

# ➤ Dodeka™ Series

Leader in Advanced Face Milling Applications

## Primary Application

Dodeka Mini and Dodeka platforms are the most comprehensive face milling boosters on the market today. Twelve true cutting edges per insert mean low cost-per-edge and high productivity. With Beyond™ premium milling grades, achieve up to 30% higher metal removal rates (MRR), 25% lower cutting forces due to soft cutting action, and up to 35% better tool life in light to heavy machining.

## Features and Benefits

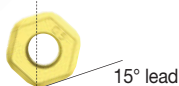
**Dodeka Series • Most comprehensive face milling platform on the market. Providing an excellent cost-per-cutting edge with market leading performance. The Dodeka Series platform will cover all your face milling application needs.**

All cutter body variations can be loaded with one insert style.

**Dodeka Mini High-Feed 15°  
Dodeka High-Feed 15°**



**12** True  
Cutting  
Edges



**Dodeka Mini** Ap1 max = 1,6mm  
**Dodeka** Ap1 max = 2,2mm

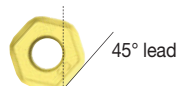
Dodeka Mini HF and Dodeka HF can be loaded with all Dodeka Mini standard inserts, except wiper inserts.

See High-Feed section, pages B110–B119.

**Dodeka Mini 45°  
Dodeka 45°**



**12** True  
Cutting  
Edges



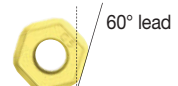
**Dodeka Mini** Ap1 max = 3,2mm  
**Dodeka** Ap1 max = 4,5mm

Best-in-class leader in face milling up to Ap1 max = 4,5mm.

**Dodeka Mini 60°**

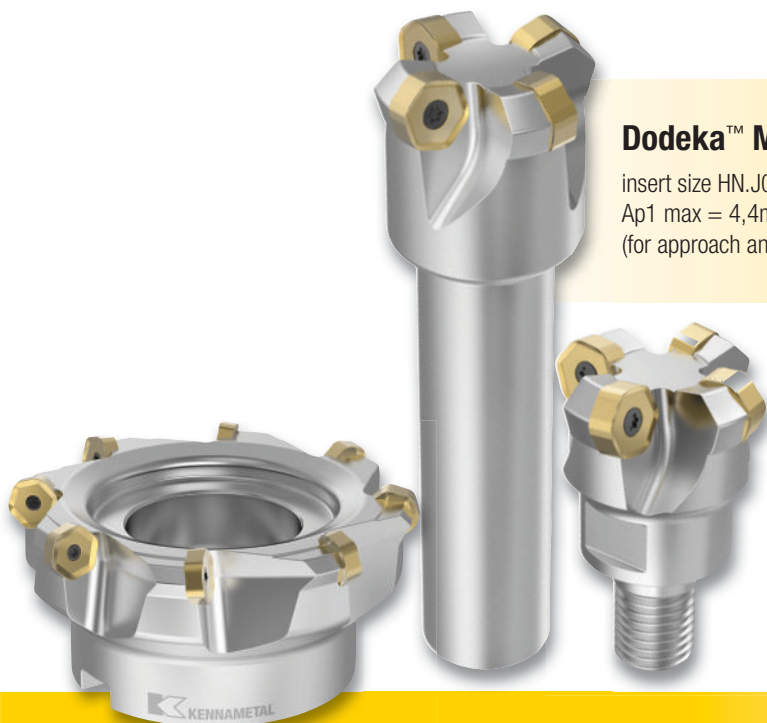


**12** True  
Cutting  
Edges



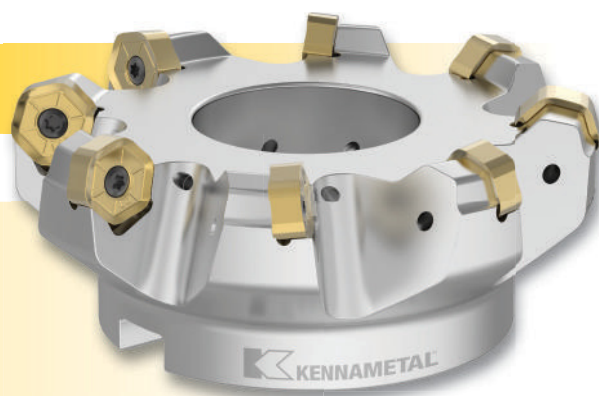
**Dodeka Mini** Ap1 max = 4,4mm

Achieve a higher axial depth-of-cut capability up to Ap1 = 4,4mm with standard Dodeka Mini inserts.



### Dodeka™ Mini Series

insert size HN.J06  
 $A_{p1} \text{ max} = 4,4\text{mm}$   
 (for approach angle  $60^\circ$ )



### Dodeka

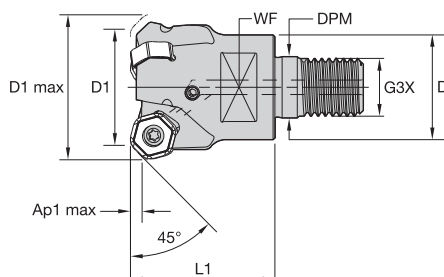
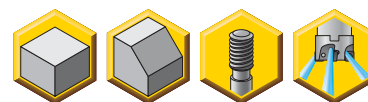
insert size HN.J0905  
 $A_{p1} \text{ max} = 4,5\text{mm}$



Applicable in most material groups • Excellent results in machining titanium



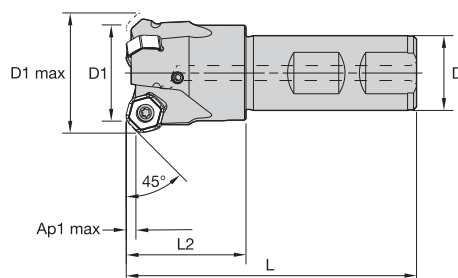
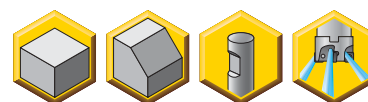
- Twelve cutting edges per insert.
- Maximum number of teeth per diameter.
- Productivity booster in all materials.



### ■ Dodeka Mini 45° • Screw-On End Mills

| order number | catalogue number  | D1 | D1 max | D  | DPM  | G3X | L1   | WF | Ap1 max | Z | kg   | max RPM |
|--------------|-------------------|----|--------|----|------|-----|------|----|---------|---|------|---------|
| 4125882      | KSHR025D03M16HN06 | 25 | 33,2   | 29 | 17,0 | M16 | 32,0 | 22 | 3,2     | 3 | 0,13 | 20000   |
| 4126344      | KSHR032D04M16HN06 | 32 | 40,2   | 29 | 17,0 | M16 | 40,0 | 22 | 3,2     | 4 | 0,21 | 17600   |

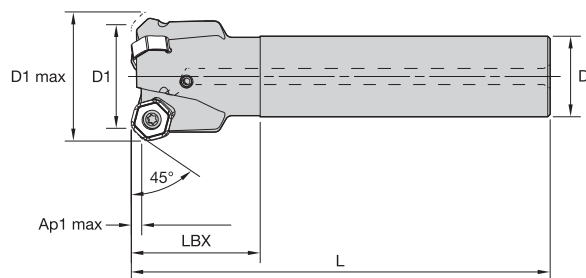
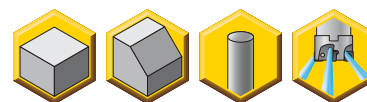
- Twelve cutting edges per insert.
- Maximum number of teeth per diameter.
- Productivity booster in all materials.



### ■ Dodeka Mini 45° • Weldon End Mills

| order number | catalogue number  | D1 | D1 max | D  | L  | L2 | Ap1 max | Z | kg   | max RPM |
|--------------|-------------------|----|--------|----|----|----|---------|---|------|---------|
| 4126348      | KSHR025D03B20HN06 | 25 | 33,2   | 20 | 82 | 32 | 3,2     | 3 | 0,21 | 20000   |
| 4126349      | KSHR032D03B25HN06 | 32 | 40,2   | 25 | 97 | 40 | 3,2     | 3 | 0,40 | 17600   |
| 4126350      | KSHR032D04B25HN06 | 32 | 40,2   | 25 | 97 | 40 | 3,2     | 4 | 0,41 | 17600   |

- Twelve cutting edges per insert.
- Maximum number of teeth per diameter.
- Productivity booster in all materials.



## ■ Dodeka Mini 45° • Cylindrical End Mills

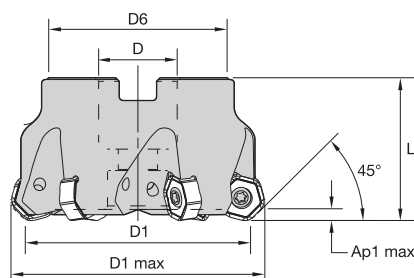
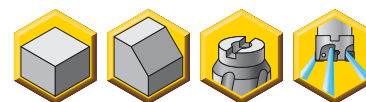
| order number | catalogue number      | D1 | D1 max | D  | L   | LBX | Ap1 max | Z | kg   | max RPM |
|--------------|-----------------------|----|--------|----|-----|-----|---------|---|------|---------|
| 4126352      | KSHR025D03A20HN06L120 | 25 | 33,2   | 20 | 120 | 32  | 3,2     | 3 | 0,28 | 20000   |
| 4126383      | KSHR032D03A25HN06L130 | 32 | 40,2   | 25 | 130 | 40  | 3,2     | 3 | 0,50 | 17600   |
| 4126384      | KSHR032D04A25HN06L130 | 32 | 40,2   | 25 | 130 | 40  | 3,2     | 4 | 0,50 | 17600   |

## ■ Spare Parts



| D1 | insert screw | Nm  | wrench  |
|----|--------------|-----|---------|
| 25 | 193.492      | 3,5 | 170.025 |
| 32 | 193.492      | 3,5 | 170.025 |

- Twelve cutting edges per insert.
- Maximum number of teeth per diameter.
- Productivity booster in all materials.



