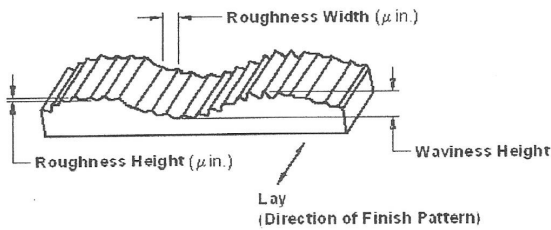


SURFACE CONDITIONS

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One of the most important parameters of the success of a gasket application is the surface condition of the mating assembly components. The suppliers' lack of control of these conditions can lead to gasket failure. Below is a list of surface features and their definitions.



- **Surface roughness** consists of fine irregularities in the surface texture, usually those resulting from the inherent action of a production process.
- **Roughness height** is the depth of the typical groove.
- **Roughness width** may be caused by the finish on the tool, the size of the grit of a grinding wheel, etc.
- **Waviness** is a more widely spaced pattern of a surface machine or work deflections, vibration or chatter. In gasketing, the extreme waviness rather than the roughness is often more difficult to seal or will require thicker gasket or special treatments.
- **Flaws** are unintentional, unexpected, and unwanted interruptions in the surface finish such as cracks, nicks, scratches, and ridges.
- **Lay** is the direction of the predominant surface pattern. This would typically be in the direction of the tool movement.

Roughness is most commonly expressed in Ra (arithmetic average of absolute values) or Rms (root mean squared) and will be in micro-meters or micro-inches.

The chart below illustrates the ranges of surface roughness that can be produced by various processes.

Manufacturing Process	Roughness Average												
	Top Number - Micrometers Bottom Number - (Microinches)												
	50 (2000)	25 (1000)	12.5 (500)	6.3 (250)	3.2 (125)	1.6 (63)	0.80 (32)	0.40 (16)	0.20 (8)	0.10 (4)	0.05 (2)	0.025 (1)	0.012 (.5)
Flame Cutting													
Snagging													
Sawing													
Planing, Shaping													
Drilling													
Chemical Milling													
Elect Discharge Machining													
Milling													
Broaching													
Reaming													
Electron Beam													
Laser													
Electro-Chemical													
Boring, Turning													
Barrel Finishing													
	50 (2000)	25 (1000)	12.5 (500)	6.3 (250)	3.2 (125)	1.6 (63)	0.80 (32)	0.40 (16)	0.20 (8)	0.10 (4)	0.05 (2)	0.025 (1)	0.012 (.5)
Electrolytic Grinding													
Roller Burnishing													
Grinding													
Honing													
Electro-Polish													
Polishing													
Lapping													
Super Finishing													
Sand Casting													
Hot Rolling													
Forging													
Permanent Mold Casting													
Investment Casting													
Extruding													
Cold Rolling, Drawing													
Die Casting													