



# Keep Your Process Ultra Clean

## Tri-Clover® UltraPure ISO 2037

### Application

Alfa Laval Tri-Clover® UltraPure ISO 2037 installation package is the perfect choice for ultra pure processes within the demanding pharmaceutical, biotech and personal care industries.

### Standard design

The UltraPure ISO 2037 tubes & fittings are in accordance to ISO 2037 in:

- ISO 2037 (Tubes)
- ISO 2851 (Bends, Tees)
- ISO 2852 (Clamp connections)

### Materials

The UltraPure ISO 2037 tubes & fittings are available in 1.4404 (316L) stainless steel

All tubes are annealed, pickled and passivated in accordance with DIN EN 10217-7 W2Ab.



### Steel material composition in accordance to DIN 10088-1

Steel designation		% by mass								
Number	Name	C	Si	Mn	P	S	N	Cr	Mo	Ni
1.4404	X2CrNiMo17-12-2	≤ 0.030	≤ 1.00	≤ 2.0	≤ 0.045	≤ 0.015 <sup>(b)</sup>	≤ 0.11	16.5 to 18.5	2.00 to 2.50	10.0 to 13.0 <sup>(c)</sup>

b) For bars, rods, wire, sections, bright products and the relevant semi-finished products, a maximum content of 0,030 % S applies.

c) Where for special reasons, e. g. hot workability for the fabrication of seamless tubes where it is necessary to minimize the delta ferrite content, or with the aim of low magnetic permeability, the maximum Ni content may be increased by 1,50 % (m/m) for 1.4404.

### Elastomers

Seal rings are available in EPDM, FPM and PTFE

### Elastomer properties

	EPDM	FPM	PTFE
FDA (CFR 21: 177.2600)	Yes	Yes	Yes
USP Class VI certified	Yes	Yes	No
Recommended operating temperature, °C	-10°C to +140°C	-10°C to +180°C	-10°C to +220°C
<b>Resistance</b>			
Steam resistance	Yes	No	Yes
Alkali resistance	Yes	No	Yes
Resistance to fats/oils	No	Yes	Yes
Ozone resistance	Yes	Yes	Yes

## Dimensions

Dimensions and tolerances in accordance with ISO 2037

Dimension	1"	1 ½"	2"	2 ½"	3"	4"
Outside diameter (mm)	25.0	38.0	51.0	63.5	76.1	101.6
Inside diameter (mm)	22.6	35.6	48.6	60.3	72.9	97.6
Wall thickness (mm)	1.2	1.2	1.2	1.6	1.6	2.0

## Internal and external surface finish

Hygiene class <sup>a</sup>	Surface texture		
	Internal surface	Seam internal	External
H4o H4	Ra < 0.40 µm	Ra < 0.40 µm	Ra < 0.80 µm
HE4o <sup>b</sup> HE4 <sup>b</sup>			

a) Tubular fittings with external surface of Ra<0.80 µm are marked with an o (e.g. H4o), Machined fittings with external surface of Ra<0,80 µm are marked without an o (e.g. H4)

b) Electro polished in accordance with standardized procedures involving the removal of at least 20 µm.

## Fitting pressure rating

Pressure ratings in bar	
Bends, Tees, Reducers (80/200°C)	25/15
Clamp unions (80/200°C)	25/15

## Tube pressure rating

Table C.1 - Permissible operating pressures at room temperature 20°C

Nominal size DN/OD	25.0	38.0	51.0	63.5	76.1	101.6
	Permissible operating pressures in bar for tubes					
ISO 2037	195	126	94	105	84	82

The permissible operating pressures were calculated for seamless and welded tubes ( $\nu = 1$ ) using the design value for material number 1.4404 to DIN EN 10088-2:1995-08, Table 10 - product from C (cold strip) assuming that the permissible design tension of 100% in the seam is used.

## Other standards fulfilments

- All tubes and fittings are in accordance to the European pressure vessel directive (PED Directive 97/23/EC)
- All plastic protection end caps are in compliance to REACH (European Community Regulation on chemicals and their safe use)

## Delivery condition

To ensure easy identification and immediate use, all Tri-Clover UltraPure ISO 2037 tubes & fittings are delivered as follows:

- All tubes are delivered in lengths of 6 meters (0 to + 10 mm).
- Weld ends are delivered with straight-cut ends, free from burrs and breaks suitable for automatic welding.
- All fittings are individually marked with heat number, material, surface finish designation, and dimension.
- Internally cleaned and free from oils, grease, particulates, grinding compounds or electrolytes.
- Protected with end caps and individually dry-wrapped in plastic bags.
- Delivered with MTR (3.1) traceability certificate.

Please contact Alfa Laval for further information regarding ordering.

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The information contained herein is correct at the time of issue, but may be subject to change without prior notice.

## How to contact Alfa Laval

Contact details for all countries are continually updated on our website. Please visit [www.alfalaval.com](http://www.alfalaval.com) to access the information direct.