



For UHP gas applications in semiconductor industry
and fine chemistry






 **electropolished**
cleanroom cleaning and packing



1. SURFACES QUALITIES

Tubes and fittings:	Inner surface (ep)	Outer surface
 ultron	Ra _{max.} ≤ 10 µin (0.25 µm)	Ra _{max.} ≤ 48 µin (1.2 µm)
On request:	Ra _{max.} ≤ 5 µin (0.13 µm) Ra _{max.} ≤ 7 µin (0.18 µm) Ra _{max.} ≤ 20 µin (0.51 µm)	
Pipes:	Inner surface (ep)	Outer surface
 ultron	Ra _{max.} ≤ 25 µin (0.64 µm)	Mill finish, RA not defined
Additional notes:	<div>- Tubes and fittings will be supplied with a square cut. Different end preparations may be agreed on. Other specified surfaces or ends are available upon request.</div> <div>- The Ra value in the cold worked area of fittings (inner and outer surface) and on the surface of circumferential welds is not defined. For dimmensions OD < 1/4" (6.35 mm) roughness is not defined.</div> <div>- Free of oil and grease according to CGA G-4.1-2018 and ASTM G93 – level A.</div> <div>- Electropolishing procedure according to Dockweiler guideline Doc. 8.4-40/3.1/3.3.1</div> <div>- Passivation acc. ASTM A380 and ASTM A 967</div> <div>- Cleanroom cleaning and packing (Federal Class 10 / ISO Class 4)</div>	












2. MATERIALS

 ultron	1.4404 / UNS S31603 (316L), 1.4435 / UNS S31603 (316L), UNS S31603 (316L)
 ultron Alloy 22	N06022 according to ASTM B622 / B575 / B574 / B829 (1/4" to 1" seamless tubes)
 ultron VIM-VAR	UNS S31603 (316L) VIM-VAR double melted stainless steel according to ASTM A 269/A 632 for OD tubing (Imperial)
Hardness equivalent to:	<div>- max. 180 HV* according to DIN EN ISO 6507-1</div> <div>- max. 90 HRB* according to DIN EN ISO 6508-1</div> <div>* comparable to ASTM E-384 (HV) and ASTM E 18-22 (HRB)</div>

3. DIMENSIONS

Tubes and fittings:	Imperial according to ASTM A269 / A270 / A632	
OD x WT:	1/8" x 0.022" to 6" x 0.109"	3.18 x 0.56 mm to 152.4 x 2.77 mm
Length:	OD ≥ 1/4": min. 19.36 ft to max. 19.98 ft (6000 mm -100/+90) OD < 1/4": min. 9.51 ft to max. 9.84 ft (2950 mm ± 50)	
Manufacturing process:	Seamless Tubes ≤ 1" OD (25.40 mm)	Welded tubes ≥ 1 1/2" OD (38.10 mm)
Pipe:	Pipe according to ASTM A312	
Dimmensions:	NPS 8, 10, 12 Schedule 10S	Length: min. 19.36 ft to max. 19.98 ft
Manufacturing process:	Welded tubes	

4. QUALITY AND TEST PROCEDURES

 Verification of basic test certificate	 Visual inspection	 Endoscopic inspection of bright finished tubes
 Verification of dimmensions	 Roughness measurements	 Conductivity test (DI water)
 TOC-measurement of DI water	 Particle measurements	 Scanning electron microscope (SEM)
 XPS / ESCA	 Auger analysis (AES)	

5. TECHNICAL TERMS OF DELIVERY

Tubes and fittings are prepared for orbital welding:

Tubes

According to ASTM A 632/ A 269 / A 270 / A 312 (Pipe), DIN EN 10217-7 / 10216-5 with a length of 19.35 ft - 19.98 ft (5900 - 6090 mm), max. 10% short lengths of min. 9.84 ft (3000 mm). For electropolished tubes with an outer diameter ≤ 5.00 mm, the length is 2950 +/- 50 mm.

Tube fitting components

Prematerial according to DIN11865, ASTM A 403 (Pipe) and ASME B16.9 (Pipe).

Machined components

Prematerial according to ASTM A 479, DIN EN 10088-3, DIN 17440, ASTM A403 (Pipe)

Marking always with

DOCKWEILER / DW-Number / Dimension / Material / Heat number

Tube, pipe and fittings are permanently marked. The marking must provide all necessary information to trace back the heat number and the material grade.

6. DOCUMENTATION, PACKAGING AND SHIPPING

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

Tubes and fittings filled with N2 (99.999% incl. inert gas), closed with PA/PE squares and yellow PE caps, double-bagged and sealed in PE-sleeves.

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

The batch label on the foil contains the information ultron.