

# Never Compromise the Quality

## Alfa Laval Surfex® Tubes

### Application

The Alfa Laval Surfex® Tubes are the perfect choice for ultra-clean processes within the demanding pharmaceutical, biotech and light chemical industries.

### Standard design

Surfex® Tubes are available in two different materials: 1.4404 and 1.4435, 1.4435 with delta ferrite class 3 meeting Basel norm 2 (< 0.5%).

They are produced according to DIN 11866 with range C completely meeting the requirements of ASME BPE 1997.

### Roughness

The tubes are polished externally to  $Ra < 0.8\mu m$ , internal roughness  $Ra < 0.8\mu m$  (hygiene class H3o) or  $Ra < 0.4\mu m$  (hygiene class H4o).

Alfa Laval offers the following range of tubes:

DIN 11866 Range A	Tube dimension in DIN 11850 range 2
DIN 11866 Range B	Tube dimension in ISO 1127
DIN 11866 Range C	Tube dimension as ASME BPE 1997

Source: DIN 11866

All tubes are internally cleaned, free from grease, oil and dirt and are supplied with end caps and dry-wrapped in a plastic sleeve.

The tubes are delivered with straight ends, suitable for orbital welding (according to DIN 11866 3.2) and with traceability according to EN 10204 3.1B.



### Materials

The Surfex tubes are available in the following material

Stainless steel execution after DIN EN 10088-1	
Denomination	Stainless steel no.
X2CrNiMo 17-12-2	1.4404
X2CrNiMo 18-14-3	1.4435 <sup>a)</sup>

<sup>a)</sup> Standard stainless steel number

Source: DIN 11866

**Dimensions (mm)**

**Range A** Tube dimension for DIN 11850 range 2

Dimension DN	6	8	10	15	20	25	32	40	50	65	80	100	125	150	200
Outside dimension	8.00	10.00	13.00	19.00	23.00	29.00	35.00	41.00	53.00	70.00	85.00	104.00	129.00	154.00	204.00
Inside dimension	6.00	8.00	10.00	16.00	20.00	26.00	32.00	38.00	50.00	66.00	81.00	100.00	125.00	150.00	200.00
Tolerances, OD	±0.05	±0.05	±0.05	±0.10	±0.10	±0.12	±0.15	±0.15	±0.25	±0.30	±0.43	±0.52	±0.65	±0.77	±1.02
Wall thickness	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.00	2.00	2.00	2.00	2.00	2.00
Tolerances on wall thickness <sup>a)</sup>	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10
Weight Kg/M	0.175	0.226	0.432	0.658	0.808	1.034	1.260	1.485	1.937	3.409	4.162	5.114	6.368	7.621	10.128

**Range B** Tube dimension for DIN EN ISO 1127

Dimension DN/OD	10.2	13.5	17.2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1
Outside dimension	10.20	13.50	17.20	21.30	26.90	33.70	42.40	48.30	60.30	76.10	88.90	114.30	139.70	168.30	219.10
Inside dimension	7.00	10.30	14.00	18.10	23.70	29.70	38.40	44.30	56.30	72.10	84.30	109.70	134.50	163.10	213.90
Tolerances, OD	±0.05	±0.05	±0.10	±0.10	±0.12	±0.15	±0.15	±0.20	±0.25	±0.30	±0.44	±0.57	±0.70	±0.84	±1.10
Wall thickness	1.60	1.60	1.60	1.60	1.60	2.00	2.00	2.00	2.00	2.00	2.30	2.30	2.60	2.60	2.60
Tolerances on wall thickness <sup>a)</sup>	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.12	±0.12	±0.13	±0.13	±0.15
Weight Kg/M	0.345	0.477	0.626	0.790	1.015	1.589	2.026	2.321	2.923	3.715	4.993	6.458	8.936	10.801	14.112

**Range C** Tube dimension for ASME-BPE 1997

Dimension DN/OD (Inch)	1/4"	3/8"	1/2"	3/4"	1"	1½"	2"	2½"	3"	4"	6"
Outside dimension	6.35	9.53	12.70	19.05	25.40	38.10	50.80	63.50	76.20	101.60	152.40
Inside dimension	4.57	7.75	9.40	15.75	22.10	34.80	47.50	60.20	72.90	97.38	146.86
Tolerances, OD	±0.05	±0.05	±0.05	±0.10	±0.12	±0.15	±0.20	±0.25	±0.30	±0.51	±0.76
Wall thickness	0.89	0.89	1.65	1.65	1.65	1.65	1.65	1.65	1.65	2.11	2.77
Tolerances on wall thickness <sup>a)</sup>	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.11	±0.14
Weight Kg/M	0.124	0.197	0.457	0.720	0.982	1.508	2.033	2.558	3.084	5.263	10.390

<sup>a)</sup> = For tubes which have inside treatment (Honen, polished or electropolished) the tolerances of wall thickness may be reduced with 0.05 mm.

Source: DIN11866

Technical Data

The tables below show the DIN standards for surfaces and delta ferrit.

Inner and outer surface

Surface Character				
Hygiene Class	Inside Surface	Welding Area	Outside Surface	Material Category
H3	Ra < 0.80µm	Ra < 0.80µm	No surface treatment.	k2g k3g
H4	Ra < 0.40µm	Ra < 0.40µm	Bright annealed, raw.	l2 n2 k2g or k3g
			Or polished Ra < 0.8 µm <sup>a</sup>	
<sup>a</sup> Tubes with polished OD Ra < 0.8 µm, are marked with an "o" in the hygiene class (ex. H3o).				

Source: DIN11866

Delta Ferrit Classes

DF-Class	Delta Ferrit Value
1	≤ 3.0%
2	≤ 1.0%
3	≤ 0.5%

Source: DIN11866

Ordering:

All tubes are delivered in lengths of 6 metres.

Please state the following when ordering:

- Range (A, B or C)
- Material (1.4435 or 1.4404)
- Hygiene Class
- OD/ID dimension