

**Specification**  
safetron

For sensitive media in pharma and biotech:  
WFI, serums and parenterals

**safetron**

**bf** bright finished  
**ep** electropolished



**1. SURFACE QUALITIES**

Tubes and fittings: Inner surface (bf)

**safetron | H4o** Ra<sub>avg.</sub> ≤ 0,40 µm / 16 µin

- Surface treatment:
- Bright finished (bf) / H4o Hygienic Class according to DIN 11866/11865/11864/DIN 32676
  - Ra value for circumferential weld seam of fittings not defined
  - T-pieces according to DIN 11865, option "u".
  - Circular weld seams ground with specified Ra value on request
  - Cleaning and testing methods ASTM A 632, S3
  - Weld ends of tubes and fittings are prepared for orbital welding (square cut and faced).

Tubes and fittings: Inner surface (ep)

**safetron | HE5o** Ra<sub>avg.</sub> ≤ 0,25 µm / 10µin

- Surface treatment:
- Electropolished (ep)/HE5o Hygienic Class according to DIN 11866/11865/11864/DIN 32676
  - Ra value for circumferential weld seam of formed parts not defined
  - T-pieces according to DIN 11865, option "u".
  - Circular weld seams ground with specified Ra value on request.
  - Cleaning and testing procedures according to Spec. doc. 8.4-40/3.2/3.3.2
  - Oil and grease-free in accordance with CGA G-4.1-2018 and ASTM G93 – level B
  - Weld ends of tubes and fittings are prepared for orbital welding (square cut and faced).

**2. MATERIALS**

Austenitic stainless steel tubes and fittings in:

**safetron** 1.4435 / UNS S31603 (316L) acc. to Basler Norm 2 (BN2)  
1.4404 / UNS S31603 (316L)

Hardness equivalent to: - max. 180 HV\* according to DIN EN ISO 6507-1  
- max. 90 HRB\* according to DIN EN ISO 6508-1

\* comparable to ASTM E-384 (HV) and ASTM E 18-22 (HRB)

**3. DIMENSIONS**

Imperial acc. to ASTM A269 / A270 / A632, ASME BPE and DIN 11866 Serie C

OD x WT: 1/4" to 6" (0.250 x 0.035 inch to 6.000 x 0.109 inch) 6,35 x 0,89 mm to 152,40 x 2,77 mm

ISO acc. to DIN EN ISO 1127 und DIN 11866 Serie B

OD x WT: 13,50 x 1,60 mm to 219,10 x 2,60 mm

Metric acc. to DIN 11866 Series A

on request

Manufacturing process: Welded or seamless tubes

**4. QUALITY AND TEST PROCEDURES**



Verification of basic test certificate



Visual inspection



Endoscopic inspection of bright finished tubes



Verification of dimensions



Roughness measurements



Delta ferrite measurement 1.4435 BN2 / 316L

**5. TECHNICAL TERMS OF DELIVERY**

Tubes and fittings are prepared for orbital welding:

**Tubes**

According to 11866, ASTM A 269/A 270, DIN EN 10217-7/10216-5 with a length of 5900 - 6090 mm (max. 10% short lengths of min. 3000 mm possible).

For electropolished tubes with outer diameter ≤ 5.00 mm, the length is 2950 ± 50 mm.

**Fittings**

According to DIN 11865, DIN 32676, DIN 11864

**Marking always with**

DOCKWEILER / DW-Number / Dimension / Material / Heat number / Standards and Hygiene Class

Tube and fittings shall be permanently marked as per Dockweiler guideline AA 8.5.2-80. The marking must provide all necessary information to trace back the heat number and the material grade.

**6. DOCUMENTATION, PACKAGING AND SHIPPING**

**Documentation**

The documentation result by the Dockweiler Inspection Certificate 3.1 according to DIN EN 10204. Optional online documentation WebCert.

**Packaging**

Bright finished tubes and fittings are sealed with transparent PE caps and individually packaged in PE foil. The batch label on the foil packaging contains the information safetron.

Electropolished tubes and fittings are sealed with PA/PE squares and yellow PE caps, sleeved and sealed in PE. The batch label on the foil packaging contains the information safetron ep.

**Shipping**

Delivery in tubular container or wooden crate, fittings in strong cardboard box with shock absorbing filler.