

# CUTTING TOOLS & PRECISION TOOLS

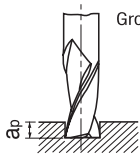
## Cutting Conditions



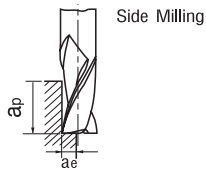
### • VG MILL Two Flutes L9442

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Work Material Milling Condition	Carbon Steels, Cast Irons (150-250HB)		Alloy Steels, Pre-hardened Steels (25-35HRC)		Hardened Steels (35-45HRC)		Hardened Steels (45-55HRC)		Stainless Steels (SUS304, 316)		Nickel Alloys, Titanium Alloys		
	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	
Dia. of Mill mm													
2	11200	340	10500	240	7300	130	5300	80	5300	90	3300	50	
4	6400	460	6000	320	4200	180	3000	110	3000	130	1900	70	
6	4600	550	4300	390	3000	210	2200	130	2200	150	1400	80	
8	3400	550	3200	390	2200	210	1600	130	1600	150	1000	80	
10	2800	560	2600	390	1800	210	1300	130	1300	150	800	80	
12	2300	560	2200	400	1500	210	1100	130	1100	150	700	80	
16	1700	450	1600	320	1100	180	800	100	800	110	500	60	
20	1350	380	1300	280	900	160	650	90	650	100	400	50	
Side Milling	a <sub>p</sub>	1.5D				1D		1.5D		1D			
	a <sub>e</sub>	0.1D				0.05D		0.02D		0.1D		0.05D	
Grooving	a <sub>p</sub>	0.5D				0.3D		0.05D		0.5D		0.05D	



Grooving

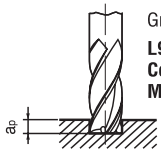


Side Milling

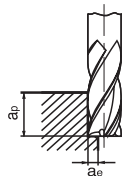
### • VG MILL Four Flutes L9444

Conventional Milling : VG Mill L9444

Work Material Milling Condition	Carbon Steels, Cast Irons (150-250HB)		Alloy Steels, Pre-hardened Steels (25-35HRC)		Hardened Steels (35-45HRC)		Hardened Steels (45-55HRC)		Stainless Steels (SUS304, 316)		Nickel Alloys, Titanium Alloys		
	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	Rotation min <sup>-1</sup>	Feed mm/min	
Dia. of Mill mm													
2	12800	570	12000	380	8300	130	6000	150	6000	130	3700	70	
4	6800	730	6400	490	4400	180	3200	200	3200	170	2000	90	
6	4600	770	4300	520	3000	210	2200	210	2200	180	1400	100	
8	3400	770	3200	520	2200	210	1600	210	1600	180	1000	100	
10	2800	780	2600	520	1800	210	1300	210	1300	180	800	100	
12	2300	780	2200	530	1500	210	1100	210	1100	180	700	100	
16	1700	650	1600	420	1100	180	800	170	800	150	500	80	
20	1350	600	1300	380	900	160	650	150	650	140	400	75	
Side Milling	a <sub>p</sub>	1.5D				1D		1.5D		1.5D		1D	
	a <sub>e</sub>	0.1D				0.05D		0.02D		0.1D		0.05D	
Grooving	a <sub>p</sub>	0.5D				0.3D		0.05D		0.5D		0.1D	



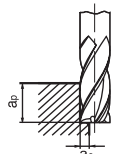
Grooving  
L9444  
Conventional  
Milling



Side Milling

### High Speed Milling : VG Mill L9444

Work Material Milling Condition	Rolled Steels Carbon Steels SS, S C		Alloy Steels SCM Pre-Hardened Steels NAK, HPM		Hardened Steels (35-45HRC)		Harden Steels (45-55 HRC)		Stainless Steels (SUS 304, 316)		
	Rotation min <sup>-1</sup>	Feed mm/min <sup>-1</sup>	Rotation min <sup>-1</sup>	Feed mm/min <sup>-1</sup>	Rotation min <sup>-1</sup>	Feed mm/min <sup>-1</sup>	Rotation min <sup>-1</sup>	Feed mm/min <sup>-1</sup>	Rotation min <sup>-1</sup>	Feed mm/min <sup>-1</sup>	
Dia. of Mill mm											
2	47800	2200	47800	1600	39800	1200	31800	900	15900	400	
4	23900	2600	23900	1900	19900	1400	15900	1100	8000	490	
6	16000	2700	16000	2000	13300	1500	10600	1200	5300	510	
8	12000	2700	12000	2000	10000	1500	8000	1200	4000	520	
10	9600	2700	9600	2000	8000	1500	6400	1200	3200	520	
12	8000	2700	8000	2000	6700	1500	5300	1200	2700	520	
16	6000	2200	6000	1600	5000	1200	4000	900	2000	450	
20	4800	2000	4800	1400	4000	1000	3200	750	1600	380	
Side Milling	a <sub>p</sub>	1.5D				1D		1D		1.5D	
	a <sub>e</sub>	0.1D				0.05D		0.02D		0.1D	



Side Milling  
L9444  
High Speed Milling