Tap Drill Size and Thread Percentage (Metric and Unified)

Tap drill diameter for a target percentage of thread from the major diameter and pitch, and the thread percentage a given drill gives (cut taps).

Method: % thread = 76.98 (D − d)/P for 60° threads (machinists' practice; Machinery's Handbook)

Input parameters

Unit system: SI

Parameter	Value	Unit
Thread major diameter	8.0000	mm
Pitch Unified threads: pitch = 1/TPI (25.4 mm ÷ threads per inch, e.g. 1/4-20 UNC has 1.27 mm).	1.2500	mm
Target thread percentage	75.000	
Drill to check	6.8000	mm

Calculated results

Parameter	Value	Unit
Drill for the target	6.7822	mm
Thread percentage with the drill	73.901	

Notes for this case

- For cutting taps on 60° threads; forming taps need a larger hole. Round to a drill you can buy.

Formula and method

$$x = 76.98\,\frac{D-d}{P}, \quad d = D - \frac{xP}{76.98}$$

Variables

D	Thread major diameter	m
P	Pitch	m
x	Target thread percentage	-
d_d	Drill to check	m
d_t	Drill for the target	m
x_d	Thread percentage with the drill	-

Method and standards

Thread geometry.

Assumptions and limits

- Pitch is entered as a length; for Unified threads divide 25.4 mm by the threads per inch.
- The page warns when the drill to check gives 0 % or less (drill at or above the major diameter) or more than 100 % thread.
- 60° threads, cut taps.

References

- % thread = 76.98 (D − d)/P for 60° threads (machinists' practice; Machinery's Handbook)

Report details

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Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/mechanical/manufacturing/tap-drill-size

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.