

RECOMMENDED CUTTING CONDITIONS

SHOULDER MILLING (At a small width of cut.★)

	Work Material	Hardness	Grade	Cutting Speed vc (m/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Feed per Tooth fz (mm/tooth)
P	Carbon Steel Alloy Steel	180—280HB	VP15TF	200 (80—300)	≤0.05D ₁	≤0.05D ₁	0.2 (≤0.4)
	Pre-Hardened Steel	≤45HRC	VP15TF	150 (80—200)	≤0.05D ₁	≤0.05D ₁	0.15 (≤0.3)
	Alloy Tool Steel	180—380HB	VP15TF	150 (80—200)	≤0.05D ₁	≤0.05D ₁	0.15 (≤0.3)
M	Stainless Steel	≤270HB	VP15TF	150 (100—200)	≤0.05D ₁	≤0.05D ₁	0.2 (≤0.4)
K	Cast Iron	Tensile Strength ≤350MPa	MP8010	250 (180—450)	≤0.05D ₁	≤0.05D ₁	0.3 (≤0.4)
	Ductile Cast Iron	Tensile Strength ≤350MPa	MP8010	200 (80—300)	≤0.05D ₁	≤0.1D ₁	0.3 (≤0.4)
H	Hardened Steel	45—55HRC	MP8010	100 (80—120)	≤0.05D ₁	≤0.02D ₁	0.1 (≤0.2)
	Hardened Steel	55—65HRC	MP8010	80 (60—100)	≤0.05D ₁	≤0.02D ₁	0.1 (≤0.2)

★ When the pick feed direction is along the axis of the tool such as finish machining at the wall part.

SLOTTING•SHOULDER MILLING (At a large width of cut.★)

	Work Material	Hardness	Grade	Cutting Speed vc (m/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Feed per Tooth fz (mm/tooth)
P	Carbon Steel Alloy Steel	180—280HB	VP15TF	200 (80—300)	≤0.02D ₁	≤D ₁	0.2 (≤0.4)
	Pre-Hardened Steel	≤45HRC	VP15TF	150 (80—200)	≤0.02D ₁	≤D ₁	0.15 (≤0.3)
	Alloy Tool Steel	180—380HB	VP15TF	150 (80—200)	≤0.02D ₁	≤D ₁	0.15 (≤0.3)
M	Stainless Steel	≤270HB	VP15TF	150 (100—200)	≤0.02D ₁	≤D ₁	0.2 (≤0.4)
K	Cast Iron	Tensile Strength ≤350MPa	MP8010	250 (180—450)	≤0.03D ₁	≤D ₁	0.3 (≤0.4)
	Ductile Cast Iron	Tensile Strength ≤350MPa	MP8010	200 (80—300)	≤0.03D ₁	≤D ₁	0.3 (≤0.4)
H	Hardened Steel	45—55HRC	MP8010	100 (80—120)	≤0.01D ₁	≤D ₁	0.1 (≤0.2)
	Hardened Steel	55—65HRC	MP8010	70 (60—80)	≤0.01D ₁	≤D ₁	0.1 (≤0.2)

★ When the feed is in the radial axis of the tool. E.g. machining a side wall.

(Note 1) Cutting conditions are for a standard steel shank type. If vibration or chipping of the insert occurs, reduce the cutting conditions appropriately.

(Note 2) Cutting speed is calculated at the peripheral edge of the tool. Calculate spindle speed in the following way.

Spindle speed $n(\text{min}^{-1}) = 1000 \times \text{Cutting speed } vc \div \text{Diameter of cutting tool } D_1 \div 3.14$

(Note 3) Please note the following when machining hardened steel with MP8010.

- Shorten tool overhang as much as possible.
- Use a carbide shank type.
- Depth of cut setting is important to prevent fracture.