

RECOMMENDED CUTTING CONDITIONS

CUTTING CONDITIONS FOR SHOULDER MILLING

Work Material	Hardness	Grade Breaker	Cutting Speed vc (m/min)	Cutting Width ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)		
						φ40 Length of cut 56mm φ50 Length of cut 42mm	φ50 Length of cut 56mm φ63 Length of cut 56mm	φ50 Length of cut 84mm
P Mild Steel	≤180HB	VP15TF M Breaker	200 (160–250)	−0.15D ₁	−20	0.25	0.25	0.2
					−50	0.2	0.2	0.15
					−80	—	—	0.1
			160 (120–200)	−0.3D ₁	−20	0.25	0.25	0.2
					−50	0.2	0.2	0.15
					−80	—	—	0.1
Carbon Steel Alloy Steel	180–350HB	VP15TF M Breaker	160 (120–200)	−0.15D ₁	−20	0.25	0.25	0.2
					−50	0.2	0.2	0.15
					−80	—	—	0.1
			120 (100–140)	−0.3D ₁	−20	0.25	0.25	0.2
					−50	0.2	0.2	0.15
					−80	—	—	0.1
M Stainless Steel	≤270HB	VP20RT M Breaker	160 (120–200)	−0.15D ₁	−10	0.25	0.25	0.2
					−50	0.2	0.2	0.15
					−80	—	—	0.1
			120 (100–140)	−0.3D ₁	−10	0.25	0.25	0.2
					−50	0.2	0.2	0.15
					−80	—	—	0.1
K Gray Cast Iron	Tensile Strength ≤350MPa	MC5020 H Breaker	230 (180–280)	−0.15D ₁	−10	0.3	0.3	0.25
					−50	0.25	0.25	0.2
					−80	—	—	0.15
		MC5020 H Breaker	190 (140–240)	−0.3D ₁	−10	0.25	0.25	0.2
					−50	0.2	0.2	0.15
					−80	—	—	0.1
Ductile Cast Iron	Tensile Strength ≤800MPa	MC5020 H Breaker	190 (140–220)	−0.15D ₁	−10	0.25	0.25	0.2
					−50	0.2	0.2	0.15
					−80	—	—	0.1
		MC5020 H Breaker	170 (120–220)	−0.3D ₁	−10	0.2	0.2	0.15
					−50	0.15	0.15	0.1
					−80	—	—	0.07
S Ti Alloy	≤350HB	VP20RT H Breaker	40 (30–60)	−0.15D ₁	−20	0.1	0.1	—
					−50	0.1	0.1	—
Heat Resistant Alloy	—	VP20RT H Breaker	30 (20–40)	−0.15D ₁	−10	0.07	0.07	—

(Note) The above cutting conditions are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

CUTTING CONDITIONS FOR SLOT MILLING

Work Material	Hardness	Grade Breaker	Cutting Speed vc (m/min)	Cutting Width ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/tooth)		
						φ40 Length of cut 56mm φ50 Length of cut 42mm	φ50 Length of cut 56mm φ63 Length of cut 56mm	φ50 Length of cut 84mm
P Mild Steel	≤180HB	VP15TF M Breaker	140 (120–160)	D ₁	−20	0.2	0.2	0.15
					−50	0.15	0.15	—
Carbon Steel Alloy Steel	180–350HB	VP15TF M Breaker	100 (80–120)	D ₁	−20	0.15	0.15	0.1
					−50	0.1	0.1	—
M Stainless Steel	≤270HB	VP20RT M Breaker	100 (80–120)	D ₁	−10	0.1	0.1	0.07
K Gray Cast Iron	Tensile Strength ≤350MPa	MC5020 H Breaker	190 (140–240)	D ₁	−10	0.25	0.25	0.2
					−50	0.2	0.2	0.15
Ductile Cast Iron	Tensile Strength ≤800MPa	MC5020 H Breaker	170 (120–220)	D ₁	−10	0.15	0.15	0.1
					−50	0.1	0.1	—
S Ti Alloy	≤350HB	VP20RT H Breaker	40 (30–60)	D ₁	−50	0.08	0.08	—
					Heat Resistant Alloy	—	VP20RT H Breaker	30 (20–40)

(Note) The above cutting conditions are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust processing conditions if the vibration is generated.