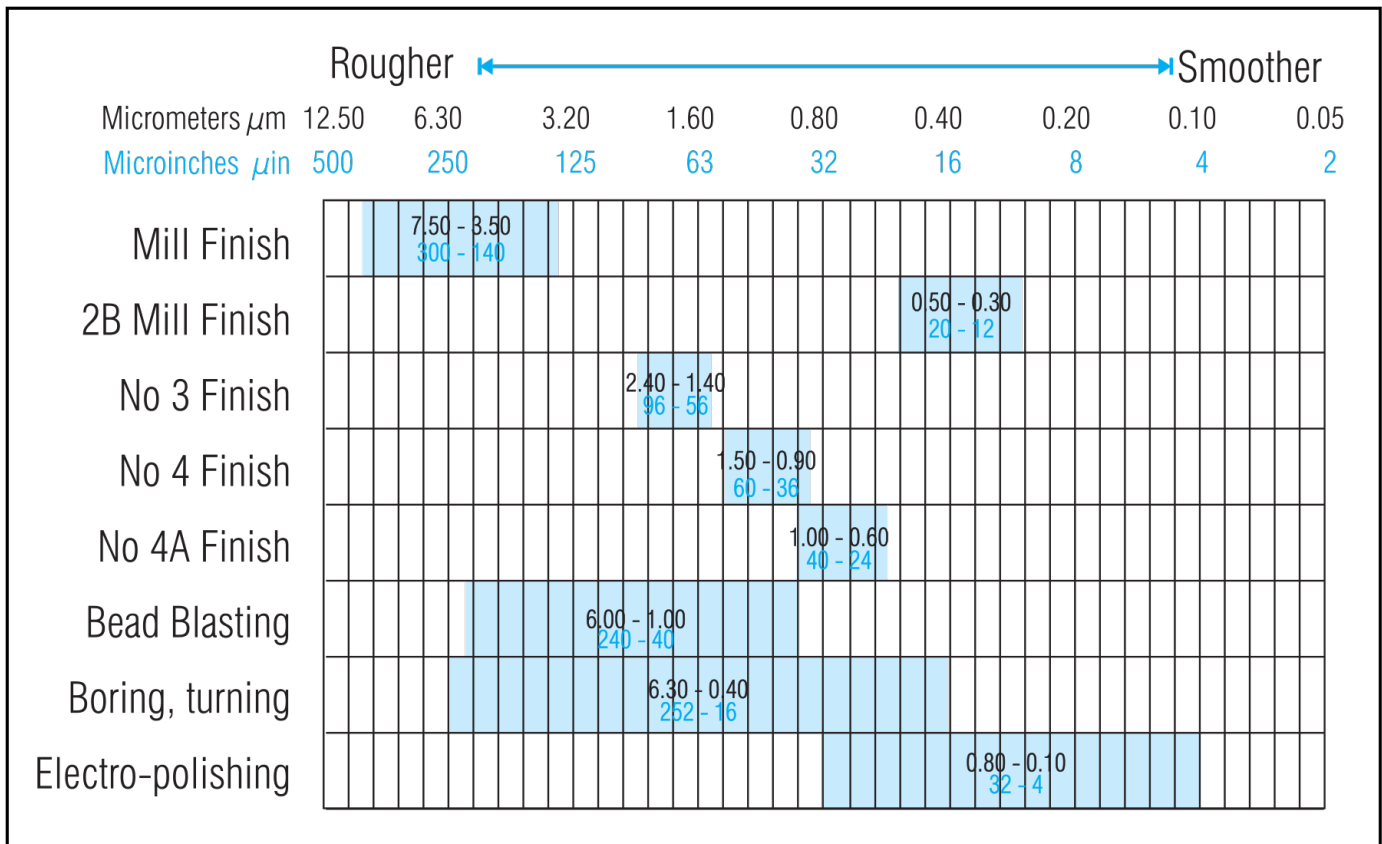


# Surface Textures of Stainless Steel



## Definitions

**Stainless steel** is defined as a steel alloy containing at least 10% chromium, plus other elements, especially nickel. Stainless steel is widely used in equipment designed and constructed to meet sanitary guidelines. It offers a long service life with product contact areas that are easy to clean and sterilize. The surface texture of these areas also has a direct bearing on the cleanability and sanitary standards.

**Surface texture** is defined as the typical surface of material, including geometric irregularities in or the composite of certain deviations. It includes roughness, waviness, and lay (grain).

**Ra (roughness average)** is a standard of the finishing industry for an average of the peaks and valleys of the metal surface. These measurements are expressed in micro inches ( $\mu\text{in}$ ) or micrometers ( $\mu\text{m}$ ).

**RMS (Root Mean Square)** is a machining standard used to diagnose machine operations and surface finish (tool lines, etc.).

## Unpolished Stainless Steel Textures

**Mill Finish** has a dull-gray, matte appearance that is produced by cold rolling to specified thickness, annealing, and descaling. Typical Ra would be 3.50 - 7.50  $\mu\text{m}$  (140 - 300  $\mu\text{in}$ ).

**2B Mill Finish** is a bright defect-free finish that is produced by a final, light cold roll pass on polished rolls. There is no visible "grain" with this finish. Typical Ra would be 0.30 - 0.50  $\mu\text{m}$  (12 - 20  $\mu\text{in}$ ).

*Note:* a 2B mill finish is only available on stainless steel sheet stock (less than 7ga). Stainless steel plate or bar stock is only available in a mill finish.

## Polished Stainless Steel Textures

**No. 3 Finish** has an intermediate polished finish with an Ra of 1.40 - 2.40  $\mu\text{m}$  (56 - 96  $\mu\text{in}$ ). This finish is generally used where a semifinished polish surface is required and may receive additional polishing,

**No. 4 & 4A Finishes** are general purpose sanitary finishes with an Ra of 0.90 - 1.50  $\mu\text{m}$  (36 - 60  $\mu\text{in}$ ) for No. 4, and 0.60 - 1.00  $\mu\text{m}$  (24 - 40  $\mu\text{in}$ ) for No. 4A.

The finishes are generally used in the food processing industry and will have a bright finish with a visible "grain" that prevents mirror-like reflections. 4A is USDA compliant.

## Other Textures

**Bead Blasting** has a Ra of 1.00 - 6.00  $\mu\text{m}$  (40 - 240  $\mu\text{in}$ ).

**Boring, Turning** has a Ra of 0.40 - 6.30  $\mu\text{m}$  (16 - 252  $\mu\text{in}$ ).

**Electro Polishing** has a Ra of 0.10 - 0.80  $\mu\text{m}$  (4 - 32  $\mu\text{in}$ ).

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