

TYPICAL VALUES FOR SURFACE ROUGHNESS MEASUREMENT COMPARISONS

R _s (µin)	1	2	4	8	16	32	63	125	250	500	1000	2000
R _a (µm)	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25.0	50.0
RMS (µin)	1.1	2.2	4.4	8.8	17.6	32.5	64.3	137.5	275	550	1100	2200
R _t (µm)	0.3	0.5	0.8	1.2	2.0	4.0	8.0	16	32	50	100	200
N Values	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
Swiss Stds		▽▽▽			▽▽▽			▽▽			▽	

SURFACE FINISH AND PROFILE

R_a = Roughness Average
 R_q = RMS = Root Mean Square Roughness
 R_t = Maximum Height of the Profile = Peak to Valley Roughness
 R_{sk} = Skewness
 R_{ku} = Kurtosis

ANGULAR MEASUREMENTS

1 Arc minute = 1' = 1.667 x 10⁻² degrees = slope of 291 microinches per inch
 1 Arc second = 1" = 2.778 x 10⁻⁴ degrees = slope of 4.8 microinches per inch
 1 Microradian = 0.206 arc seconds = slope of 1 microinch per inch

WAVELENGTHS OF SELECTED LASERS AND LIGHT SOURCES

1 λ = 1 wave = 2 fringes
 He Yellow, λ = 587.6 nm = 5876 Å = 0.5876 microns = 23.1 microinches
 He Ne Laser, λ = 632.8 nm = 6328 Å = 0.6328 microns = 24.9 microinches
 Sodium Vapor, λ = 589.3 nm = 5893 Å = 0.5893 microns = 23.2 microinches
 Hg Green, λ = 546.1 nm = 5461 Å = 0.5461 microns = 21.5 microinches
 CO₂ Laser, λ = 10,600 nm = 106,000 Å = 10.6 microns = 417.3 microinches

TYPICAL COEFFICIENTS OF THERMAL EXPANSION

(INCHES PER INCH PER DEGREE K, VARIES BY TEMPERATURE AND GRADE)

Aluminum (6061-T6)	23.4 X 10 ⁻⁶	Silicon Carbide (CVD)	4.6 X 10 ⁻⁶
Copper (OFHC)	16.9 X 10 ⁻⁶	Pyrex®	3.2 X 10 ⁻⁶
Steel	11.5 X 10 ⁻⁶	Silicon	2.5 X 10 ⁻⁶
Beryllium 1-70H	11.4 X 10 ⁻⁶	Invar®	1.2 X 10 ⁻⁶
Titanium	8.9 X 10 ⁻⁶	Fused Quartz	5.5 X 10 ⁻⁷
Granite	6.3 X 10 ⁻⁶	Zerodur®	1.0 X 10 ⁻⁷
Tungsten Carbide	4.9 X 10 ⁻⁶	ULE®	3.0 X 10 ⁻⁸

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DIMENSIONAL

1 Microinch = 1 µin = 10⁻⁶ in = 254 Å = 25.4 nm
 1 Micron = 1 µm = 10⁻⁶ m = 10³ nm = 39.37 µin
 1 Nanometer = 10⁻⁹ m = 10 Å = 3.937 X 10⁻⁸ in

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