

SURFACE ROUGHNESS PROFILE PARAMETERS

Parameter	Name
Ra	Roughness Average (Ra)
Rq	Root Mean Square (RMS) Roughness
Rt	Maximum Height of the Profile
Rv, Rm	Maximum Profile Valley Depth
Rp	Maximum Profile Peak Height
Rpm	Average Maximum Profile Peak Height
Rz	Average Maximum Height of the Profile
Rmax	Maximum Roughness Depth
Rc	Mean Height of Profile Irregularities
Rz(iso)	Roughness Height
Ry	Maximum Height of the Profile
Wt, W	Waviness Height
S	Mean Spacing of Local Peaks of the Profile
Sm, RSm	Mean Spacing of Profile Irregularities
D	Profile Peak Density
Pc	Peak Count (Peak Density)
HSC	Height Spot Count
λa	Average Wavelength of the Profile
λq	Root Mean Square (RMS) Wavelength of the Profile
Δa	Average Absolute Slope
Δq	Root Mean Square (RMS) Slope
Lo	Developed Profile Length
lr	Profile Length Ratio
Rsk,Sk	Skewness

Surface Finish Definitions:

1. **Ra:** Ra is the arithmetic average of the absolute values of the roughness profile ordinates. Also known as Arithmetic Average (AA), Center Line Average (CLA). The average roughness is the area between the roughness profile and its mean line, or the integral of the absolute value of the roughness profile height over the evaluation length
2. **Rz:** Rz is the arithmetic mean value of the single roughness depths of consecutive sampling lengths. Z is the sum of the height of the highest peaks and the lowest valley depth within a sampling length.
3. **Cutoff λc:** of a profile filter determines which wavelengths belong to roughness and which ones to waviness.
4. **Sampling Length:** is the reference for roughness evaluation. Its length is equal to the cutoff wavelength.
5. **Traversing Length:** is the overall length traveled by the stylus when acquiring the traced profile. It is the total of Pre-travel, evaluation length and post travel
6. **Evaluation Length:** is the part of the traversing length from where the values of the surface parameters are determined.
7. **Pre-Travel:** the first part of the traversing length.
8. **Post-Travel:** The last part of the traversing length

Selection of Cutoff λc

Profile		Cutoff	Sampling/Evaluation Length
Rz (μm)	Ra (μm)	λc (mm)	lr / ln (mm)
Up to .1	Up to .02	.08	.08 / .4
Over .1 up to .5	Over .02 up to .1	.25	.25 / 1.25
Over .5 up to 10	Over .1 up to 2	.8	.8 / 4
Over 10 up to 50	Over 2 up to 10	2.5	2.5 / 12.5
Over 50 up to 200	Over 10 up to 80	8	8 / 40