Surface roughness chart: Ra, N grades and processes

Ra is the arithmetic mean profile deviation in micrometres. N grades are an older notation still often seen on drawings. Theoretical Ra in turning ≈ f^2 / (32 r).

Roughness grades (ISO 1302)

N	RA, MM	TYPICAL PROCESS
N12	50,0	Rough sawing, flame cutting
N11	25,0	Rough machining
N10	12,5	Roughing
N9	6,3	Normal machining
N8	3,2	Normal machined surface
N7	1,6	Finish turning / milling
N6	0,800	Fine finishing, grinding
N5	0,400	Grinding
N4	0,200	Fine grinding, honing
N3	0,100	Lapping
N2	0,050	Lapping, polishing
N1	0,025	Superfinishing

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