

0°/90° Shoulder Mills • VSM11™

Recommended Starting Speeds [m/min]*

| Material Group | | WDN10U | WK15CM | | | WK15PM | | | WN10HM | | | WN25PM | | | WP25PM | | |
|----------------|---|--------|-------------|------|-----|------------|-----|-----|------------|-----|-----|------------|-----|------|------------|-----|--|
| P | 1 | — | — | — | — | — | — | — | — | — | — | — | — | 330 | 285 | 270 | |
| | 2 | — | — | — | — | — | — | — | — | — | — | — | — | 275 | 240 | 200 | |
| | 3 | — | — | — | — | — | — | — | — | — | — | — | — | 255 | 215 | 175 | |
| | 4 | — | — | — | — | — | — | — | — | — | — | — | — | 225 | 185 | 150 | |
| | 5 | — | — | — | — | — | — | — | — | — | — | — | — | 185 | 170 | 150 | |
| | 6 | — | — | — | — | — | — | — | — | — | — | — | — | 165 | 125 | 100 | |
| M | 1 | — | — | — | — | — | — | — | — | — | — | — | — | 205 | 180 | 165 | |
| | 2 | — | — | — | — | — | — | — | — | — | — | — | — | 185 | 160 | 130 | |
| | 3 | — | — | — | — | — | — | — | — | — | — | — | — | 140 | 120 | 95 | |
| K | 1 | — | — | — | 420 | 385 | 340 | 270 | 245 | 215 | — | — | — | 230 | 205 | 185 | |
| | 2 | — | — | — | 335 | 295 | 275 | 210 | 190 | 175 | — | — | — | 180 | 160 | 150 | |
| | 3 | — | — | — | 280 | 250 | 230 | 175 | 160 | 145 | — | — | — | 150 | 135 | 120 | |
| N | 1 | 4010 | 3505 | 2990 | — | — | — | — | — | — | 795 | 695 | 600 | 1075 | 945 | 875 | |
| | 2 | 1600 | 1495 | 1400 | — | — | — | — | — | — | 795 | 695 | 600 | 945 | 875 | 760 | |
| | 3 | 1600 | 1495 | 1400 | — | — | — | — | — | — | 560 | 485 | 420 | 945 | 875 | 760 | |
| S | 1 | — | — | — | — | — | — | — | — | — | — | — | — | 40 | 35 | 25 | |
| | 2 | — | — | — | — | — | — | — | — | — | — | — | — | 40 | 35 | 25 | |
| | 3 | — | — | — | — | — | — | — | — | — | — | — | — | 50 | 40 | 25 | |
| | 4 | — | — | — | — | — | — | — | — | — | — | — | — | 70 | 50 | 35 | |
| H | 1 | — | — | — | — | — | — | — | — | — | — | — | — | 120 | 90 | 70 | |

| Material Group | | WP35CM | | | WP40PM | | | WS30PM | | | WS40PM | | | WU35PM | | |
|----------------|---|--------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|
| P | 1 | 455 | 395 | 370 | 295 | 260 | 245 | — | — | — | — | — | — | 260 | 230 | 215 |
| | 2 | 280 | 255 | 230 | 250 | 215 | 180 | — | — | — | — | — | — | 220 | 190 | 160 |
| | 3 | 255 | 230 | 205 | 230 | 195 | 160 | — | — | — | — | — | — | 200 | 170 | 140 |
| | 4 | 190 | 175 | 160 | 205 | 170 | 135 | — | — | — | — | — | — | 180 | 150 | 120 |
| | 5 | 260 | 230 | 210 | 170 | 155 | 135 | — | — | — | 170 | 145 | 120 | 150 | 135 | 120 |
| | 6 | 160 | 135 | 110 | 150 | 115 | 90 | — | — | — | 150 | 110 | 80 | 130 | 100 | 80 |
| M | 1 | 205 | 185 | 155 | 195 | 170 | 155 | 225 | 200 | 185 | 210 | 170 | 140 | 170 | 150 | 135 |
| | 2 | 185 | 160 | 140 | 175 | 150 | 125 | 205 | 180 | 145 | 180 | 145 | 120 | 155 | 130 | 110 |
| | 3 | 145 | 130 | 115 | 130 | 115 | 90 | 155 | 135 | 105 | 145 | 110 | 85 | 115 | 100 | 80 |
| K | 1 | 295 | 265 | 240 | — | — | — | — | — | — | — | — | — | — | — | — |
| | 2 | 235 | 210 | 190 | — | — | — | — | — | — | — | — | — | — | — | — |
| | 3 | 195 | 175 | 160 | — | — | — | — | — | — | — | — | — | — | — | — |
| N | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| S | 1 | — | — | — | — | — | — | 45 | 40 | 30 | 40 | 35 | 25 | 35 | 30 | 25 |
| | 2 | — | — | — | — | — | — | 45 | 40 | 30 | 40 | 35 | 25 | 35 | 30 | 25 |
| | 3 | — | — | — | — | — | — | 55 | 45 | 30 | 50 | 40 | 25 | 45 | 35 | 25 |
| | 4 | — | — | — | — | — | — | 70 | 60 | 40 | 60 | 50 | 30 | 60 | 45 | 30 |
| H | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

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 [mm]

| Insert Geometry | Programmed Feed per Tooth (fz) as a % of Radial Depth of Cut (ae) | | | | | | | | | | | | | | | Insert Geometry |
|-----------------|---|-------------|------|------|-------------|------|------|-------------|------|------|-------------|------|---------|-------------|------|-----------------|
| | 5% | | | 10% | | | 20% | | | 30% | | | 40-100% | | | |
| .F..PCD | 0,12 | 0,18 | 0,29 | 0,08 | 0,13 | 0,21 | 0,06 | 0,10 | 0,16 | 0,06 | 0,09 | 0,14 | 0,05 | 0,08 | 0,12 | .F..PCD |
| .F..ALP | 0,12 | 0,22 | 0,31 | 0,08 | 0,16 | 0,23 | 0,06 | 0,12 | 0,17 | 0,06 | 0,10 | 0,15 | 0,05 | 0,10 | 0,14 | .F..ALP |
| .E..ML | 0,17 | 0,27 | 0,36 | 0,13 | 0,20 | 0,26 | 0,10 | 0,15 | 0,19 | 0,08 | 0,13 | 0,17 | 0,08 | 0,12 | 0,16 | .E..ML |
| .S..MM | 0,23 | 0,32 | 0,47 | 0,17 | 0,23 | 0,34 | 0,13 | 0,17 | 0,25 | 0,11 | 0,15 | 0,22 | 0,10 | 0,14 | 0,20 | .S..MM |
| .S..MH | 0,23 | 0,37 | 0,56 | 0,17 | 0,27 | 0,40 | 0,13 | 0,20 | 0,30 | 0,11 | 0,17 | 0,26 | 0,10 | 0,16 | 0,24 | .S..MH |

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

