

# ECONOMICS OF MATERIALS PROCESSING

Process	Typical Tolerance (mm)	Materials	Labour Costs	Equipment Costs	Economic Batch Size
<b>Casting</b>					
sand	±1.5	any, but steel difficult	medium to high	low - high if automated	manual < 100 automated, any quantity
shell	±0.1	most	high	high	>100
die	±0.05	Al, Zn, Mn and Cu alloys	low	high	> 1000
<b>Deformation</b>					
hot forging open die	±5.0	most	high	medium	1-100
cold forging and extrusion	±0.1	most stronger materials difficult	low	high	>1000
rolling	±0.5	most	low	high	>5000m
<b>Press working</b>					
blanking	±0.03	usually steel, Al or Cu alloy	low	high	>1000
drawing	±0.1	as above	low	medium to high	>1000
<b>Machining</b>					
drilling	±0.05	most unhardened materials (excluding ceramics)	medium	low	1+
turning	±0.03	most unhardened materials	high to medium	medium	1+
milling	±0.05	(excluding ceramics)	high to medium	medium	1+
grinding	±0.08	most	medium	medium	1+
<b>Injection moulding</b>	±0.1	most thermosetting plastics and thermoplastics	low	high	>1000

