

CUTTING DATA

HSS Cutting Tools

Starting cutting data for HSS / HSS-E drills and HSS / HSS-E / HSS-E-PM taps.

HSS Drills	HSS-E Cobalt	HSS Taps	Metric
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How to use this guide

Use the lower end for harder materials, deep holes and uncertain machine rigidity. HSS-E / cobalt tools can usually operate nearer the upper end under stable conditions.

HSS drill starting cutting speed

Workpiece	Starting Vc (m/min)	Notes
Mild steel	20-30	General HSS drill
Medium / alloy steel	15-25	Reduce as strength rises
Stainless steel	8-15	HSS-E cobalt preferred
Cast iron	15-25	Short-chipping
Aluminum	30-60	Bright/polished flute
Brass / copper alloy	25-50	Suitable point geometry
Titanium	5-10	Strong coolant
Nickel alloy	5-8	Very conservative speed

HSS DRILL FEED

Starting feed per revolution

Drill D	fn (mm/rev)
1-3 mm	0.03-0.08
>3-6 mm	0.06-0.12
>6-10 mm	0.10-0.18
>10-16 mm	0.15-0.25
>16-25 mm	0.20-0.32
>25-40 mm	0.25-0.40

Formulas

$$\text{RPM } n = (1000 \times Vc) / (\pi \times D)$$

$$Vf = \text{RPM} \times fn$$

Deep-hole note

- Use pecking only when chip evacuation requires it.
- For stainless, avoid rubbing that can work-harden the hole.

Aluminum note

- Clear long chips before they pack in the flute.
- Keep flutes clean to prevent built-up edge.

HSS TAPS

Starting tap cutting speed

Workpiece	Starting Vc (m/min)
Carbon steel	6-15
Alloy steel	5-12
Stainless steel	4-8
Cast iron	8-15
Aluminum / non-ferrous	10-25
Titanium / nickel	2-5

Tap feed relationship

Tap feed per revolution = thread pitch
 $V_f = \text{RPM} \times \text{pitch}$

Disclaimer: HSS performance depends strongly on cobalt content, coating, point geometry, tap flute style and lubricant.