







# Modular End Mills

High-Performance DUO-LOCK® Modular End Mills • VariMill™

## ■ VariMill • 4XC5 • 4XCT • Asymmetrical Flute Spacing

Material Group	  			Side Milling (A) and Slotting (B)			short	medium	long	Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.									
	A		B	adapter reach						D1 – Diameter									
	ap		ae	ap	WP15PE WS15PE		WP15PE WS15PE		WP15PE WS15PE		frac.	3/8	1/2	5/8	3/4	1	1 1/4		
	min		max	min	max	min	max	min	max	dec.	.3750	.5000	.6250	.7500	1.0000	1.2500			
	Cutting Speed – vc SFM		Cutting Speed – vc SFM		Cutting Speed – vc SFM		Cutting Speed – vc SFM		Cutting Speed – vc SFM										
P	0	1.5 x D	0.5 x D	1 x D	490	– 660	441	– 594	441	– 594	441	– 594	IPT	.0023	.0029	.0034	.0037	.0042	.0042
	1	1.5 x D	0.5 x D	1 x D	490	– 660	441	– 594	441	– 594	441	– 594	IPT	.0023	.0029	.0034	.0037	.0042	.0042
	2	1.5 x D	0.5 x D	1 x D	460	– 620	414	– 558	414	– 558	414	– 558	IPT	.0023	.0029	.0034	.0037	.0042	.0042
	3	1.5 x D	0.5 x D	1 x D	390	– 520	351	– 468	351	– 468	351	– 468	IPT	.0019	.0025	.0029	.0033	.0038	.0041
	4	1.5 x D	0.5 x D	0.75 x D	300	– 490	270	– 441	270	– 441	270	– 441	IPT	.0017	.0022	.0026	.0029	.0033	.0034
	5	1.5 x D	0.5 x D	1 x D	200	– 330	170	– 281	160	– 264	160	– 264	IPT	.0016	.0020	.0023	.0026	.0031	.0033
M	6	1.5 x D	0.5 x D	0.75 x D	160	– 250	136	– 213	128	– 200	128	– 200	IPT	.0013	.0016	.0019	.0021	.0024	.0024
	1	1.5 x D	0.5 x D	1 x D	300	– 380	240	– 304	210	– 266	210	– 266	IPT	.0019	.0025	.0029	.0033	.0038	.0041
	2	1.5 x D	0.5 x D	1 x D	200	– 260	160	– 208	140	– 182	140	– 182	IPT	.0016	.0020	.0023	.0026	.0031	.0033
K	3	1.5 x D	0.5 x D	1 x D	200	– 230	160	– 184	140	– 161	140	– 161	IPT	.0013	.0016	.0019	.0021	.0024	.0024
	1	1.5 x D	0.5 x D	1 x D	390	– 490	351	– 441	351	– 441	351	– 441	IPT	.0023	.0029	.0034	.0037	.0042	.0042
	2	1.5 x D	0.5 x D	1 x D	360	– 460	324	– 414	324	– 414	324	– 414	IPT	.0019	.0025	.0029	.0033	.0038	.0041
S	3	1.5 x D	0.5 x D	1 x D	360	– 430	324	– 387	324	– 387	324	– 387	IPT	.0016	.0020	.0023	.0026	.0031	.0033
	1	1.5 x D	0.3 x D	0.3 x D	160	– 300	128	– 240	96	– 180	96	– 180	IPT	.0019	.0025	.0029	.0033	.0038	.0041
	2	1.5 x D	0.3 x D	0.3 x D	80	– 130	64	– 104	48	– 78	48	– 78	IPT	.0010	.0013	.0015	.0018	.0021	.0022
	3	1.5 x D	0.5 x D	1 x D	200	– 260	160	– 208	120	– 156	120	– 156	IPT	.0016	.0020	.0023	.0026	.0031	.0033
H	4	1.5 x D	0.5 x D	1 x D	160	– 200	128	– 160	96	– 120	96	– 120	IPT	.0014	.0018	.0021	.0024	.0028	.0030
	1	1.5 x D	0.5 x D	0.75 x D	260	– 460	208	– 368	156	– 276	156	– 276	IPT	.0017	.0022	.0026	.0029	.0033	.0034
	2	1.5 x D	0.2 x D	0.5 x D	230	– 390	184	– 312	138	– 234	138	– 234	IPT	.0013	.0016	.0019	.0021	.0024	.0024

