-90EL304T1M | 10.00 (254) | 15.00 (381) | 0.12 (3) |
| WF-120-90EL304T1M | 12.00 (304.8) | 18.00 (457.2) | 0.12 (3) |

316 stainless steel and #7 polish available upon request.

90° ELBOW WITH TANGENTS, TYPE 2

| Part No. | Tube O.D. | A | Wall |
|------------------|--------------|---------------|-------------|
| WF-08-90EL304T2M | 0.50 (12.7) | 3.00 (76.2) | 0.049 (1.2) |
| WF-12-90EL304T2M | 0.75 (19.1) | 3.00 (76.2) | 0.065 (1.7) |
| WF-16-90EL304T2M | 1.00 (25.4) | 2.06 (52.4) | 0.065 (1.7) |
| WF-18-90EL304T2M | 1.50 (38.1) | 2.94 (74.6) | 0.065 (1.7) |
| WF-20-90EL304T2M | 2.00 (50.8) | 4.06 (103.2) | 0.065 (1.7) |
| WF-25-90EL304T2M | 2.50 (63.5) | 5.19 (131.8) | 0.065 (1.7) |
| WF-30-90EL304T2M | 3.00 (76.2) | 6.31 (160.3) | 0.065 (1.7) |
| WF-40-90EL304T2M | 4.00 (101.6) | 8.32 (211.3) | 0.083 (2.1) |
| WF-60-90EL304T2M | 6.00 (152.4) | 12.46 (316.5) | 0.083 (2.1) |

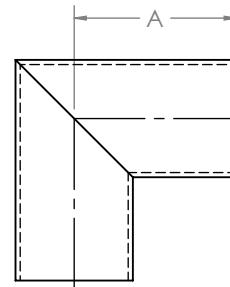
316 stainless steel and #7 polish available upon request.

90° ELBOW WITH EXTENDED TANGENTS, TYPE 3

| Part No. | Tube O.D. | A | Wall |
|------------------|--------------|--------------|-------------|
| WF-08-90EL316T3M | 0.50 (12.7) | 3.00 (76.2) | 0.049 (1.2) |
| WF-12-90EL316T3M | 0.75 (19.1) | 3.00 (76.2) | 0.065 (1.7) |
| WF-16-90EL316T3M | 1.00 (25.4) | 3.00 (76.2) | 0.065 (1.7) |
| WF-18-90EL316T3M | 1.50 (38.1) | 4.50 (114.3) | 0.065 (1.7) |
| WF-20-90EL316T3M | 2.00 (50.8) | 5.75 (146.1) | 0.065 (1.7) |
| WF-25-90EL316T3M | 2.50 (63.5) | 5.19 (131.8) | 0.065 (1.7) |
| WF-30-90EL316T3M | 3.00 (76.2) | 6.31 (160.3) | 0.065 (1.7) |
| WF-40-90EL316T3M | 4.00 (101.6) | 8.32 (211.2) | 0.083 (2.1) |

Only available in 316 stainless steel.

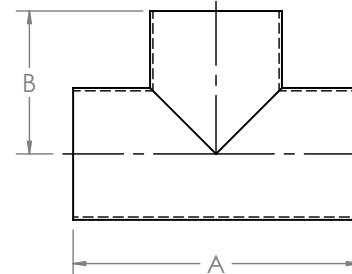
90° MITERED ELBOW



| Part No. | Tube O.D. | A | Wall |
|----------------|--------------|--------------|-------------|
| WF-12-90ELMTRM | 0.75 (19.1) | 1.00 (25.4) | 0.065 (1.7) |
| WF-16-90ELMTRM | 1.00 (25.4) | 1.88 (47.8) | 0.065 (1.7) |
| WF-18-90ELMTRM | 1.50 (38.1) | 2.25 (57.2) | 0.065 (1.7) |
| WF-20-90ELMTRM | 2.00 (50.8) | 3.00 (76.2) | 0.065 (1.7) |
| WF-25-90ELMTRM | 2.50 (63.5) | 3.00 (76.2) | 0.065 (1.7) |
| WF-30-90ELMTRM | 3.00 (76.2) | 3.25 (82.6) | 0.065 (1.7) |
| WF-40-90ELMTRM | 4.00 (101.6) | 4.87 (123.7) | 0.083 (2.1) |
| WF-60-90ELMTRM | 6.00 (152.4) | 5.00 (127) | 0.083 (2.1) |

Custom lengths and larger sizes available upon request. 316 stainless steel and #7 polish also available.

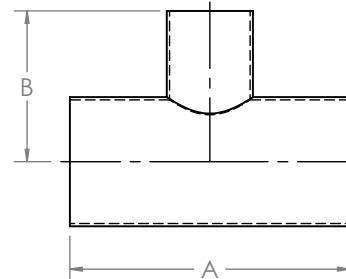
TEE



| Part No. | Tube O.D. | A | B | Wall |
|------------------|---------------|---------------|--------------|-------------|
| WF-12-12TE304M | 0.75 (19.1) | 4.00 (101.6) | 2.00 (50.8) | 0.065 (1.7) |
| WF-16-16TE304M | 1.00 (25.4) | 3.75 (95.3) | 1.88 (47.6) | 0.065 (1.7) |
| WF-18-18TE304M | 1.50 (38.1) | 4.50 (114.3) | 2.25 (57.2) | 0.065 (1.7) |
| WF-20-20TE304M | 2.00 (50.8) | 6.00 (152.4) | 3.00 (76.2) | 0.065 (1.7) |
| WF-25-25TE304M | 2.50 (63.5) | 6.00 (152.4) | 3.00 (76.2) | 0.065 (1.7) |
| WF-30-30TE304M | 3.00 (76.2) | 6.50 (165.1) | 3.25 (82.6) | 0.065 (1.7) |
| WF-40-40TE304M | 4.00 (101.6) | 7.75 (196.9) | 3.88 (98.4) | 0.083 (2.1) |
| WF-60-60TE304M | 6.00 (152.4) | 11.25 (285.8) | 5.63 (142.9) | 0.083 (2.1) |
| WF-80-80TE304M | 8.00 (203.2) | 14.00 (355.6) | 7.00 (177.8) | 0.12 (3) |
| WF-100-100TE304M | 10.00 (254) | 16.93 (430) | 8.47 (215) | 0.12 (3) |
| WF-120-120TE304M | 12.00 (304.8) | 20.00 (508) | 10.00 (254) | 0.12 (3) |

316 stainless steel and #7 polish available upon request.

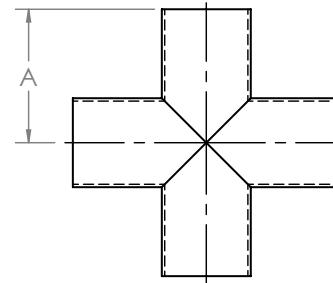
REDUCING TEE



| Part No. | Tube O.D. | A | B |
|----------------|-----------------------------|--------------|--------------|
| WF-16-12RT304M | 1.00 (25.4) X 0.75 (19.1) | 3.75 (95.3) | 2.13 (54) |
| WF-18-12RT304M | 1.50 (38.1) X 0.75 (19.1) | 4.50 (114.3) | 2.25 (57.2) |
| WF-18-16RT304M | 1.50 (38.1) X 1.00 (25.4) | 4.50 (114.3) | 2.38 (60.3) |
| WF-20-12RT304M | 2.00 (50.8) X 0.75 (19.1) | 6.00 (152.4) | 2.38 (60.3) |
| WF-20-16RT304M | 2.00 (50.8) X 1.00 (25.4) | 6.00 (152.4) | 2.38 (60.3) |
| WF-20-18RT304M | 2.00 (50.8) X 1.50 (38.1) | 6.00 (152.4) | 2.50 (63.5) |
| WF-25-18RT304M | 2.50 (63.5) X 1.50 (38.1) | 6.00 (152.4) | 2.75 (69.9) |
| WF-25-20RT304M | 2.50 (63.5) X 2.00 (50.8) | 6.00 (152.4) | 3.25 (82.6) |
| WF-30-18RT304M | 3.00 (76.2) X 1.50 (38.1) | 6.50 (165.1) | 3.00 (76.2) |
| WF-30-20RT304M | 3.00 (76.2) X 2.00 (50.8) | 6.50 (165.1) | 3.50 (88.9) |
| WF-30-25RT304M | 3.00 (76.2) X 2.50 (63.5) | 6.50 (165.1) | 3.25 (82.6) |
| WF-40-20RT304M | 4.00 (101.6) X 2.00 (50.8) | 7.75 (196.9) | 4.00 (101.6) |
| WF-40-25RT304M | 4.00 (101.6) X 2.50 (63.5) | 7.75 (196.9) | 3.75 (95.3) |
| WF-40-30RT304M | 4.00 (101.6) X 3.00 (76.2) | 7.75 (196.9) | 3.75 (95.3) |
| WF-60-30RT304M | 6.00 (152.4) X 3.00 (76.2) | 10.00 (254) | 4.75 (120.7) |
| WF-60-40RT304M | 6.00 (152.4) X 4.00 (101.6) | 10.00 (254) | 4.88 (123.8) |

Custom sizes available upon request. 316 stainless steel and #7 polish also available.

4-WAY CROSS



| Part No. | Tube O.D. | A | Wall |
|----------------|--------------|-------------|-------------|
| WF-12-12CS304M | 0.75 (19.1) | 1.88 (47.6) | 0.065 (1.7) |
| WF-16-16CS304M | 1.00 (25.4) | 1.88 (47.6) | 0.065 (1.7) |
| WF-18-18CS304M | 1.50 (38.1) | 2.25 (57.2) | 0.065 (1.7) |
| WF-20-20CS304M | 2.00 (50.8) | 3.00 (76.2) | 0.065 (1.7) |
| WF-25-25CS304M | 2.50 (63.5) | 3.00 (76.2) | 0.065 (1.7) |
| WF-30-30CS304M | 3.00 (76.2) | 3.25 (82.6) | 0.065 (1.7) |
| WF-40-40CS304M | 4.00 (101.6) | 3.88 (98.4) | 0.083 (2.1) |
| WF-60-60CS304M | 6.00 (152.4) | 5.00 (127) | 0.083 (2.1) |

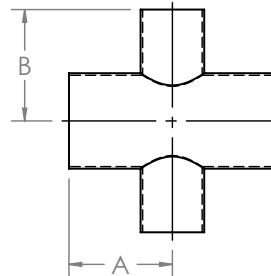
316 stainless steel and #7 polish available upon request.

DID YOU KNOW...

With 89,000 square feet of combined space, we have a large warehouse stocked with a wide variety of components to provide short lead times. We house the latest state-of-the-art manufacturing, tooling, and CNC equipment including a fiber laser cutter, press brake, 5-axis milling, robotic welding, band saws, tube benders, and more. We also have on-site engineering and project management staff to assist at any point during the process.



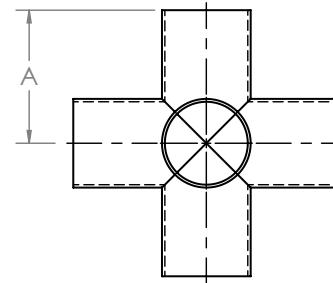
4-WAY REDUCING CROSS



| Part No. | Tube O.D. | A | B |
|----------------|-----------------------------|-------------|--------------|
| WF-16-12CS304M | 1.00 (25.4) X 0.75 (19.1) | 1.88 (47.8) | 1.12 (28.4) |
| WF-18-12CS304M | 1.50 (38.1) X 0.75 (19.1) | 2.25 (57.2) | 1.38 (35.1) |
| WF-18-16CS304M | 1.50 (38.1) X 1.00 (25.4) | 2.25 (57.2) | 2.13 (54.1) |
| WF-20-12CS304M | 2.00 (50.8) X 0.75 (19.1) | 3.00 (76.2) | 1.63 (41.4) |
| WF-20-18CS304M | 2.00 (50.8) X 1.50 (38.1) | 3.00 (76.2) | 2.50 (63.5) |
| WF-25-18CS304M | 2.50 (63.5) X 1.50 (38.1) | 3.00 (76.2) | 2.75 (69.9) |
| WF-25-20CS304M | 2.50 (63.5) X 2.00 (50.8) | 3.00 (76.2) | 3.25 (82.6) |
| WF-30-18CS304M | 3.00 (76.2) X 1.50 (38.1) | 3.25 (82.6) | 3.00 (76.2) |
| WF-40-18CS304M | 4.00 (101.6) X 1.50 (38.1) | 3.88 (98.6) | 3.50 (88.9) |
| WF-40-20CS304M | 4.00 (101.6) X 2.00 (50.8) | 3.88 (98.6) | 4.00 (101.6) |
| WF-40-25CS304M | 4.00 (101.6) X 2.50 (63.5) | 3.88 (98.6) | 3.75 (95.3) |
| WF-40-30CS304M | 4.00 (101.6) X 3.00 (76.2) | 3.88 (98.6) | 3.75 (95.3) |
| WF-60-18CS304M | 6.00 (152.4) X 1.50 (38.1) | 5.00 (127) | 4.50 (114.3) |
| WF-60-20CS304M | 6.00 (152.4) X 2.00 (50.8) | 5.00 (127) | 5.00 (127) |
| WF-60-25CS304M | 6.00 (152.4) X 2.50 (63.5) | 5.00 (127) | 4.75 (120.7) |
| WF-60-30CS304M | 6.00 (152.4) X 3.00 (76.2) | 5.00 (127) | 4.75 (120.7) |
| WF-60-40CS304M | 6.00 (152.4) X 4.00 (101.6) | 5.00 (127) | 4.88 (124) |

Custom sizes available upon request. 316 stainless steel and #7 polish also available.