## ■ Dodeka Mini 45° • Shell Mills

| order number | catalogue number   | D1  | D1 max | D  | D6 | L  | Ap1 max | Z  | kg   | max RPM |
|--------------|--------------------|-----|--------|----|----|----|---------|----|------|---------|
| 4126387      | KSHR040A04RS45HN06 | 40  | 48,2   | 22 | 38 | 40 | 3,2     | 4  | 0,25 | 15800   |
| 4124313      | KSHR040A05RS45HN06 | 40  | 48,2   | 22 | 38 | 40 | 3,2     | 5  | 0,25 | 15800   |
| 4126388      | KSHR050A04RS45HN06 | 50  | 58,2   | 22 | 38 | 40 | 3,2     | 4  | 0,36 | 12700   |
| 4122886      | KSHR050A05RS45HN06 | 50  | 58,2   | 22 | 38 | 40 | 3,2     | 5  | 0,37 | 12700   |
| 4126389      | KSHR050A06RS45HN06 | 50  | 58,2   | 22 | 38 | 40 | 3,2     | 6  | 0,36 | 12700   |
| 4122887      | KSHR063A04RS45HN06 | 63  | 71,2   | 22 | 50 | 40 | 3,2     | 4  | 0,59 | 10100   |
| 4122889      | KSHR063A06RS45HN06 | 63  | 71,2   | 22 | 50 | 40 | 3,2     | 6  | 0,65 | 10100   |
| 4126390      | KSHR063A08RS45HN06 | 63  | 71,2   | 22 | 50 | 40 | 3,2     | 8  | 0,64 | 10100   |
| 4126391      | KSHR080A05RS45HN06 | 80  | 88,1   | 27 | 60 | 50 | 3,2     | 5  | 1,13 | 7900    |
| 4126392      | KSHR080A08RS45HN06 | 80  | 88,1   | 27 | 64 | 50 | 3,2     | 8  | 1,25 | 7900    |
| 4126403      | KSHR080A10RS45HN06 | 80  | 88,1   | 27 | 60 | 50 | 3,2     | 10 | 1,19 | 7900    |
| 4126404      | KSHR100B06RS45HN06 | 100 | 108,1  | 32 | 80 | 50 | 3,2     | 6  | 1,73 | 6300    |
| 4126405      | KSHR100B09RS45HN06 | 100 | 108,1  | 32 | 80 | 50 | 3,2     | 9  | 1,84 | 6300    |
| 4126406      | KSHR100B12RS45HN06 | 100 | 108,1  | 32 | 80 | 50 | 3,2     | 12 | 1,84 | 6300    |
| 4126408      | KSHR125B12RS45HN06 | 125 | 133,1  | 40 | 90 | 63 | 3,2     | 12 | 2,98 | 5050    |
| 4124262      | KSHR125B16RS45HN06 | 125 | 133,1  | 40 | 90 | 63 | 3,2     | 16 | 3,05 | 5050    |

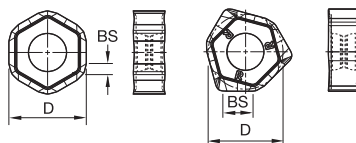
## ■ Spare Parts



| D1  | insert screw | Nm  | wrench  | socket-head cap screw | coolant lock screw assembly | coolant lock screw | coolant shower plate |
|-----|--------------|-----|---------|-----------------------|-----------------------------|--------------------|----------------------|
| 40  | 193.492      | 3,5 | 170.025 | 125.025               | —                           | —                  | —                    |
| 50  | 193.492      | 3,5 | 170.025 | 125.025               | —                           | —                  | —                    |
| 63  | 193.492      | 3,5 | 170.025 | 125.025               | —                           | —                  | —                    |
| 80  | 193.492      | 3,5 | 170.025 | 125.230               | —                           | —                  | —                    |
| 100 | 193.492      | 3,5 | 170.025 | —                     | MS2189C                     | —                  | —                    |
| 125 | 193.492      | 3,5 | 170.025 | —                     | —                           | 420.200            | 470.232              |

NOTE: Coolant lock screw assembly and coolant cap must be ordered separately.

- ◆◆ first choice with coolant
- ◇◇ first choice without coolant
- ◆ alternate choice with coolant
- ◇ alternate choice without coolant



|       |    |   |    |     |    |    |    |    |    |
|-------|----|---|----|-----|----|----|----|----|----|
| P1-P2 |    |   |    | ◇/◆ | ◆◆ |    | ◇◇ |    |    |
| P3-P4 |    |   |    | ◇/◆ | ◆◆ |    | ◇  | ◇◇ |    |
| P5-P6 |    |   |    | ◇/◆ | ◆◆ |    | ◇  | ◇◇ |    |
| M1-M2 |    |   |    | ◇/◆ | ◆  |    |    | ◆  | ◆◆ |
| M3    |    |   |    | ◇/◆ | ◆  |    |    |    | ◆◆ |
| K1-K2 |    | ◇ | ◆◆ |     |    | ◇◇ |    |    |    |
| K3    |    | ◇ | ◆◆ |     |    |    | ◇◇ |    |    |
| N1    | ◆◆ |   |    |     |    |    |    |    |    |
| N2    | ◆◆ |   |    |     |    |    |    |    |    |
| S1    |    |   |    |     | ◆  |    |    |    | ◆◆ |
| S2    |    |   |    |     | ◆  |    |    |    | ◆◆ |
| S3    |    |   |    | ◆   | ◆  |    |    |    | ◆◆ |
| S4    |    |   |    | ◆   | ◆  |    |    |    | ◆◆ |



| ISO catalogue number   | D  | BS   | KC410M  | KC510M  | KC520M | KC522M  | KC725M | KCK15   | KCPK30  | KCPM40  | KCSM40  |
|------------------------|----|------|---------|---------|--------|---------|--------|---------|---------|---------|---------|
| <b>Light Machining</b> |    |      |         |         |        |         |        |         |         |         |         |
| HNGJ0604ANFNLDJ        | 12 | 1,54 | 4121575 | -       | -      | -       | -      | -       | -       | -       | -       |
| HNGJ0604ANENLD         | 12 | 1,54 | -       | 4121576 | -      | 4121578 | -      | 4119227 | 4119190 | 5550701 | 6165862 |



|                          |    |      |   |   |         |         |         |         |         |         |         |
|--------------------------|----|------|---|---|---------|---------|---------|---------|---------|---------|---------|
| <b>General Machining</b> |    |      |   |   |         |         |         |         |         |         |         |
| HNPJ0604ANSNGD           | 12 | 1,45 | - | - | 4119696 | 4119697 | 4119701 | 4119699 | 4119700 | 5550703 | 6165759 |



|                        |    |      |   |   |   |         |         |         |         |         |         |
|------------------------|----|------|---|---|---|---------|---------|---------|---------|---------|---------|
| <b>Heavy Machining</b> |    |      |   |   |   |         |         |         |         |         |         |
| HNGJ0604ANSNHD         | 12 | 1,45 | - | - | - | -       | -       | 6039660 | 6039812 | 6039659 | 6165864 |
| HNPJ0604ANSNHD         | 12 | 1,45 | - | - | - | 4119703 | 4119229 | -       | 4119228 | 5550702 | 6165760 |
| HNPJ060432ANSNHD       | 12 | -    | - | - | - | -       | -       | -       | -       | 6068798 | 6165861 |



|                             |    |      |   |   |   |         |   |   |   |         |         |
|-----------------------------|----|------|---|---|---|---------|---|---|---|---------|---------|
| <b>Finishing with Wiper</b> |    |      |   |   |   |         |   |   |   |         |         |
| XNGJ0604ANENLD3W            | 12 | 4,80 | - | - | - | 4121607 | - | - | - | 5879813 | 6165863 |

## Recommended Starting Feeds

### ■ Recommended Starting Feeds [mm]

| Light Machining | General Purpose | Heavy Machining |
|-----------------|-----------------|-----------------|
|-----------------|-----------------|-----------------|

| Insert<br>Geometry | Recommended Starting Feed per Tooth (Fz) in<br>Relation to % of Radial Engagement (ae) |      |      |      |      |      |      |      |      |      |      |      |         |      |      | Insert<br>Geometry |
|--------------------|----------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|---------|------|------|--------------------|
|                    | 5%                                                                                     |      |      | 10%  |      |      | 20%  |      |      | 30%  |      |      | 40–100% |      |      |                    |
| .F..LDJ            | 0,17                                                                                   | 0,46 | 0,79 | 0,12 | 0,33 | 0,57 | 0,09 | 0,25 | 0,43 | 0,08 | 0,22 | 0,37 | 0,07    | 0,20 | 0,34 | .F..LDJ            |
| .E..LD             | 0,18                                                                                   | 0,59 | 0,99 | 0,13 | 0,43 | 0,71 | 0,10 | 0,32 | 0,53 | 0,09 | 0,28 | 0,46 | 0,08    | 0,25 | 0,42 | .E..LD             |
| .S..GD             | 0,33                                                                                   | 0,79 | 1,19 | 0,24 | 0,57 | 0,86 | 0,18 | 0,43 | 0,64 | 0,16 | 0,37 | 0,56 | 0,14    | 0,34 | 0,51 | .S..GD             |
| .S..HD             | 0,33                                                                                   | 0,84 | 1,35 | 0,24 | 0,60 | 0,97 | 0,18 | 0,45 | 0,72 | 0,16 | 0,39 | 0,63 | 0,14    | 0,36 | 0,57 | .S..HD             |

HNG.....: Ground inserts; high versatility for all finishing applications and difficult-to-machine stainless steels and high-temp alloys.

