



Future-Mill Series

FMR Tools



Feature

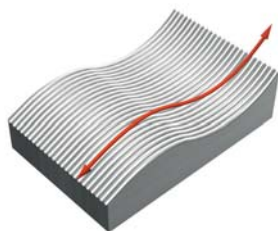
- Rotating prevention system for rigid clamping.
- 4~8 edges available round type insert.
- Full line-up with various size insert.
(Insert size 05, 06, 07, 08, 10, 12, 16, 20)
- Chattering free thanks to the unequal flute spacing.
- High precision designing of the insert seat.
- Unique rotating prevention system.
- Easy insert change.

Multy purpose Milling tool

FMR Tools

Contents

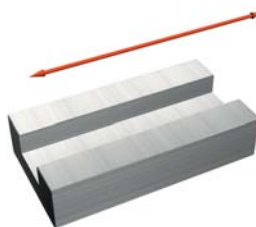
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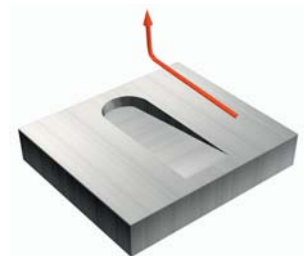
Contouring



Helical
ramping



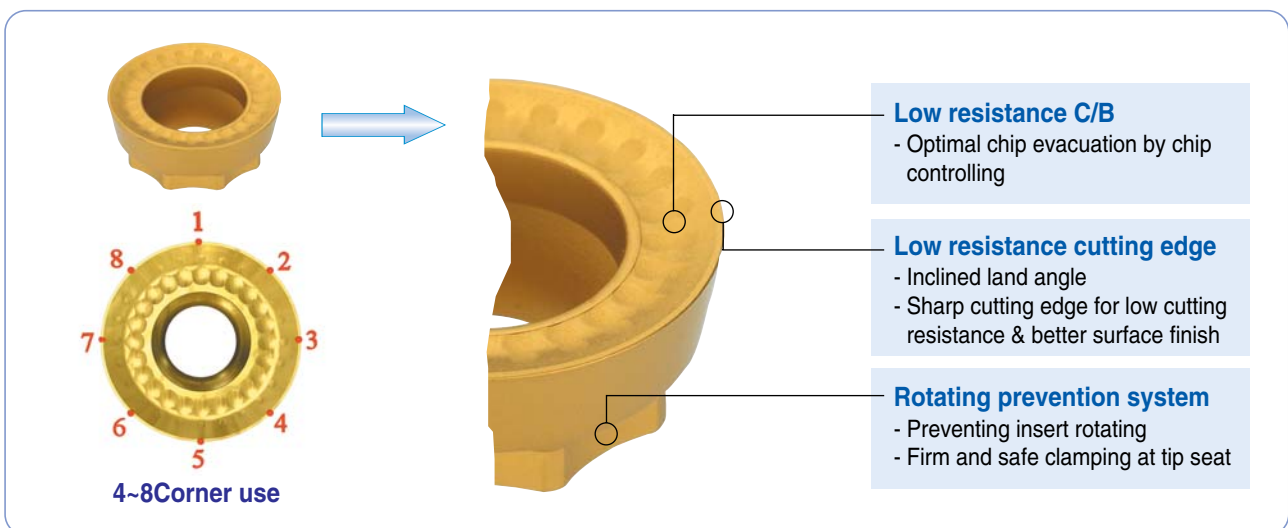
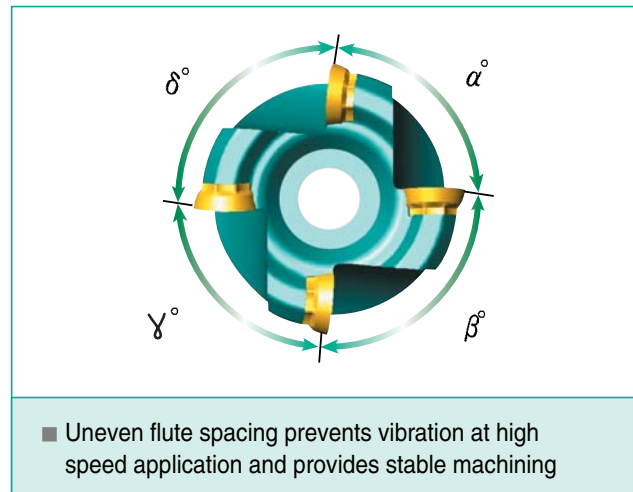
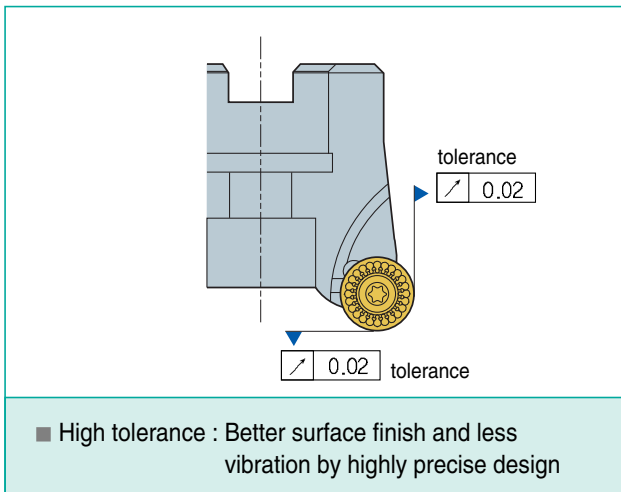
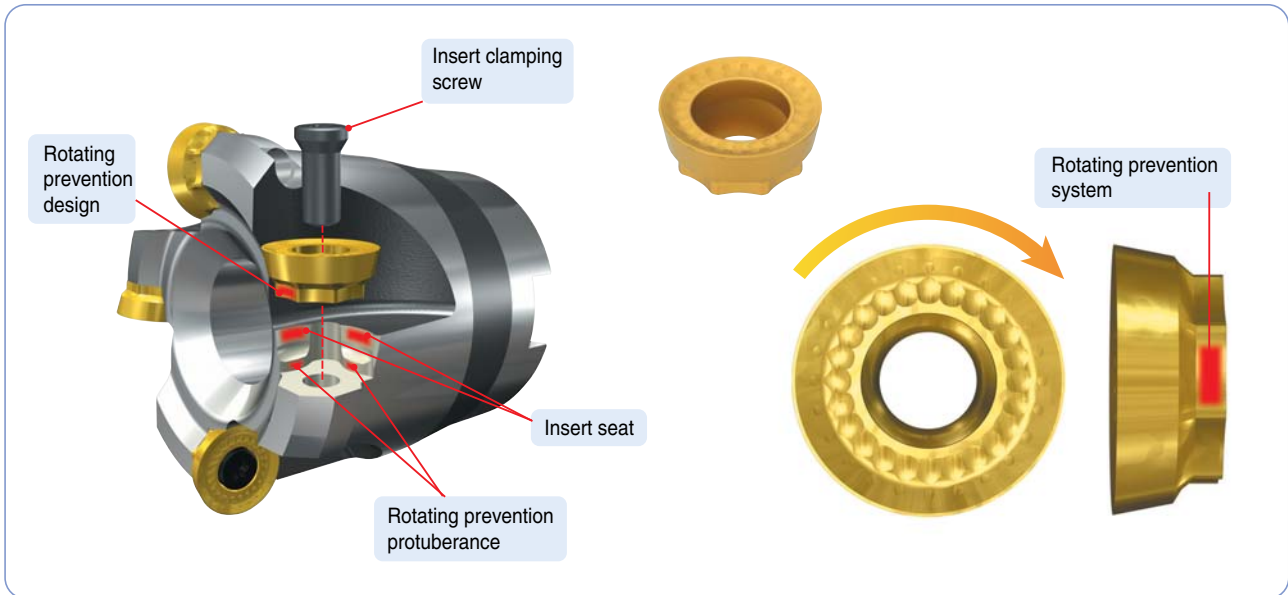
Slotting &
shouldering



Ramping down

Multy purpose Milling tool FMR Tools


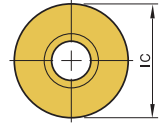
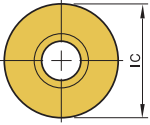
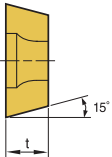

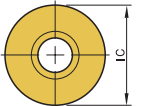
Features of FMR



Multy purpose Milling tool

FMR Tools

FMR H-tolerance insert



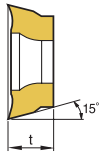
| Designation | Use | Applicable cutter | Dimension (mm) | | Grade | | | | | | | | Shape |
|-------------|-----------|---|----------------|------|------------------|-----------------------|----------------------------|----------------------------|-----------------------|-----------------------|----------------------------|-------------|---|
| | | | IC | t | P C 3 5 | P C 3 4 5 | N C M 3 2 5 | N C M 3 3 5 | P C 9 5 0 | P C 8 5 0 | P C 6 5 1 0 | H 0 1 | |
| RDHW0501M0F | Finishing | FMRM1000RD FMRS1000RD | 5 | 1.59 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ |  |
| RDHW0501M0E | General | | 5 | 1.59 | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW0501M0S | Medium | | 5 | 1.59 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW06T1M0F | Finishing | FMRM1500RD FMRS1500RD | 6 | 1.98 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ |  |
| RDHW06T1M0E | General | | 6 | 1.98 | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW06T1M0S | Medium | | 6 | 1.98 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW0702M0F | Finishing | FMRM2000RD FMRS2000RD | 7 | 2.38 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ |  |
| RDHW0702M0E | General | | 7 | 2.38 | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW0702M0S | Medium | | 7 | 2.38 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW0803M0F | Finishing | FMRM2500RD FMRS2500RD | 8 | 3.18 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ |  |
| RDHW0803M0E | General | | 8 | 3.18 | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW0803M0S | Medium | | 8 | 3.18 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW1605M0F | Finishing | FMRC(M)5000RD FMRM5000RD FMRS5000RD | 16 | 5.56 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ |  |
| RDHW1605M0E | General | | 16 | 5.56 | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW1605M0S | Medium | | 16 | 5.56 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW2006M0F | Finishing | FMRC(M)6000RD FMRM6000RD FMRS6000RD | 20 | 6.35 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ |  |
| RDHW2006M0E | General | | 20 | 6.35 | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ | |
| RDHW2006M0S | Medium | | 20 | 6.35 | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | |

