

In all forms and shapes

Fittings from Alfa Laval - Tri-Clover

Application

Alfa Laval is your complete source for specialized fittings and tubing required in food, dairy, beverage, personal care, biotechnology and pharmaceutical process applications. Smooth, crevice-free interiors and secure, self-aligning joints are characteristic of Alfa Laval Fittings. Each offers superior corrosion-resistance and unmatched service life. Alfa Laval fittings are designed and manufactured to ensure dimensional accuracy and structural integrity, making them easy to install. Tri-Clover Tri-Clamp® and Tri-Weld® Fittings are part of Alfa Laval's product line. Tubing is manufactured to Alfa Laval's stringent specifications, making it a perfect match for the Weld Fittings. Choose from a complete range of tube sizes, surface finishes and connect options. All BPE items are individually capped and bagged in clear 6 mil. Poly bags. All product is labeled with a bar code, product information and manufacturing date. This provides the optimum identification and ensures that the product arrives to the job site in a clean orbital weld condition.

Bio-Pharmaceutical Fittings

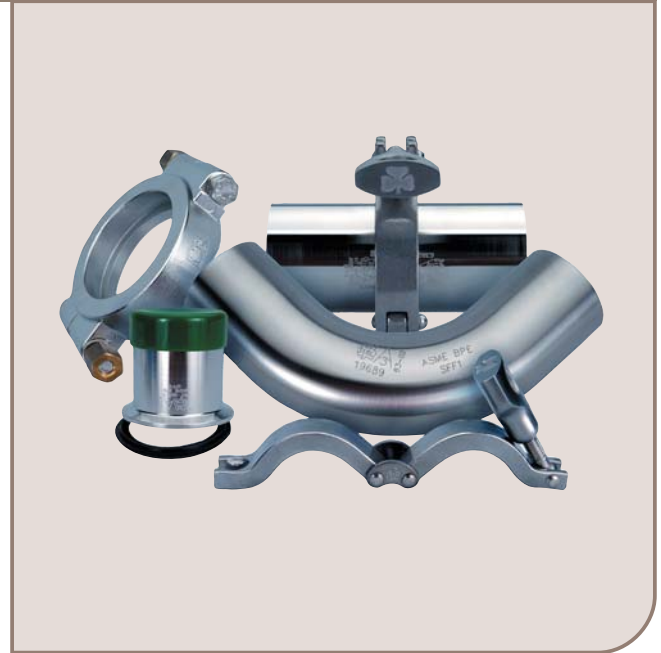
Alfa Laval is proud to present their line of Fittings designed for use in the Pharmaceutical and Bio-Technologies Industries. This line consists of Tri-Clover parts with either Tri-Weld ends suitable for use with Orbital Welding Equipment or self-aligning Tri-Clamp end connections. Alfa Laval offers a full line of Biopharmaceutical Fittings that are manufactured in compliance with the ASME BPE-1997 Standard and current with the 2001 Revision.

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Technical Data

Full Traceability - Material Test Reports (MTR's) are included with both shipment and invoice. MTR's are also available in an electronic file format upon request. Permanent markings on all components allow a quick identification of all Heat numbers, Material Grade, Surface Finish Designation to the BPE Standard (SFF1 or SFF4), and Manufacturer logo.

Wide Range of Surface Finish offering - Alfa Laval offers a range of Mechanical Polish as well as Electropolish finishes. Mechanical polishing is achieved by using a progressive series of abrasives, from low to high grit. This allows a consistent internal finish and both optimal and economical cleaning. Electropolishing is a further process that promotes a Chromium enriched surface layer that maximizes corrosion resistance as well as minimizing bacterial buildup on surface cavities. Metallurgy - Incoming raw material goes through a stringent inspection process to ensure its chemistry will be ideal for both weldability and electropolishing.



Quality Control Methods - Our manufacturing facilities operate under an approved ISO 9001 quality standard. Wall thickness integrity is maintained through the use of fabrication grade minimum wall tubing for all cold-formed tubular products. Our BPE fittings are designed for use with all current orbital welding equipment. After cold forming, our tube product is resized to ensure that the ovality falls within the prescribed BPE tolerances. End facing is provided with a machined square-cut method. This allows for the most accurate and consistent orbital weld result. All fittings are put through 100% visual inspection and ovality and squareness tolerances are inspected with calibrated equipment. Surface finish is inspected with a calibrated profilometer to ensure the Roughness average (Ra) maximum is not exceeded.

Sanitary fittings identified with this symbol on the following pages are accepted as meeting the 3A sanitary standards by the appropriate committees of the International Association of Milk, Food and Environmental Sanitarians, U.S. Public Health Service, and Dairy Industry Committee.

Service Rating of Tri-Clamp® Connections

Service Ratings* (PSI)						
Size Tube OD	1 inch	1½ inch	2 inch	2½ inch	3 inch	4 inch
13MHLA	(Screw tightened to maximum)					
at 70°F	150	150	150	150	150	100
at 250°F	125	125	125	125	125	75
13MHHM	(Wing nut tightened to 25 in. lb. of torque)					
at 70°F	500	500	450	400	350	300
at 250°F	300	300	300	200	195	150
13MHHS	(Wing nut tightened to 25 in. lb. of torque)					
at 70°F	600	600	550	450	350	300
at 250°F	300	300	275	225	175	150
13MHP	(Bolts tightened to 20 ft. lb. of torque)					
at 70°F	3000	1500	1000	1000	1000	800
at 250°F	1200	1200	800	800	800	600
A13MO	(1-3" nuts tightened to 20 in. lb., 4" to 30 in. lb.)					
at 70°F	500	500	350	300	200	100
at 250°F	250	250	200	150	100	100
A13MHM	(Wing nut tightened to 25 in. lb. of torque)					
at 70°F	500	500	450	400	350	300
at 250°F	300	300	250	200	175	150

* 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 Tri-Clover 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 Tri-Clover 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
Resistance					
Acid Resistance	Good	Good to Excel.	Good to Excel.	Poor to Good	Good to Excel.
Alkali Resistance	Fair to Good	Good to Excel.	Poor to Good	Poor to Fair	Excellent
Resistance to Fats/Oils	Good to Excel.	Poor	Good to Excel.	Poor to Good	Excellent
Abrasion Resistance	Excellent	Good	Good to Excel.	Poor	Fair
Compression Set Resistance	Good	Fair	Good to Excel.	Good to Excel.	Cold Flows

Basic Dimensions of Tri-Clamp ®

Connection 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

Sanitary Tube Information

Tube OD	Tube ID	Wall Thickness	Volume	Weight Dry	Weight with Water	Flow (GPM) at a Mean Velocity		
						Inches	Inches	Inches
½	0.37	0.065	0.56	30.6	35.3	1.7	2.3	3.4
¾	0.62	0.065	1.57	48.2	61.3	4.7	6.6	9.4
1	0.87	0.065	3.09	65.8	91.5	9.3	13	19
1½	1.37	0.065	7.66	100.9	164.8	23	32	46
2	1.87	0.065	14.27	136.1	255.1	43	60	86
2½	2.37	0.065	22.92	171.2	362.4	69	96	138
3	2.87	0.065	33.6	206.4	486.7	101	141	202
4	3.834	0.083	59.97	351.8	851.9	180	252	360
6	5.782	0.109	136.39	694.7	1832.2	409	573	818
8	7.782	0.109	247.07	930.6	2991.1	741	1038	1482