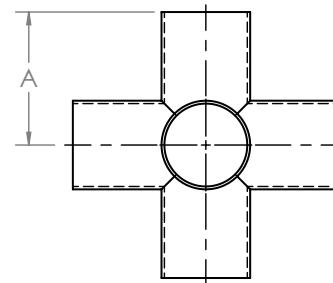
5-WAY CROSS



| Part No. | Tube O.D. | A | Wall |
|-------------------|--------------|-------------|-------------|
| WF-12-12CS3045WYM | 0.75 (19.1) | 1.00 (25.4) | 0.065 (1.7) |
| WF-16-16CS3045WYM | 1.00 (25.4) | 1.88 (47.8) | 0.065 (1.7) |
| WF-18-18CS3045WYM | 1.50 (38.1) | 2.25 (57.2) | 0.065 (1.7) |
| WF-20-20CS3045WYM | 2.00 (50.8) | 3.00 (76.2) | 0.065 (1.7) |
| WF-25-25CS3045WYM | 2.50 (63.5) | 3.00 (76.2) | 0.065 (1.7) |
| WF-30-30CS3045WYM | 3.00 (76.2) | 3.25 (82.6) | 0.065 (1.7) |
| WF-40-40CS3045WYM | 4.00 (101.6) | 3.88 (98.6) | 0.083 (2.1) |
| WF-60-60CS3045WYM | 6.00 (152.4) | 5.00 (127) | 0.083 (2.1) |

316 stainless steel and #7 polish available upon request.

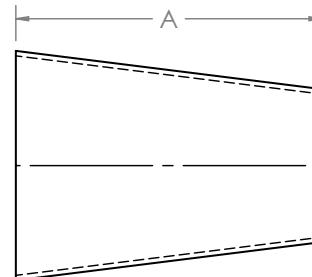
6-WAY CROSS



| Part No. | Tube O.D. | A | Wall |
|-------------------|--------------|-------------|-------------|
| WF-12-12CS3046WYM | 0.75 (19.1) | 1.00 (25.4) | 0.065 (1.7) |
| WF-16-16CS3046WYM | 1.00 (25.4) | 1.88 (47.8) | 0.065 (1.7) |
| WF-18-18CS3046WYM | 1.50 (38.1) | 2.25 (57.2) | 0.065 (1.7) |
| WF-20-20CS3046WYM | 2.00 (50.8) | 3.00 (76.2) | 0.065 (1.7) |
| WF-25-25CS3046WYM | 2.50 (63.5) | 3.00 (76.2) | 0.065 (1.7) |
| WF-30-30CS3046WYM | 3.00 (76.2) | 3.25 (82.6) | 0.065 (1.7) |
| WF-40-40CS3046WYM | 4.00 (101.6) | 3.88 (98.6) | 0.083 (2.1) |
| WF-60-60CS3046WYM | 6.00 (152.4) | 5.00 (127) | 0.083 (2.1) |

316 stainless steel and #7 polish available upon request.

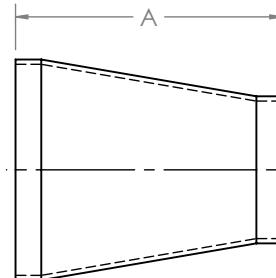
CONCENTRIC REDUCER, TYPE 1



| Part No. | Tube O.D. | A | Wall |
|------------------|-----------------------------|--------------|-------------|
| WF-12-08RC304T1M | 0.75 (19.1) X 0.50 (12.7) | 1.00 (25.4) | 0.065 (1.7) |
| WF-16-08RC304T1M | 1.00 (25.4) X 0.50 (12.7) | 1.50 (38.1) | 0.065 (1.7) |
| WF-16-12RC304T1M | 1.00 (25.4) X 0.75 (19.1) | 1.00 (25.4) | 0.065 (1.7) |
| WF-18-08RC304T1M | 1.50 (38.1) X 0.50 (12.7) | 3.50 (88.9) | 0.065 (1.7) |
| WF-18-16RC304T1M | 1.50 (38.1) X 1.00 (25.4) | 2.00 (50.8) | 0.065 (1.7) |
| WF-20-16RC304T1M | 2.00 (50.8) X 1.00 (25.4) | 4.00 (101.6) | 0.065 (1.7) |
| WF-20-18RC304T1M | 2.00 (50.8) X 1.50 (38.1) | 2.00 (50.8) | 0.065 (1.7) |
| WF-25-18RC304T1M | 2.50 (63.5) X 1.50 (38.1) | 4.00 (101.6) | 0.065 (1.7) |
| WF-25-20RC304T1M | 2.50 (63.5) X 2.00 (50.8) | 2.00 (50.8) | 0.065 (1.7) |
| WF-30-18RC304T1M | 3.00 (76.2) X 1.50 (38.1) | 6.00 (152.4) | 0.065 (1.7) |
| WF-30-20RC304T1M | 3.00 (76.2) X 2.00 (50.8) | 4.00 (101.6) | 0.065 (1.7) |
| WF-30-25RC304T1M | 3.00 (76.2) X 2.50 (63.5) | 2.00 (50.8) | 0.065 (1.7) |
| WF-40-18RC304T1M | 4.00 (101.6) X 1.50 (38.1) | 10.00 (254) | 0.065 (1.7) |
| WF-40-20RC304T1M | 4.00 (101.6) X 2.00 (50.8) | 8.00 (203.2) | 0.065 (1.7) |
| WF-40-25RC304T1M | 4.00 (101.6) X 2.50 (63.5) | 6.00 (152.4) | 0.065 (1.7) |
| WF-40-30RC304T1M | 4.00 (101.6) X 3.00 (76.2) | 4.00 (101.6) | 0.083 (2.1) |
| WF-60-30RC304T1M | 6.00 (152.4) X 3.00 (76.2) | 6.00 (152.4) | 0.083 (2.1) |
| WF-60-40RC304T1M | 6.00 (152.4) X 4.00 (101.6) | 4.00 (101.6) | 0.083 (2.1) |

316 stainless steel and #7 polish available upon request.

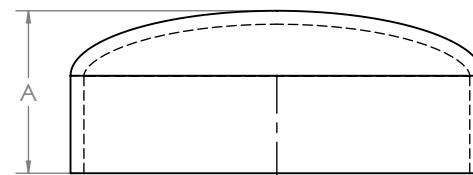
CONCENTRIC REDUCER, TYPE 4



| Part No. | Tube O.D. | A | Wall |
|------------------|-----------------------------|--------------|-------------|
| WF-16-12RC304T4M | 1.00 (25.4) X 0.75 (19.1) | 2.38 (60.3) | 0.065 (1.7) |
| WF-18-16RC304T4M | 1.50 (38.1) X 1.00 (25.4) | 2.38 (60.3) | 0.065 (1.7) |
| WF-20-16RC304T4M | 2.00 (50.8) X 1.00 (25.4) | 2.38 (60.3) | 0.065 (1.7) |
| WF-20-18RC304T4M | 2.00 (50.8) X 1.50 (38.1) | 2.38 (60.3) | 0.065 (1.7) |
| WF-25-18RC304T4M | 2.50 (63.5) X 1.50 (38.1) | 2.38 (60.3) | 0.065 (1.7) |
| WF-25-20RC304T4M | 2.50 (63.5) X 2.00 (50.8) | 2.38 (60.3) | 0.065 (1.7) |
| WF-30-18RC304T4M | 3.00 (76.2) X 1.50 (38.1) | 3.63 (92.1) | 0.065 (1.7) |
| WF-30-20RC304T4M | 3.00 (76.2) X 2.00 (50.8) | 3.63 (92.1) | 0.065 (1.7) |
| WF-30-25RC304T4M | 3.00 (76.2) X 2.50 (63.5) | 3.63 (92.1) | 0.065 (1.7) |
| WF-40-18RC304T4M | 4.00 (101.6) X 1.50 (38.1) | 5.50 (139.7) | 0.065 (1.7) |
| WF-40-20RC304T4M | 4.00 (101.6) X 2.00 (50.8) | 3.63 (92.1) | 0.065 (1.7) |
| WF-40-25RC304T4M | 4.00 (101.6) X 2.50 (63.5) | 3.63 (92.1) | 0.065 (1.7) |
| WF-40-30RC304T4M | 4.00 (101.6) X 3.00 (76.2) | 3.63 (92.1) | 0.083 (2.1) |
| WF-60-30RC304T4M | 6.00 (152.4) X 3.00 (76.2) | 5.50 (139.7) | 0.083 (2.1) |
| WF-60-40RC304T4M | 6.00 (152.4) X 4.00 (101.6) | 5.50 (139.7) | 0.083 (2.1) |

Custom sizes and lengths available upon request. 316 stainless steel and #7 polish also available.

WELD CAP



| Part No. | Tube O.D. | A | Wall |
|------------------|---------------|-------------|-------------|
| WF-08-08WC304M | 0.50 (12.7) | 0.28 (7.1) | 0.049 (1.2) |
| WF-12-12WC304M | 0.75 (19.1) | 0.31 (8) | 0.065 (1.7) |
| WF-16-16WC304M | 1.00 (25.4) | 0.47 (11.9) | 0.065 (1.7) |
| WF-18-18WC304M | 1.50 (38.1) | 0.59 (15.1) | 0.065 (1.7) |
| WF-20-20WC304M | 2.00 (50.8) | 0.78 (19.8) | 0.065 (1.7) |
| WF-25-25WC304M | 2.50 (63.5) | 1.06 (27) | 0.065 (1.7) |
| WF-30-30WC304M | 3.00 (76.2) | 1.09 (27.8) | 0.065 (1.7) |
| WF-40-40WC304M | 4.00 (101.6) | 1.28 (32.5) | 0.083 (2.1) |
| WF-60-60WC304M | 6.00 (152.4) | 2.13 (54) | 0.083 (2.1) |
| WF-80-80WC304M | 8.00 (203.2) | 2.61 (66.3) | 0.12 (3) |
| WF-100-100WC304M | 10.00 (254) | 3.14 (79.8) | 0.12 (3) |
| WF-120-120WC304M | 12.00 (304.8) | 3.78 (96) | 0.12 (3) |

316 stainless steel and #7 polish available upon request.

STAINLESS STEEL TUBING

OVERVIEW

HIS Innovations Group is proud to supply high-quality stainless steel tubing for different industries and applications. Standard or custom lengths of tubing are available, as well as various tube fittings. HIS also has in-house CNC tooling capabilities to bend your tube to the specifications that your system requires.