● : Stock item, ○ : Under preparing for stock

Multy purpose Milling tool




FMR Tools

FMR K-tolerance(unground) insert




| Designation | Use | Applicable cutter | Dimension (mm) | | Grade | | | | | | | | Shape |
|---------------|-----------|---|----------------|------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------|--|
| | | | IC | t | P C 3 5 | P C 3 5 | N C 3 5 | N C 3 5 | P C 3 5 | P C 3 5 | P C 3 5 | H 0 1 | |
| RDKT10T3M0-MM | General | FMRC(M)3000RD FMRM3000RD FMRS3000RD | 10 | 3.97 | ● | ● | ● | ● | ● | ○ | ● | ○ |    |
| RDKT10T3M0-MF | Finishing | | 10 | 3.97 | ● | ● | ○ | ○ | ● | ● | ○ | ○ | |
| RDKT10T3M0-MA | Aluminum | | 10 | 3.97 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| RDKT1204M0-MM | General | FMRC(M)4000RD FMRM4000RD FMRS4000RD | 12 | 4.76 | ● | ● | ● | ● | ● | ○ | ● | ○ | |
| RDKT1204M0-MF | Finishing | | 12 | 4.76 | ● | ● | ○ | ○ | ● | ● | ○ | ○ | |
| RDKT1204M0-MA | Aluminum | | 12 | 4.76 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| RDKT1605M0-MM | General | FMRC(M)5000RD FMRM5000RD FMRS5000RD | 16 | 5.56 | | | | | | | | | |
| | | | 16 | 5.56 | ● | ● | ● | ● | ● | ○ | ● | ○ | |
| | | | 16 | 5.56 | | | | | | | | | |
| RDKT2006M0-MM | General | FMRC(M)6000RD FMRS6000RD | 20 | 6.35 | | | | | | | | | |
| | | | 20 | 6.35 | ● | ● | ● | ● | ● | ○ | ● | ○ | |

● : Stock item, ○ : Under preparing for stock

Chip Breakers

| Configuration | | Cutting edge | Features |
|---------------|----|---|--|
| Finishing | MF |  | Low cutting resistance Finish or hard-to-cut material cutting chip breaker. |
| Medium | MM |  | General and wide milling application. |
| Aluminum | MA |  | Aluminum cutting C/B Buffing surface treatment : good chip flow & adhesion resistance |

Edge treatment for ground insert

| Configuration | Sharp edge (for ground insert) | Designation | Honing (for ground insert) | Designation | T-land & honing (for ground insert) |
|---------------|---|-------------|---|-------------|---|
| RDHW□□□□MOF |  | RDHW□□□□MOE |  | RDHW□□□□MOS |  |

Multy purpose Milling tool

FMR Tools

Recommended cutting condition

| ISO | Designation Grade | | RDHW0501M0□ | | | | RDHW06T1M0□ | | | |
|-----|----------------------|--|-------------|---------------|---------|-------------|-------------|---------------|---------|-------------|
| | | | V(m/min) | fz (mm/tooth) | V (sfm) | fz (ipt) | V(m/min) | fz (mm/tooth) | V (sfm) | fz (ipt) |
| P | PC3535,PC3545 | | 100~230 | 0.15~0.30 | 330~760 | 0.006~0.012 | 130~250 | 0.15~0.40 | 430~830 | 0.006~0.016 |
| | PC9530 | | 100~250 | 0.15~0.30 | 330~830 | 0.006~0.012 | 130~300 | 0.15~0.40 | 430~990 | 0.006~0.016 |
| M | PC8520 | | 50~150 | 0.05~0.30 | 170~500 | 0.002~0.012 | 80~200 | 0.05~0.40 | 260~660 | 0.002~0.016 |
| | PC9530 | | 80~200 | 0.05~0.30 | 260~660 | 0.002~0.012 | 100~240 | 0.05~0.40 | 330~790 | 0.002~0.016 |
| S | PC8520 | | 20~70 | 0.05~0.30 | 65~230 | 0.002~0.012 | 20~70 | 0.05~0.40 | 65~230 | 0.002~0.016 |
| K | PC6510 | | 130~230 | 0.15~0.20 | 430~760 | 0.006~0.008 | 150~250 | 0.15~0.30 | 500~830 | 0.006~0.012 |

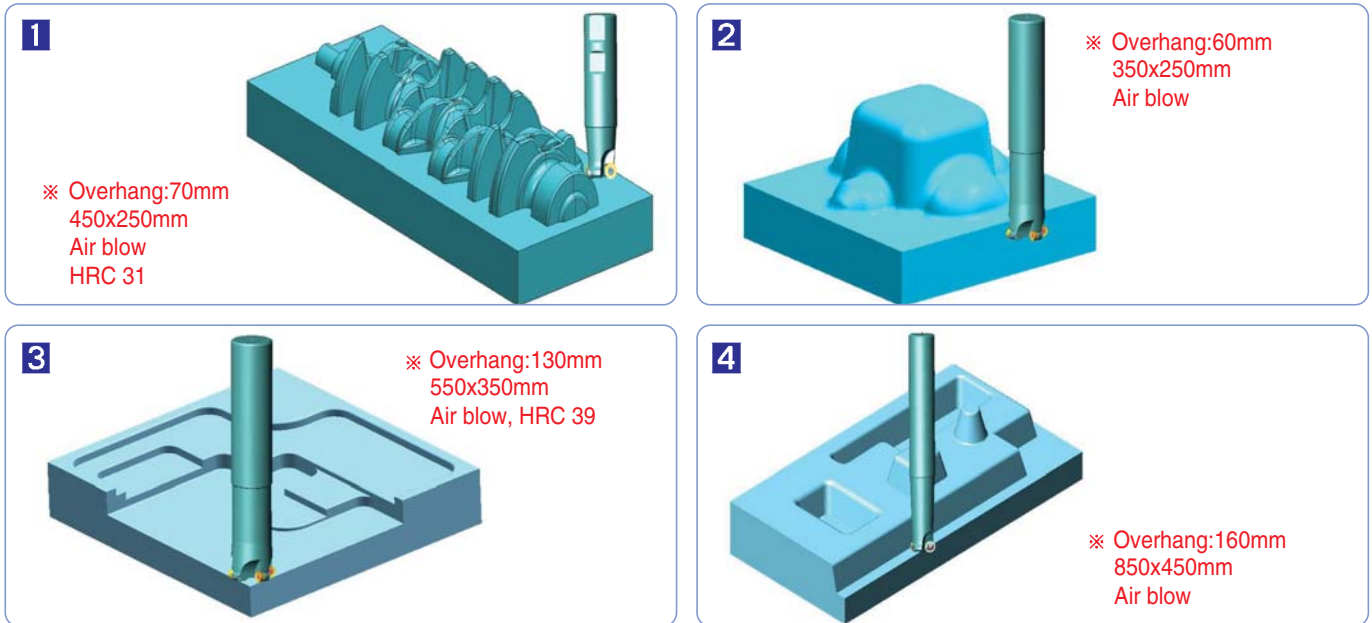
| ISO | Designation Grade | | RDHW0702M0□ | | | | RDHW0803M0□ | | | |
|-----|----------------------|--|-------------|---------------|---------|-------------|-------------|---------------|---------|-------------|
| | | | V(m/min) | fz (mm/tooth) | V (sfm) | fz (ipt) | V(m/min) | fz (mm/tooth) | V (sfm) | fz (ipt) |
| P | PC3535,PC3545 | | 150~300 | 0.20~0.50 | 500~990 | 0.008~0.02 | 150~300 | 0.20~0.50 | 500~990 | 0.008~0.02 |
| | PC9530 | | 170~300 | 0.20~0.50 | 560~990 | 0.008~0.02 | 170~300 | 0.20~0.50 | 560~990 | 0.008~0.02 |
| M | PC8520 | | 120~250 | 0.05~0.50 | 400~830 | 0.002~0.02 | 120~250 | 0.05~0.50 | 400~830 | 0.002~0.02 |
| | PC9530 | | 140~280 | 0.05~0.50 | 460~920 | 0.002~0.02 | 140~280 | 0.05~0.50 | 460~920 | 0.002~0.02 |
| S | PC8520 | | 20~70 | 0.05~0.50 | 65~230 | 0.002~0.02 | 20~70 | 0.05~0.50 | 65~230 | 0.002~0.02 |
| K | PC6510 | | 150~230 | 0.15~0.40 | 500~760 | 0.006~0.016 | 150~230 | 0.15~0.40 | 500~760 | 0.006~0.016 |

