

Datasheet

Surface 'texture' or 'roughness' control and measurement is an intrinsic part of the production process of high specification tubes. Whilst a surface can feel smooth to touch, the actual surface, once examined under laboratory conditions, is a function of a number of factors from manufacturing technologies, to lubricants, to cleaning processes.

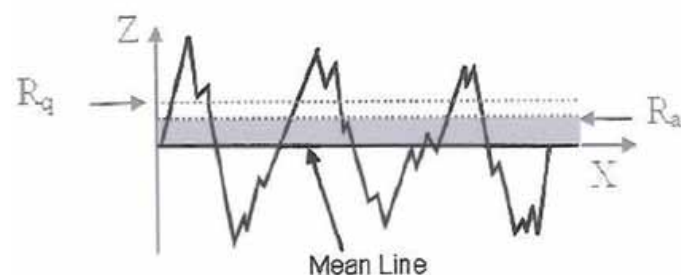
Roughness (R), Waviness (W) and Form (F) categorize engineering surfaces

Typical Standards: BS 1134:2010 Assessment of surface texture - Guidance and general information
 ISO 4287-1 Surface Roughness Terminology Part 1
 ANSI B46.1 Surface texture, surface roughness, waviness and lay

| | | |
|-------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Main Definitions: | Ra | Is the universally recognized, and most used, international parameter of roughness. It is the arithmetic mean of the absolute departures of the roughness profile from the mean line, Ra is reported in microns. |
| | Rq and RMS | Rq is the root Mean Square parameter corresponding to Ra. |
| | Rp | Is the maximum height of the profile above the mean line within the sampling length |
| | Rt | Is the maximum peak to valley height of the profile in the total assessment length L. |
| | Rz | $Rz = (Rp + Rp)$ within the sampling length l |
| | Rv | The the maximum depth of the profile below the mean line with the sampling length l |
| | Rp | Is the Maximum height of the profile above the mean line within the sampling length l |
| | AA | Arithmetic Average |
| | CLA | Centre Line Average, this is Ra expressed in Microinch |

Roughness Parameters

The Root Mean Square (RMS) roughness (Rq) is the root mean square average of the roughness profile ordinates. Note: Rq is also called RMS



Roughness Depth

The Single Roughness Depth (Rzi) is the vertical distance between the highest peak and the deepest valley within a sampling length.

The Mean Roughness Depth (Rz) is the arithmetic mean value of the single roughness depths of consecutive sampling lengths.

The Maximum Roughness Depth ($Rmax$) is the largest single roughness depth within the evaluation length.

The unit of Rz are micrometres or microinches.



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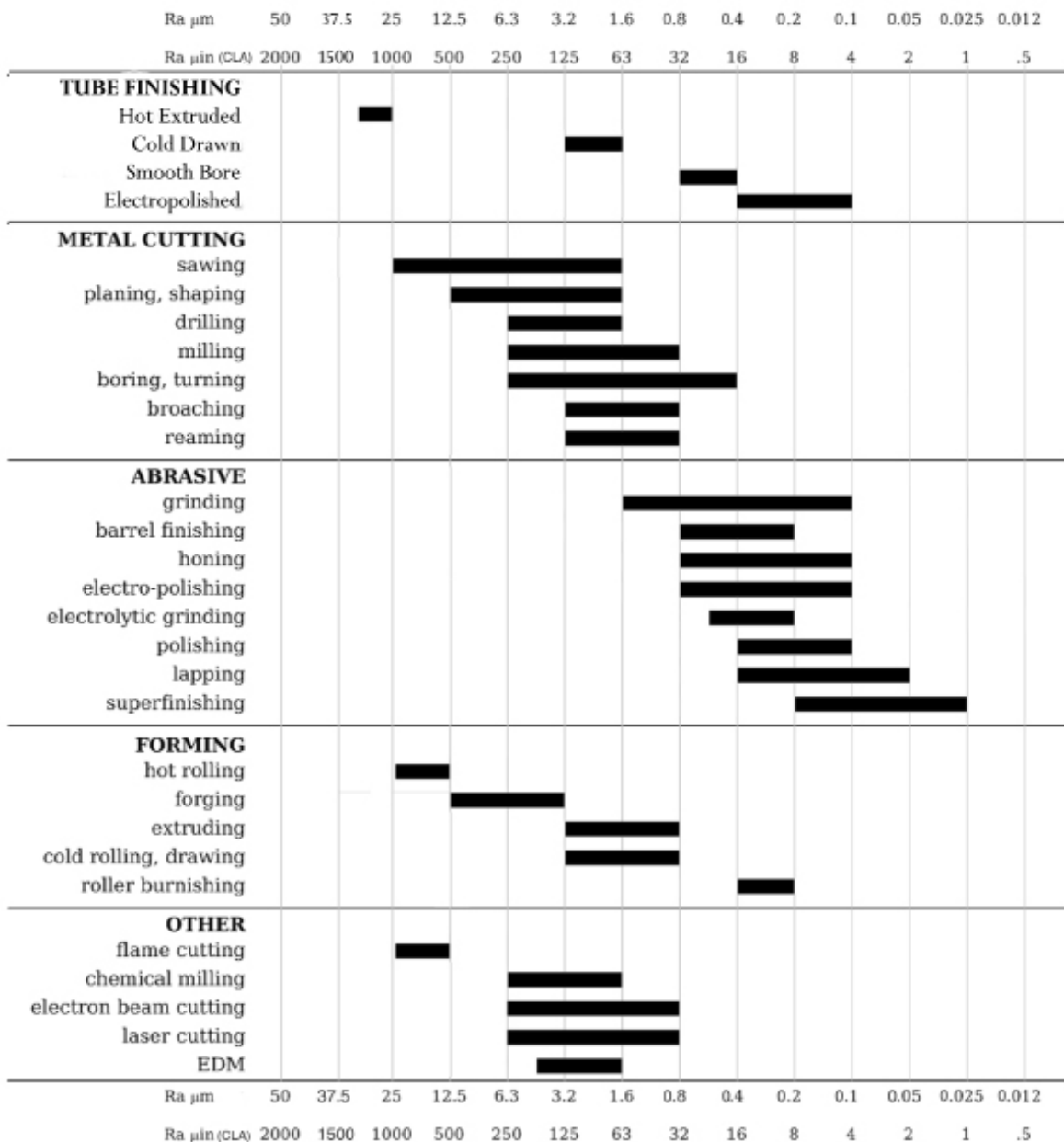
surface finishes


| Roughness Indicator | | | | | | | | | | | | | | | | | |
|-------------------------------------------|-------|-------|-------|-------|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| Roughness Number Comparison 'Rugotest. 3' | | No.1 | N0 | N1 | N2 | N3 | N4 | N5 | N6 | N7 | N8 | N9 | N10 | N11 | N12 | N13 | N14 |
| Ra | µm | 0.006 | 0.012 | 0.025 | 0.05 | 0.1 | 0.2 | 0.4 | 0.8 | 1.6 | 3.2 | 6.3 | 12.5 | 25 | 50 | 100 | 200 |
| Ra CLA | µinch | 0.25 | 0.5 | 1 | 2 | 3 | 4 | 16 | 32 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |

e.g typical reading on 25.4mm OD x 1.30mm wall Ti Al3/2.5V seamless tube:

Ra = 0.326 µm Rz = 2.820 µm CLA = 13 µ"
 Rq = 0.421 µm Rt = 3.795 µm

Indicative surface roughness comparisons



Typical Range 

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