HNP.....: Pressed inserts; lower cost per edge for most roughing to semi-finishing operations.

XNG.....: Wiper finishing insert. To be used in combination with HNGJ..LD insert.



| Material Group |   | KC410M * |   |   | KC510M |            |     | KC520M |            |     | KC522M |            |     | KC725M |            |     |
|----------------|---|----------|---|---|--------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|
| P              | 1 | -        | - | - | -      | -          | -   | -      | -          | -   | 395    | <b>340</b> | 325 | 310    | <b>275</b> | 260 |
|                | 2 | -        | - | - | -      | -          | -   | -      | -          | -   | 330    | <b>290</b> | 240 | 265    | <b>230</b> | 190 |
|                | 3 | -        | - | - | -      | -          | -   | -      | -          | -   | 305    | <b>260</b> | 210 | 240    | <b>205</b> | 170 |
|                | 4 | -        | - | - | 295    | <b>240</b> | 205 | -      | -          | -   | 270    | <b>220</b> | 180 | 215    | <b>180</b> | 145 |
|                | 5 | -        | - | - | -      | -          | -   | -      | -          | -   | 220    | <b>205</b> | 180 | 180    | <b>160</b> | 145 |
|                | 6 | -        | - | - | -      | -          | -   | -      | -          | -   | 200    | <b>150</b> | 120 | 155    | <b>120</b> | 95  |
| M              | 1 | -        | - | - | -      | -          | -   | -      | -          | -   | 245    | <b>215</b> | 200 | 205    | <b>180</b> | 160 |
|                | 2 | -        | - | - | -      | -          | -   | -      | -          | -   | 220    | <b>190</b> | 155 | 185    | <b>155</b> | 130 |
|                | 3 | -        | - | - | -      | -          | -   | -      | -          | -   | 170    | <b>145</b> | 115 | 140    | <b>120</b> | 95  |
| K              | 1 | -        | - | - | 355    | <b>320</b> | 290 | 325    | <b>295</b> | 260 | 275    | <b>245</b> | 220 | -      | -          | -   |
|                | 2 | -        | - | - | 275    | <b>245</b> | 230 | 250    | <b>230</b> | 210 | 215    | <b>190</b> | 180 | -      | -          | -   |
|                | 3 | -        | - | - | 235    | <b>210</b> | 190 | 210    | <b>190</b> | 175 | 180    | <b>160</b> | 145 | -      | -          | -   |
| N              | 1 | -        | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -        | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -        | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| S              | 1 | -        | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -        | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -        | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 4 | -        | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| H              | 1 | -        | - | - | 190    | <b>155</b> | 110 | -      | -          | -   | 145    | <b>110</b> | 85  | -      | -          | -   |
|                | 2 | -        | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -        | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |

| Material Group |   | KCK15 |            |     | KCPK30 |            |     | KCPM40 |            |     | KCSM40 |            |     |
|----------------|---|-------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|
| P              | 1 | -     | -          | -   | 545    | <b>475</b> | 445 | 355    | <b>310</b> | 295 | 275    | <b>240</b> | 205 |
|                | 2 | -     | -          | -   | 335    | <b>305</b> | 275 | 300    | <b>260</b> | 215 | 240    | <b>205</b> | 160 |
|                | 3 | -     | -          | -   | 305    | <b>275</b> | 245 | 275    | <b>235</b> | 190 | 205    | <b>180</b> | 160 |
|                | 4 | -     | -          | -   | 230    | <b>210</b> | 190 | 245    | <b>205</b> | 160 | 180    | <b>160</b> | 145 |
|                | 5 | -     | -          | -   | 310    | <b>275</b> | 250 | 205    | <b>185</b> | 160 | 160    | <b>145</b> | 125 |
|                | 6 | -     | -          | -   | 190    | <b>160</b> | 145 | 180    | <b>140</b> | 110 | 125    | <b>110</b> | 90  |
| M              | 1 | -     | -          | -   | 245    | <b>220</b> | 185 | 235    | <b>205</b> | 185 | 275    | <b>220</b> | 180 |
|                | 2 | -     | -          | -   | 220    | <b>190</b> | 170 | 210    | <b>180</b> | 150 | 180    | <b>145</b> | 125 |
|                | 3 | -     | -          | -   | 175    | <b>155</b> | 140 | 155    | <b>140</b> | 110 | 145    | <b>125</b> | 110 |
| K              | 1 | 505   | <b>460</b> | 410 | 355    | <b>320</b> | 290 | -      | -          | -   | -      | -          | -   |
|                | 2 | 400   | <b>355</b> | 330 | 280    | <b>250</b> | 230 | -      | -          | -   | -      | -          | -   |
|                | 3 | 335   | <b>300</b> | 275 | 235    | <b>210</b> | 190 | -      | -          | -   | -      | -          | -   |
| N              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| S              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 4 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| H              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |

\*Recommended for wet machining only.

NOTE: FIRST choice starting speeds are in **bold type**.

As the average chip thickness increases, the speed should be decreased.

Dry

Wet

| Material Group |   | KC410M |             |     | KC510M |            |     | KC520M |            |     | KC522M |            |     | KC725M |            |     |
|----------------|---|--------|-------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|
| P              | 1 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 315    | <b>270</b> | 260 | 250    | <b>220</b> | 210 |
|                | 2 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 265    | <b>230</b> | 190 | 210    | <b>185</b> | 150 |
|                | 3 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 245    | <b>210</b> | 170 | 190    | <b>165</b> | 135 |
|                | 4 | -      | -           | -   | 235    | <b>190</b> | 165 | -      | -          | -   | 215    | <b>175</b> | 145 | 170    | <b>145</b> | 115 |
|                | 5 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 175    | <b>165</b> | 145 | 145    | <b>130</b> | 115 |
|                | 6 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 160    | <b>120</b> | 95  | 125    | <b>95</b>  | 75  |
| M              | 1 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 195    | <b>170</b> | 160 | 165    | <b>145</b> | 130 |
|                | 2 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 175    | <b>150</b> | 125 | 150    | <b>125</b> | 105 |
|                | 3 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 135    | <b>115</b> | 90  | 110    | <b>95</b>  | 75  |
| K              | 1 | -      | -           | -   | 285    | <b>255</b> | 230 | 260    | <b>235</b> | 210 | 220    | <b>195</b> | 175 | -      | -          | -   |
|                | 2 | -      | -           | -   | 220    | <b>195</b> | 185 | 200    | <b>185</b> | 170 | 170    | <b>150</b> | 145 | -      | -          | -   |
|                | 3 | -      | -           | -   | 190    | <b>170</b> | 150 | 170    | <b>150</b> | 140 | 145    | <b>130</b> | 115 | -      | -          | -   |
| N              | 1 | 1170   | <b>1035</b> | 955 | 615    | <b>550</b> | 505 | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | 1035   | <b>955</b>  | 880 | 555    | <b>510</b> | 470 | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | 1035   | <b>955</b>  | 880 | 555    | <b>510</b> | 470 | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| S              | 1 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 40     | <b>30</b>  | 25  | 30     | <b>30</b>  | 25  |
|                | 2 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 40     | <b>30</b>  | 25  | 30     | <b>30</b>  | 25  |
|                | 3 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 50     | <b>40</b>  | 25  | 45     | <b>30</b>  | 25  |
|                | 4 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 70     | <b>50</b>  | 30  | 50     | <b>45</b>  | 30  |
| H              | 1 | -      | -           | -   | 150    | <b>125</b> | 90  | -      | -          | -   | 115    | <b>90</b>  | 70  | -      | -          | -   |
|                | 2 | -      | -           | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -      | -           | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |

| Material Group |   | KCK15 |            |     | KCPK30 |            |     | KCPM40 |            |     | KCSM40 |            |     |
|----------------|---|-------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|
| P              | 1 | -     | -          | -   | 435    | <b>380</b> | 355 | 285    | <b>250</b> | 235 | -      | -          | -   |
|                | 2 | -     | -          | -   | 270    | <b>245</b> | 220 | 240    | <b>210</b> | 170 | -      | -          | -   |
|                | 3 | -     | -          | -   | 245    | <b>220</b> | 195 | 220    | <b>190</b> | 150 | -      | -          | -   |
|                | 4 | -     | -          | -   | 185    | <b>170</b> | 150 | 195    | <b>165</b> | 130 | -      | -          | -   |
|                | 5 | -     | -          | -   | 250    | <b>220</b> | 200 | 165    | <b>150</b> | 130 | 165    | <b>140</b> | 115 |
|                | 6 | -     | -          | -   | 150    | <b>130</b> | 118 | 145    | <b>110</b> | 90  | 145    | <b>105</b> | 75  |
| M              | 1 | -     | -          | -   | 195    | <b>175</b> | 150 | 190    | <b>165</b> | 150 | 200    | <b>165</b> | 135 |
|                | 2 | -     | -          | -   | 175    | <b>150</b> | 135 | 170    | <b>145</b> | 120 | 170    | <b>140</b> | 115 |
|                | 3 | -     | -          | -   | 140    | <b>125</b> | 110 | 125    | <b>110</b> | 90  | 140    | <b>105</b> | 80  |
| K              | 1 | 405   | <b>370</b> | 330 | 285    | <b>255</b> | 230 | -      | -          | -   | -      | -          | -   |
|                | 2 | 320   | <b>285</b> | 265 | 225    | <b>200</b> | 185 | -      | -          | -   | -      | -          | -   |
|                | 3 | 270   | <b>240</b> | 220 | 190    | <b>170</b> | 150 | -      | -          | -   | -      | -          | -   |
| N              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| S              | 1 | -     | -          | -   | -      | -          | -   | 40     | <b>30</b>  | 30  | 40     | <b>30</b>  | 25  |
|                | 2 | -     | -          | -   | -      | -          | -   | 40     | <b>30</b>  | 30  | 40     | <b>30</b>  | 25  |
|                | 3 | -     | -          | -   | -      | -          | -   | 50     | <b>40</b>  | 30  | 50     | <b>40</b>  | 25  |
|                | 4 | -     | -          | -   | 65     | <b>50</b>  | 30  | 65     | <b>50</b>  | 30  | 55     | <b>50</b>  | 30  |
| H              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |

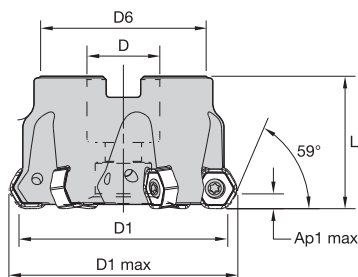
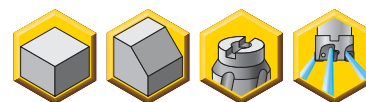
NOTE: FIRST choice starting speeds are in **bold** type.  
As the average chip thickness increases, the speed should be decreased.

Dry  
Wet





- Twelve cutting edges per insert.
- Higher  $A_{p1}$  max with standard inserts.
- Productivity booster in all materials.



## ■ Dodeka Mini 60° • Shell Mills

| order number | catalogue number   | D1  | D1 max | D  | D6 | L  | $A_{p1}$ max | Z | kg   | max RPM |
|--------------|--------------------|-----|--------|----|----|----|--------------|---|------|---------|
| 4147022      | KSHR040A04RS60HN06 | 40  | 46,4   | 22 | 38 | 40 | 4,3          | 4 | 0,21 | 15800   |
| 4147713      | KSHR040A05RS60HN06 | 40  | 46,4   | 22 | 38 | 40 | 4,3          | 5 | 0,21 | 15800   |
| 4147714      | KSHR050A04RS60HN06 | 50  | 56,4   | 22 | 38 | 40 | 4,3          | 4 | 0,32 | 12700   |
| 4147715      | KSHR050A05RS60HN06 | 50  | 56,4   | 22 | 38 | 40 | 4,3          | 5 | 0,32 | 12700   |
| 4147716      | KSHR063A04RS60HN06 | 63  | 69,3   | 22 | 50 | 40 | 4,3          | 4 | 0,57 | 10100   |
| 4147717      | KSHR063A06RS60HN06 | 63  | 69,3   | 22 | 50 | 40 | 4,3          | 6 | 0,59 | 10100   |
| 4147718      | KSHR080A05RS60HN06 | 80  | 86,3   | 27 | 60 | 50 | 4,3          | 5 | 1,08 | 7900    |
| 4147719      | KSHR080A08RS60HN06 | 80  | 86,3   | 27 | 60 | 50 | 4,3          | 8 | 1,15 | 7900    |
| 4147720      | KSHR100B06RS60HN06 | 100 | 106,3  | 32 | 80 | 50 | 4,3          | 6 | 1,70 | 6300    |
| 4147722      | KSHR125B08RS60HN06 | 125 | 131,3  | 40 | 90 | 63 | 4,3          | 8 | 2,92 | 5050    |

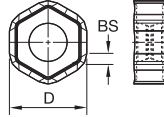
## ■ Spare Parts



| D1  | insert screw | Nm  | wrench  | mounting screw | socket-head cap screw | coolant lock screw assembly | coolant lock screw | coolant shower plate |
|-----|--------------|-----|---------|----------------|-----------------------|-----------------------------|--------------------|----------------------|
| 40  | 193.492      | 3,5 | 170.025 | KLSSM22-39-CG  | —                     | —                           | —                  | —                    |
| 50  | 193.492      | 3,5 | 170.025 | —              | 125.025               | —                           | —                  | —                    |
| 63  | 193.492      | 3,5 | 170.025 | —              | 125.025               | —                           | —                  | —                    |
| 80  | 193.492      | 3,5 | 170.025 | —              | 125.230               | —                           | —                  | —                    |
| 100 | 193.492      | 3,5 | 170.025 | —              | —                     | MS2189C                     | —                  | —                    |
| 125 | 193.492      | 3,5 | 170.025 | —              | —                     | —                           | 420.200            | 470.232              |

NOTE: Coolant lock screw assembly and coolant cap must be ordered separately.

- ◆◆ first choice with coolant
- ◇◇ first choice without coolant
- ◆ alternate choice with coolant
- ◇ alternate choice without coolant



|       |    |   |    |     |    |    |    |    |    |
|-------|----|---|----|-----|----|----|----|----|----|
| P1-P2 |    |   |    | ◇/◆ | ◆◆ |    | ◇◇ |    |    |
| P3-P4 |    |   |    | ◇/◆ | ◆◆ |    | ◇  | ◇◇ |    |
| P5-P6 |    |   |    | ◇/◆ | ◆◆ |    | ◇  | ◇◇ |    |
| M1-M2 |    |   |    | ◇/◆ | ◆  |    |    | ◆  | ◆◆ |
| M3    |    |   |    | ◇/◆ | ◆  |    |    |    | ◆◆ |
| K1-K2 |    | ◇ | ◆◆ |     |    | ◇◇ |    |    |    |
| K3    |    | ◇ | ◆◆ |     |    |    | ◇◇ |    |    |
| N1    | ◆◆ |   |    |     |    |    |    |    |    |
| N2    | ◆◆ |   |    |     |    |    |    |    |    |
| S1    |    |   |    |     | ◆  |    |    |    | ◆◆ |
| S2    |    |   |    |     | ◆  |    |    |    | ◆◆ |
| S3    |    |   |    | ◆   | ◆  |    |    |    | ◆◆ |
| S4    |    |   |    | ◆   | ◆  |    |    |    | ◆◆ |



| ISO catalogue number   | D  | BS   | KC410M  | KC510M  | KC520M | KC522M  | KC725M | KCK15   | KCPK30  | KCPM40  | KCSM40  |
|------------------------|----|------|---------|---------|--------|---------|--------|---------|---------|---------|---------|
| <b>Light Machining</b> |    |      |         |         |        |         |        |         |         |         |         |
| HNGJ0604ANFNLDJ        | 12 | 1,54 | 4121575 | -       | -      | -       | -      | -       | -       | -       | -       |
| HNGJ0604ANENLD         | 12 | 1,54 | -       | 4121576 | -      | 4121578 | -      | 4119227 | 4119190 | 5550701 | 6165862 |



|                          |    |      |   |   |         |         |         |         |         |         |         |
|--------------------------|----|------|---|---|---------|---------|---------|---------|---------|---------|---------|
| <b>General Machining</b> |    |      |   |   |         |         |         |         |         |         |         |
| HNPJ0604ANSNGD           | 12 | 1,45 | - | - | 4119696 | 4119697 | 4119701 | 4119699 | 4119700 | 5550703 | 6165759 |



|                        |    |      |   |   |   |         |         |         |         |         |         |
|------------------------|----|------|---|---|---|---------|---------|---------|---------|---------|---------|
| <b>Heavy Machining</b> |    |      |   |   |   |         |         |         |         |         |         |
| HNGJ0604ANSNHD         | 12 | 1,45 | - | - | - | -       | -       | 6039660 | 6039812 | 6039659 | 6165864 |
| HNPJ0604ANSNHD         | 12 | 1,45 | - | - | - | 4119703 | 4119229 | -       | 4119228 | 5550702 | 6165760 |
| HNPJ060432ANSNHD       | 12 | -    | - | - | - | -       | -       | -       | -       | 6068798 | 6165861 |

## Recommended Starting Feeds

### Recommended Starting Feeds [mm]

| Light Machining | General Purpose | Heavy Machining |
|-----------------|-----------------|-----------------|
|-----------------|-----------------|-----------------|

| Insert<br>Geometry | Recommended Starting Feed per Tooth (Fz) in<br>Relation to % of Radial Engagement (ae) |      |      |      |      |      |      |      |      |      |      |      |         |      |      | Insert<br>Geometry |
|--------------------|----------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|---------|------|------|--------------------|
|                    | 5%                                                                                     |      |      | 10%  |      |      | 20%  |      |      | 30%  |      |      | 40–100% |      |      |                    |
|                    |                                                                                        |      |      |      |      |      |      |      |      |      |      |      |         |      |      |                    |
| .F..LDJ            | 0,13                                                                                   | 0,37 | 0,64 | 0,10 | 0,27 | 0,46 | 0,07 | 0,20 | 0,35 | 0,06 | 0,18 | 0,30 | 0,06    | 0,16 | 0,28 | .F..LDJ            |
| .E..LD             | 0,15                                                                                   | 0,48 | 0,81 | 0,11 | 0,35 | 0,58 | 0,08 | 0,26 | 0,43 | 0,07 | 0,23 | 0,38 | 0,07    | 0,21 | 0,35 | .E..LD             |
| .S..GD             | 0,27                                                                                   | 0,64 | 0,97 | 0,20 | 0,46 | 0,70 | 0,15 | 0,35 | 0,52 | 0,13 | 0,30 | 0,45 | 0,12    | 0,28 | 0,42 | .S..GD             |
| .S..HD             | 0,27                                                                                   | 0,68 | 1,10 | 0,20 | 0,49 | 0,79 | 0,15 | 0,37 | 0,59 | 0,13 | 0,32 | 0,51 | 0,12    | 0,29 | 0,47 | .S..HD             |