| ISO | Designation Grade | | RDKT10T3M0-□□ | | | | RDKT1204M0-□□ | | | |
|-----|----------------------|--|---------------|---------------|-----------|---------------|---------------|---------------|-----------|-------------|
| | | | V(m/min) | fz (mm/tooth) | V (sfm) | fz (ipt) | V(m/min) | fz (mm/tooth) | V (sfm) | fz (ipt) |
| P | NCM325 | | 100~300 | 0.10~0.40 | 330~990 | 0.004~0.016 | 120~250 | 0.15~0.60 | 400~830 | 0.006~0.024 |
| | NCM335 | | 100~250 | 0.10~0.40 | 330~830 | 0.004~0.016 | 120~220 | 0.15~0.60 | 400~730 | 0.006~0.024 |
| | PC3535,PC3545 | | 100~250 | 0.10~0.50 | 330~830 | 0.004~0.02 | 100~220 | 0.10~0.60 | 330~730 | 0.004~0.024 |
| M | PC8520 | | 80~160 | 0.05~0.50 | 260~530 | 0.002~0.02 | 80~160 | 0.10~0.60 | 260~530 | 0.004~0.024 |
| | PC9530 | | 80~180 | 0.05~0.50 | 260~600 | 0.002~0.02 | 80~180 | 0.10~0.60 | 260~600 | 0.004~0.024 |
| S | PC8520 | | 20~70 | 0.05~0.50 | 66~230 | 0.002~0.02 | 20~70 | 0.05~0.50 | 65~230 | 0.002~0.02 |
| K | PC6510 | | 150~250 | 0.08~0.35 | 500~830 | 0.0032~0.0014 | 150~230 | 0.10~0.55 | 500~760 | 0.004~0.022 |
| N | H01 | | 400~1200 | 0.05~0.65 | 1320~3960 | 0.002~0.028 | 400~1000 | 0.10~0.70 | 1320~3300 | 0.004~0.028 |

| ISO | Designation Grade | | RDHW1605M0□, RDKT1605M0-MM | | | | RDHW2006M0□, RDKT2006M0-MM | | | |
|-----|----------------------|--|----------------------------|---------------|---------|-------------|----------------------------|---------------|---------|-------------|
| | | | V(m/min) | fz (mm/tooth) | V (sfm) | fz (ipt) | V(m/min) | fz (mm/tooth) | V (sfm) | fz (ipt) |
| P | PC3535,PC3545 | | 100~230 | 0.25~0.70 | 330~760 | 0.01~0.028 | 90~210 | 0.25~0.80 | 300~690 | 0.01~0.032 |
| | PC9530 | | 100~250 | 0.30~0.70 | 330~830 | 0.012~0.028 | 90~210 | 0.30~0.80 | 300~690 | 0.012~0.032 |
| M | PC8520 | | 80~200 | 0.20~0.65 | 260~660 | 0.008~0.026 | 80~200 | 0.25~0.70 | 260~660 | 0.01~0.028 |
| | PC9530 | | 90~210 | 0.20~0.65 | 300~690 | 0.008~0.026 | 90~210 | 0.25~0.70 | 300~690 | 0.01~0.028 |
| S | PC8520 | | 20~70 | 0.20~0.60 | 65~230 | 0.008~0.024 | 20~70 | 0.25~0.70 | 65~230 | 0.01~0.028 |
| K | PC6510 | | 140~200 | 0.25~0.70 | 460~660 | 0.01~0.028 | 95~220 | 0.25~0.80 | 300~730 | 0.01~0.032 |

Multy purpose Milling tool FMR Tools

Machining examples



| Workpiece | Test tool | Cutting condition | | | | | ap x ae | Result (Cutting time) |
|------------------------------------|--------------------------------------|--------------------|-----------------------|---------------------|------------------------|------------|---|--------------------------|
| | | V (m/min) (sfm) | N(min ⁻¹) | F (mm/min) (ipm) | fz (mm/tooth) (ipt) | | | |
| 1 SCM440 41CrMo4 AISI4140 | FMRS4032RD-S RDKT1204M0-MM PC3535 | 200 | 1989 | 1591 | 0.4 | 1.5 × 0.7D | 5Hour(V _B 0.29) | |
| | | 660 | | 63.64 | 0.016 | | | |
| 2 KP1 | FMRS4050RD-L RDKT1204M0-MM PC3545 | 173 | 1100 | 2100 | 0.4 | 1.5 × 1.0D | 2Hour(V _B 0.32) | |
| | | 570.9 | | 84 | 0.016 | | | |
| 3 KP4M | FMRS4050RD-M RDKT1204M0-MM PC3535 | 210 | 1350 | 2100 | 0.39 | 1.0 × 1.0D | 1.5Hour(V _B 0.25) | |
| | | 693 | | 84 | 0.0156 | | | |
| 4 KP4M | FMRS3025RD-L RDKT10T3M0-MM PC3545 | 133 | 1700 | 2200 | 0.43 | 1.0 × 0.4D | 3Hour(V _B 0.30) Overhang(160mm) | |
| | | 438.9 | | 88 | 0.0172 | | | |

Note

- 1) Insert should be firmly clamped in the insert seat part (rotating prevention system) of cutter.
- 2) In case of noise from chattering, reduce L(overhang length) or decrease feed rate, spindle speed and axial depth of cut.
- 3) Reduce spindle speed or axial depth of cut if horsepower of machine is not enough.
- 4) Use coolant or air for smooth chip evacuation and long tool life.
- 5) Reduce axial depth of cut, spindle speed and feed rate up to 30~50% in the machining of high hardness material (HRC 50~60)

Multy purpose Milling tool FMR Tools

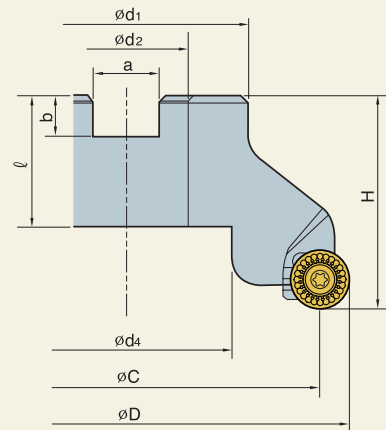
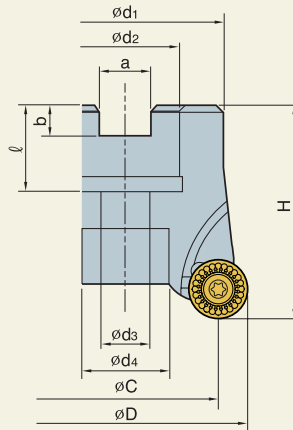
FMRC(M)

FMRC(M) 3000/4000



40~80mm
1 5/8~3 1/4 inch

100~150mm
4~5 inch



| Pitch | Designation | Dimension(mm) | | | | | | | | | | | Stock | Insert |
|-------------------|-------------|---------------|----------|------------|------------|----|-------------|--------|------------|------------|--------|-------|-------|--|
| | | ϕD | ϕC | ϕd_1 | ϕd_2 | H | a | b | ϕd_3 | ϕd_4 | ℓ | Tooth | | |
| Close pitch | 3040RD | 40 | 30 | 36 | 15.875(16) | 40 | 8.4 | 5.6 | 9 | 14 | 18(20) | 3 | ● | R D K T 1 0 T 3 M O I □ |
| | 3050RD | 50 | 40 | 42 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 4 | ● | |
| | 3063RD | 63 | 53 | 49 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 5 | ● | |
| | 3080RD | 80 | 70 | 57 | 25.4(27) | 50 | 9.75(12.4) | 6(7.0) | 14 | 19 | 25(22) | 6 | ● | |
| | 3100RD | 100 | 90 | 67 | 31.75(32) | 50 | 12.95(14.4) | 8(8) | - | 45 | 32(32) | 7 | ● | |
| Extra close pitch | 3040RD-H | 40 | 30 | 36 | 15.875(16) | 40 | 8.4 | 5.6 | 9 | 14 | 18(20) | 4 | ● | |
| | 3050RD-H | 50 | 40 | 42 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 5 | ● | |
| | 3063RD-H | 63 | 53 | 49 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 6 | ● | |
| | 3080RD-H | 80 | 70 | 57 | 25.4(27) | 50 | 9.75(12.4) | 6(7.0) | 14 | 19 | 25(22) | 7 | ● | |
| | 3100RD-H | 100 | 90 | 67 | 31.75(32) | 50 | 12.95(14.4) | 8(8) | - | 45 | 32(32) | 8 | ● | |
| Coarse pitch | 4050RD | 50 | 38 | 42 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 4 | ● | |
| | 4063RD | 63 | 51 | 49 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 4 | ● | |
| | 4080RD | 80 | 68 | 57 | 25.4(27) | 50 | 9.75(12.4) | 6(7.0) | 14 | 19 | 25(22) | 5 | ● | |
| | 4100RD | 100 | 88 | 67 | 31.75(32) | 50 | 12.95(14.4) | 8(8) | - | 45 | 32(32) | 6 | ● | |
| | 4125RD | 125 | 113 | 87 | 38.10(40) | 63 | 16.15(16.4) | 10(9) | - | 56 | 38(35) | 7 | ● | |
| Close pitch | 4063RD-M | 63 | 51 | 49 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 5 | ● | R D K T 1 2 0 4 M O I □ |
| | 4080RD-M | 80 | 68 | 57 | 25.4(27) | 50 | 9.75(12.4) | 6(7.0) | 14 | 19 | 25(22) | 6 | ● | |
| | 4100RD-M | 100 | 88 | 67 | 31.75(32) | 50 | 12.95(14.4) | 8(8) | - | 45 | 32(32) | 7 | ● | |
| | 4125RD-M | 125 | 113 | 87 | 38.10(40) | 63 | 16.15(16.4) | 10(9) | - | 56 | 38(35) | 8 | ● | |

● : Stock item, ○ : Under preparing for stock

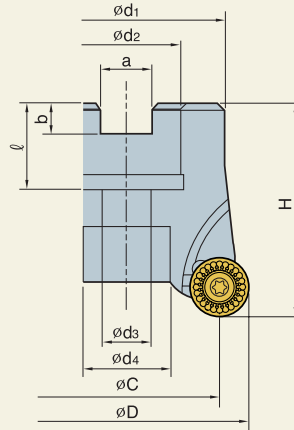
Multy purpose Milling tool FMR Tools

FMRC(M)