DETAILS

| | |
|-----------------------------------|---|
| Specifications | Tubing is manufactured to ASTM A249/A269 and ASME SA249 requirements. Stainless steel is manufactured to ASTM A312 and AMSE SA312 requirements. |
| Material | 304L and 316L stainless steel |
| Dimensions | ASTM tube sizes from 0.125" (3.18 mm) to 8.00" (203.2 mm) |
| Reference Documents | ASTM: A269 and A632 |
| Pipe & Tube Length | Nominal lengths: 10-foot or 20-foot |
| Material Types | ASTM: Single-melt (seamless or welded) |
| Tolerance | In accordance with ASTM: A269 and A263 |
| Finish | The tube shall be supplied with a bright annealed finish |
| Weld Ends | Square ends suitable for orbital welding |
| Cleaning | Tube cleaning conforms to ASTM G93.0 specification for use in oxygen-enriched environments. |
| Testing & Inspection | Visual and dimensional inspection |
| Marking & Traceability | Each tube is marked with size, wall thickness, ASTM specification, stainless steel type, and heat number. |
| Labeling | Each component's bag is affixed with a label identifying the component's part number. |
| Documentation | A Quality Inspection Certificate can be provided upon request. The report contains the following information: <ul style="list-style-type: none"> • Material composition • Nominal outside diameter size • Chemical composition • Statement of quality assurance testing • Lot and heat identification for traceability |
| Packaging | All tubing is capped, bagged, and packaged for shipment in such a manner, which prevents damage to product and primary product packaging. |
| Quality | The HIS quality program incorporated non-destructive and destructive testing, statistical process control, dimensional, and operator auditing on products. We welcome on-site inspections or surveys by your company prior to shipment. |

CHEMICAL COMPOSITION

| Element/Alloys | 304L (wt%) | 316L (wt%) |
|---------------------|---------------|---------------|
| (C) Carbon, max | 0.035% | 0.035% |
| (MN) Manganese,max | 2.00 | 2.00 |
| (P) Phosphorus, max | 0.04 | 0.04 |
| (S) Sulfur, max | 0.30 | 0.30 |
| (Si) Silicon, max | 0.75 | 0.75 |
| (Ni) Nickel | 8.00 - 13.00 | 10.00 - 15.00 |
| (Cr) Chromium | 18.00 - 20.00 | 16.00 - 18.00 |
| (Mo) Molybdenum | N/A | 2.00 - 3.00 |
| (Fe) Iron | Bal | Bal |

PART NUMBERS

20 065W 316L SSA
 | | | |
 Corresponding tube number Wall thickness: 0.065" Material: 316L stainless steel Finish: SSA bright annealed

DETAILS

Measurements are listed in inches (mm).

| Number | Tube O.D. | Wall Thickness | Material Type | ID | Finish |
|--------|--------------|----------------|---------------|--------|-----------------|
| 02 | 0.13 (3.2) | 0.035 (0.9) | 304L, 316L | Welded | Bright Annealed |
| 04 | 0.25 (6.4) | 0.035 (0.9) | 304L, 316L | Welded | Bright Annealed |
| 06 | 0.38 (9.5) | 0.035 (0.9) | 304L, 316L | Welded | Bright Annealed |
| 08 | 0.50 (12.7) | 0.049 (1.2) | 304L, 316L | Welded | Bright Annealed |
| 12 | 0.75 (19.1) | 0.065 (1.7) | 304L, 316L | Welded | Bright Annealed |
| 16 | 1.00 (25.4) | 0.065 (1.7) | 304L, 316L | Welded | Bright Annealed |
| 18 | 1.50 (38.1) | 0.065 (1.7) | 304L, 316L | Welded | Bright Annealed |
| 20 | 2.00 (50.8) | 0.065 (1.7) | 304L, 316L | Welded | Bright Annealed |
| 25 | 2.50 (63.5) | 0.065 (1.7) | 304L, 316L | Welded | Bright Annealed |
| 30 | 3.00 (76.2) | 0.065 (1.7) | 304L, 316L | Welded | Bright Annealed |
| 40 | 4.00 (101.6) | 0.083 (2.1) | 304L, 316L | Welded | Bright Annealed |
| 60 | 6.00 (152.4) | 0.083 (2.1) | 304L, 316L | Welded | Pickled |
| 80 | 8.00 (203.2) | 0.12 (3) | 304L, 316L | Welded | Pickled |

Other sizes, wall thicknesses, and polishes available upon request. Seamless tubing also available.

SANITARY STAINLESS STEEL TUBING, A270

OVERVIEW

HIS Innovations Group is proud to supply the finest quality of stainless steel tubing to match ASTM A270 specifications to be used in multiple industries and applications. Standard or custom lengths of tubing are available. HIS also has in-house CNC tooling capabilities to bend your tube to the specifications that your system requires.

SPECIFICATIONS

Tubing is manufactured to ASTM A270 and ASME SA249 requirements. Stainless steel is manufactured to ASTM A312 and AMSE SA312 requirements.

FINISH

Surface finish is 20 $\mu\text{-in Ra}$ (0.5 μm) I.D. and 30 $\mu\text{-in Ra}$ (0.8 μm) O.D. maximum measured per ASME/ANSI B46.1 with the profilometer reading at 90 degrees to major polishing pattern, with ends prepared for orbital welding. Other Ra finishes available upon request.

DETAILS

| | |
|-----------------------------------|---|
| Material | 304L and 316L stainless steel |
| Dimensions | From 0.50" (12.7 mm) to 4.00" (101.6 mm) O.D. |
| Reference Documents | ASTM: A270 |
| Pipe & Tube Length | Nominal lengths: 20-foot |
| Material Types | ASTM: Single-melt (seamless or welded) |
| Annealing | Hydrogen bright annealed in line to 1040°C (1900°F) minimum and rapidly quenched. |
| Testing & Inspection | The tubing goes beyond the requirements of ASTM A269 and A270 by performing the full battery of ASTM bend and deformation test required by ASME SA249 as well as visual and dimensional inspections performed by HIS. |
| Marking & Traceability | Each tube is marked with size, wall thickness, ASTM specification, stainless steel type, and heat number. |
| Labeling | Each component's bag is affixed with a label identifying the component's part number. |
| Documentation | A Quality Inspection Certificate can be provided upon request. The report contains the following information: <ul style="list-style-type: none">• Material composition• Nominal outside diameter size• Chemical composition• Statement of quality assurance testing• Lot and heat identification for traceability |
| Packaging | All tubing is protected in a heat-sealed with 2-mil poly sleeve to prevent contamination. Tubing is then capped, bagged, and packaged for shipment in such a manner, which prevents damage to product and primary product packaging. |
| Quality | The HIS quality program incorporated non-destructive and destructive testing, statistical process control, dimensional, and operator auditing on products. We welcome on-site inspections or surveys by your company prior to shipment. |

CHEMICAL COMPOSITION

| Element/Alloys | 304L (wt%) | 316L (wt%) |
|---------------------|---------------|---------------|
| (C) Carbon, max | 0.035 | 0.035% |
| (MN) Manganese,max | 2.00 | 2.00 |
| (P) Phosphorus, max | 0.04 | 0.04 |
| (S) Sulfur | 0.03 | 0.005 - 0.017 |
| (Si) Silicon, max | 0.75 | 0.75 |
| (Ni) Nickel | 8.00 - 13.00 | 10.00 - 15.00 |
| (Cr) Chromium | 18.00 - 20.00 | 16.00 - 18.00 |
| (Mo) Molybdenum | N/A | 2.00 - 3.00 |

PART NUMBERS

20 065W 316L A270

| | | |

Corresponding tube number Wall thickness: 0.065" Material: 316L stainless steel Finish: Polished to A270 specifications

DIMENSIONAL TOLERANCES

Measurements are listed in inches (mm).

| Number | Tube O.D. | Nominal Wall | Outside Diameter | Material |
|--------|--------------|--------------|-------------------------------|------------|
| 08 | 0.50 (12.7) | 0.049 (1.25) | +/-0.004 (0.10) | 304L, 316L |
| 12 | 0.75 (19.1) | 0.065 (1.65) | +/-0.004 (0.10) | 304L, 316L |
| 16 | 1.00 (25.4) | 0.065 (1.65) | +/-0.002 (0.05)/-0.008 (0.20) | 304L, 316L |
| 18 | 1.50 (38.1) | 0.065 (1.65) | +/-0.002 (0.05)/-0.008 (0.20) | 304L, 316L |
| 20 | 2.00 (50.8) | 0.065 (1.65) | +/-0.002 (0.05)/-0.011 (0.28) | 304L, 316L |
| 25 | 2.50 (63.5) | 0.065 (1.65) | +/-0.002 (0.05)/-0.011 (0.28) | 304L, 316L |
| 30 | 3.00 (76.2) | 0.065 (1.65) | +/-0.003 (0.08)/-0.012 (0.30) | 304L, 316L |
| 40 | 4.00 (101.6) | 0.083 (2.11) | +/-0.003 (0.08)/-0.015 (0.38) | 304L, 316L |

Other sizes, wall thicknesses, and polishes available upon request. Seamless tubing also available.

3 SANITARY TRI-CLAMP FITTINGS

| | |
|----------------------|---------|
| Specifications | 93 |
| End Cap | 94 |
| PTFE Gasket | 94 |
| Ferrules | 95-96 |
| Tri-Clamp | 97 |
| Elbows | 98 |
| Tees, Crosses & Ys | 99-101 |
| Reducers & Adapters | 102-105 |
| PVC-Fitting Hose Hit | 106 |



SANITARY FITTINGS SPECIFICATIONS

HIS is pleased to offer a variety of sanitary grade fittings as well as custom fittings to match your specific application.

APPLICATIONS

- Biopharmaceutical
- Cosmetic
- Food & Beverage

SPECIFICATIONS

- Meets ASME-BPE and 3-A sanitary standards

MATERIALS

- 304L stainless steel
- 316L stainless steel available upon request

FINISH

- #7 polish 180 grit I.D./150 grit O.D.

MANUFACTURING & ASSEMBLY

The HIS manufacturing facility is located in Hillsboro, Oregon. HIS uses top-quality equipment and the latest orbital welding techniques. All welding is performed to applicable specifications and accepted industry standards.

QUALITY TESTING

HIS tests against the customer's specifications.

- Helium leak detection
- Pressure testing
- ISO 9001:2015 documentation

PACKAGING AND PROTECTION

QA/QC will verify that all components are suitably packaged and identified per the appropriate specifications.

TECHNICAL APPLICATIONS INFORMATION

The staff at HIS is always ready to discuss your application. In most cases, it is possible to provide literature references for the points discussed here.

SIZING

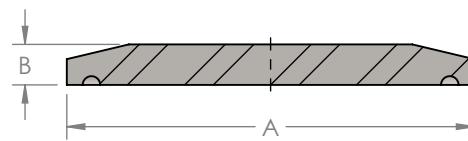
| Part Number | Tube O.D. in. (mm) |
|-------------|--------------------|
| 08 | 0.50 (12.7) |
| 12 | 0.75 (19.1) |
| 16 | 1.00 (25.4) |
| 18 | 1.50 (38.1) |
| 20 | 2.00 (50.8) |
| 25 | 2.50 (63.5) |
| 30 | 3.00 (76.2) |
| 40 | 4.00 (101.6) |
| 60 | 6.00 (152.4) |
| 80 | 8.00 (203.2) |
| 100 | 10.00 (254) |
| 120 | 12.00 (304.8) |

PART NUMBERS



SANITARY FITTINGS

END CAP



SANITARY FITTINGS

| Part No. | Flange Size | A | B |
|----------|---------------|---------------|-------------|
| TC-12EC | 0.75 (19.1) | 0.98 (25) | 0.19 (4.7) |
| TC-18EC | 1.00 (25.4) | 1.98 (50.4) | 0.25 (6.4) |
| TC-20EC | 1.50 (38.1) | 2.52 (63.9) | 0.25 (6.4) |
| TC-25EC | 2.00 (50.8) | 3.05 (77.4) | 0.25 (6.4) |
| TC-30EC | 2.50 (63.5) | 3.58 (90.9) | 0.25 (6.4) |
| TC-40EC | 3.00 (76.2) | 4.68 (118.9) | 0.31 (7.9) |
| TC-50EC | 4.00 (101.6) | 5.69 (144.5) | 0.34 (8.7) |
| TC-60EC | 6.00 (152.4) | 6.57 (166.9) | 0.44 (11.1) |
| TC-80EC | 8.00 (203.2) | 8.57 (217.7) | 0.44 (11.1) |
| TC-100EC | 10.00 (254) | 10.57 (268.5) | 0.44 (11.1) |
| TC-120EC | 12.00 (304.8) | 12.57 (319.3) | 0.44 (11.1) |

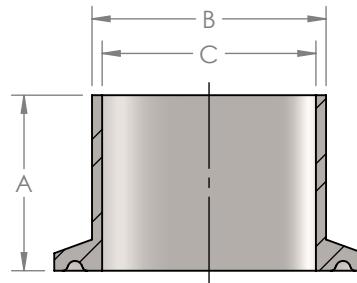
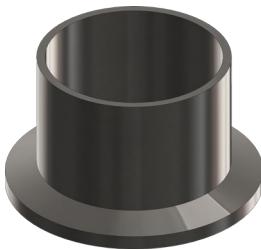
PTFE GASKET



| Part No. | Flange Size | A | B |
|-------------|---------------|---------------|------------|
| SG-12-PTFE | 0.75 (19.1) | 0.98 (25) | 0.20 (5.1) |
| SG-16-PTFE | 1.00 (25.4) | 1.98 (50.4) | 0.20 (5.1) |
| SG-18-PTFE | 1.50 (38.1) | 1.98 (50.4) | 0.20 (5.1) |
| SG-20-PTFE | 2.00 (50.8) | 2.52 (63.9) | 0.20 (5.1) |
| SG-25-PTFE | 2.50 (63.5) | 3.05 (77.4) | 0.20 (5.1) |
| SG-30-PTFE | 3.00 (76.2) | 3.58 (90.9) | 0.20 (5.1) |
| SG-40-PTFE | 4.00 (101.6) | 4.68 (118.9) | 0.20 (5.1) |
| SG-60-PTFE | 6.00 (152.4) | 6.57 (166.9) | 0.20 (5.1) |
| SG-80-PTFE | 8.00 (203.2) | 8.57 (217.7) | 0.20 (5.1) |
| SG-100-PTFE | 10.00 (254) | 10.57 (268.5) | 0.20 (5.1) |
| SG-120-PTFE | 12.00 (304.8) | 12.55 (318.8) | 0.20 (5.1) |

SANITARY FITTINGS

SHORT-WELD FERRULE



SANITARY FITTINGS

| Part No. | Flange Size | A | B | C |
|---------------|--------------|-------------|--------------|--------------|
| TC-08FR50S | 0.50 (12.7) | 0.50 (12.7) | 0.50 (12.7) | 0.37 (9.4) |
| TC-12FR75S | 0.75 (19.1) | 0.50 (12.7) | 0.75 (19.1) | 0.62 (15.7) |
| TC-16FR100S | 1.00 (25.4) | 0.50 (12.7) | 1.00 (25.4) | 0.87 (22.1) |
| TC-18FR150S | 1.50 (38.1) | 0.50 (12.7) | 1.50 (38.1) | 1.37 (34.8) |
| TC-20FR200S | 2.00 (50.8) | 0.50 (12.7) | 2.00 (50.8) | 1.87 (47.5) |
| TC-25FR250S | 2.50 (63.5) | 0.50 (12.7) | 2.50 (63.5) | 2.37 (60.2) |
| TC-30FR300S | 3.00 (76.2) | 0.50 (12.7) | 3.00 (76.2) | 2.87 (72.9) |
| TC-40FR400S | 4.00 (101.6) | 0.63 (15.9) | 4.00 (101.6) | 3.83 (97.4) |
| TC-60FR600S | 6.00 (152.4) | 0.88 (22.2) | 6.00 (152.4) | 5.78 (146.9) |
| TC-80FR800S | 8.00 (203.2) | 0.88 (22.2) | 8.00 (203.2) | 7.78 (197.7) |
| TC-100FR1000S | 10.00 (254) | 0.88 (22.2) | 10.00 (254) | 9.73 (247.2) |

Custom sizes and lengths available upon request.