HNG....: Ground inserts; high versatility for all finishing applications and difficult-to-machine stainless steels and high-temp alloys.  
HNP....: Pressed inserts; lower cost per edge for most roughing to semi-finishing operations.

| Material Group |   | KC410M* |   |   | KC510M |            |     | KC520M |            |     | KC522M |            |     | KC725M |            |     |
|----------------|---|---------|---|---|--------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|
| P              | 1 | -       | - | - | -      | -          | -   | -      | -          | -   | 395    | <b>340</b> | 325 | 310    | <b>275</b> | 260 |
|                | 2 | -       | - | - | -      | -          | -   | -      | -          | -   | 330    | <b>290</b> | 240 | 265    | <b>230</b> | 190 |
|                | 3 | -       | - | - | -      | -          | -   | -      | -          | -   | 305    | <b>260</b> | 210 | 240    | <b>205</b> | 170 |
|                | 4 | -       | - | - | 295    | <b>240</b> | 205 | -      | -          | -   | 270    | <b>220</b> | 180 | 215    | <b>180</b> | 145 |
|                | 5 | -       | - | - | -      | -          | -   | -      | -          | -   | 220    | <b>205</b> | 180 | 180    | <b>160</b> | 145 |
|                | 6 | -       | - | - | -      | -          | -   | -      | -          | -   | 200    | <b>150</b> | 120 | 155    | <b>120</b> | 95  |
| M              | 1 | -       | - | - | -      | -          | -   | -      | -          | -   | 245    | <b>215</b> | 200 | 205    | <b>180</b> | 160 |
|                | 2 | -       | - | - | -      | -          | -   | -      | -          | -   | 220    | <b>190</b> | 155 | 185    | <b>155</b> | 130 |
|                | 3 | -       | - | - | -      | -          | -   | -      | -          | -   | 170    | <b>145</b> | 115 | 140    | <b>120</b> | 95  |
| K              | 1 | -       | - | - | 355    | <b>320</b> | 290 | 325    | <b>295</b> | 260 | 275    | <b>245</b> | 220 | -      | -          | -   |
|                | 2 | -       | - | - | 275    | <b>245</b> | 230 | 250    | <b>230</b> | 210 | 215    | <b>190</b> | 180 | -      | -          | -   |
|                | 3 | -       | - | - | 235    | <b>210</b> | 190 | 210    | <b>190</b> | 175 | 180    | <b>160</b> | 145 | -      | -          | -   |
| N              | 1 | -       | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -       | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -       | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| S              | 1 | -       | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -       | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -       | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 4 | -       | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| H              | 1 | -       | - | - | 190    | <b>155</b> | 110 | -      | -          | -   | 145    | <b>110</b> | 85  | -      | -          | -   |
|                | 2 | -       | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -       | - | - | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |

| Material Group |   | KCK15 |            |     | KCPK30 |            |     | KCPM40 |            |     | KCSM40 |            |     |
|----------------|---|-------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|
| P              | 1 | -     | -          | -   | 545    | <b>475</b> | 445 | 355    | <b>310</b> | 295 | 275    | <b>240</b> | 205 |
|                | 2 | -     | -          | -   | 335    | <b>305</b> | 275 | 300    | <b>260</b> | 215 | 240    | <b>205</b> | 160 |
|                | 3 | -     | -          | -   | 305    | <b>275</b> | 245 | 275    | <b>235</b> | 190 | 205    | <b>180</b> | 160 |
|                | 4 | -     | -          | -   | 230    | <b>210</b> | 190 | 245    | <b>205</b> | 160 | 180    | <b>160</b> | 145 |
|                | 5 | -     | -          | -   | 310    | <b>275</b> | 250 | 205    | <b>185</b> | 160 | 160    | <b>145</b> | 125 |
|                | 6 | -     | -          | -   | 190    | <b>160</b> | 145 | 180    | <b>140</b> | 110 | 125    | <b>110</b> | 90  |
| M              | 1 | -     | -          | -   | 245    | <b>220</b> | 185 | 235    | <b>205</b> | 185 | 275    | <b>220</b> | 180 |
|                | 2 | -     | -          | -   | 220    | <b>190</b> | 170 | 210    | <b>180</b> | 150 | 180    | <b>145</b> | 125 |
|                | 3 | -     | -          | -   | 175    | <b>155</b> | 140 | 155    | <b>140</b> | 110 | 145    | <b>125</b> | 110 |
| K              | 1 | 505   | <b>460</b> | 410 | 355    | <b>320</b> | 290 | -      | -          | -   | -      | -          | -   |
|                | 2 | 400   | <b>355</b> | 330 | 280    | <b>250</b> | 230 | -      | -          | -   | -      | -          | -   |
|                | 3 | 335   | <b>300</b> | 275 | 235    | <b>210</b> | 190 | -      | -          | -   | -      | -          | -   |
| N              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| S              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 4 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| H              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |

\*Recommended for wet machining only.

NOTE: FIRST choice starting speeds are in **bold** type.

As the average chip thickness increases, the speed should be decreased.

Dry

Wet

| Material Group |   | KC410M |             |     | KC510M |            |     | KC520M |            |     | KC522M |            |     | KC725M |            |     |
|----------------|---|--------|-------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|
| P              | 1 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 315    | <b>270</b> | 260 | 250    | <b>220</b> | 210 |
|                | 2 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 265    | <b>230</b> | 190 | 210    | <b>185</b> | 150 |
|                | 3 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 245    | <b>210</b> | 170 | 190    | <b>165</b> | 135 |
|                | 4 | -      | -           | -   | 235    | <b>190</b> | 165 | -      | -          | -   | 215    | <b>175</b> | 145 | 170    | <b>145</b> | 115 |
|                | 5 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 175    | <b>165</b> | 145 | 145    | <b>130</b> | 115 |
|                | 6 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 160    | <b>120</b> | 95  | 125    | <b>95</b>  | 75  |
| M              | 1 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 195    | <b>170</b> | 160 | 165    | <b>145</b> | 130 |
|                | 2 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 175    | <b>150</b> | 125 | 150    | <b>125</b> | 105 |
|                | 3 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 135    | <b>115</b> | 90  | 110    | <b>95</b>  | 75  |
| K              | 1 | -      | -           | -   | 285    | <b>255</b> | 230 | 260    | <b>235</b> | 210 | 220    | <b>195</b> | 175 | -      | -          | -   |
|                | 2 | -      | -           | -   | 220    | <b>195</b> | 185 | 200    | <b>185</b> | 170 | 170    | <b>150</b> | 145 | -      | -          | -   |
|                | 3 | -      | -           | -   | 190    | <b>170</b> | 150 | 170    | <b>150</b> | 140 | 145    | <b>130</b> | 115 | -      | -          | -   |
| N              | 1 | 1170   | <b>1035</b> | 955 | 615    | <b>550</b> | 505 | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | 1035   | <b>955</b>  | 880 | 555    | <b>510</b> | 470 | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | 1035   | <b>955</b>  | 880 | 555    | <b>510</b> | 470 | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| S              | 1 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 40     | <b>30</b>  | 25  | 30     | <b>30</b>  | 25  |
|                | 2 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 40     | <b>30</b>  | 25  | 30     | <b>30</b>  | 25  |
|                | 3 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 50     | <b>40</b>  | 25  | 45     | <b>30</b>  | 25  |
|                | 4 | -      | -           | -   | -      | -          | -   | -      | -          | -   | 70     | <b>50</b>  | 30  | 50     | <b>45</b>  | 30  |
| H              | 1 | -      | -           | -   | 150    | <b>125</b> | 90  | -      | -          | -   | 115    | <b>90</b>  | 70  | -      | -          | -   |
|                | 2 | -      | -           | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -      | -           | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |