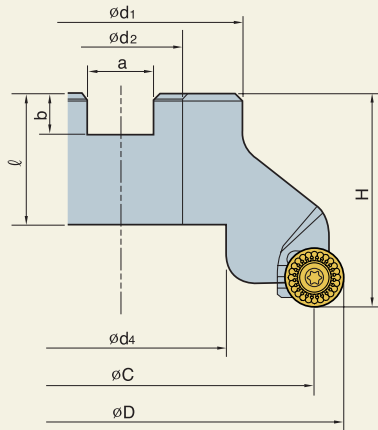
FMRC(M) 5000/6000



50~80mm
2~3 1/4inch



100~160mm
4~6 3/8inch



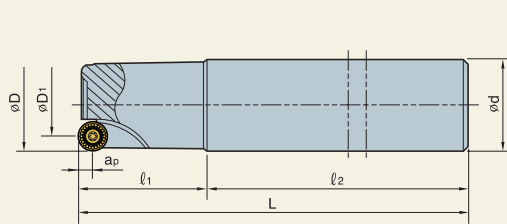
| Pitch | Designation | Dimension(mm) | | | | | | | | | | | Stock | Insert |
|-------------------|-------------|---------------|----------|------------|------------|----|-------------|--------|------------|------------|--------|-------|-------|--|
| | | ϕD | ϕC | ϕd_1 | ϕd_2 | H | a | b | ϕd_3 | ϕd_4 | ℓ | Tooth | | |
| Close pitch | 5050RD | 50 | 34 | 42 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 3 | ● | R R D D K H T W 1 1 6 6 0 0 5 5 M M |
| | 5063RD | 63 | 47 | 49 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 4 | ● | |
| | 5080RD | 80 | 64 | 57 | 25.4(27) | 50 | 9.75(12.4) | 6(7.0) | 14 | 19 | 25(22) | 5 | ● | |
| | 5100RD | 100 | 84 | 67 | 31.75(32) | 50 | 12.95(14.4) | 8(8) | - | 45 | 32(32) | 6 | ● | |
| | 5125RD | 125 | 109 | 87 | 38.10(40) | 63 | 16.15(16.4) | 10(9) | - | 56 | 38(35) | 7 | ● | |
| Extra close pitch | 5063RD-H | 63 | 47 | 49 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 5 | ● | M M I □ |
| | 5080RD-H | 80 | 64 | 57 | 25.4(27) | 50 | 9.75(12.4) | 6(7.0) | 14 | 19 | 25(22) | 6 | ● | |
| | 5100RD-H | 100 | 84 | 67 | 31.75(32) | 50 | 12.95(14.4) | 8(8) | - | 45 | 32(32) | 7 | ● | |
| | 5125RD-H | 125 | 109 | 87 | 38.10(40) | 63 | 16.15(16.4) | 10(9) | - | 56 | 38(35) | 8 | ● | |
| Coarse pitch | 6063RD | 63 | 43 | 49 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 3 | ● | R R D D K H T W 2 2 0 0 0 0 6 6 M M I □ |
| | 6080RD | 80 | 60 | 57 | 25.4(27) | 50 | 9.75(12.4) | 6(7.0) | 14 | 19 | 25(22) | 4 | ● | |
| | 6100RD | 100 | 80 | 67 | 31.75(32) | 50 | 12.95(14.4) | 8(8) | - | 45 | 32(32) | 5 | ● | |
| | 6125RD | 125 | 105 | 87 | 38.10(40) | 63 | 16.15(16.4) | 10(9) | - | 56 | 38(35) | 6 | ● | |
| | 6160RD | 160 | 140 | 107 | 50.80(40) | 63 | 19.25(16.4) | 11(9) | - | 78 | 38(35) | 7 | ● | |
| Close pitch | 6063RD-M | 63 | 43 | 49 | 22.225(22) | 50 | 8.4(10.4) | 5(6.3) | 11 | 16.5 | 20(20) | 4 | ● | M M |
| | 6080RD-M | 80 | 60 | 57 | 25.4(27) | 50 | 9.75(12.4) | 6(7.0) | 14 | 19 | 25(22) | 5 | ● | |
| | 6100RD-M | 100 | 80 | 67 | 31.75(32) | 50 | 12.95(14.4) | 8(8) | - | 45 | 32(32) | 6 | ● | |
| | 6125RD-M | 125 | 105 | 87 | 38.10(40) | 63 | 16.15(16.4) | 10(9) | - | 56 | 38(35) | 7 | ● | |
| | 6160RD-M | 160 | 140 | 107 | 50.80(40) | 63 | 19.25(16.4) | 11(9) | - | 78 | 38(35) | 8 | ● | |

● : Stock item, ○ : Under preparing for stock

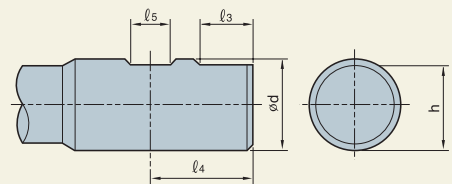
Multy purpose Milling tool FMR Tools

FMRS

FMRS 1000/1500/2000/2500



[Type A]



[Type B]

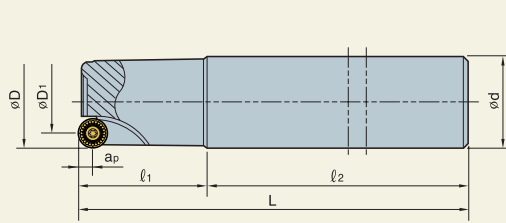
| Shank | Designation | Dimension(mm) | | | | | | | | | | | Tooth | Stock | Type | Insert |
|----------|-------------|-----------------|-------------------|-----|-----------------|-------|-------|-------|-------|-------|------|-------|-------|-------|------|------------|
| | | $\varnothing D$ | $\varnothing D_1$ | L | $\varnothing d$ | l_1 | l_2 | l_3 | l_4 | l_5 | h | a_p | | | | |
| Long | 1008RD-M | 8 | 5.5 | 80 | 10 | 30 | 50 | - | - | - | - | 2.5 | 1 | ● | A | RDHW0501M□ |
| | 1008RD-L | 8 | 5.5 | 100 | 10 | 50 | 50 | - | - | - | - | 2.5 | 1 | ● | A | |
| | 1010RD-M | 10 | 5 | 100 | 12 | 44 | 56 | - | - | - | - | 2.5 | 2 | ● | A | |
| | 1010RD-L | 10 | 5 | 120 | 12 | 64 | 56 | - | - | - | - | 2.5 | 2 | ● | A | |
| | 1012RD-M | 12 | 7 | 100 | 12 | 44 | 56 | - | - | - | - | 2.5 | 2 | ● | A | |
| | 1012RD-L | 12 | 7 | 160 | 16 | 80 | 80 | - | - | - | - | 2.5 | 2 | ● | A | |
| | 1015RD-M | 15 | 10 | 160 | 16 | 80 | 80 | - | - | - | - | 2.5 | 3 | ● | A | |
| | 1015RD-L | 15 | 10 | 200 | 16 | 100 | 100 | - | - | - | - | 2.5 | 3 | ● | A | |
| Long | 1510RD-M | 10 | 6 | 100 | 12 | 44 | 56 | - | - | - | - | 3.0 | 1 | ● | A | RDHW0611M□ |
| | 1510RD-L | 10 | 6 | 120 | 12 | 64 | 56 | - | - | - | - | 3.0 | 1 | ● | A | |
| | 1512RD-M | 12 | 6 | 110 | 12 | 54 | 56 | - | - | - | - | 3.0 | 2 | ● | A | |
| | 1512RD-L | 12 | 6 | 160 | 16 | 80 | 80 | - | - | - | - | 3.0 | 2 | ● | A | |
| | 1516RD-M | 16 | 10 | 130 | 16 | 60 | 70 | - | - | - | - | 3.0 | 3 | ● | A | |
| | 1516RD-L | 16 | 10 | 180 | 20 | 90 | 90 | - | - | - | - | 3.0 | 3 | ● | A | |
| | 1520RD-M | 20 | 14 | 150 | 20 | 80 | 70 | - | - | - | - | 3.0 | 3 | ● | A | |
| | 1520RD-L | 20 | 14 | 200 | 20 | 90 | 110 | - | - | - | - | 3.0 | 3 | ● | A | |
| Standard | 2015RD-S | 15 | 8 | 115 | 16 | 55 | 60 | - | 24 | 10 | 14.2 | 3.5 | 2 | ● | B | RDHW0702M□ |
| Long | 2015RD-M | 15 | 8 | 150 | 20 | 80 | 70 | - | - | - | - | 3.5 | 2 | ● | A | |
| | 2015RD-L | 15 | 8 | 200 | 20 | 90 | 110 | - | - | - | - | 3.5 | 2 | ● | A | |
| Standard | 2020RD-S | 20 | 14 | 125 | 20 | 65 | 60 | - | 25 | 11 | 18.2 | 3.5 | 3 | ● | B | |
| Long | 2020RD-M | 20 | 14 | 150 | 20 | 80 | 70 | - | - | - | - | 3.5 | 3 | ● | A | |
| | 2020RD-L | 20 | 14 | 200 | 25 | 90 | 110 | - | - | - | - | 3.5 | 3 | ● | A | |
| Standard | 2516RD-S | 16 | 8 | 115 | 16 | 55 | 60 | - | 24 | 10 | 14.2 | 4 | 2 | ● | B | RDHW0803M□ |
| Long | 2516RD-M | 16 | 8 | 150 | 16 | 80 | 70 | - | - | - | - | 4 | 2 | ● | A | |
| | 2516RD-L | 16 | 8 | 200 | 20 | 90 | 110 | - | - | - | - | 4 | 2 | ● | A | |
| Standard | 2520RD-S | 20 | 12 | 125 | 20 | 65 | 60 | - | 25 | 11 | 18.2 | 4 | 2 | ● | B | |
| Long | 2520RD-M | 20 | 12 | 150 | 20 | 80 | 70 | - | - | - | - | 4 | 2 | ● | A | |
| | 2520RD-L | 20 | 12 | 200 | 25 | 100 | 100 | - | - | - | - | 4 | 2 | ● | A | |
| Standard | 2525RD-S | 25 | 17 | 125 | 25 | 55 | 70 | 17 | 32 | 12 | 23 | 4 | 3 | ● | B | |
| Long | 2525RD-M | 25 | 17 | 200 | 25 | 90 | 110 | - | - | - | - | 4 | 3 | ● | A | |
| | 2525RD-L | 25 | 17 | 250 | 32 | 110 | 140 | - | - | - | - | 4 | 3 | ● | A | |