DIN 11851 FITTINGS & WRENCHES

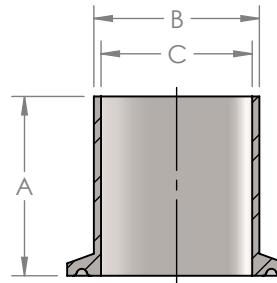
Contact us for information about our DIN 11851 fittings and custom CNC machined wrenches.

- 304 stainless steel
- DIN 15 to DIN 80



SANITARY FITTINGS

BUTT-WELD FERRULE



| Part No. | Flange Size | A | B | C |
|--------------|--------------|-------------|--------------|--------------|
| TC-08FR50 | 0.50 (12.7) | 1.13 (28.6) | 0.50 (12.7) | 0.38 (9.5) |
| TC-12FR75 | 0.75 (19.1) | 1.13 (28.6) | 0.75 (19.1) | 0.62 (15.8) |
| TC-16FR100 | 1.00 (25.4) | 1.13 (28.6) | 1.00 (25.4) | 0.87 (22.1) |
| TC-18FR150 | 1.50 (38.1) | 1.13 (28.6) | 1.50 (38.1) | 1.37 (34.8) |
| TC-20FR200 | 2.00 (50.8) | 1.13 (28.6) | 2.00 (50.8) | 1.87 (47.5) |
| TC-25FR250 | 2.50 (63.5) | 1.13 (28.6) | 2.50 (63.5) | 2.37 (60.2) |
| TC-30FR300 | 3.00 (76.2) | 1.13 (28.6) | 3.00 (76.2) | 2.87 (72.9) |
| TC-40FR400 | 4.00 (101.6) | 1.13 (28.6) | 4.00 (101.6) | 3.83 (97.4) |
| TC-60FR600 | 6.00 (152.4) | 1.50 (38.1) | 6.00 (152.4) | 5.78 (146.9) |
| TC-80FR800 | 8.00 (203.2) | 1.50 (38.1) | 8.00 (203.2) | 7.78 (197.7) |
| TC-100FR1000 | 10.00 (254) | 1.50 (38.1) | 10.00 (254) | 9.73 (247.2) |

Custom sizes and lengths available upon request.

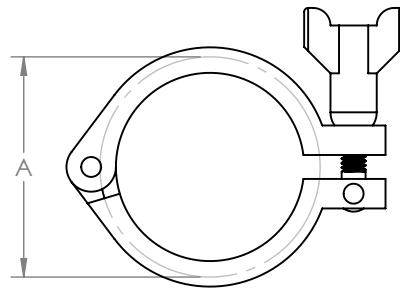
HYDRAULIC SWAGING

The Swagelok Multi-head Hydraulic Swaging Unit allows for a perfect leak-proof swage in seconds up to 2.0" (50.8 mm) diameter tubing.



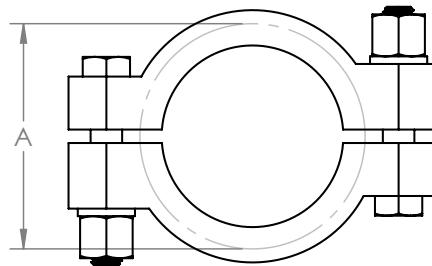
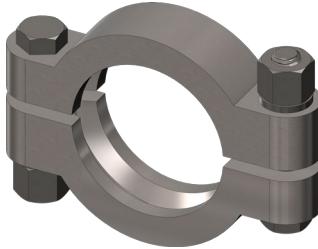
SANITARY FITTINGS

HEAVY DUTY TRI-CLAMP



| Part No. | Flange Size | A |
|-----------|---------------------------|---------------|
| TC-08HCP | 0.50 (12.7) - 0.75 (19.1) | 1.12 (28.4) |
| TC-16HCP | 1.00 (25.4) - 1.50 (38.1) | 2.12 (53.9) |
| TC-20HCP | 2.00 (50.8) | 2.65 (67.4) |
| TC-25HCP | 2.50 (63.5) | 3.19 (80.9) |
| TC-30HCP | 3.00 (76.2) | 3.72 (94.4) |
| TC-40HCP | 4.00 (101.6) | 4.82 (122.4) |
| TC-60HCP | 6.00 (152.4) | 6.70 (170.1) |
| TC-80HCP | 8.00 (203.2) | 8.70 (220.9) |
| TC-100HCP | 10.00 (254) | 10.74 (272.8) |
| TC-120HCP | 12.00 (304.8) | 12.74 (323.6) |

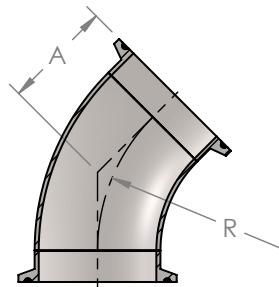
HIGH PRESSURE TRI-CLAMP



| Part No. | Flange Size | A |
|----------|---------------------------|--------------|
| TC-16PCP | 1.00 (25.4) - 1.50 (38.1) | 2.05 (52) |
| TC-20PCP | 2.00 (50.8) | 2.58 (65.5) |
| TC-25PCP | 2.50 (63.5) | 3.11 (79) |
| TC-30PCP | 3.00 (76.2) | 3.64 (92.5) |
| TC-40PCP | 4.00 (101.6) | 4.74 (120.5) |
| TC-60PCP | 6.00 (152.4) | 6.63 (168.5) |

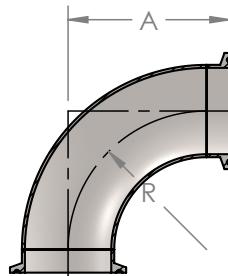
SANITARY FITTINGS

45° ELBOW



| Part No. | Flange Size | A | R |
|-----------|--------------|--------------|---------------|
| TC-08EL45 | 0.50 (12.7) | 2.75 (69.9) | 0.75 (19.1) |
| TC-12EL45 | 0.75 (19.1) | 2.75 (69.9) | 1.13 (28.6) |
| TC-16EL45 | 1.00 (25.4) | 1.13 (28.6) | 1.50 (38.1) |
| TC-18EL45 | 1.50 (38.1) | 1.44 (36.5) | 2.25 (57.2) |
| TC-20EL45 | 2.00 (50.8) | 1.75 (44.5) | 3.00 (76.2) |
| TC-25EL45 | 2.50 (63.5) | 2.06 (52.4) | 3.75 (95.3) |
| TC-30EL45 | 3.00 (76.2) | 2.38 (60.3) | 4.50 (114.3) |
| TC-40EL45 | 4.00 (101.6) | 3.13 (79.4) | 6.00 (152.4) |
| TC-60EL45 | 6.00 (152.4) | 4.63 (117.5) | 9.00 (228.6) |
| TC-80EL45 | 8.00 (203.2) | 5.88 (149.2) | 12.00 (304.8) |

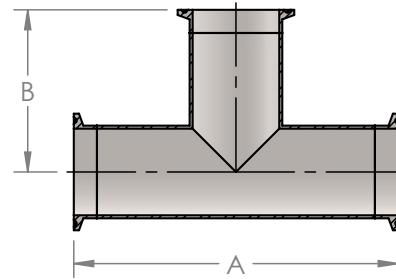
90° ELBOW



| Part No. | Flange Size | A | R |
|-----------|--------------|--------------|---------------|
| TC-08EL90 | 0.50 (12.7) | 3.50 (88.9) | 0.75 (19.1) |
| TC-12EL90 | 0.75 (19.1) | 3.50 (88.9) | 1.13 (28.6) |
| TC-16EL90 | 1.00 (25.4) | 2.00 (50.8) | 1.50 (38.1) |
| TC-18EL90 | 1.50 (38.1) | 2.75 (69.9) | 2.25 (57.2) |
| TC-20EL90 | 2.00 (50.8) | 3.50 (88.9) | 3.00 (76.2) |
| TC-25EL90 | 2.50 (63.5) | 4.25 (108) | 3.75 (95.3) |
| TC-30EL90 | 3.00 (76.2) | 5.00 (127) | 4.50 (114.3) |
| TC-40EL90 | 4.00 (101.6) | 6.63 (168.3) | 6.00 (152.4) |
| TC-60EL90 | 6.00 (152.4) | 9.88 (250.8) | 9.00 (228.6) |
| TC-80EL90 | 8.00 (203.2) | 12.88 (327) | 12.00 (304.8) |

SANITARY FITTINGS

TEE



| Part No. | Flange Size | A | B |
|----------|--------------|---------------|--------------|
| TC-08TEE | 0.50 (12.7) | 5.25 (133.4) | 2.65 (67.3) |
| TC-12TEE | 0.75 (19.1) | 5.25 (133.4) | 2.65 (67.3) |
| TC-16TEE | 1.00 (25.4) | 4.75 (120.7) | 2.38 (60.3) |
| TC-18TEE | 1.50 (38.1) | 5.50 (139.7) | 2.75 (69.9) |
| TC-20TEE | 2.00 (50.8) | 7.00 (177.8) | 3.50 (88.9) |
| TC-25TEE | 2.50 (63.5) | 7.00 (177.8) | 3.50 (88.9) |
| TC-30TEE | 3.00 (76.2) | 7.50 (190.5) | 3.50 (88.9) |
| TC-40TEE | 4.00 (101.6) | 9.00 (228.6) | 4.50 (114.3) |
| TC-60TEE | 6.00 (152.4) | 11.75 (298.5) | 5.88 (149.2) |
| TC-80TEE | 8.00 (203.2) | 15.75 (400.1) | 7.88 (200) |

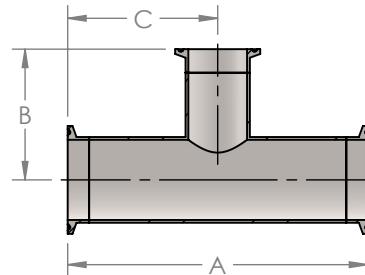
DID YOU KNOW...

With 89,000 square feet of combined space, we house the latest state-of-the-art manufacturing, tooling, and CNC equipment including a fiber laser cutter, press brake, 5-axis milling, robotic welding, band saws, tube benders, and more. We also have on-site engineering and project management staff.