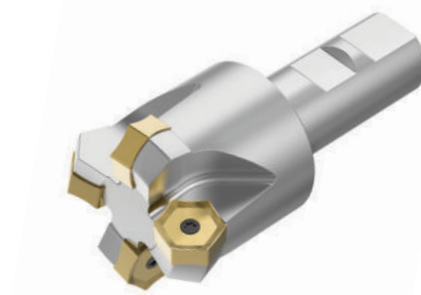
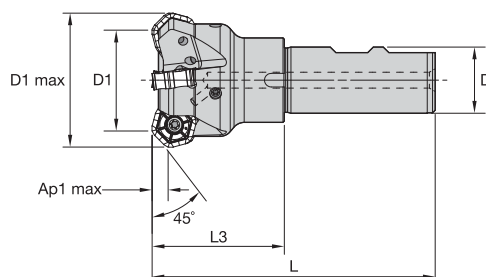
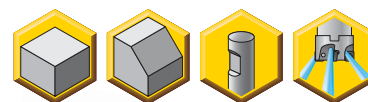
| Material Group |   | KCK15 |            |     | KCPK30 |            |     | KCPM40 |            |     | KCSM40 |            |     |
|----------------|---|-------|------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|
| P              | 1 | -     | -          | -   | 435    | <b>380</b> | 355 | 285    | <b>250</b> | 235 | -      | -          | -   |
|                | 2 | -     | -          | -   | 270    | <b>245</b> | 220 | 240    | <b>210</b> | 170 | -      | -          | -   |
|                | 3 | -     | -          | -   | 245    | <b>220</b> | 195 | 220    | <b>190</b> | 150 | -      | -          | -   |
|                | 4 | -     | -          | -   | 185    | <b>170</b> | 150 | 195    | <b>165</b> | 130 | -      | -          | -   |
|                | 5 | -     | -          | -   | 250    | <b>220</b> | 200 | 165    | <b>150</b> | 130 | 165    | <b>140</b> | 115 |
|                | 6 | -     | -          | -   | 150    | <b>130</b> | 120 | 145    | <b>110</b> | 90  | 145    | <b>105</b> | 75  |
| M              | 1 | -     | -          | -   | 195    | <b>175</b> | 150 | 190    | <b>165</b> | 150 | 200    | <b>165</b> | 135 |
|                | 2 | -     | -          | -   | 175    | <b>150</b> | 135 | 170    | <b>145</b> | 120 | 170    | <b>140</b> | 115 |
|                | 3 | -     | -          | -   | 140    | <b>125</b> | 110 | 125    | <b>110</b> | 90  | 140    | <b>105</b> | 80  |
| K              | 1 | 405   | <b>370</b> | 330 | 285    | <b>255</b> | 230 | -      | -          | -   | -      | -          | -   |
|                | 2 | 320   | <b>285</b> | 265 | 225    | <b>200</b> | 185 | -      | -          | -   | -      | -          | -   |
|                | 3 | 270   | <b>240</b> | 220 | 190    | <b>170</b> | 150 | -      | -          | -   | -      | -          | -   |
| N              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
| S              | 1 | -     | -          | -   | -      | -          | -   | 40     | <b>30</b>  | 30  | 40     | <b>30</b>  | 25  |
|                | 2 | -     | -          | -   | -      | -          | -   | 40     | <b>30</b>  | 30  | 40     | <b>30</b>  | 25  |
|                | 3 | -     | -          | -   | -      | -          | -   | 50     | <b>40</b>  | 30  | 50     | <b>40</b>  | 25  |
|                | 4 | -     | -          | -   | 65     | <b>50</b>  | 30  | 65     | <b>50</b>  | 30  | 55     | <b>50</b>  | 30  |
| H              | 1 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 2 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |
|                | 3 | -     | -          | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   |

NOTE: FIRST choice starting speeds are in **bold** type.  
As the average chip thickness increases, the speed should be decreased.

Dry  
Wet



- Twelve cutting edges per insert.
- Soft cutting action.
- Through tool coolant.



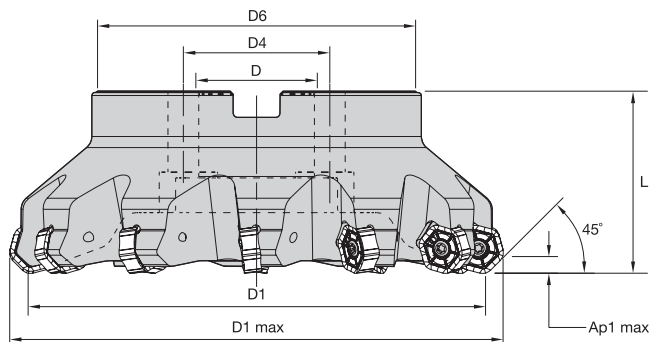
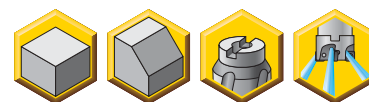
### ■ Dodeka 45° • Weldon End Mills

| order number | catalogue number     | D1 | D1 max | D  | L   | L3    | Ap1 max | Z | kg   | max RPM |
|--------------|----------------------|----|--------|----|-----|-------|---------|---|------|---------|
| 3324830      | KSHR40D04R50B25SHN09 | 40 | 51,0   | 25 | 107 | 50,00 | 4,5     | 4 | 0,52 | 15800   |

### ■ Spare Parts

|    |  |  |  |
|----|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| D1 | insert screw                                                                       | Nm                                                                                 | wrench                                                                               |
| 40 | 193.492                                                                            | 3,5                                                                                | 170.025                                                                              |

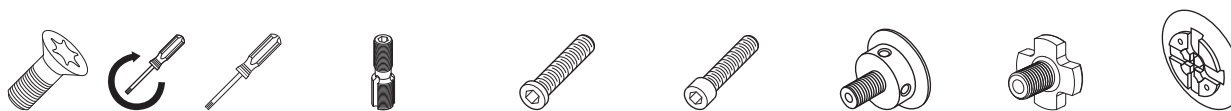
- Twelve cutting edges per insert.
- Through coolant standard.
- Soft cutting action.



## ■ Dodeka 45° • Shell Mills

| order number | catalogue number   | D1  | D1 max | D  | D4  | D6  | L  | Ap1 max | Z  | kg   | max RPM |
|--------------|--------------------|-----|--------|----|-----|-----|----|---------|----|------|---------|
| 3324831      | KSHR50A04RS45HN09  | 50  | 61,0   | 22 | —   | 38  | 40 | 4,5     | 4  | 0,32 | 12700   |
| 3324832      | KSHR50A05RS45HN09  | 50  | 61,0   | 22 | —   | 38  | 40 | 4,5     | 5  | 0,33 | 12700   |
| 3749959      | KSHR63A05RS45HN09  | 63  | 74,0   | 22 | —   | 50  | 40 | 4,5     | 5  | 0,60 | 10100   |
| 3325163      | KSHR63A06RS45HN09  | 63  | 74,0   | 22 | —   | 50  | 40 | 4,5     | 6  | 0,56 | 10100   |
| 3325164      | KSHR63A07RS45HN09  | 63  | 74,0   | 22 | —   | 50  | 40 | 4,5     | 7  | 0,57 | 10100   |
| 3749960      | KSHR80A05RS45HN09  | 80  | 91,0   | 27 | —   | 60  | 50 | 4,5     | 5  | 1,12 | 7900    |
| 3325165      | KSHR80A06RS45HN09  | 80  | 91,0   | 27 | —   | 60  | 50 | 4,5     | 6  | 1,07 | 7900    |
| 3325166      | KSHR80A09RS45HN09  | 80  | 91,0   | 27 | —   | 60  | 50 | 4,5     | 9  | 1,11 | 7900    |
| 3749961      | KSHR100B06RS45HN09 | 100 | 111,0  | 32 | —   | 80  | 50 | 4,5     | 6  | 1,73 | 6300    |
| 3325167      | KSHR100B08RS45HN09 | 100 | 111,0  | 32 | —   | 80  | 50 | 4,5     | 8  | 1,68 | 6300    |
| 3325168      | KSHR100B11RS45HN09 | 100 | 111,0  | 32 | —   | 80  | 50 | 4,5     | 11 | 1,73 | 6300    |
| 3749962      | KSHR125B08RS45HN09 | 125 | 135,9  | 40 | —   | 90  | 63 | 4,5     | 8  | 2,84 | 5050    |
| 3325169      | KSHR125B10RS45HN09 | 125 | 135,9  | 40 | —   | 90  | 63 | 4,5     | 10 | 2,77 | 5050    |
| 3325170      | KSHR125B14RS45HN09 | 125 | 136,0  | 40 | —   | 90  | 63 | 4,5     | 14 | 2,86 | 5050    |
| 3750013      | KSHR160C10RS45HN09 | 160 | 171,0  | 40 | 67  | 110 | 63 | 4,5     | 10 | 4,75 | 3900    |
| 3325171      | KSHR160C12RS45HN09 | 160 | 171,0  | 40 | 67  | 110 | 63 | 4,5     | 12 | 4,56 | 3900    |
| 3325172      | KSHR160C16RS45HN09 | 160 | 171,0  | 40 | 67  | 110 | 63 | 4,5     | 16 | 4,70 | 3900    |
| 3587732      | KSHR200C16RS45HN09 | 200 | 211,0  | 60 | 102 | 130 | 63 | 4,5     | 16 | 6,43 | 3180    |
| 3587753      | KSHR250C20RS45HN09 | 250 | 261,0  | 60 | 102 | 130 | 63 | 4,5     | 20 | 9,93 | 2550    |

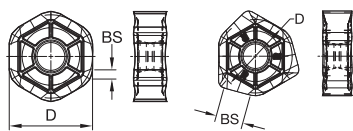
## ■ Spare Parts



| D1  | insert screw | Nm  | wrench  | mounting screw with coolant grooves | low-head cap screw | socket-head cap screw | coolant lock screw assembly | coolant lock screw | coolant shower plate |
|-----|--------------|-----|---------|-------------------------------------|--------------------|-----------------------|-----------------------------|--------------------|----------------------|
| 50  | 193.492      | 3,5 | 170.025 | MS2072CG                            | 129.025            | —                     | —                           | —                  | —                    |
| 63  | 193.492      | 3,5 | 170.025 | MS1234CG                            | —                  | 125.025               | —                           | —                  | —                    |
| 80  | 193.492      | 3,5 | 170.025 | MS2038CG                            | —                  | 125.230               | —                           | —                  | —                    |
| 100 | 193.492      | 3,5 | 170.025 | —                                   | —                  | —                     | MS2189C                     | —                  | —                    |
| 125 | 193.492      | 3,5 | 170.025 | —                                   | —                  | —                     | —                           | 420.200            | 470.232              |
| 160 | 193.492      | 3,5 | 170.025 | —                                   | —                  | —                     | —                           | 420.200            | 470.233              |
| 200 | 193.492      | 3,5 | 170.025 | —                                   | —                  | —                     | —                           | —                  | 470.234              |
| 250 | 193.492      | 3,5 | 170.025 | —                                   | —                  | —                     | —                           | —                  | 470.235              |

NOTE: Coolant lock screw assembly and coolant cap must be ordered separately.