● : Stock item, ○ : Under preparing for stock

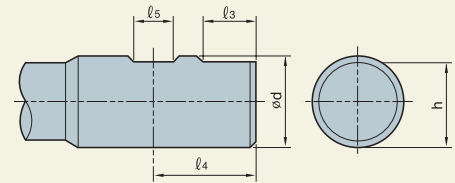
Multy purpose Milling tool FMR Tools

FMRS

FMRS 3000/4000



[Type A]



[Type B]

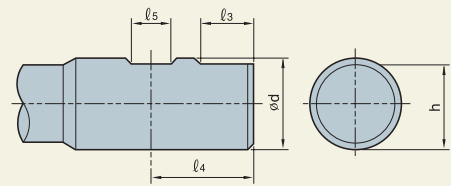
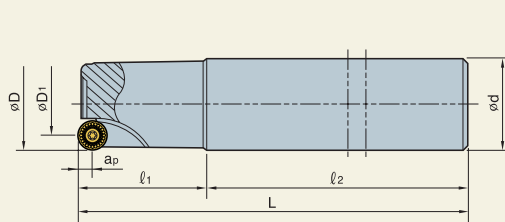
| Shank | Designation | Dimension(mm) | | | | | | | | | | | Tooth | Stock | Type | Insert |
|----------|-------------|---------------|------------|-----|----------|-------|-------|-------|-------|-------|----|-------|-------|-------|------|--|
| | | ϕD | ϕD_1 | L | ϕd | l_1 | l_2 | l_3 | l_4 | l_5 | h | a_p | | | | |
| Standard | 3021RD-M | 21 | 11 | 150 | 20 | 40 | 110 | - | - | - | - | 5 | 1 | ○ | A | R D K T 1 0 T 3 M O □ |
| | 3021RD-M2 | 21 | 11 | 150 | 20 | 40 | 110 | - | - | - | - | 5 | 2 | ● | A | |
| Long | 3021RD-L | 21 | 11 | 200 | 20 | 50 | 150 | - | - | - | - | 5 | 1 | ○ | A | |
| | 3021RD-L2 | 21 | 11 | 200 | 20 | 50 | 150 | - | - | - | - | 5 | 2 | ● | A | |
| Standard | 3025RD-S | 25 | 15 | 115 | 25 | 35 | 80 | 17 | 32 | 12 | 23 | 5 | 2 | ● | B | |
| Long | 3025RD-M | 25 | 15 | 200 | 25 | 70 | 130 | - | - | - | - | 5 | 2 | ● | A | |
| | 3025RD-L | 25 | 15 | 250 | 25 | 100 | 150 | - | - | - | - | 5 | 2 | ● | A | |
| Long | 3026RD-M | 26 | 16 | 200 | 25 | 70 | 130 | - | - | - | - | 5 | 2 | ● | A | |
| | 3026RD-L | 26 | 16 | 250 | 25 | 100 | 150 | - | - | - | - | 5 | 2 | ● | A | |
| Standard | 3032RD-S | 32 | 22 | 125 | 32 | 40 | 85 | 19 | 36 | 14 | 30 | 5 | 3 | ● | B | |
| Long | 3032RD-M | 32 | 22 | 200 | 32 | 70 | 130 | - | - | - | - | 5 | 3 | ● | A | |
| | 3032RD-L | 32 | 22 | 300 | 32 | 150 | 150 | - | - | - | - | 5 | 3 | ● | A | |
| Standard | 3040RD-S | 40 | 30 | 125 | 32 | 40 | 85 | 19 | 36 | 14 | 30 | 5 | 4 | ● | B | |
| Long | 3040RD-M | 40 | 30 | 200 | 32 | 70 | 130 | - | - | - | - | 5 | 4 | ● | A | |
| | 3040RD-L | 40 | 30 | 300 | 32 | 150 | 150 | - | - | - | - | 5 | 4 | ● | A | |
| Standard | 4032RD-S | 32 | 20 | 125 | 32 | 40 | 85 | 19 | 36 | 14 | 30 | 6 | 2 | ● | B | |
| Long | 4032RD-M | 32 | 20 | 200 | 32 | 70 | 130 | - | - | - | - | 6 | 2 | ● | A | |
| | 4032RD-L | 32 | 20 | 300 | 32 | 150 | 150 | - | - | - | - | 6 | 2 | ● | A | |
| Standard | 4033RD-S | 33 | 21 | 125 | 32 | 40 | 85 | 19 | 36 | 14 | 30 | 6 | 2 | ○ | B | |
| Long | 4033RD-M | 33 | 21 | 200 | 32 | 70 | 130 | - | - | - | - | 6 | 2 | ● | A | |
| | 4033RD-L | 33 | 21 | 300 | 32 | 150 | 150 | - | - | - | - | 6 | 2 | ● | A | |
| Standard | 4040RD-S | 40 | 28 | 125 | 32 | 40 | 85 | 19 | 36 | 14 | 30 | 6 | 3 | ● | B | |
| Long | 4040RD-M | 40 | 28 | 200 | 32 | 70 | 130 | - | - | - | - | 6 | 3 | ● | A | |
| | 4040RD-L | 40 | 28 | 300 | 32 | 150 | 150 | - | - | - | - | 6 | 3 | ● | A | |
| Standard | 4050RD-S | 50 | 38 | 150 | 42 | 50 | 100 | 19 | 40 | 14 | 40 | 6 | 4 | ● | B | |
| Long | 4050RD-M | 50 | 38 | 250 | 42 | 100 | 150 | - | - | - | - | 6 | 4 | ● | A | |
| | 4050RD-L | 50 | 38 | 300 | 42 | 150 | 150 | - | - | - | - | 6 | 4 | ● | A | |

● : Stock item, ○ : Under preparing for stock

Multy purpose Milling tool FMR Tools

FMRS

FMRS 5000/6000



[Type A]

[Type B]

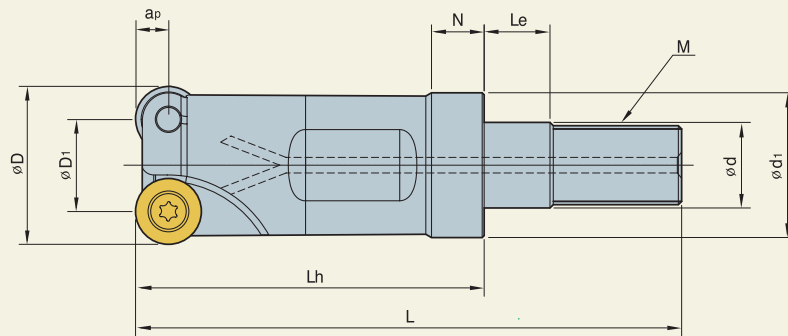
| Shank | Designation | Dimension(mm) | | | | | | | | | | | Tooth | Stock | Type | Insert |
|----------|-------------|---------------|------------|-----|----------|-------|-------|-------|-------|-------|----|-------|-------|-------|------|--|
| | | ϕD | ϕD_1 | L | ϕd | l_1 | l_2 | l_3 | l_4 | l_5 | h | a_p | | | | |
| Standard | 5040RD-S | 40 | 24 | 125 | 32 | 40 | 85 | 19 | 36 | 14 | 30 | 8 | 2 | ● | B | R D K T W 1 6 0 0 5 M O O M □ R D K T W 1 6 0 0 5 M O O M □ |
| Long | 5040RD-M | 40 | 24 | 200 | 32 | 70 | 130 | - | - | - | - | 8 | 2 | ● | A | |
| | 5040RD-L | 40 | 24 | 300 | 32 | 150 | 150 | - | - | - | - | 8 | 2 | ● | A | |
| Standard | 5050RD-S | 50 | 34 | 150 | 42 | 50 | 100 | 19 | 40 | 14 | 40 | 8 | 3 | ● | B | |
| Long | 5050RD-M | 50 | 34 | 250 | 42 | 100 | 150 | - | - | - | - | 8 | 3 | ● | A | |
| | 5050RD-L | 50 | 34 | 300 | 42 | 150 | 150 | - | - | - | - | 8 | 3 | ● | A | |
| Standard | 5063RD-S | 63 | 47 | 150 | 42 | 50 | 100 | 19 | 40 | 14 | 40 | 8 | 4 | ● | B | |
| Long | 5063RD-M | 63 | 47 | 250 | 42 | 100 | 150 | - | - | - | - | 8 | 4 | ● | A | |
| | 5063RD-L | 63 | 47 | 300 | 42 | 150 | 150 | - | - | - | - | 8 | 4 | ● | A | |
| Standard | 6050RD-S | 50 | 30 | 150 | 42 | 50 | 100 | 19 | 40 | 14 | 40 | 10 | 3 | ● | B | |
| Long | 6050RD-M | 50 | 30 | 250 | 42 | 100 | 150 | - | - | - | - | 10 | 3 | ● | A | |
| | 6050RD-L | 50 | 30 | 300 | 42 | 150 | 150 | - | - | - | - | 10 | 3 | ● | A | |
| Standard | 6063RD-S | 63 | 43 | 150 | 42 | 50 | 100 | 19 | 40 | 14 | 40 | 10 | 4 | ● | B | |
| Long | 6063RD-M | 63 | 43 | 250 | 42 | 100 | 150 | - | - | - | - | 10 | 4 | ● | A | |
| | 6063RD-L | 63 | 43 | 300 | 42 | 150 | 150 | - | - | - | - | 10 | 4 | ● | A | |