## ■ VariMill II™ • 5VCC • 5VCE • Unequal Flute Spacing

Material Group	  			Side Milling (A) and Slotting (B)			short	medium	long	Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.									
	A		B	adapter reach						D1 – Diameter									
	ap		ae	ap	WP15PE WS15PE		WP15PE WS15PE		WP15PE WS15PE		frac.	3/8	1/2	5/8	3/4	1	1 1/4		
	min		max	min	max	min	max	min	max	min	max	dec.	.3750	.5000	.6250	.7500	1.0000	1.2500	
	Cutting Speed – vc SFM		Cutting Speed – vc SFM		Cutting Speed – vc SFM		Cutting Speed – vc SFM		Cutting Speed – vc SFM										
P	0	1.5 x D	0.5 x D	1 x D	490	– 660	441	– 594	441	– 594	441	– 594	IPT	.0023	.0029	.0034	.0037	.0042	.0042
	1	1.5 x D	0.5 x D	1 x D	490	– 660	441	– 594	441	– 594	441	– 594	IPT	.0023	.0029	.0034	.0037	.0042	.0042
	2	1.5 x D	0.5 x D	1 x D	460	– 620	414	– 558	414	– 558	414	– 558	IPT	.0023	.0029	.0034	.0037	.0042	.0042
	3	1.5 x D	0.5 x D	1 x D	390	– 520	351	– 468	351	– 468	351	– 468	IPT	.0019	.0025	.0029	.0033	.0038	.0041
	4	1.5 x D	0.5 x D	0.75 x D	300	– 490	270	– 441	270	– 441	270	– 441	IPT	.0017	.0022	.0026	.0029	.0033	.0034
	5	1.5 x D	0.5 x D	1 x D	200	– 330	170	– 281	160	– 264	160	– 264	IPT	.0016	.0020	.0023	.0026	.0031	.0033
M	6	1.5 x D	0.5 x D	0.75 x D	160	– 250	136	– 213	128	– 200	128	– 200	IPT	.0013	.0016	.0019	.0021	.0024	.0024
	1	1.5 x D	0.5 x D	1 x D	300	– 380	240	– 304	210	– 266	210	– 266	IPT	.0019	.0025	.0029	.0033	.0038	.0041
	2	1.5 x D	0.5 x D	1 x D	200	– 260	160	– 208	140	– 182	140	– 182	IPT	.0016	.0020	.0023	.0026	.0031	.0033
K	3	1.5 x D	0.5 x D	1 x D	200	– 230	160	– 184	140	– 161	140	– 161	IPT	.0013	.0016	.0019	.0021	.0024	.0024
	1	1.5 x D	0.5 x D	1 x D	390	– 490	351	– 441	351	– 441	351	– 441	IPT	.0023	.0029	.0034	.0037	.0042	.0042
	2	1.5 x D	0.5 x D	1 x D	360	– 460	324	– 414	324	– 414	324	– 414	IPT	.0019	.0025	.0029	.0033	.0038	.0041
S	3	1.5 x D	0.5 x D	1 x D	360	– 430	324	– 387	324	– 387	324	– 387	IPT	.0016	.0020	.0023	.0026	.0031	.0033
	1	1.5 x D	0.3 x D	0.3 x D	160	– 300	128	– 240	96	– 180	96	– 180	IPT	.0019	.0025	.0029	.0033	.0038	.0041
	2	1.5 x D	0.3 x D	0.3 x D	80	– 130	64	– 104	48	– 78	48	– 78	IPT	.0010	.0013	.0015	.0018	.0021	.0022
	3	1.5 x D	0.5 x D	1 x D	200	– 260	160	– 208	120	– 156	120	– 156	IPT	.0016	.0020	.0023	.0026	.0031	.0033
H	4	1.5 x D	0.5 x D	1 x D	160	– 200	128	– 160	96	– 120	96	– 120	IPT	.0014	.0018	.0021	.0024	.0028	.0030
	1	1.5 x D	0.5 x D	0.75 x D	260	– 460	208	– 368	156	– 276	156	– 276	IPT	.0017	.0022	.0026	.0029	.0033	.0034
	2	1.5 x D	0.2 x D	0.5 x D	230	– 390	184	– 312	138	– 234	138	– 234	IPT	.0013	.0016	.0019	.0021	.0024	.0024

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.  
 Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.  
 Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >1/2".  
 For side milling with ap bigger than 1 x D reduce IPT by 20%!