



Cutting Processes – Tolerance and Surface roughness

Useful table of tolerance and surface roughness achievable with cutting and machining process (collectively termed "material removal processes").

NOTE: These information have been collated personally from a variety of sources.

Process Name	Tolerance (mm)		Surface Tolerance (μm)	
	min	max	min	max
Electro- discharge wire cutting	0.01	0.125	0.1	30
Band sawing	0.8	3	0.8	45
Circular sawing	0.2	3	0.8	45
Cropping/guillotining	0.2	2	0.1	12.5
Sheet metal	0.01	1	0.1	12.5
Water jet cutting	0.1	0.25	3.2	27
Oxyfuel gas cutting	0.8	2	6.3	71
Plasma arc cutting	0.5	2.54	12	128
Chemical machining	0.004	0.3	0.8	12.5
Chemical polishing	-	-	0.0001	1.3
Electro-Chemical Machining	0.013	0.5	0.2	12.5
Electro-Discharge Machining	0.05	0.1	0.1	30
Electron beam machining	0.005	0.05	0.2	6.3
Electropolishing	-	-	0.012	1.3
Abrasive jet machining	0.05	0.125	0.1	1.6
Abrasive grinding / polishing	0.0006	0.1	0.025	6.3
Broaching	0.0015	0.02	0.4	6.3
Drilling	0.02	0.5	0.4	12.5

Honing	0.00055	0.04	0.025	1.6
Lapping	0.00055	0.04	0.012	0.8
Milling (CNC)	0.01	1	0.2	25
Milling (manual)	0.01	1	0.2	25
Planing/shaping	0.02	1	0.4	25
Reaming	0.002	0.07	0.4	6.3
Turning/boring (CNC)	0.003	0.2	0.05	25
Turning/boring (manual)	0.003	0.2	0.05	25
Ultrasonic machining	0.005	0.05	0.2	1.6
Laser beam machining	0.013	0.13	0.2	6.3

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