● : Stock item, ○ : Under preparing for stock

Multy purpose Milling tool FMR Tools

FMRM

FMRM 1000/1500/2000/2500/3000/4000/5000



| Designation | Dimension(mm) | | | | | | | | | Tooth | Stock | Insert |
|-------------|-----------------|-------------------|----|-------|-------|-------------------|-----------------|----|-------|-------|-------|------------------------------|
| | $\varnothing D$ | $\varnothing D_1$ | L | L_h | L_e | $\varnothing d_1$ | $\varnothing d$ | M | a_p | | | |
| 1008RD-M06 | 8 | 5.5 | 40 | 25 | 5 | 9.5 | 6.5 | 6 | 2.5 | 1 | ● | RDHW0501M0□ |
| 1010RD-M06 | 10 | 5 | 40 | 25 | 5 | 9.5 | 6.5 | 6 | 2.5 | 2 | ● | |
| 1012RD-M06 | 12 | 7 | 40 | 25 | 5 | 11 | 6.5 | 6 | 2.5 | 2 | ● | |
| 1015RD-M08 | 15 | 10 | 47 | 30 | 5 | 14.5 | 8.5 | 8 | 2.5 | 3 | ● | |
| 1510RD-M06 | 10 | 7 | 40 | 25 | 5 | 9.5 | 6.5 | 6 | 3 | 1 | ● | RDHW06T1M0□ |
| 1512RD-M06 | 12 | 6 | 40 | 25 | 5 | 11 | 6.5 | 6 | 3 | 2 | ● | |
| 1516RD-M08 | 16 | 10 | 47 | 30 | 5 | 14.5 | 8.5 | 8 | 3 | 3 | ● | |
| 1520RD-M10 | 20 | 14 | 56 | 35 | 6 | 18 | 10.5 | 10 | 3 | 3 | ● | |
| 2015RD-M08 | 15 | 8 | 47 | 30 | 5 | 14.5 | 8.5 | 8 | 3.5 | 2 | ● | RDHW0702M0□ |
| 2020RD-M10 | 20 | 13 | 56 | 35 | 6 | 18 | 10.5 | 10 | 3.5 | 3 | ● | |
| 2516RD-M08 | 16 | 8 | 47 | 30 | 5 | 14.5 | 8.5 | 8 | 4 | 2 | ● | RDHW0803M0□ |
| 2520RD-M10 | 20 | 12 | 56 | 35 | 6 | 18 | 10.5 | 10 | 4 | 2 | ● | |
| 2525RD-M12 | 25 | 17 | 69 | 45 | 6 | 22.5 | 12.5 | 12 | 4 | 3 | ● | |
| 3021RD-M10 | 21 | 11 | 56 | 35 | 6 | 18 | 10.5 | 10 | 5 | 2 | ● | RDKT10T3M0-□□ |
| 3025RD-M12 | 25 | 15 | 69 | 45 | 6 | 22.5 | 12.5 | 12 | 5 | 2 | ● | |
| 3032RD-M16 | 32 | 22 | 77 | 50 | 7 | 29 | 16.5 | 16 | 5 | 3 | ● | |
| 3042RD-M16 | 42 | 32 | 77 | 50 | 7 | 29 | 16.5 | 16 | 5 | 4 | ● | RDKT1204M0-□□ |
| 4025RD-M12 | 25 | 13 | 69 | 45 | 6 | 22.5 | 12.5 | 12 | 6 | 2 | ● | |
| 4032RD-M16 | 32 | 20 | 77 | 50 | 7 | 29 | 16.5 | 16 | 6 | 2 | ● | |
| 4040RD-M16 | 40 | 28 | 77 | 50 | 7 | 29 | 16.5 | 16 | 6 | 3 | ● | |
| 4042RD-M16 | 42 | 28 | 77 | 50 | 7 | 29 | 16.5 | 16 | 6 | 4 | ● | |
| 5040RD-M16 | 40 | 24 | 77 | 50 | 7 | 29 | 16.5 | 16 | 8 | 2 | ● | RDKT1605M0-MM RDHW1605M0□ |

● : Stock item, ○ : Under preparing for stock

Matching of modular head & shank adaptor

Designation : FMRM1008RD - M06

Modular head screw size (M06)

=

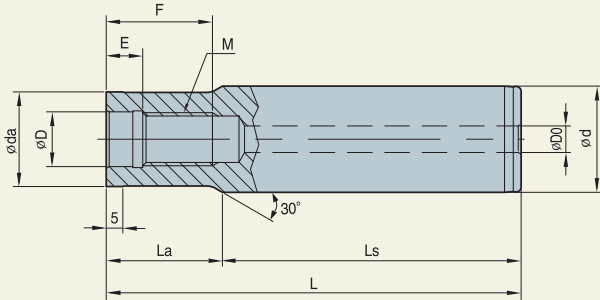
Shank designation : MAT - M06 - 020 - S10S

Shank adaptor screw size (M06)

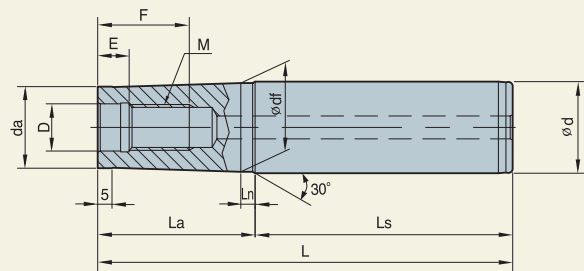
Multy purpose Milling tool

FMR Tools

Shank Adaptors



Straight Neck adaptor



Taper Neck adaptor

| Designation | Dimension(mm) | | | | | | | | | | | | Stock |
|------------------|-----------------|------------------|-------|-------|-----|-----------------|-----|-----|-----|------------------|------------------|-------|-------|
| | $\varnothing d$ | $\varnothing da$ | L_a | L_s | L | $\varnothing D$ | E | M | F | $\varnothing de$ | $\varnothing df$ | L_n | |
| MAT-M06-020-S10S | 10 | 9.5 | 20 | 50 | 70 | 6.5 | 8 | M6 | 18 | 9.3 | - | - | ● |
| MAT-M6B-020-S12S | 12 | 11 | 20 | 56 | 76 | 6.5 | 8 | M6 | 18 | 10.8 | - | - | ● |
| MAT-M6B-040-S12S | 12 | 11 | 40 | 56 | 96 | 6.5 | 8 | M6 | 18 | 10.8 | - | - | ● |
| MAT-M08-020-S16S | 16 | 14.5 | 20 | 60 | 80 | 8.5 | 8 | M8 | 20 | 14.3 | - | - | ● |
| MAT-M10-030-S20S | 20 | 18 | 30 | 70 | 100 | 10.5 | 9 | M10 | 25 | 17.7 | - | - | ● |
| MAT-M12-030-S25S | 25 | 22.5 | 30 | 80 | 110 | 12.5 | 9 | M12 | 29 | 22.2 | - | - | ● |
| MAT-M16-035-S32S | 32 | 28.5 | 35 | 90 | 125 | 16.5 | 10 | M16 | 32 | 28.2 | - | - | ● |
| MAT-M06-040-S12T | 12 | 9.5 | 40 | 56 | 96 | 6.5 | 8 | M6 | 18 | 9.3 | 11.4 | 3 | ● |
| MAT-M06-065-S16T | 16 | 9.5 | 65 | 60 | 125 | 6.5 | 8 | M6 | 18 | 9.3 | 15.4 | 5 | ● |
| MAT-M6B-065-S16T | 16 | 11 | 65 | 60 | 125 | 6.5 | 8 | M6 | 18 | 10.8 | 15.4 | 5 | ● |
| MAT-M6B-080-S16T | 16 | 11 | 80 | 80 | 160 | 6.5 | 8 | M6 | 18 | 10.8 | 15.4 | 5 | ● |
| MAT-M08-040-S16T | 16 | 14.5 | 40 | 60 | 100 | 8.5 | 8 | M8 | 20 | 14.3 | 15.4 | 5 | ● |
| MAT-M08-065-S16T | 16 | 14.5 | 65 | 60 | 125 | 8.5 | 8 | M8 | 20 | 14.3 | 15.4 | 5 | ● |
| MAT-M08-080-S20T | 20 | 14.5 | 80 | 70 | 150 | 8.5 | 8 | M8 | 20 | 14.3 | 19 | 5 | ● |
| MAT-M08-110-S25T | 25 | 14.5 | 110 | 80 | 190 | 8.5 | 8 | M8 | 20 | 14.3 | 24 | 5 | ● |
| MAT-M10-050-S20T | 20 | 18 | 50 | 70 | 120 | 10.5 | 9 | M10 | 25 | 17.7 | 19 | 5 | ● |
| MAT-M10-070-S20T | 20 | 18 | 70 | 70 | 140 | 10.5 | 9 | M10 | 25 | 17.7 | 19 | 5 | ● |
| MAT-M10-090-S25T | 25 | 18 | 90 | 80 | 170 | 10.5 | 9 | M10 | 25 | 17.7 | 24 | 5 | ● |
| MAT-M10-110-S25T | 25 | 18 | 110 | 80 | 190 | 10.5 | 9 | M10 | 25 | 17.7 | 24 | 5 | ● |
| MAT-M10-130-S32T | 32 | 18 | 130 | 90 | 220 | 10.5 | 9 | M10 | 25 | 17.7 | 31 | 5 | ● |
| MAT-M12-050-S25T | 25 | 22.5 | 50 | 80 | 130 | 12.5 | 9 | M12 | 29 | 22.2 | 24 | 5 | ● |
| MAT-M12-070-S25T | 25 | 22.5 | 70 | 80 | 150 | 12.5 | 9 | M12 | 29 | 22.2 | 24 | 5 | ● |
| MAT-M12-090-S25T | 25 | 22.5 | 90 | 80 | 170 | 12.5 | 9 | M12 | 29 | 22.2 | 24 | 5 | ● |
| MAT-M12-110-S32T | 32 | 22.5 | 110 | 90 | 200 | 12.5 | 9 | M12 | 29 | 22.2 | 31 | 5 | ● |
| MAT-M12-175-S40T | 40 | 22.5 | 175 | 125 | 300 | 12.5 | 9 | M12 | 29 | 22.2 | 39 | 5 | ● |
| MAT-M16-055-S32T | 32 | 28.5 | 55 | 90 | 145 | 16.5 | 11 | M16 | 32 | 28.2 | 31 | 5 | ● |
| MAT-M16-080-S32T | 32 | 28.5 | 80 | 90 | 170 | 16.5 | 11 | M16 | 32 | 28.2 | 31 | 5 | ● |
| MAT-M16-120-S32T | 32 | 28.5 | 120 | 90 | 210 | 16.5 | 11 | M16 | 32 | 28.2 | 31 | 5 | ● |
| MAT-M16-175-S40T | 40 | 28.5 | 175 | 125 | 300 | 16.5 | 11 | M16 | 32 | 28.2 | 39 | 5 | ● |

