

# Victory™ Shoulder Mills • VSM490™-15 Series

## Insert Selection Guide

Material Group	Light Machining		General Purpose		Heavy Machining	
	Geometry	Grade	Geometry	Grade	Geometry	Grade
P1-P2	XNGU-ML	WP40PM	XNPU-MM	WP40PM	XNPU-MM	WP40PM
P3-P4	XNGU-ML	WP40PM	XNPU-MM	WP40PM	XNPU-MM	WP40PM
P5-P6	XNGU-MM	WP25PM	XNPU-MM	WP35CM	XNPU-MM	WP40PM
M1-M2	XNGU-ML	WS40PM	XNGU-ML	WS40PM	XNPU-MM	WS40PM
M3	XNGU-ML	WS40PM	XNGU-ML	WS40PM	XNPU-MM	WS40PM
K1-K2	XNPU-MM	WK15PM	XNGU-MH	WK15CM	XNGU-MH	WK15CM
K3	XNPU-MM	WK15PM	XNGU-MH	WP35CM	XNGU-MH	WP35CM
N1-N2	XNGU-ALP	WN25PM	XNGU-ALP	WN25PM	XNGU-ALP	WN25PM
N3	XNGU-ALP	WN25PM	XNGU-ALP	WN25PM	XNGU-ALP	WN25PM
S1-S2	XNGU-ML	WP25PM	XNGU-ML	WS40PM	XNPU-MM	WS40PM
S3	XNGU-ML	WS40PM	XNGU-ML	WS40PM	XNPU-MM	WS40PM
S4	XNGU-ML	WS40PM	XNGU-ML	WS40PM	XNPU-MM	WS40PM
H1	-	-	-	-	-	-

## Recommended Starting Speeds [SFM]\*

Material Group		WK15CM	WK15PM	WN25PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
P	1	-	-	-	1085 935 885	1495 1295 1215	970 855 805	-	855 755 705
	2	-	-	-	900 785 655	920 835 755	820 705 590	-	720 625 525
	3	-	-	-	835 705 575	835 755 675	755 640 525	-	655 560 460
	4	-	-	-	740 605 490	625 575 525	675 560 445	-	590 490 395
	5	-	-	-	605 560 490	855 755 690	560 510 445	560 475 395	490 445 395
	6	-	-	-	540 410 330	525 445 360	490 375 295	490 360 260	425 330 260
M	1	-	-	-	675 590 540	675 605 510	640 560 510	690 560 460	560 490 445
	2	-	-	-	605 525 425	605 525 460	575 490 410	590 475 395	510 425 360
	3	-	-	-	460 395 310	475 425 375	425 375 295	475 360 280	375 330 260
K	1	1380 1265 1115	885 805 705	-	755 675 605	970 870 785	-	-	-
	2	1100 970 900	690 625 575	-	590 525 490	770 690 625	-	-	-
	3	920 820 755	575 525 475	-	490 445 395	640 575 525	-	-	-
N	1	-	-	3525 3100 2870	-	-	-	-	-
	2	-	-	3100 2870 2495	-	-	-	-	-
	3	-	-	3100 2870 2495	-	-	-	-	-
S	1	-	-	-	130 115 80	-	-	130 115 80	115 100 80
	2	-	-	-	130 115 80	-	-	130 115 80	115 100 80
	3	-	-	-	165 130 80	-	-	165 130 80	150 115 80
	4	-	-	-	230 165 115	-	-	195 165 100	195 150 100
H	1	-	-	-	395 295 230	-	-	-	-

NOTE: FIRST choice starting speeds are in **bold** type. As the average chip thickness increases, the speed should be decreased.  
 \*Material groups P, M, K, and H show recommended starting speeds for dry machining. For wet machining, reduce speed by 20%.  
 \*Material groups N and S show recommended starting speeds for wet machining. Not recommended for dry machining.

## Recommended Starting Feeds [IPT]

Insert Geometry	Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae)															Insert Geometry
	5%			10%			20%			30%			40-100%			
.E..ALP	.005	<b>.008</b>	.012	.003	<b>.006</b>	.009	.002	<b>.004</b>	.007	.002	<b>.004</b>	.006	.002	<b>.004</b>	.005	E..ALP
.E..ML	.007	<b>.012</b>	.018	.005	<b>.009</b>	.013	.004	<b>.006</b>	.010	.003	<b>.006</b>	.008	.003	<b>.005</b>	.008	E..ML
.S..MM	.008	<b>.015</b>	.024	.006	<b>.011</b>	.017	.005	<b>.008</b>	.013	.004	<b>.007</b>	.011	.004	<b>.007</b>	.010	S..MM
.S..MH	.009	<b>.017</b>	.028	.006	<b>.012</b>	.020	.005	<b>.009</b>	.015	.004	<b>.008</b>	.013	.004	<b>.007</b>	.012	S..MH

NOTE: Use "Light Machining" values as starting feed rate.

## Best Practices

### VSM490-15 Z-Axis Plunge

cutting diameter (D1)	Z max	Y	cutting diameter (D1)	Z max	Y
1.000	.094	.121	3.000	.094	.211
1.250	.094	.136	4.000	.094	.243
1.500	.094	.149	5.000	.094	.272
2.000	.094	.172	6.000	.094	.298
2.500	.094	.192			

