Specification
ultron

For UHP gas applications in semiconductor industry and fine chemistry

ultron

ep **Electropolished**

1. SURFACES QUALITIES

Tubes and fittings:	Inner surface (ep)	Outer surface
ultron	**$Ra_{avg.} \leq$ 0,25 µm (10 µin)**	**$Ra_{avg.} \leq$ 1.0 µm (40 µin)**
On request:	$Ra_{avg.} \leq$ 0,13 µm (5 µin) $Ra_{avg.} \leq$ 0,18 µm (7 µin) $Ra_{avg.} \leq$ 0,38 µm (15 µin) $Ra_{avg} \leq$ 0,51 µm (20 µin)	

Pipe:	Inner surface (ep)	Outer surface
ultron	**$Ra_{avg.} \leq$ 0,51 µm (20 µin)**	Mill finish, Ra not defined

Additional notes:
- Tube and Fittings are prepared for orbital welding (acc. to Dockweiler guideline Doc. 8.3-9/7).
- Ra values may differ for 1/8" tubes
- Pipe will be supplied with a square cut (acc. to Dockweiler guideline Doc. 8.3-9/7).
- Other specified surfaces or ends are available upon request.
- 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.
- Free of oil and grease acc. to CGA G-4.1-2018 and ASTM G93 – level A.
- Electropolishing procedure acc. to Dockweiler guideline Doc. 8.4-40/3.1/3.3.1
- Cleanroom cleaning and packing (ISO Class 4 / Federal Class 10)

2. MATERIALS

ultron	1.4404 / UNS S31603 (316L) 1.4435 / UNS S31603 (316L) 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. DIMMENSIONS

Imperial:	according to ASTM A269 / A270 / A63	
OD x WT	1/8" x 0.022" to 6" x 0.109"	3,18 x 0,56 mm to 152,40 x 2,77 mm

Metrisch:	according to DIN 11866	
OD x WT	6,00 x 1,00 mm to 35,00 x 1,50 mm	Lenght: 6000 mm -100/+90

Manufacturing process:	Seamless tubes (≤ 1")	Welded or seamless tubes (> 1")

Pipe:	according to ASTM A312	
OD x WT	NPS 8, 10, 12, 16, 20 Schedule 10S	219,08 x 3,76 mm bis 508,00 x 5,54 mm

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

Acc. to ASTM A632 / A269 / A270 / A312 (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 acc. to ASTM A 479, DIN EN 10088-3, DIN EN 10272, DIN EN 10254, DIN EN 10222-5 and ASTM A 182

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 & SHIPPING

Documentation

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

Packaging

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

The batch label on the foil contains the information ultron.

Shipping

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