SANITARY FITTINGS

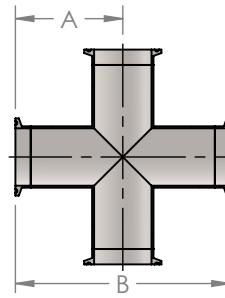
REDUCING TEE



| Part No. | Flange Size | A | B | C |
|------------|-----------------------------|---------------|--------------|--------------|
| TC-12X08RT | 0.75 (19.1) X 0.50 (12.7) | 5.25 (133.4) | 2.63 (66.7) | 2.63 (66.7) |
| TC-160X8RT | 1.00 (25.4) X 0.50 (12.7) | 4.75 (120.7) | 2.63 (66.7) | 2.38 (60.3) |
| TC-16X12RT | 1.00 (25.4) X 0.75 (19.1) | 4.75 (120.7) | 2.63 (66.7) | 2.38 (60.3) |
| TC-18X08RT | 1.50 (38.1) X 0.50 (12.7) | 5.50 (139.7) | 2.75 (69.9) | 2.75 (69.9) |
| TC-18X12RT | 1.50 (38.1) X 0.75 (19.1) | 5.50 (139.7) | 2.75 (69.9) | 2.75 (69.9) |
| TC-18X16RT | 1.50 (38.1) X 1.00 (25.4) | 5.50 (139.7) | 2.63 (66.7) | 2.75 (69.9) |
| TC-20X16RT | 2.00 (50.8) X 1.00 (25.4) | 7.00 (177.8) | 2.88 (73) | 3.50 (88.9) |
| TC-20X18RT | 2.00 (50.8) X 1.50 (38.1) | 7.00 (177.8) | 3.00 (76.2) | 3.50 (88.9) |
| TC-25X20RT | 2.50 (63.5) X 2.00 (50.8) | 7.00 (177.8) | 3.75 (95.3) | 3.50 (88.9) |
| TC-30X18RT | 3.00 (76.2) X 1.50 (38.1) | 7.50 (190.5) | 3.50 (88.9) | 3.75 (95.3) |
| TC-30X20RT | 3.00 (76.2) X 2.00 (50.8) | 7.50 (190.5) | 4.00 (101.6) | 3.75 (95.3) |
| TC-30X25RT | 3.00 (76.2) X 2.50 (63.5) | 7.50 (190.5) | 3.75 (95.3) | 3.75 (95.3) |
| TC-40X20RT | 4.00 (101.6) X 2.00 (50.8) | 9.00 (228.6) | 4.50 (114.3) | 4.50 (114.3) |
| TC-40X25RT | 4.00 (101.6) X 2.50 (63.5) | 9.00 (228.6) | 4.25 (108) | 4.50 (114.3) |
| TC-40X30RT | 4.00 (101.6) X 3.00 (76.2) | 9.00 (228.6) | 4.25 (108) | 4.50 (114.3) |
| TC-60X30RT | 6.00 (152.4) X 3.00 (76.2) | 11.75 (298.5) | 5.63 (142.9) | 5.88 (149.2) |
| TC-60X40RT | 6.00 (152.4) X 4.00 (101.6) | 11.75 (298.5) | 5.75 (146.1) | 5.88 (149.2) |

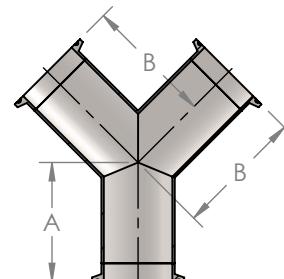
SANITARY FITTINGS

4-WAY CROSS



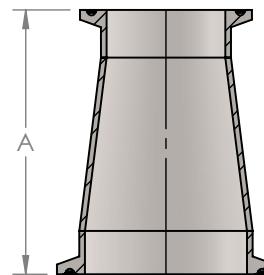
| Part No. | Flange Size | A | B |
|----------|--------------|--------------|--------------|
| TC-08CS | 0.50 (12.7) | 2.38 (60.3) | 4.75 (120.7) |
| TC-12CS | 0.75 (19.1) | 2.38 (60.3) | 4.75 (120.7) |
| TC-16CS | 1.00 (25.4) | 2.38 (60.3) | 4.75 (120.7) |
| TC-18CS | 1.50 (38.1) | 2.75 (69.9) | 5.50 (139.7) |
| TC-20CS | 2.00 (50.8) | 3.50 (88.9) | 7.00 (177.8) |
| TC-25CS | 2.50 (63.5) | 3.50 (88.9) | 7.00 (177.8) |
| TC-30CS | 3.00 (76.2) | 3.75 (95.3) | 7.50 (190.5) |
| TC-40CS | 4.00 (101.6) | 4.50 (114.3) | 9.00 (228.6) |

TRUE Y



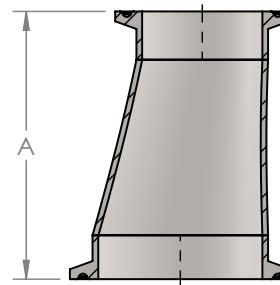
| Part No. | Flange Size | A | B |
|----------|--------------|--------------|--------------|
| TC-16Y | 1.00 (25.4) | 2.13 (54) | 2.00 (50.8) |
| TC-18Y | 1.50 (38.1) | 2.63 (66.7) | 2.75 (69.9) |
| TC-20Y | 2.00 (50.8) | 3.25 (82.6) | 3.50 (88.9) |
| TC-25Y | 2.50 (63.5) | 3.13 (79.4) | 4.25 (108) |
| TC-30Y | 3.00 (76.2) | 4.00 (101.6) | 5.00 (127) |
| TC-40Y | 4.00 (101.6) | 5.13 (130.2) | 6.63 (168.3) |
| TC-60Y | 6.00 (152.4) | 8.00 (203.2) | 9.88 (250.8) |

CONICAL REDUCER

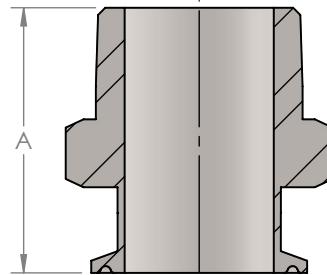


| Part No. | Flange Size | A |
|------------|-----------------------------|--------------|
| TC-12X08RC | 0.75 (19.1) X 0.50 (12.7) | 2.00 (50.8) |
| TC-16X08RC | 1.00 (25.4) X 0.50 (12.7) | 2.50 (63.5) |
| TC-16X12RC | 1.00 (25.4) X 0.75 (19.1) | 2.00 (50.8) |
| TC-18X08RC | 1.50 (38.1) X 0.50 (12.7) | 4.50 (114.3) |
| TC-18X12RC | 1.50 (38.1) X 0.75 (19.1) | 4.00 (101.6) |
| TC-18X16RC | 1.50 (38.1) X 1.00 (25.4) | 3.00 (76.2) |
| TC-20X16RC | 2.00 (50.8) X 1.00 (25.4) | 5.00 (127) |
| TC-20X18RC | 2.00 (50.8) X 1.50 (38.1) | 3.00 (76.2) |
| TC-25X18RC | 2.50 (63.5) X 1.50 (38.1) | 5.00 (127) |
| TC-25X20RC | 2.50 (63.5) X 2.00 (50.8) | 3.00 (76.2) |
| TC-30X18RC | 3.00 (76.2) X 1.50 (38.1) | 7.00 (177.8) |
| TC-30X20RC | 3.00 (76.2) X 2.00 (50.8) | 5.00 (127) |
| TC-30X25RC | 3.00 (76.2) X 2.50 (63.5) | 3.00 (76.2) |
| TC-40X20RC | 4.00 (101.6) X 2.00 (50.8) | 9.13 (231.8) |
| TC-40X25RC | 4.00 (101.6) X 2.50 (63.5) | 7.13 (181) |
| TC-40X30RC | 4.00 (101.6) X 3.00 (76.2) | 5.13 (130.2) |
| TC-60X30RC | 6.00 (152.4) X 3.00 (76.2) | 7.38 (187.3) |
| TC-60X40RC | 6.00 (152.4) X 4.00 (101.6) | 7.00 (177.8) |

ECCENTRIC REDUCER



| Part No. | Flange Size | A |
|------------|-----------------------------|--------------|
| TC-12X08RE | 0.75 (19.1) X 0.50 (12.7) | 2.00 (50.8) |
| TC-16X08RE | 1.00 (25.4) X 0.50 (12.7) | 2.50 (63.5) |
| TC-16X12RE | 1.00 (25.4) X 0.75 (19.1) | 2.00 (50.8) |
| TC-18X08RE | 1.50 (38.1) X 0.50 (12.7) | 4.50 (114.3) |
| TC-18X12RE | 1.50 (38.1) X 0.75 (19.1) | 4.00 (101.6) |
| TC-18X16RE | 1.50 (38.1) X 1.00 (25.4) | 3.00 (76.2) |
| TC-20X16RE | 2.00 (50.8) X 1.00 (25.4) | 5.00 (127) |
| TC-20X18RE | 2.00 (50.8) X 1.50 (38.1) | 3.00 (76.2) |
| TC-25X18RE | 2.50 (63.5) X 1.50 (38.1) | 5.00 (127) |
| TC-25X20RE | 2.50 (63.5) X 2.00 (50.8) | 3.00 (76.2) |
| TC-30X18RE | 3.00 (76.2) X 1.50 (38.1) | 7.00 (177.8) |
| TC-30X20RE | 3.00 (76.2) X 2.00 (50.8) | 5.00 (127) |
| TC-30X25RE | 3.00 (76.2) X 2.50 (63.5) | 3.00 (76.2) |
| TC-40X20RE | 4.00 (101.6) X 2.00 (50.8) | 9.13 (231.8) |
| TC-40X25RE | 4.00 (101.6) X 2.50 (63.5) | 7.13 (181) |
| TC-40X30RE | 4.00 (101.6) X 3.00 (76.2) | 5.13 (130.2) |
| TC-60X30RE | 6.00 (152.4) X 3.00 (76.2) | 8.88 (225.4) |
| TC-60X40RE | 6.00 (152.4) X 4.00 (101.6) | 7.00 (177.8) |

TC-NPT MALE ADAPTER

| Part No. | Size | A |
|--------------|-----------------------------|-------------|
| TC-08-08MNPT | 0.50 (12.7) X 0.50 (12.7) | 2.00 (50.8) |
| TC-12-08MNPT | 0.75 (19.1) X 0.50 (12.7) | 2.00 (50.8) |
| TC-12-12MNPT | 0.75 (19.1) X 0.75 (19.1) | 2.00 (50.8) |
| TC-16-16MNPT | 1.00 (25.4) X 1.00 (25.4) | 2.25 (57.2) |
| TC-18-12MNPT | 1.50 (38.1) X 0.75 (19.1) | 2.19 (55.5) |
| TC-18-16MNPT | 1.50 (38.1) X 1.00 (25.4) | 2.25 (57.2) |
| TC-18-18MNPT | 1.50 (38.1) X 1.50 (38.1) | 2.44 (61.9) |
| TC-18-20MNPT | 1.50 (38.1) X 2.00 (50.8) | 2.63 (66.7) |
| TC-20-20MNPT | 2.00 (50.8) X 2.00 (50.8) | 2.63 (66.7) |
| TC-25-20MNPT | 2.50 (63.5) X 2.00 (50.8) | 2.47 (62.7) |
| TC-25-25MNPT | 2.50 (63.5) X 2.50 (63.5) | 2.66 (67.5) |
| TC-30-30MNPT | 3.00 (76.2) X 3.00 (76.2) | 2.78 (70.6) |
| TC-40-40MNPT | 4.00 (101.6) X 4.00 (101.6) | 3.28 (83.3) |

ASME CUSTOM SANITARY FLANGE ADAPTERS

HIS is here to provide support and solutions when your system requires custom sanitary flange adapters. Our hands-on engineering team can either use your drawings or create ones that match your vision. We have the skill-set, the tooling, and welding capabilities to provide an adapter that matches your system's specific requirements.

Step 1: Select a flange size

0.5" (12.7 mm) - 6.0" (152.4 mm)

Step 2: Select material

304 stainless steel

Step 3: Select desired adapter

Compression

316/316L stainless steel

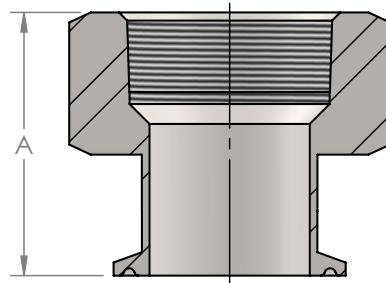
Sanitary

Aluminum

Threaded Connection

SANITARY FITTINGS

TC-NPT FEMALE ADAPTER



| Part No. | Size | A |
|--------------|-----------------------------|-------------|
| TC-08-08FNPT | 0.50 (12.7) X 0.50 (12.7) | 2.00 (50.8) |
| TC-12-08FNPT | 0.75 (19.1) X 0.50 (12.7) | 2.00 (50.8) |
| TC-12-12FNPT | 0.75 (19.1) X 0.75 (19.1) | 2.00 (50.8) |
| TC-16-16FNPT | 1.00 (25.4) X 1.00 (25.4) | 1.63 (41.4) |
| TC-18-12FNPT | 1.50 (38.1) X 0.75 (19.1) | 1.63 (41.4) |
| TC-18-16FNPT | 1.50 (38.1) X 1.00 (25.4) | 1.63 (41.4) |
| TC-18-18FNPT | 1.50 (38.1) X 1.50 (38.1) | 2.25 (57.2) |
| TC-18-20FNPT | 1.50 (38.1) X 2.00 (50.8) | 2.25 (57.2) |
| TC-20-20FNPT | 2.00 (50.8) X 2.00 (50.8) | 2.34 (59.4) |
| TC-25-20FNPT | 2.50 (63.5) X 2.00 (50.8) | 1.41 (35.8) |
| TC-25-25FNPT | 2.50 (63.5) X 2.50 (63.5) | 2.09 (53.1) |
| TC-30-30FNPT | 3.00 (76.2) X 3.00 (76.2) | 2.19 (55.6) |
| TC-40-40FNPT | 4.00 (101.6) X 4.00 (101.6) | 2.63 (66.8) |

CERTIFIED WELDERS

Our stainless steel fabrication shop is staffed with AMSE Section IX Position 6G Certified welders to ensure that your product is of the highest quality and accuracy from start to finish. We also have a custom fabrication division to help with non-standard components and projects.



