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. ≤ 0,25 µm (10 µin)**	**Ra avg. ≤ 1.0 µm (40 µin)**
On request:	Ra avg. ≤ 0,13 µm (5 µin) Ra avg. ≤ 0,18 µm (7 µin) Ra avg. ≤ 0,38 µm (15 µin)	

Pipe:	Inner surface (ep)	Outer surface
ultron	**Ra avg. ≤ 0,51 µm (20 µin)**	Mill finish, RA not defined

Additional notes:	- Tube und 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 dimensions 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. DIMENSIONS

Imperial:	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

Pipe:	Pipe according to ASTM A312	
Dimensions	NPS 8, 10, 12 Schedule 10S	Length: min. 19.36 ft to max. 19.98 ft

Metric:		
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")

4. QUALITY AND TEST PROCEDURES

- Verification of basic test certificate
- Visual inspection
- Endoscopic inspection of bright finished tubes
- Verification of dimensions
- 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 A 632/ A 269 / 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)

Tube fitting components

Prematerial acc. to ASTM A 269 / A 632 / A 312 / A 403 (Pipe), DIN EN 10217-7 / 10216-5

Machined components

Prematerial acc. 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 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

Tubes and fittings filled with N2 (99.9998% incl. inert gas), closed 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.