● : Stock item, ○ : Under preparing for stock

Multy purpose Milling tool

FMR Tools

Technical data

Feed rate as per depth of cut

Unit : fz (mm/tooth)

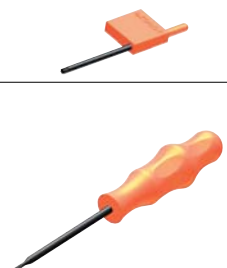
| Designation | C/B | Depth of cut(mm) | | | | | | | | |
|---------------|-------|------------------|---------|------|------|------|------|------|------|------|
| | | 0.2-0.5 | 0.5-1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 |
| RDHW0501M0□ | — | 0.25 | 0.15 | - | - | - | - | - | - | - |
| RDHW06T1M0□ | — | 0.30 | 0.20 | 0.10 | - | - | - | - | - | - |
| RDHW0702M0□ | — | 0.35 | 0.25 | 0.10 | 0.07 | - | - | - | - | - |
| RDHW0803M0□ | — | 0.40 | 0.30 | 0.15 | 0.01 | - | - | - | - | - |
| RDKT10T3M0-□□ | MF/MM | - | 0.40 | 0.35 | 0.30 | 0.20 | - | - | - | - |
| RDKT1204M0-□□ | MF/MM | - | 0.50 | 0.45 | 0.30 | 0.25 | 0.22 | - | - | - |
| RDHW1605M0□ | — | - | 0.60 | 0.50 | 0.45 | 0.35 | 0.30 | 0.20 | 0.10 | - |
| RDHW2006M0□ | — | - | - | 0.60 | 0.50 | 0.40 | 0.30 | 0.25 | 0.15 | 0.10 |
| RDKT1605M0-□□ | MM | - | 0.60 | 0.50 | 0.45 | 0.35 | 0.30 | 0.20 | 0.10 | - |
| RDKT2006M0-□□ | MM | - | - | 0.60 | 0.50 | 0.40 | 0.30 | 0.25 | 0.15 | 0.10 |

Unit : fz (inch/tooth)

| Designation | C/B | Depth of cut(inch) | | | | | | | | |
|---------------|-------|--------------------|-----------|-------|--------|-------|--------|-------|-------|-------|
| | | 0.008-0.02 | 0.02-0.04 | 0.08 | 0.12 | 0.16 | 0.2 | 0.24 | 0.28 | 0.32 |
| RDHW0501M0□ | — | 0.010 | 0.006 | - | - | - | - | - | - | - |
| RDHW06T1M0□ | — | 0.012 | 0.008 | 0.004 | - | - | - | - | - | - |
| RDHW0702M0□ | — | 0.014 | 0.010 | 0.004 | 0.0028 | - | - | - | - | - |
| RDHW0803M0□ | — | 0.016 | 0.012 | 0.006 | 0.0004 | - | - | - | - | - |
| RDKT10T3M0-□□ | MF/MM | - | 0.016 | 0.014 | 0.012 | 0.008 | - | - | - | - |
| RDKT1204M0-□□ | MF/MM | - | 0.020 | 0.018 | 0.012 | 0.01 | 0.0088 | - | - | - |
| RDHW1605M0□ | — | - | 0.024 | 0.020 | 0.018 | 0.014 | 0.012 | 0.008 | 0.004 | - |
| RDHW2006M0□ | — | - | - | 0.024 | 0.020 | 0.016 | 0.012 | 0.010 | 0.006 | 0.004 |
| RDKT1605M0-□□ | MM | - | 0.024 | 0.020 | 0.018 | 0.014 | 0.012 | 0.008 | 0.004 | - |
| RDKT2006M0-□□ | MM | - | - | 0.024 | 0.020 | 0.016 | 0.012 | 0.010 | 0.006 | 0.004 |

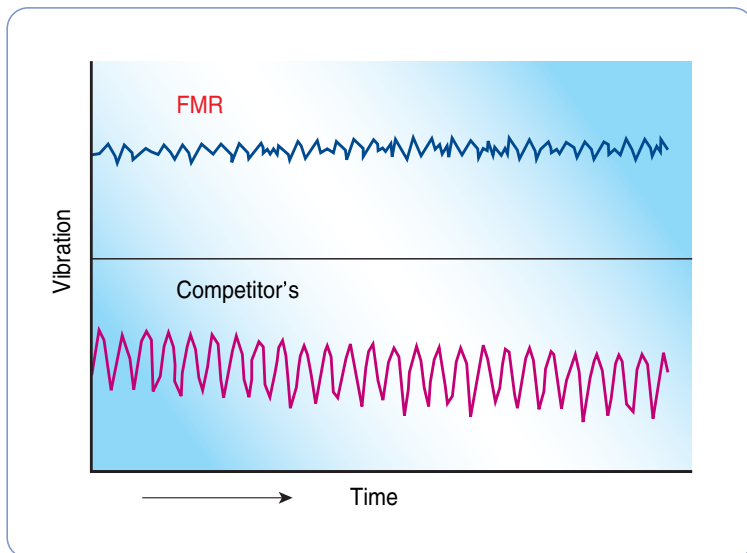
Part

| Cutter | Screw | Wrench |
|---------|---------------|--------|
| FMR1000 | FTNA0203 | TW06P |
| FMR1500 | FTNA02205 | TW06P |
| FMR2000 | FTKA02555 | TW07S |
| FMR2500 | FTNA0305 | TW09S |
| FMR3000 | FTGA03508(07) | TW15S |
| FMR4000 | FTKA0410 | TW15S |
| FMR5000 | FTGA0513-P | TW20S |
| FMR6000 | FTGA0515-P | TW20S |



Multy purpose Milling tool FMR Tools

FMR vibration test

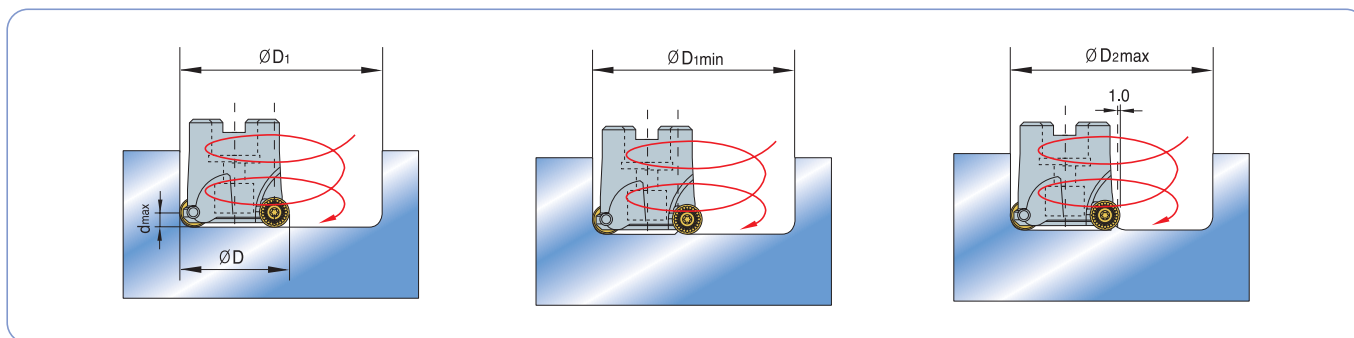


※ Machine example

- FMRS3032RD-S
- RDKT10T3M0-MM (PC3535)
- Workpiece : SKD11

| | V | fz | a _d | R _d |
|--------|-----|-------|----------------|----------------|
| Metric | 200 | 0.40 | 2.0 | 4.0 |
| Inch | 660 | 0.016 | 0.08 | 0.16 |

Helical cutting technical data



Unit : mm

| Section | ØD | ØD1 | ØD1min | ØD2max | Insert | d _{max} |
|----------|----|-----|--------|--------|-------------|------------------|
| FMR 1000 | 8 | 11 | 10 | 14 | RDHW0501M0□ | 2.5 |
| | 10 | 15 | 12 | 18 | | |
| | 12 | 19 | 16 | 22 | | |
| | 15 | 25 | 22 | 28 | | |
| FMR 1500 | 10 | 14 | 12 | 18 | RDHW06T1M0□ | 3 |
| | 12 | 18 | 14 | 22 | | |
| | 16 | 26 | 22 | 30 | | |
| | 20 | 34 | 30 | 38 | | |
| FMR 2000 | 15 | 23 | 18 | 28 | RDHW0702M0□ | 3.5 |
| | 20 | 33 | 28 | 38 | | |

