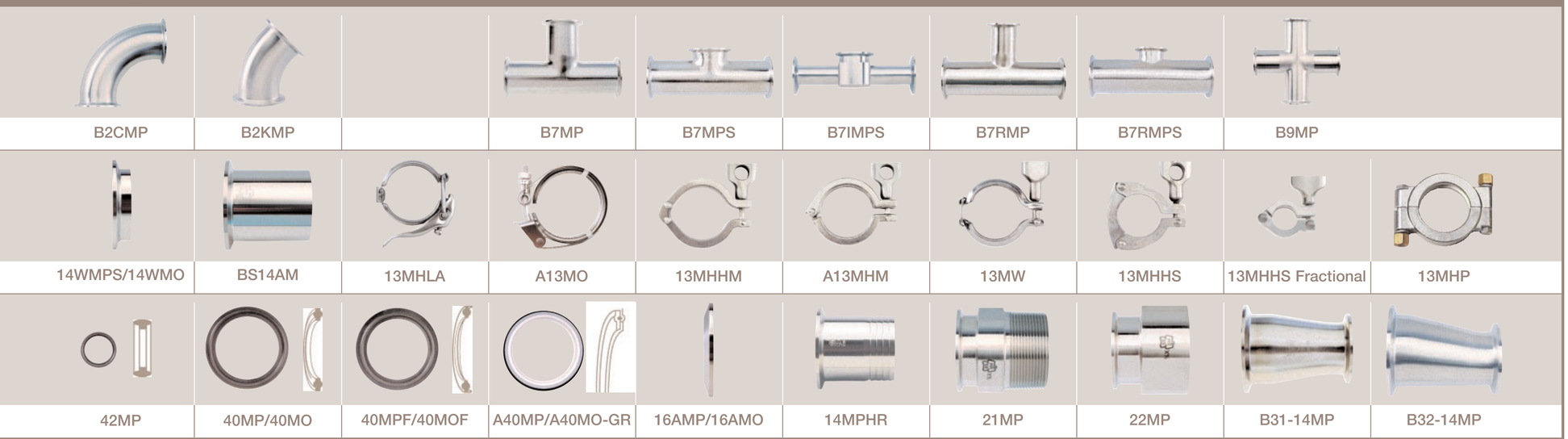
Biopharmaceutical Fittings

Alfa Laval's line of fittings for the Pharmaceutical and Biotechnology industries consist of Tri-Clover parts with either Tri-Weld® ends suitable for use with orbital welding equipment or self-aligning Tri-Clamp® end connections. Our full line of Biopharm Fittings are manufactured in compliance with the current revision of the ASME BPE Standards.

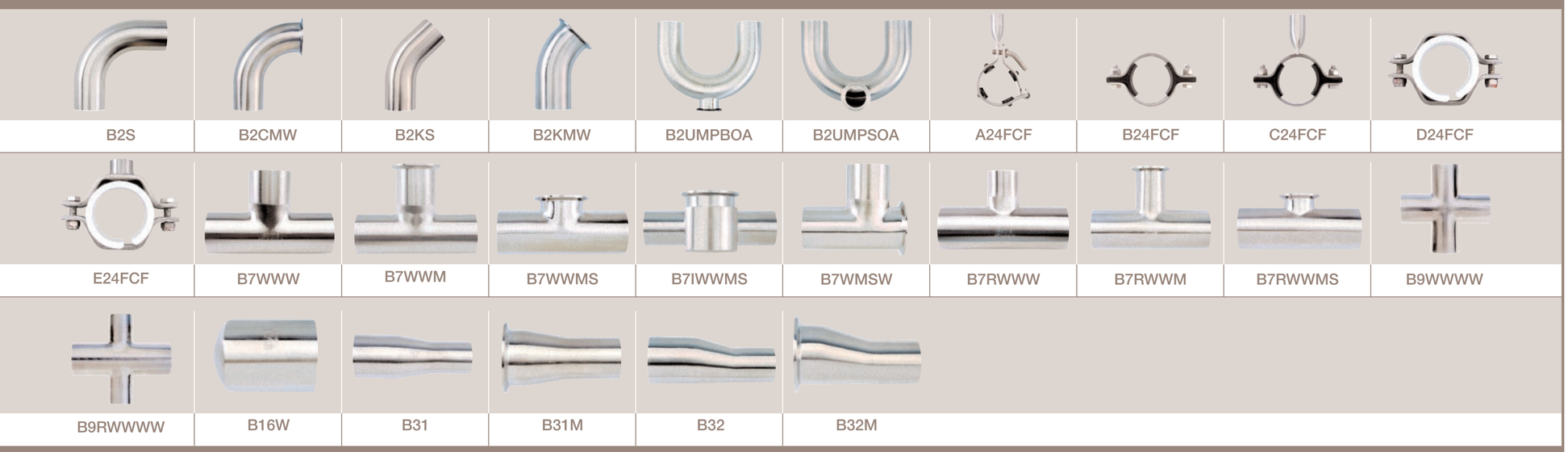
Our Biopharmaceutical fittings are available in a wide range of surface finishes. They are individually capped and bagged, and each shipment includes MTRs.

Tri-Clover®

Tri-Clamp®



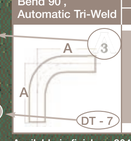
Tri-Weld®



Ordering Information

When ordering, please specify the complete part number including: description, size, material and surface finish

Example: B2S - 1 - 316L - PL A - B - C - D

A Description	Size		Dimensions A	
B2S Bend 90˚, Automatic Tri-Weld	in	mm	in	mm
	B (Size)			

Designates compliance with 3A

Complies to the ASME BPE Standard

Available in finishes: 304 - #1 and #7; 316L - #1 and #7, PC, PL, PD and PM. See Surface Finish Codes chart.