- ◆◆ first choice with coolant
- ◆◇ first choice without coolant
- ◆ alternate choice with coolant
- ◇ alternate choice without coolant



|       |    |    |     |    |    |    |    |    |    |
|-------|----|----|-----|----|----|----|----|----|----|
| P1-P2 |    |    | ◇/◆ | ◆◆ |    | ◆◇ |    |    |    |
| P3-P4 |    |    | ◇/◆ | ◆◆ |    | ◆◇ | ◆◇ |    |    |
| P5-P6 |    |    | ◇/◆ | ◆◆ |    | ◆◇ | ◆◇ |    |    |
| M1-M2 |    |    | ◇/◆ | ◆  |    |    | ◆  | ◆◆ |    |
| M3    |    |    | ◇/◆ | ◆  |    |    |    | ◆◆ |    |
| K1-K2 |    | ◆◆ |     |    | ◆◇ |    |    |    | ◆◇ |
| K3    |    | ◆◆ |     |    |    | ◆◇ |    |    |    |
| N1    | ◆◆ |    |     |    |    |    |    |    |    |
| N2    | ◆◆ |    |     |    |    |    |    |    |    |
| S1    |    |    |     | ◆  |    |    |    | ◆◆ |    |
| S2    |    |    |     | ◆  |    |    |    | ◆◆ |    |
| S3    |    |    | ◆   | ◆  |    |    |    | ◆◆ |    |
| S4    |    |    | ◆   | ◆  |    |    |    | ◆◆ |    |

| ISO catalogue number   | D  | BS   | KC410M  | KC520M  | KC522M  | KC725M  | KCK15   | KCPK30  | KCPM40 | KCSM40  | KY3500 |
|------------------------|----|------|---------|---------|---------|---------|---------|---------|--------|---------|--------|
| <b>Light Machining</b> |    |      |         |         |         |         |         |         |        |         |        |
| HNGJ0905ANFNLDJ        | 16 | 1,80 | 3849320 | -       | -       | -       | -       | -       | -      | -       | -      |
| HNGJ0905ANENLD         | 16 | 1,80 | -       | 3331174 | 3093561 | 3331175 | 3330952 | 3331178 | -      | 6178103 | -      |

|                          |    |      |   |         |         |         |         |         |         |         |   |
|--------------------------|----|------|---|---------|---------|---------|---------|---------|---------|---------|---|
| <b>General Machining</b> |    |      |   |         |         |         |         |         |         |         |   |
| HNGJ0905ANSNGD           | 16 | 1,80 | - | -       | -       | 3331176 | 3331173 | 3093719 | 5550793 | 6178104 | - |
| HNPJ0905ANSNGD           | 16 | 1,80 | - | 3763726 | 3774250 | 3763727 | 3763725 | 3763728 | 5550795 | -       | - |

|                        |    |      |   |   |         |         |         |         |         |         |   |
|------------------------|----|------|---|---|---------|---------|---------|---------|---------|---------|---|
| <b>Heavy Machining</b> |    |      |   |   |         |         |         |         |         |         |   |
| HNGJ0905ANSNHD         | 16 | 1,66 | - | - | -       | 3556331 | 3556330 | 3556332 | 5550794 | 6178105 | - |
| HNPJ0905ANSNHD         | 16 | 1,66 | - | - | 3774249 | 3763723 | 3763185 | 3763724 | 5550796 | 6178108 | - |
| HNPJ090543ANSNHD       | 16 | -    | - | - | 3774251 | 3763730 | 3763729 | 3763731 | 5550797 | 6178109 | - |
| HNGJ090543ANSNHD       | 16 | -    | - | - | -       | 3556374 | 3556373 | 3556375 | 6068043 | 6178106 | - |

|                             |    |      |   |   |   |         |         |         |   |         |   |
|-----------------------------|----|------|---|---|---|---------|---------|---------|---|---------|---|
| <b>Finishing with Wiper</b> |    |      |   |   |   |         |         |         |   |         |   |
| XNGJ0905ANSNGD3W            | 16 | 6,00 | - | - | - | 3547033 | 3547022 | 3547035 | - | 6178107 | - |

|                                       |    |      |   |   |   |   |   |   |   |   |         |
|---------------------------------------|----|------|---|---|---|---|---|---|---|---|---------|
| <b>High Speed Cast Iron Machining</b> |    |      |   |   |   |   |   |   |   |   |         |
| HNEC0905ANSN                          | 16 | 1,95 | - | - | - | - | - | - | - | - | 6140064 |

## Recommended Starting Feeds

### ■ Recommended Starting Feeds [mm]

| Light Machining | General Purpose | Heavy Machining |
|-----------------|-----------------|-----------------|
|-----------------|-----------------|-----------------|

| Insert<br>Geometry | Recommended Starting Feed per Tooth (Fz) in<br>Relation to % of Radial Engagement (ae) |      |      |      |      |      |      |      |      |      |      |      |         |      |      | Insert<br>Geometry |
|--------------------|----------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|---------|------|------|--------------------|
|                    | 5%                                                                                     |      |      | 10%  |      |      | 20%  |      |      | 30%  |      |      | 40–100% |      |      |                    |
| .F..LDJ            | 0,17                                                                                   | 0,46 | 0,79 | 0,12 | 0,33 | 0,57 | 0,09 | 0,25 | 0,43 | 0,08 | 0,22 | 0,37 | 0,07    | 0,20 | 0,34 | .F..LDJ            |
| .E..LD             | 0,23                                                                                   | 0,66 | 0,99 | 0,17 | 0,47 | 0,71 | 0,13 | 0,35 | 0,53 | 0,11 | 0,31 | 0,46 | 0,10    | 0,28 | 0,42 | .E..LD             |
| .S..GD             | 0,33                                                                                   | 0,72 | 1,15 | 0,24 | 0,52 | 0,82 | 0,18 | 0,39 | 0,61 | 0,16 | 0,34 | 0,54 | 0,14    | 0,31 | 0,49 | .S..GD             |
| .S..HD             | 0,33                                                                                   | 0,84 | 1,35 | 0,24 | 0,60 | 0,97 | 0,18 | 0,45 | 0,72 | 0,16 | 0,39 | 0,63 | 0,14    | 0,36 | 0,57 | .S..HD             |

HNG....: Ground inserts; high versatility for all finishing applications and difficult-to-machine stainless steels and high-temp alloys.

HNP....: Pressed inserts; lower cost per edge for most roughing to semi-finishing operations.

XNG....: Wiper finishing insert. To be used in combination with HNGJ..LD insert.

| Material Group |   | KC410M* | KC520M             | KC522M             | KC725M             | KCK15              |
|----------------|---|---------|--------------------|--------------------|--------------------|--------------------|
| P              | 1 | - - -   | - - -              | 395 <b>340</b> 325 | 310 <b>275</b> 260 | - - -              |
|                | 2 | - - -   | - - -              | 330 <b>290</b> 240 | 265 <b>230</b> 190 | - - -              |
|                | 3 | - - -   | - - -              | 305 <b>260</b> 210 | 240 <b>205</b> 170 | - - -              |
|                | 4 | - - -   | - - -              | 270 <b>220</b> 180 | 215 <b>180</b> 145 | - - -              |
|                | 5 | - - -   | - - -              | 220 <b>205</b> 180 | 180 <b>160</b> 145 | - - -              |
|                | 6 | - - -   | - - -              | 200 <b>150</b> 120 | 155 <b>120</b> 95  | - - -              |
| M              | 1 | - - -   | - - -              | 245 <b>215</b> 200 | 205 <b>180</b> 160 | - - -              |
|                | 2 | - - -   | - - -              | 220 <b>190</b> 155 | 185 <b>155</b> 130 | - - -              |
|                | 3 | - - -   | - - -              | 170 <b>145</b> 115 | 140 <b>120</b> 95  | - - -              |
| K              | 1 | - - -   | 325 <b>295</b> 260 | 275 <b>245</b> 220 | - - -              | 505 <b>460</b> 410 |
|                | 2 | - - -   | 250 <b>230</b> 210 | 215 <b>190</b> 180 | - - -              | 400 <b>355</b> 330 |
|                | 3 | - - -   | 210 <b>190</b> 175 | 180 <b>160</b> 145 | - - -              | 335 <b>300</b> 275 |
| N              | 1 | - - -   | - - -              | - - -              | - - -              | - - -              |
|                | 2 | - - -   | - - -              | - - -              | - - -              | - - -              |
|                | 3 | - - -   | - - -              | - - -              | - - -              | - - -              |
| S              | 1 | - - -   | - - -              | - - -              | - - -              | - - -              |
|                | 2 | - - -   | - - -              | - - -              | - - -              | - - -              |
|                | 3 | - - -   | - - -              | - - -              | - - -              | - - -              |
|                | 4 | - - -   | - - -              | - - -              | - - -              | - - -              |
| H              | 1 | - - -   | - - -              | 145 <b>110</b> 85  | - - -              | - - -              |
|                | 2 | - - -   | - - -              | - - -              | - - -              | - - -              |
|                | 3 | - - -   | - - -              | - - -              | - - -              | - - -              |