SANITARY FITTINGS

SANITARY PVC HOSE KITS

SPECIFICATIONS

- 3A sanitary standards
- FDA - CFR Title 21 Parts 170 to 199
- USDA
- NFS 51 and 61 standards
- California Proposition 65

MATERIALS

Crystal clear PVC compound reinforced with helically-wound spring steel wire.

TEMPERATURE RANGE

- -4° C to +65° C (+25° F to 150° F)

FEATURES

- Custom hose lengths available upon request
- 29.9" HG vacuum rating
- Glass-smooth interior reduces material build up
- Electrogalvanized helical steel wire can be used for static dissipation
- Self-extinguishing
- Non-toxic
- Silicone-free



| Part No. | A | Hose Nominal I.D. | Hose Nominal O.D. | Max Working Pressure* | | Minimum Bend Radius @ 70° F |
|--------------|---------------|-------------------|-------------------|-----------------------|------------------|-----------------------------|
| | | | | @ 20° C (70° F) | @ 50° C (122° F) | |
| TC-12FH12PVC | 12.00 (304.8) | 0.75 (19.1) | 1.03 (26.1) | 70 | 50 | 3.00 (76.2) |
| TC-12FH18PVC | 18.00 (457.2) | 0.75 (19.1) | 1.03 (26.1) | 70 | 50 | 3.00 (76.2) |
| TC-12FH24PVC | 24.00 (609.9) | 0.75 (19.1) | 1.03 (26.1) | 70 | 50 | 3.00 (76.2) |
| TC-12FH36PVC | 36.00 (914.4) | 0.75 (19.1) | 1.03 (26.1) | 70 | 50 | 3.00 (76.2) |
| TC-16FH12PVC | 12.00 (304.8) | 1.00 (25.4) | 1.29 (32.8) | 70 | 35 | 4.00 (101.6) |
| TC-16FH18PVC | 18.00 (457.2) | 1.00 (25.4) | 1.29 (32.8) | 70 | 35 | 4.00 (101.6) |
| TC-16FH24PVC | 24.00 (609.9) | 1.00 (25.4) | 1.29 (32.8) | 70 | 35 | 4.00 (101.6) |
| TC-16FH36PVC | 36.00 (914.4) | 1.00 (25.4) | 1.29 (32.8) | 70 | 35 | 4.00 (101.6) |
| TC-18FH12PVC | 12.00 (304.8) | 1.50 (28.1) | 1.85 (47.1) | 50 | 30 | 6.00 (152.4) |
| TC-18FH18PVC | 18.00 (457.2) | 1.50 (28.1) | 1.85 (47.1) | 50 | 30 | 6.00 (152.4) |
| TC-18FH24PVC | 24.00 (609.9) | 1.50 (28.1) | 1.85 (47.1) | 50 | 30 | 6.00 (152.4) |
| TC-18FH36PVC | 36.00 (914.4) | 1.50 (28.1) | 1.85 (47.1) | 50 | 30 | 6.00 (152.4) |
| TC-20FH12PVC | 12.00 (304.8) | 2.00 (50.8) | 2.39 (60.8) | 50 | 30 | 8.00 (203.2) |
| TC-20FH18PVC | 18.00 (457.2) | 2.00 (50.8) | 2.39 (60.8) | 50 | 30 | 8.00 (203.2) |
| TC-20FH24PVC | 24.00 (609.9) | 2.00 (50.8) | 2.39 (60.8) | 50 | 30 | 8.00 (203.2) |
| TC-20FH36PVC | 36.00 (914.4) | 2.00 (50.8) | 2.39 (60.8) | 50 | 30 | 8.00 (203.2) |

* Working Pressure reduces as temperature increases. Pressure ratings can only be obtained with proper coupling procedures.

4

VALVES

4.1 BALL VALVES

| | |
|---------------------|-----|
| Specifications | 108 |
| Vacuum Ball Valve | 109 |
| Sanitary Ball Valve | 110 |

4.2 RIGHT ANGLE VALVES

| | |
|--------------------------------|---------|
| Specifications | 111-112 |
| Manually Operated With Bellows | 113-114 |
| Pneumatically Operated | 114-116 |

4.3 Y-INLINE VALVES

| | |
|--------------------------------|-----|
| Manually Operated With Bellows | 117 |
| Pneumatically Operated | 118 |



BALL VALVE SPECIFICATIONS

APPLICATIONS

- Food & Beverage
- Semiconductor
- Bio-Technology
- Cosmetic

SPECIFICATIONS

Valves are inspected and tested to API 598 and meet ANSI/FCI70-2 Class VI and MSS SP-61 seat leakage requirements. All materials comply with applicable ASTM material specifications, FDA, USDA, and ASME BPE material requirements.

FEATURES

- Tru-Drain tapered body cavity to eliminate pooling of process materials
- Integral purge and drain ports
- High-cycle live-loaded stem packing
- 3-piece swing-in-place construction for easy repair in the service line
- Full port design to eliminate the pooling of process media and improve the flow
- Blow-out-proof system
- Locking device enables personnel to secure the valve in open or closed positions when manually operated
- Investment cast to improve dimensional control and reduce porosity

MATERIAL

Made of corrosion-resistant 316 stainless steel (A-351 Gr. CF8M) and with 316L stainless steel (A-351 Gr. CF3M) weld ends.

FINISH

- 25 Ra internal surface finish

TEMPERATURE RANGE (PTFE)

- -40° C to ~232° C (-40° F to ~450° F)

MAXIMUM PRESSURE (PTFE)

- 1000 psi (0.25" - 1.00")
- 800 psi (1.50" - 2.00")
- 600 psi (2.50" - 4.00")
- 300 psi (6.00")

| Part Name | Material | QTY |
|-----------------------|----------|-----|
| Body | CF8M | 1 |
| End Cap | CF8M | 2 |
| Ball | 316 SS | 1 |
| Stem | 316 SS | 1 |
| Seat | PTFE | 2 |
| Body Seal | PTFE | 2 |
| Body Bolt | 304 SS | 4 |
| Body Nut | 304 SS | 4 |
| Thrust Washer | PTFE | 1 |
| Stem Packing Set | PTFE | 1 |
| Packing Gland | 304 SS | 2 |
| Belleville Washer | 301 SS | 2 |
| Gland Nut | 304 SS | 1 |
| Gland Nut Lock Washer | 304 SS | 1 |
| Handle | 304 SS | 1 |
| Handle Lock | 304 SS | 1 |
| Handle Nut | 304 SS | 1 |
| Handle Cover | Vinyl | 1 |

PART NUMBERS

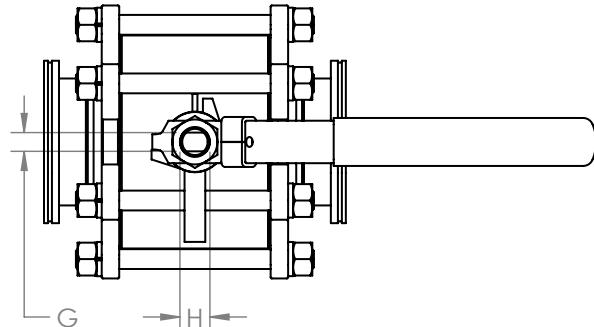
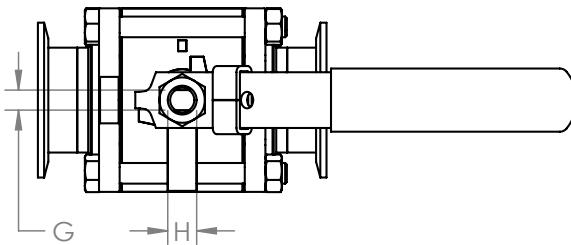
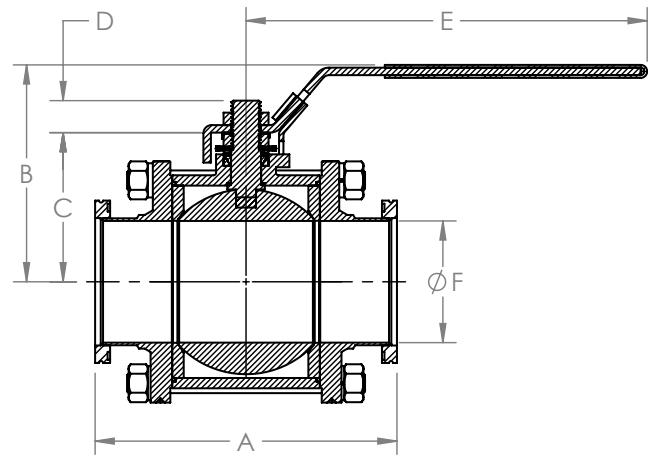
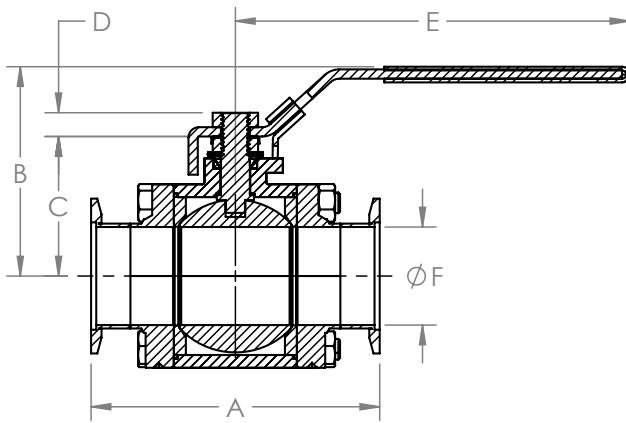
VC-BV-KF162FP

Series: Ball Valve |
 Fitting: KF16 Flange |
 Variation: 2-Way Full Port

VACUUM BALL VALVE

KF FLANGESISO FLANGES

BALL VALVES



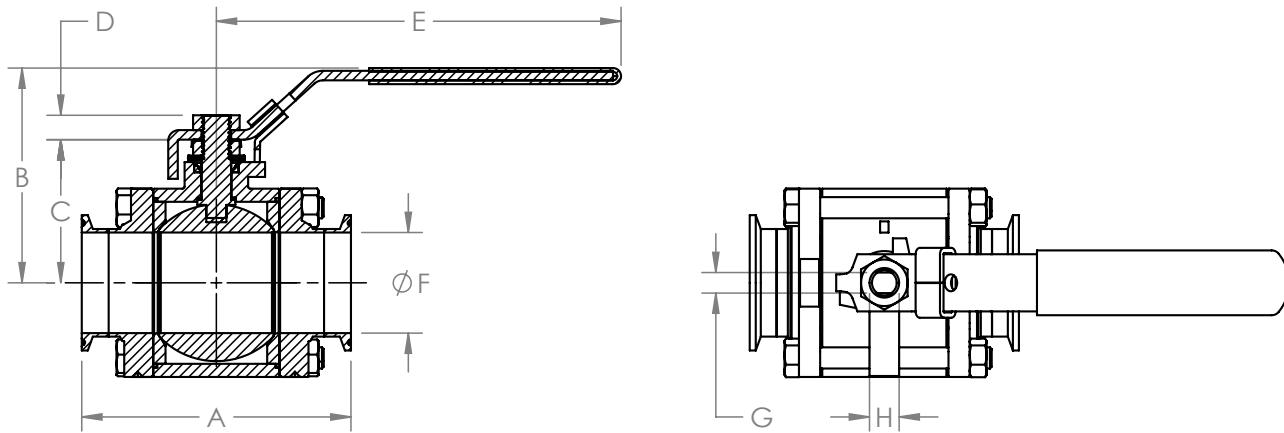
| Part No. | Tube O.D. | A | B | C | D | E | F | G | H |
|----------------|--------------|---------------|--------------|--------------|-------------|---------------|-------------|-------------|-------------|
| VC-BV-KF162FP | 0.75 (19.1) | 3.80 (96.5) | 2.30 (58.4) | 1.35 (34.3) | 0.30 (7.6) | 5.20 (132.1) | 0.62 (15.7) | 0.26 (6.6) | 0.38 (9.7) |
| VC-BV-KF252FP | 1.00 (25.4) | 3.80 (96.5) | 2.80 (71.1) | 1.77 (45) | 0.32 (8.1) | 5.70 (144.8) | 0.87 (22.1) | 0.31 (7.9) | 0.46 (11.7) |
| VC-BV-KF402FP | 1.50 (38.1) | 4.80 (121.9) | 3.70 (94) | 2.39 (60.7) | 0.41 (10.4) | 7.50 (190.5) | 1.37 (34.8) | 0.38 (9.7) | 0.54 (13.7) |
| VC-BV-KF502FP | 2.00 (50.8) | 5.30 (134.6) | 4.00 (101.6) | 2.70 (68.6) | 0.45 (11.4) | 7.50 (190.5) | 1.87 (47.5) | 0.38 (9.7) | 0.54 (13.7) |
| VC-BV-IS802FP | 3.00 (76.2) | 8.26 (209.8) | 5.90 (149.9) | 3.90 (99.1) | 0.68 (17.3) | 12.20 (309.9) | 2.87 (72.9) | 0.47 (11.9) | 0.77 (19.6) |
| VC-BV-IS1002FP | 4.00 (101.6) | 10.01 (254.3) | 6.90 (175.3) | 4.76 (120.9) | 0.95 (24.1) | 12.60 (320) | 3.83 (97.3) | 0.59 (15) | 0.93 (23.6) |

Additional end connections and flange sizes available upon request.

