

Presentation table for roughness classes

Surface finishes



Grit	polished	polished	polished	400	320	240	180	150	120	80	60	40	36
Roughness classes	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12	N13
Rz (Rt) (Indication in METRIC)	0,22 to 0,30	0,45 to 0,60	0,80 to 1,10	1,00 to 1,80	1,60 to 2,80	3,00 to 4,80	3,00 to 6,50	5,90 to 8,00	12,00 to 16,00	23,00 to 32,00	46,00 to 57,00	90,00 to 110,00	180,00 to 220,00
Ra (Indication METRIC / in micrometers)	0,03	0,05	0,10	0,20	0,40	0,80	1,20	1,60	3,20	6,30	12,50	25,00	50,00
Rz (Rt) (Indication IMPERIAL)	0,3	0,5	0,8	1,2	2,0	4,0	8,0	13	25	50	100	200	-
Ra (Indication IMPERIAL / in microinches)	1	2	4	8	16	32	63	125	250	500	1000	2000	-

Every technical surface that is produced, for example, by machining or forming processes, is rough. During the grinding process, the scratching of the abrasive grains on the surface creates valleys and peaks. There are various methods of determining the roughness of a surface, on the basis of which a cross-section of the surface is scanned for measurement. The length of the defined measuring section has an influence on the result of the roughness depth (Rt).

One method for determining the roughness depth can be the arithmetic mean roughness index (Ra). The value is the best known and most widely used indication of roughness worldwide, but not as meaningful as the averaged roughness depth (Rz).

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To determine the **arithmetic mean roughness index (Ra)** the height and depth differences of the surface will be logged when measuring the cross-section. With the help of an integral formula, the arithmetic mean roughness index can then be determined. The span of this index goes from 50 μ m, on very rough surfaces with noticeable grooves, up to 0.03 μ m, with no longer visible traces of processing is sufficient.

The **averaged roughness depth (Rz)** describes the surface roughness better. Here the measurement section is divided into 5 individual measuring sections of equal length. In each of the 5 areas, the individual roughness (Z) will be determined. It is the distance from the highest to the lowest point of the profile, within the individual measurement section. These 5 individual roughness values are added and divided by 5 (arithmetic mean taken). The result of this method is referred to as the averaged roughness depth.