Formulas

Measurement unit abbreviations

fpr	feed per revolution
fpt	feed per tooth
rpm	revolutions per minute
tpi	threads per inch

Constants

π	3.1416

Formulas

Descriptions	Full	Abbreviated
Bend allowance (for 90° bend)	(radius + (0.4 × thickness)) × 1.5708	(r + (0.4 × T)) × 1.5708
Cutting force	length × thickness × shear strength	L × T × S
External thread depth (imperial)	0.6134 × pitch	0.6134 × P
Feed rate per minute	feed per tooth × # teeth × revolutions per minute	fpt × N × rpm
Internal thread depth (imperial)	0.5413 × pitch	0.5413 × P

Formulas (continued)

Measurement over wires	major diameter + (3 × wire diameter) $-\left(\frac{1.5155}{\text{threads per inch}}\right)$	MD + (3 × WD) $-\left(\frac{1.5155}{\text{tpi}}\right)$
Measurement over wires	pitch diameter − (0.866025 × pitch) + (3 × wire diameter)	PD − (0.866025 × P) + (3 × WD)
Pitch diameter (metric)	major diameter − (0.6495 × pitch)	MD − (0.6495 × P)
Revolutions per minute (imperial)	$\frac{12 \times \text{cutting speed}}{\pi \times \text{diameter}}$	$\frac{12 \times CS}{\pi D}$
Revolutions per minute (metric)	$\frac{1\,000 \times \text{cutting speed}}{\pi \times \text{diameter}}$	$\frac{1\,000 \times CS}{\pi D}$
Tap drill size	major diameter − pitch	MD − P
Time (for lathe)	$\frac{\text{length}}{\text{feed per revolution} \times \text{revolutions per minute}}$	$\frac{L}{fpr \times rpm}$
Time (for mill)	$\frac{\text{length}}{\text{feed per tooth} \times \#\text{ teeth} \times \text{revolutions per minute}}$	$\frac{L}{fpt \times N \times rpm}$
Wire size	0.57735 × pitch	0.57735 × P