SANITARY BALL VALVE - TRI-CLAMP FITTING



BALL VALVES



| Part No. | Tube O.D. | A | B | C | D | E | F | G | H |
|------------|-------------|--------------|--------------|-------------|-------------|---------------|-------------|-------------|-------------|
| BV-TC122FP | 0.75 (19.1) | 3.50 (88.9) | 2.30 (58.4) | 1.35 (34.3) | 0.30 (7.6) | 5.20 (132.1) | 0.62 (15.7) | 0.26 (6.6) | 0.38 (9.7) |
| BV-TC162FP | 1.00 (25.4) | 3.50 (88.9) | 2.80 (71.1) | 1.77 (45) | 0.32 (8.1) | 5.70 (144.8) | 0.87 (22.1) | 0.31 (7.9) | 0.46 (11.7) |
| BV-TC182FP | 1.50 (38.1) | 4.50 (114.3) | 3.70 (94) | 2.39 (60.7) | 0.41 (10.4) | 7.50 (190.5) | 1.37 (34.8) | 0.38 (9.7) | 0.54 (13.7) |
| BV-TC202FP | 2.00 (50.8) | 5.00 (127) | 4.00 (101.6) | 2.70 (68.6) | 0.45 (11.4) | 7.50 (190.5) | 1.87 (47.5) | 0.38 (9.7) | 0.54 (13.7) |
| BV-TC252FP | 2.50 (63.5) | 6.75 (171.5) | 5.60 (142.2) | 3.54 (89.9) | 0.68 (17.3) | 12.20 (309.9) | 2.37 (60.2) | 0.47 (11.9) | 0.77 (19.6) |
| BV-TC302FP | 3.00 (76.2) | 7.76 (197.1) | 5.90 (149.9) | 3.90 (99.1) | 0.68 (17.3) | 12.20 (309.9) | 2.87 (72.9) | 0.47 (11.9) | 0.77 (19.6) |

Additional flange sizes available upon request.

RIGHT ANGLE & INLINE VALVE SPECIFICATIONS

HIS is pleased to offer vacuum valves designed and manufactured for research and production applications. These valves are the result of a long and careful development program designed to ensure product quality, reliability, and value.

FEATURES

- Long life operation
- Manual and electro pneumatic actuation
- Fail-safe operators that close in the event of air pressure loss
- Compact size
- Simple and fast maintenance

END CONNECTIONS

- Tube ends
- KF flanges
- ISO flanges
- CF flanges available upon request

SPECIFICATIONS

- Leak rate = 2×10^{-9} std.cc./second
- Pressure range = 1×10^{-9} Torr to 760 Torr Viton® seal bonnet
- Viton® seal bonnet bake-out limitation = 150° C
- Copper gasket bake-out limitation = 200° C
- Maximum pressure before opening = 1.2 Bar
- Operating air pressure = 60-100 psi
- Cycles until service = 16 to 50 ~ 1,000,000
 - Full orifice open = 63 to 150 ~ 500,000

MATERIALS

- Body: 304 stainless steel
- Poppet: 304 stainless steel
- Bellows: 304 stainless steel, welded seal
- Seal: Viton® o-ring

APPLICATIONS

KF and ISO port models are designed for high vacuum applications that are typically used in areas requiring easy mountable and demountable flange type seals.

CF port models are designed for ultra-high vacuum applications using copper gaskets instead of an o-ring. These are used more commonly in applications that require a more permanent seal.

MANUFACTURING & ASSEMBLY

The HIS manufacturing facility is located in Hillsboro, Oregon. HIS uses top-quality equipment and the latest orbital welding techniques. All welding is performed to applicable specifications and accepted industry standards.

PACKAGING AND PROTECTION

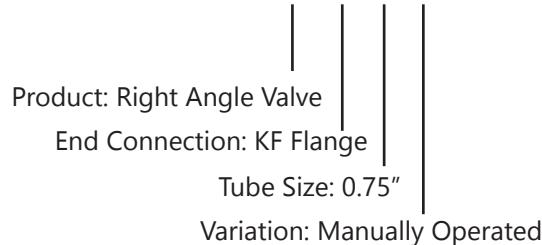
QA/QC will verify that all components are suitably packaged and identified per the appropriate specifications.

SIZING

| Part Number | Tube O.D. (in.) |
|-------------|-----------------|
| 16 | 0.75 (19.1) |
| 25 | 1.00 (25.4) |
| 40 | 1.50 (38.1) |
| 50 | 2.00 (50.8) |
| 63 | 2.50 (63.5) |
| 80 | 3.00 (76.2) |
| 100 | 4.00 (101.6) |
| 160 | 6.00 (152.4) |
| 200 | 8.00 (203.2) |

PART NUMBERS

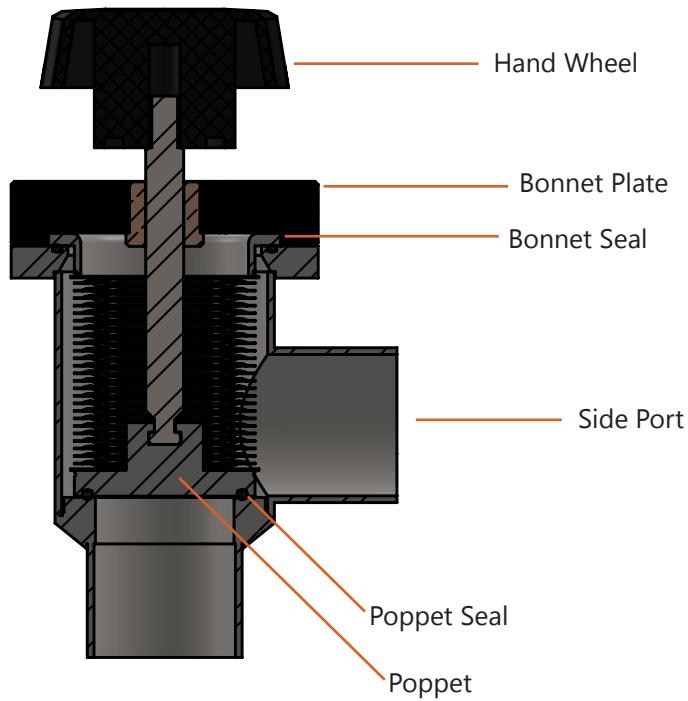
VC-AV-KF16M



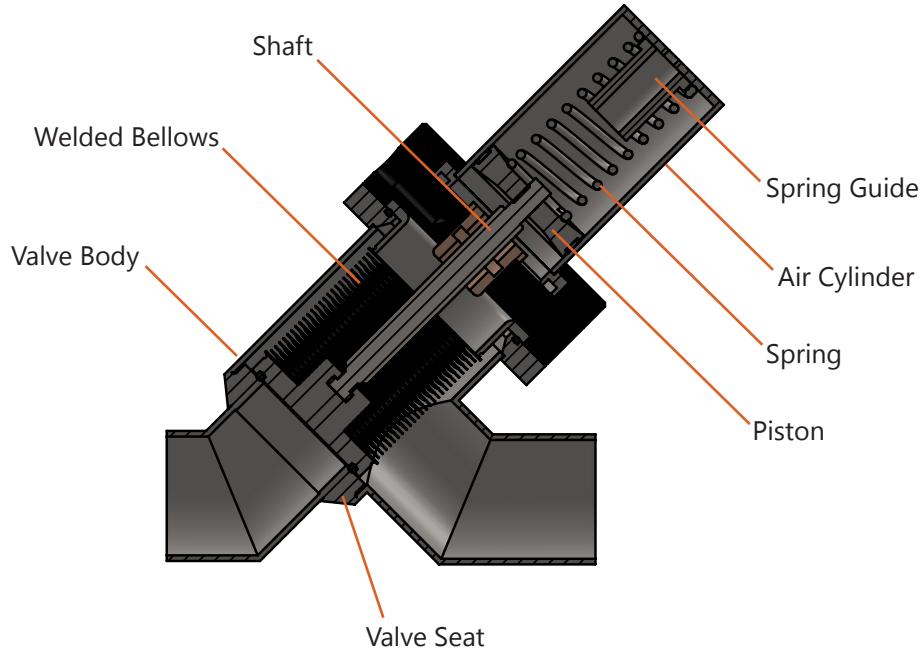
RIGHT ANGLE & Y-INLINE VALVES

MANUALLY OPERATED WITH BELLOW RIGHT ANGLE VALVE

RIGHT ANGLE VALVES

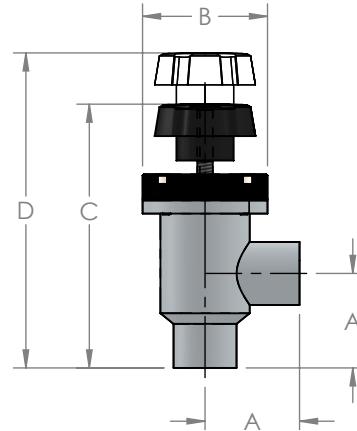


PNEUMATICALLY ACTUATED Y-INLINE VALVE



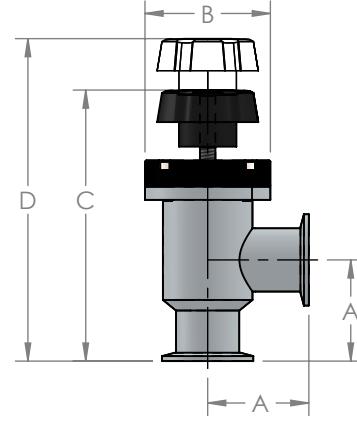
RIGHT ANGLE VALVES

MANUALLY OPERATED WITH BELLows RIGHT ANGLE - TUBE END



| Part No. | Tube O.D. | A | B | C | D |
|-------------|-------------|-------------|--------------|--------------|---------------|
| VC-AV-TS16M | 0.75 (19.1) | 2.00 (50.8) | 2.25 (57.2) | 5.25 (133.4) | 6.00 (152.4) |
| VC-AV-TS25M | 1.00 (25.4) | 1.88 (47.8) | 2.25 (57.2) | 4.97 (126.2) | 5.70 (144.8) |
| VC-AV-TS40M | 1.50 (38.1) | 2.25 (57.2) | 3.00 (76.2) | 6.28 (159.5) | 7.50 (190.5) |
| VC-AV-TS50M | 2.00 (50.8) | 3.25 (82.6) | 3.50 (88.9) | 7.99 (202.9) | 9.76 (247.9) |
| VC-AV-TS63M | 2.50 (63.5) | 3.00 (76.2) | 4.00 (101.6) | 8.35 (212.1) | 10.95 (278.1) |
| VC-AV-TS80M | 3.00 (76.2) | 3.25 (82.6) | 4.50 (114.3) | 8.67 (220.2) | 11.02 (279.9) |

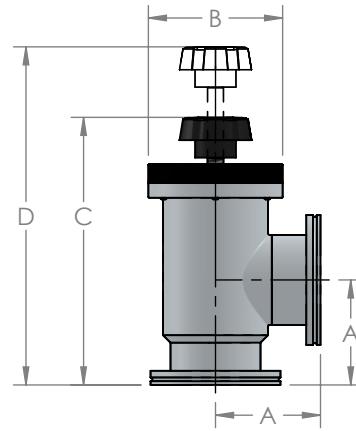
MANUALLY OPERATED WITH BELLows RIGHT ANGLE - KF FLANGE



| Part No. | Tube O.D. | A | B | C | D |
|-------------|-------------|-------------|-------------|--------------|--------------|
| VC-AV-KF16M | 0.75 (19.1) | 2.15 (54.6) | 2.24 (56.9) | 5.41 (137.4) | 6.15 (156.2) |
| VC-AV-KF25M | 1.00 (25.4) | 2.03 (51.6) | 2.24 (56.9) | 5.13 (130.3) | 5.89 (149.6) |
| VC-AV-KF40M | 1.50 (38.1) | 2.40 (61) | 2.98 (75.7) | 6.20 (157.5) | 7.48 (190) |
| VC-AV-KF50M | 2.00 (50.8) | 3.40 (86.4) | 3.48 (88.4) | 8.15 (207) | 9.91 (251.7) |