| Material Group |   | KCPK30             | KCPM40             | KCSM40             | KY3500             |
|----------------|---|--------------------|--------------------|--------------------|--------------------|
| P              | 1 | 545 <b>475</b> 445 | 355 <b>310</b> 295 | 275 <b>240</b> 205 | - - -              |
|                | 2 | 335 <b>305</b> 275 | 300 <b>260</b> 215 | 240 <b>205</b> 160 | - - -              |
|                | 3 | 305 <b>275</b> 245 | 275 <b>235</b> 190 | 205 <b>180</b> 160 | - - -              |
|                | 4 | 230 <b>210</b> 190 | 245 <b>205</b> 160 | 180 <b>160</b> 145 | - - -              |
|                | 5 | 310 <b>275</b> 250 | 205 <b>185</b> 160 | 160 <b>145</b> 125 | - - -              |
|                | 6 | 190 <b>160</b> 145 | 180 <b>140</b> 110 | 125 <b>110</b> 90  | - - -              |
| M              | 1 | 245 <b>220</b> 185 | 235 <b>205</b> 185 | 275 <b>220</b> 180 | - - -              |
|                | 2 | 220 <b>190</b> 170 | 210 <b>180</b> 150 | 180 <b>145</b> 125 | - - -              |
|                | 3 | 175 <b>155</b> 140 | 155 <b>140</b> 110 | 145 <b>125</b> 110 | - - -              |
| K              | 1 | 355 <b>320</b> 290 | - - -              | - - -              | 965 <b>875</b> 780 |
|                | 2 | 280 <b>250</b> 230 | - - -              | - - -              | 760 <b>685</b> 635 |
|                | 3 | 235 <b>210</b> 190 | - - -              | - - -              | - - -              |
| N              | 1 | - - -              | - - -              | - - -              | - - -              |
|                | 2 | - - -              | - - -              | - - -              | - - -              |
|                | 3 | - - -              | - - -              | - - -              | - - -              |
| S              | 1 | - - -              | - - -              | - - -              | - - -              |
|                | 2 | - - -              | - - -              | - - -              | - - -              |
|                | 3 | - - -              | - - -              | - - -              | - - -              |
|                | 4 | - - -              | - - -              | - - -              | - - -              |
| H              | 1 | - - -              | - - -              | - - -              | - - -              |
|                | 2 | - - -              | - - -              | - - -              | - - -              |
|                | 3 | - - -              | - - -              | - - -              | - - -              |

\*Recommended for wet machining only.

NOTE: FIRST choice starting speeds are in **bold** type.

As the average chip thickness increases, the speed should be decreased.

Dry

Wet







| Material Group |   | KC410M |             |     | KC520M |            |     | KC522M |            |     | KC725M |            |     | KCK15 |            |     |
|----------------|---|--------|-------------|-----|--------|------------|-----|--------|------------|-----|--------|------------|-----|-------|------------|-----|
| P              | 1 | -      | -           | -   | -      | -          | -   | 315    | <b>270</b> | 260 | 250    | <b>220</b> | 210 | -     | -          | -   |
|                | 2 | -      | -           | -   | -      | -          | -   | 265    | <b>230</b> | 190 | 210    | <b>185</b> | 150 | -     | -          | -   |
|                | 3 | -      | -           | -   | -      | -          | -   | 245    | <b>210</b> | 170 | 190    | <b>165</b> | 135 | -     | -          | -   |
|                | 4 | -      | -           | -   | -      | -          | -   | 215    | <b>175</b> | 145 | 170    | <b>145</b> | 115 | -     | -          | -   |
|                | 5 | -      | -           | -   | -      | -          | -   | 175    | <b>165</b> | 145 | 145    | <b>130</b> | 115 | -     | -          | -   |
|                | 6 | -      | -           | -   | -      | -          | -   | 160    | <b>120</b> | 95  | 125    | <b>95</b>  | 75  | -     | -          | -   |
| M              | 1 | -      | -           | -   | -      | -          | -   | 195    | <b>170</b> | 160 | 165    | <b>145</b> | 130 | -     | -          | -   |
|                | 2 | -      | -           | -   | -      | -          | -   | 175    | <b>150</b> | 125 | 150    | <b>125</b> | 105 | -     | -          | -   |
|                | 3 | -      | -           | -   | -      | -          | -   | 135    | <b>115</b> | 90  | 110    | <b>95</b>  | 75  | -     | -          | -   |
| K              | 1 | -      | -           | -   | 260    | <b>235</b> | 210 | 220    | <b>195</b> | 175 | -      | -          | -   | 405   | <b>370</b> | 330 |
|                | 2 | -      | -           | -   | 200    | <b>185</b> | 170 | 170    | <b>150</b> | 145 | -      | -          | -   | 320   | <b>285</b> | 265 |
|                | 3 | -      | -           | -   | 170    | <b>150</b> | 140 | 145    | <b>130</b> | 115 | -      | -          | -   | 270   | <b>240</b> | 220 |
| N              | 1 | 1170   | <b>1035</b> | 955 | -      | -          | -   | -      | -          | -   | -      | -          | -   | -     | -          | -   |
|                | 2 | 1035   | <b>955</b>  | 880 | -      | -          | -   | -      | -          | -   | -      | -          | -   | -     | -          | -   |
|                | 3 | 1035   | <b>955</b>  | 880 | -      | -          | -   | -      | -          | -   | -      | -          | -   | -     | -          | -   |
| S              | 1 | -      | -           | -   | -      | -          | -   | 40     | <b>30</b>  | 25  | 30     | <b>30</b>  | 25  | -     | -          | -   |
|                | 2 | -      | -           | -   | -      | -          | -   | 40     | <b>30</b>  | 25  | 30     | <b>30</b>  | 25  | -     | -          | -   |
|                | 3 | -      | -           | -   | -      | -          | -   | 50     | <b>40</b>  | 25  | 45     | <b>30</b>  | 25  | -     | -          | -   |
|                | 4 | -      | -           | -   | -      | -          | -   | 70     | <b>50</b>  | 30  | 50     | <b>45</b>  | 30  | -     | -          | -   |
| H              | 1 | -      | -           | -   | -      | -          | -   | 115    | <b>90</b>  | 70  | -      | -          | -   | -     | -          | -   |
|                | 2 | -      | -           | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   | -     | -          | -   |
|                | 3 | -      | -           | -   | -      | -          | -   | -      | -          | -   | -      | -          | -   | -     | -          | -   |

| Material Group |   | KCPK30 |            |     | KCPM40 |            |     | KCSM40 |            |     | KY3500* |   |   |
|----------------|---|--------|------------|-----|--------|------------|-----|--------|------------|-----|---------|---|---|
| P              | 1 | 435    | <b>380</b> | 355 | 285    | <b>250</b> | 235 | -      | -          | -   | -       | - | - |
|                | 2 | 270    | <b>245</b> | 220 | 240    | <b>210</b> | 170 | -      | -          | -   | -       | - | - |
|                | 3 | 245    | <b>220</b> | 195 | 220    | <b>190</b> | 150 | -      | -          | -   | -       | - | - |
|                | 4 | 185    | <b>170</b> | 150 | 195    | <b>165</b> | 130 | -      | -          | -   | -       | - | - |
|                | 5 | 250    | <b>220</b> | 200 | 165    | <b>150</b> | 130 | 165    | <b>140</b> | 115 | -       | - | - |
|                | 6 | 150    | <b>130</b> | 118 | 145    | <b>110</b> | 90  | 145    | <b>105</b> | 75  | -       | - | - |
| M              | 1 | 195    | <b>175</b> | 150 | 190    | <b>165</b> | 150 | 200    | <b>165</b> | 135 | -       | - | - |
|                | 2 | 175    | <b>150</b> | 135 | 170    | <b>145</b> | 120 | 170    | <b>140</b> | 115 | -       | - | - |
|                | 3 | 140    | <b>125</b> | 110 | 125    | <b>110</b> | 90  | 140    | <b>105</b> | 80  | -       | - | - |
| K              | 1 | 285    | <b>255</b> | 230 | -      | -          | -   | -      | -          | -   | -       | - | - |
|                | 2 | 225    | <b>200</b> | 185 | -      | -          | -   | -      | -          | -   | -       | - | - |
|                | 3 | 190    | <b>170</b> | 150 | -      | -          | -   | -      | -          | -   | -       | - | - |
| N              | 1 | -      | -          | -   | -      | -          | -   | -      | -          | -   | -       | - | - |
|                | 2 | -      | -          | -   | -      | -          | -   | -      | -          | -   | -       | - | - |
|                | 3 | -      | -          | -   | -      | -          | -   | -      | -          | -   | -       | - | - |
| S              | 1 | -      | -          | -   | 40     | <b>30</b>  | 30  | 40     | <b>30</b>  | 25  | -       | - | - |
|                | 2 | -      | -          | -   | 40     | <b>30</b>  | 30  | 40     | <b>30</b>  | 25  | -       | - | - |
|                | 3 | -      | -          | -   | 50     | <b>40</b>  | 30  | 50     | <b>40</b>  | 25  | -       | - | - |
|                | 4 | 65     | <b>50</b>  | 30  | 65     | <b>50</b>  | 30  | 55     | <b>50</b>  | 30  | -       | - | - |
| H              | 1 | -      | -          | -   | -      | -          | -   | -      | -          | -   | -       | - | - |
|                | 2 | -      | -          | -   | -      | -          | -   | -      | -          | -   | -       | - | - |
|                | 3 | -      | -          | -   | -      | -          | -   | -      | -          | -   | -       | - | - |

\*Recommended for dry machining only.

NOTE: FIRST choice starting speeds are in **bold type**.

As the average chip thickness increases, the speed should be decreased.

Dry  
Wet