C Material D Finish

Surface Finish Codes

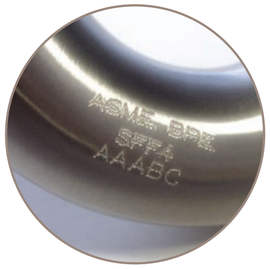
Finish Code	ID or Product Contact Surface: Maximum Surface Roughness (RA) Microinches (µ-inch)	Micrometers (µm)	ASME BPE Finish Code	Polishing Method	OD or Product Noncontact Surface
1				Unpolished	Unpolished
3	32	0.8	–	Mechanical Polished	Unpolished
7	32	0.8	–	Mechanical Polished	Polished to Ra, 32µ-inch/0.8µm
PC	20	0.5	SFF1	Mechanical Polished	Unpolished
PD	15	0.4	SFF4	Mechanical Polished and Electropolished	Unpolished
PL	20	0.5	SFF1	Mechanical Polished	Polished to Ra, 32µ-inch/0.8µm
PM	15	0.4	SFF4	Mechanical Polished and Electropolished	Polished to Ra, 32µ-inch/0.8µm

Material Test Reports (MTRs) for fittings are available online.

As one of the most comprehensive and technologically advanced reports in the market, our new Material Test Reports (MTRs) provide detailed information that takes traceability and validation to a new level. Alfa Laval has established a new standard as all MTRs are available 24/7 online at **www.alfalaval.us**

Available to contractors, channels, and end users, simply type a 5-alpha character code (e.g. AAABC) called the serial ID which you can find stenciled on each new 316SS fitting to access the following information:

- All heat certification properties used to manufacture the fitting
- Date the fitting was manufactured
- The fitting's part number and description
- View/print any MTR and this above information



This web site will even allow you to print the MTR or original heat certification from the raw material supplier. If you do not know the actual number, MTR's can be searched by either MTR serial ID or heat certification number.

Technical Information

Service Rating of Tri-Clamp Connections

Service Ratings* (PSI)

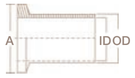
Size Tube OD	¼in and ⅜in	1in and 1½in	2in	2½in	3in	4in	6in
13MHLA	(Screw tightened to maximum)						
at 70˚F	–	150	150	150	150	150	–
at 250˚F	–	125	125	125	125	125	–
13HHM	(Wing nut tightened to 25 in. lb. of torque)						
at 70˚F	–	500	450	400	350	350	150
at 250˚F	–	300	300	200	195	195	75
13MHHS	(Wing nut tightened to 25 in. lb. of torque)						
at 70˚F	2200	600	550	450	350	350	–
at 250˚F	1200	300	275	225	175	175	–
13MHP	(Bolts tightened to 20 ft. lb. of torque)						
at 70˚F	–	1500	1000	1000	1000	1000	300
at 250˚F	–	1200	800	800	800	800	200
A13MO	(1-3" tightened to 20 in. lb., 4" to 30 in. lb.)						
at 70˚F	–	500	350	300	200	200	75
at 250˚F	–	250	200	150	100	100	50
A13MHM	(Wing nut tightened to 25 in. lb. of torque)						
at 70˚F	–	500	450	400	350	350	150
at 250˚F	–	300	250	200	175	175	75

*Service ratings are based on hydrostatic tests using standard-molded Buna-N material gaskets, with proper installation of ferrules, assembly of joints and absence of shock pressure. Contact Alfa Laval for service of other type and material gaskets, and for ratings at higher temperatures. All ratings shown are dependent upon related components within the systems and proper installation. For temperatures above 250˚F, we recommend using only 13MHP clamps. This information is only valid if Alfa Laval clamps, ferrules, and gaskets are used.

Tri-Clamp Gasket Materials

Characteristic	Buna-N (U)	EPDM (E)	Fluoro-elastomer (SFY)	Silicone (X)	PTFE (G)
Original Physical Properties					
Hardness, Shore A	70	70	70	70	–
Tensile Strength, psi	1875	1650	1212	1340	–
Elongation, %	340	317	272	260	–
Temperature Range	-65 to 200˚F	-60 to 300˚F	-20 to 350˚F	-40 to 450˚F	-40 to 200˚F
Acid Resistance	Good	Good to Excellent	Good to Excellent	Poor to Good	Good to Excellent
Alkali Resistance	Fair to Good	Good to Excellent	Poor to Good	Poor to Fair	Excellent
Resistance to Fats/Oils	Good to Excellent	Poor	Good to Excellent	Poor to Good	Excellent
Abrasion Resistance	Excellent	Good	Good to Excellent	Poor	Fair
Compression Set Resistance	Good	Fair	Good to Excellent	Good to Excellent	Cold Flows

Basic Dimensions of Tri-Clamp Connections for Sanitary OD-Tubing



OD Outer Diameter (inches)	ID Inner Diameter (inches)	Wall Thickness (inches/gauge)	A Ferrule Face (inches)
½	0.37	0.065 / 16 ga.	0.984
¾	0.62	0.065 / 16 ga.	0.984
1	0.87	0.065 / 16 ga.	1.984
1½	1.37	0.065 / 16 ga.	1.984
2	1.87	0.065 / 16 ga.	2.516
2½	2.37	0.065 / 16 ga.	3.047
3	2.87	0.065 / 16 ga.	3.579
4	3.87	0.083 / 14 ga.	4.682