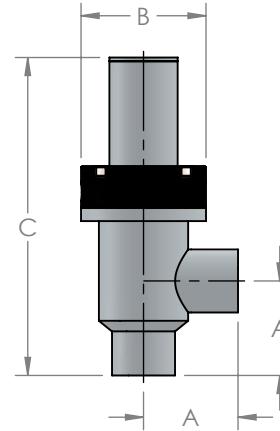
RIGHT ANGLE VALVES

MANUALLY OPERATED WITH BELLows RIGHT ANGLE - ISO FLANGE



| Part No. | Tube O.D. | A | B | C | D |
|--------------|-------------|-------------|--------------|--------------|---------------|
| VC-AV-ISO63M | 2.50 (63.5) | 3.25 (82.6) | 4.00 (101.6) | 8.60 (218.4) | 11.20 (284.5) |
| VC-AV-ISO80M | 3.00 (76.2) | 3.50 (88.9) | 4.50 (114.3) | 8.92 (226.6) | 11.28 (286.5) |

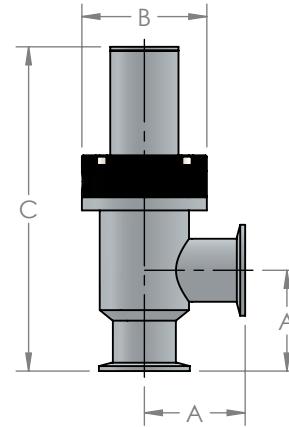
PNEUMATICALLY ACTUATED RIGHT ANGLE - TUBE END



| Part No. | Tube O.D. | A | B | C |
|-------------|-------------|-------------|-------------|---------------|
| VC-AV-TS16P | 0.75 (19.1) | 2.00 (50.8) | 2.25 (57.2) | 6.03 (153.2) |
| VC-AV-TS25P | 1.00 (25.4) | 1.88 (47.8) | 2.25 (57.2) | 5.77 (146.6) |
| VC-AV-TS40P | 1.50 (38.1) | 2.25 (57.2) | 3.00 (76.2) | 7.69 (195.3) |
| VC-AV-TS50P | 2.00 (50.8) | 3.25 (82.6) | 3.50 (88.9) | 10.17 (258.3) |

RIGHT ANGLE VALVES

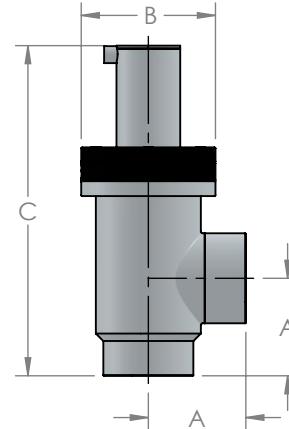
PNEUMATICALLY ACTUATED RIGHT ANGLE- KF FLANGE



| Part No. | Tube O.D. | A | B | C |
|-------------|-------------|-------------|-------------|--------------|
| VC-AV-KF16P | 0.75 (19.1) | 2.15 (54.6) | 2.24 (56.9) | 6.77 (172) |
| VC-AV-KF25P | 1.00 (25.4) | 2.03 (51.6) | 2.24 (56.9) | 6.54 (166.1) |
| VC-AV-KF40P | 1.50 (38.1) | 2.40 (61) | 2.98 (75.7) | 8.27 (210.1) |
| VC-AV-KF50P | 2.00 (50.8) | 3.39 (86.1) | 3.48 (88.4) | 9.96 (253) |

PNEUMATICALLY ACTUATED RIGHT ANGLE - TUBE END

Double Acting Air to Open / Air to Close

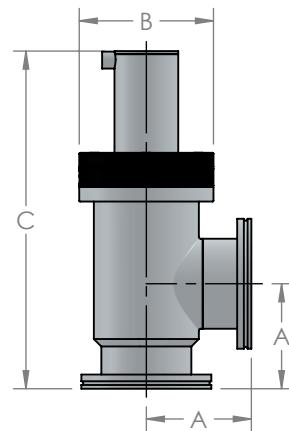


| Part No. | Tube O.D. | A | B | C |
|---------------|--------------|--------------|--------------|---------------|
| VC-AV-TS16P2 | 0.75 (19.1) | 2.00 (50.8) | 2.25 (57.2) | 6.03 (153.2) |
| VC-AV-TS25P2 | 1.00 (25.4) | 1.88 (47.8) | 2.25 (57.2) | 5.77 (146.6) |
| VC-AV-TS40P2 | 1.50 (38.1) | 2.25 (57.2) | 3.00 (76.2) | 7.69 (195.3) |
| VC-AV-TS50P2 | 2.00 (50.8) | 3.25 (82.6) | 3.50 (88.9) | 10.17 (258.3) |
| VC-AV-TS63P2 | 2.50 (63.5) | 3.00 (76.2) | 4.00 (101.6) | 10.55 (268) |
| VC-AV-TS80P2 | 3.00 (76.2) | 3.25 (82.6) | 4.50 (114.3) | 10.96 (278.4) |
| VC-AV-TS100P2 | 4.00 (101.6) | 4.22 (107.2) | 6.50 (165.1) | 14.30 (363.2) |
| VC-AV-TS160P2 | 6.00 (152.4) | 6.00 (152.4) | 9.25 (235) | 20.02 (508.5) |
| VC-AV-TS200P2 | 8.00 (203.2) | 8.00 (203.2) | 9.97 (253.2) | 25.40 (645.2) |

RIGHT ANGLE VALVES

PNEUMATICALLY ACTUATED RIGHT ANGLE - ISO FLANGE

Double Acting Air to Open / Air to Close



| Part No. | Tube O.D. | A | B | C |
|----------------|--------------|--------------|--------------|---------------|
| VC-AV-ISO63P2 | 2.50 (63.5) | 3.25 (82.6) | 3.92 (99.6) | 10.83 (275.1) |
| VC-AV-ISO80P2 | 3.00 (76.2) | 3.50 (88.9) | 4.49 (114.0) | 11.28 (286.5) |
| VC-AV-ISO100P2 | 4.00 (101.6) | 4.47 (113.5) | 5.98 (151.9) | 14.35 (364.5) |

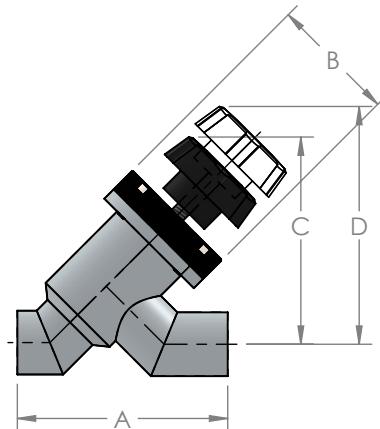
PACKAGING YOUR PRODUCTS WITH CARE

We take the time and attention on each order to make sure that your components are packaged securely for safe transit. Our QA/QC team will verify that all components are suitably packaged and identified per the appropriate specifications that you require.



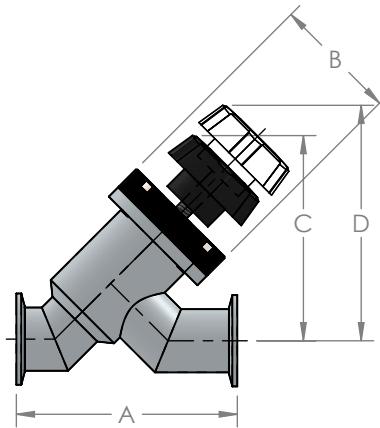
ANGLE Y-INLINE VALVES

MANUALLY OPERATED WITH BELLows Y-INLINE - TUBE END



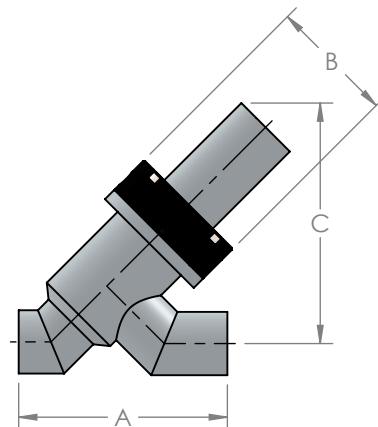
| Part No. | Tube O.D. | A | B | C | D |
|-------------|-------------|--------------|-------------|--------------|--------------|
| VC-AI-TS16M | 0.75 (19.1) | 3.70 (94) | 2.25 (57.2) | 3.91 (99.3) | 4.43 (112.5) |
| VC-AI-TS25M | 1.00 (25.4) | 3.90 (99.1) | 2.25 (57.2) | 3.82 (97) | 4.34 (110.2) |
| VC-AI-TS40M | 1.50 (38.1) | 4.82 (122.4) | 3.00 (76.2) | 4.87 (123.7) | 5.74 (145.8) |
| VC-AI-TS50M | 2.00 (50.8) | 6.70 (170.2) | 3.50 (88.9) | 5.30 (134.6) | 6.55 (166.4) |

MANUALLY OPERATED WITH BELLows Y-INLINE - KF FLANGE



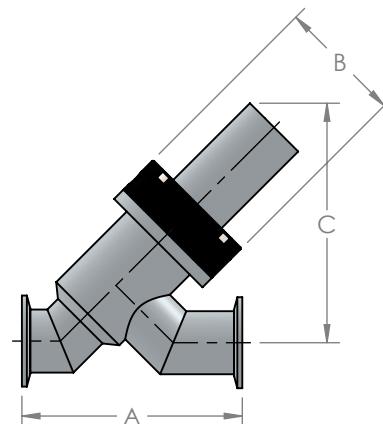
| Part No. | Tube O.D. | A | B | C | D |
|-------------|-------------|--------------|-------------|--------------|--------------|
| VC-AI-KF16M | 0.75 (19.1) | 4.00 (101.6) | 2.25 (57.2) | 3.91 (99.3) | 4.43 (112.5) |
| VC-AI-KF25M | 1.00 (25.4) | 4.20 (106.7) | 2.25 (57.2) | 3.82 (97) | 4.34 (110.2) |
| VC-AI-KF40M | 1.50 (38.1) | 5.12 (130) | 3.00 (76.2) | 5.31 (134.9) | 6.18 (157) |
| VC-AI-KF50M | 2.00 (50.8) | 7.00 (177.8) | 3.50 (88.9) | 5.30 (134.6) | 6.55 (166.4) |

PNEUMATICALLY ACTUATED Y-INLINE - TUBE END



| Part No. | Tube O.D. | A | B | C |
|-------------|-------------|--------------|--------------|--------------|
| VC-AI-TS16P | 0.75 (19.1) | 3.70 (94) | 2.25 (57.2) | 4.15 (105.4) |
| VC-AI-TS25P | 1.00 (25.4) | 3.90 (99.1) | 2.25 (57.2) | 4.09 (103.9) |
| VC-AI-TS40P | 1.50 (38.1) | 4.82 (122.4) | 3.00 (76.2) | 5.61 (142.5) |
| VC-AI-TS50P | 2.00 (50.8) | 6.70 (170.2) | 3.50 (88.9) | 7.15 (181.6) |
| VC-AI-TS63P | 2.50 (63.5) | 7.75 (196.9) | 4.00 (101.6) | 7.96 (202.2) |

PNEUMATICALLY ACTUATED Y-INLINE - KF FLANGE



| Part No. | Tube O.D. | A | B | C |
|-------------|-------------|--------------|-------------|--------------|
| VC-AI-KF16P | 0.75 (19.1) | 4.00 (101.6) | 2.24 (56.9) | 4.69 (119.1) |
| VC-AI-KF25P | 1.00 (25.4) | 4.20 (106.7) | 2.24 (56.9) | 4.72 (119.9) |
| VC-AI-KF40P | 1.50 (38.1) | 5.12 (130) | 2.98 (75.7) | 6.22 (158) |
| VC-AI-KF50P | 2.00 (50.8) | 7.00 (177.8) | 3.48 (88.4) | 7.04 (178.8) |

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|----------------------------------|------------------------------------|------------------------------------|---------------------|-------|-----|-------|---------------------------|---------------------|----|-------|----------|--|----------------------------------|--|------------------------------|--|---------------|--|----|----|----------------------|----|-----|----|-------------------------|----|----|----|------------------------|----|-------------|----|------------------------|----|--------------|----|----------------|----|-----------------------|--|------------------|----|----|----|-----------------------------|--|-----|----|----|---------------------|----|-------|----|---------------------|---------------------|--|-------------------------|--|----|----|---------|----|-----|----|-------|----|--------------------------|---------------------|----------|----------|---------------------|--|----|----|----|----|-----|-----|-----|----|----|----|----|----|----------|------------------------------------|--|-----|
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| ISO Single Claw Clamps | 41 | Weld Fitting | 76 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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