

Surface Finish and Roughness Conversion Chart between selected industry standard units

Ra µm ISO 468 e 4287	AA µinch USA ASA B.46.1	Centre Line Average CLA µinch UK BS 1134	Rt µm Germany	Rz µm JIS average in 10 points	Ry µm max. height	UEFCO	ISO 1302	MCC
0.006	0.25						N01	
0.012	0.5			0.05	0.05		N0	
0.025	1		0.25	0.1	0.1		N1	
0.05	2		0.5	0.2	0.2		N2	
0.1	4	4	0.8	0.4	0.4		N3	f5
0.2	8	8	1.6	0.8	0.8	fP	N4	
0.4	16	16	2.5	1.6	1.6	fP	N5	f4
0.8	32	32	4	3.2	3.2	fG	N6	f3
1.6	63	63	8	6.3	6.3	fF	N7	f2
3.2	125	125	16	12.5	12.5	fO	N8	f1
6.3	250	250	25	25	25	fO	N9	f
12.5	500	500	50	50	50	fR	N10	
25	1000	1000	100	100	100	fT	N11	
50	2000			200	200		N12	
100	4000			400	400		N13	
200	8000						N14	

Symbols and Finishing Grades

Ra µm	AA - CLA µinch	Conventional symbols	Surface description
0.025	1	▼▼▼▼▼ ▼▼▼▼▼	Superfinishing
0.05	2		Burnishing diamond paste
0.1	4	▼▼▼▼▼	Lapped, extremely fine finish, perfectly smooth
0.2	8		Lapped for seal joints
0.4	16	▼▼▼▼	Ground, EDM
0.8	32	▼▼▼	Machined, extremely fine finish
1.6	63	▼▼	Machined, very smooth
3.2	125	▼	Machined, smooth
6.3	250		Machined, medium finish
12.5	500		Machined, coarse
25	1000	~	Raw material
50	2000	~	Raw material

Ra = Roughness, average in micro-meters & micro-inches

RMS = Root Mean Square in micro-inches

CLA = Center Line average in micro-inches

Rt = Roughness, total in microns

N = New ISO (Grade) Scale numbers

Cut-Off Length = Length required for sample.

Conversions (math):

CLA (micro inches) = Multiply Ra(µm) x 40

RMS * (acceptable 1.1 - 1.7 factor) = Multiply CLA x 1.1

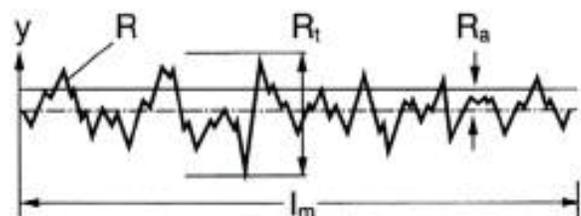
To convert Ra value to a different parameter, use this formula:

Ra x Parameter Factor = Desired Parameter

Ra to Rt:

1.0 micrometer Ra x 8.7 (Rt Factor) = 8.7 micrometer Rt

40 microinch Ra x 8.7 (Rt Factor) = 348 microinch Rt



$$R_a = \frac{1}{l_m} \int_0^{l_m} |y| dx$$