Unit : inch

| Section | ØD | ØD1 | ØD1min | ØD2max | Insert | d _{max} |
|----------|------|--------|--------|--------|-------------|------------------|
| FMR 1000 | 5/16 | 7/16 | 3/8 | 9/16 | RDHW0501M0□ | 0.098 |
| | 3/8 | 5/8 | 1/2 | 3/4 | | |
| | 1/2 | 3/4 | 5/8 | 7/8 | | |
| | 5/8 | 1 | 7/8 | 1 1/8 | | |
| FMR 1500 | 3/8 | 9/16 | 1/2 | 3/4 | RDHW06T1M0□ | 0.118 |
| | 1/2 | 3/4 | 9/16 | 7/8 | | |
| | 5/8 | 1 | 7/8 | 1 3/16 | | |
| | 3/4 | 1 3/8 | 1 3/16 | 1 1/2 | | |
| FMR 2000 | 5/8 | 15/16 | 3/4 | 1 1/8 | RDHW0702M0□ | 0.138 |
| | 3/4 | 1 5/16 | 1 1/8 | 1 1/2 | | |

Multy purpose Milling tool

FMR Tools

Unit : mm

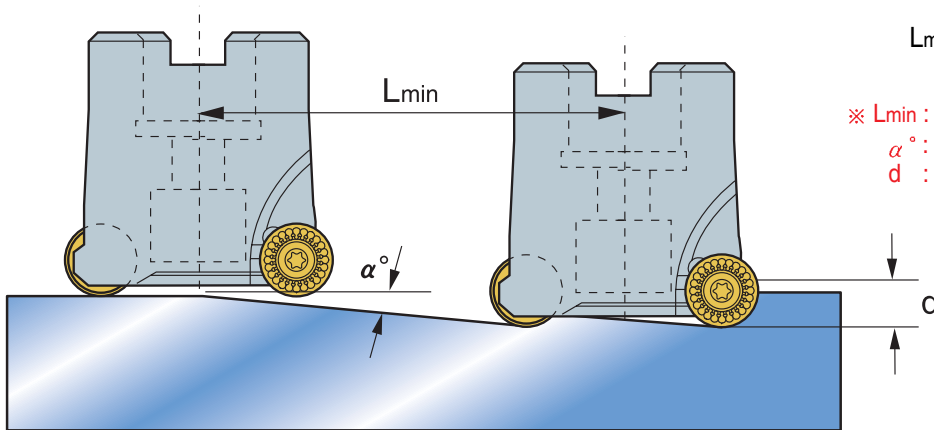
Unit : inch

| Section | ∅D | ∅D1 | ∅D1min | ∅D2max | Insert | d max |
|----------|-----|-----|--------|--------|----------------|-------|
| FMR 2500 | 16 | 24 | 18 | 30 | RDHW0803M0□ | 4 |
| | 20 | 32 | 26 | 38 | | |
| | 25 | 42 | 36 | 48 | | |
| FMR 3000 | 25 | 40 | 32 | 48 | RDKT10T3 M0□ | 5 |
| | 32 | 54 | 46 | 62 | | |
| | 40 | 70 | 62 | 78 | | |
| | 50 | 90 | 82 | 98 | | |
| | 63 | 116 | 108 | 124 | | |
| | 100 | 190 | 182 | 198 | | |
| FMR 4000 | 32 | 52 | 42 | 62 | RDKT1204 M0-□□ | 6 |
| | 40 | 68 | 58 | 78 | | |
| | 50 | 88 | 78 | 98 | | |
| | 63 | 114 | 104 | 124 | | |
| | 80 | 148 | 138 | 158 | | |
| | 100 | 188 | 178 | 198 | | |
| | 125 | 238 | 228 | 248 | | |
| FMR 5000 | 40 | 64 | 50 | 78 | RDHW1605 M0□ | 8 |
| | 50 | 84 | 70 | 98 | | |
| | 63 | 110 | 96 | 124 | RDKT1605 M0-□□ | |
| | 80 | 144 | 130 | 158 | | |
| | 100 | 184 | 170 | 198 | | |
| | 125 | 234 | 220 | 248 | | |
| FMR 6000 | 50 | 80 | 62 | 98 | RDHW2006 M0□ | 10 |
| | 63 | 106 | 88 | 124 | | |
| | 80 | 140 | 122 | 158 | RDKT2006 M0-□□ | |
| | 100 | 180 | 162 | 198 | | |
| | 125 | 230 | 212 | 248 | | |
| | 160 | 300 | 282 | 318 | | |

| Section | ∅D | ∅D1 | ∅D1min | ∅D2max | Insert | d max | |
|----------|--------|---------|---------|---------|----------------|-------|----------------|
| FMR 2500 | 5/8 | 15/16 | 3/4 | 1 3/16 | RDHW0803M0□ | 0.157 | |
| | 13/16 | 1 1/4 | 1 1/16 | 1 1/2 | | | |
| | 1 | 1 11/16 | 1 7/16 | 1 15/16 | | | |
| FMR 3000 | 1 | 1 5/8 | 1 1/4 | 1 15/16 | RDKT10T3 M0□ | 0.196 | |
| | 1 1/4 | 2 3/16 | 1 13/16 | 2 1/2 | | | |
| | 1 5/8 | 2 13/16 | 2 1/2 | 3 1/8 | | | |
| | 2 | 3 5/8 | 3 1/4 | 3 15/16 | | | |
| | 2 1/2 | 4 5/8 | 4 5/16 | 4 15/16 | | | |
| | 4 | 7 5/8 | 7 1/4 | 7 15/16 | | | |
| FMR 4000 | 1 1/4 | 2 1/16 | 1 11/16 | 2 1/2 | RDKT1204 M0-□□ | 0.236 | |
| | 1 5/8 | 2 3/4 | 2 5/16 | 3 1/8 | | | |
| | 2 | 3 1/2 | 3 1/8 | 3 15/16 | | | |
| | 2 1/2 | 4 9/16 | 4 3/16 | 4 15/16 | | | |
| | 3 3/16 | 5 15/16 | 5 1/2 | 6 5/16 | | | |
| | 4 | 7 1/2 | 7 1/8 | 7 15/16 | | | |
| | 5 | 9 1/2 | 9 1/8 | 9 15/16 | | | |
| FMR 5000 | 1 5/8 | 2 9/16 | 2 | 3 1/8 | RDHW1605 M0□ | 0.315 | |
| | 2 | 3 3/8 | 2 13/16 | 3 15/16 | | | |
| | 2 1/2 | 4 3/8 | 3 13/16 | 4 15/16 | RDKT1605 M0-□□ | | |
| | 3 3/16 | 5 3/4 | 5 3/16 | 6 5/16 | | | |
| | 4 | 7 3/8 | 6 13/16 | 7 15/16 | | | |
| | 5 | 9 3/8 | 8 13/16 | 9 15/16 | | | |
| FMR 6000 | 2 | 3 3/16 | 2 1/2 | 3 15/16 | RDHW2006 M0□ | 0.393 | |
| | 2 1/2 | 4 1/4 | 3 1/2 | 4 15/16 | | | |
| | 3 3/16 | 5 5/8 | 4 7/8 | 6 5/16 | | | RDKT2006 M0-□□ |
| | 4 | 7 3/16 | 6 1/2 | 7 15/16 | | | |
| | 5 | 9 3/16 | 8 1/2 | 9 15/16 | | | |
| | 6 3/8 | 12 | 11 1/4 | 12 3/4 | | | |

Multy purpose Milling tool FMR Tools

Ramping technical data



$$L_{min} = \frac{d}{\tan \alpha^\circ} \text{ (mm)}$$

※ L_{min} : minimum inclination cutting length
 α° : Max. ramping angle
 d : depth of cut

| Diameter (mm) | Diameter (inch) | α° (max) | L min (mm) | L min (inch) | Insert |
|---------------|-----------------|----------------------|------------|--------------|------------------------|
| 8 | 5/16 | 18.14 ° | 3.0 | 0.118 | RDHW0501MO□ (d=1mm) |
| 10 | 3/8 | 11.70 ° | 4.8 | 0.189 | |
| 12 | 1/2 | 8.43 ° | 6.7 | 0.264 | |
| 15 | 5/8 | 5.93 ° | 9.6 | 0.378 | |

| | | | | | |
|----|-----|--------|-----|-------|------------------------|
| 15 | 5/8 | 9.42 ° | 6.0 | 0.236 | RDHW0702MO□ (d=1mm) |
| 20 | 3/4 | 5.85 ° | 9.7 | 0.382 | |
| - | - | - | - | - | |

| | | | | | |
|-----|--------|---------|------|-------|--------------------------|
| 25 | 1 | 21.8 ° | 5 | 0.197 | RDKT10T3MO-□□ (d=2mm) |
| 32 | 1 5/16 | 13.24 ° | 8.5 | 0.335 | |
| 40 | 1 3/8 | 9.09 ° | 12.5 | 0.492 | |
| 50 | 2 | 6.52 ° | 17.5 | 0.689 | |
| 63 | 2 1/2 | 4.76 ° | 24 | 0.945 | |
| 80 | 3 1/4 | 3.52 ° | 32.5 | 1.280 | |
| 100 | 4 | 2.69 ° | 42.5 | 1.673 | |

| | | | | | |
|-----|-------|--------|-------|-------|---|
| 40 | 1 3/8 | 7.40 ° | 30.7 | 1.209 | RDHW1605MO□ RDKT1605MO-□□ (d=4mm) |
| 50 | 2 | 5.22 ° | 43.7 | 1.720 | |
| 63 | 2 1/2 | 3.79 ° | 60.3 | 2.374 | |
| 80 | 3 1/4 | 2.97 ° | 77.0 | 3.031 | |
| 100 | 4 | 2.09 ° | 109.6 | 4.315 | |
| 125 | 5 | 1.63 ° | 140.5 | 5.531 | |

| Diameter (mm) | Diameter (inch) | α° (max) | L min (mm) | L min (inch) | Insert |
|---------------|-----------------|----------------------|------------|--------------|------------------------|
| 10 | 3/8 | 20.67 ° | 2.6 | 0.102 | RDHW06T1MO□ (d=1mm) |
| 12 | 1/2 | 10.05 ° | 5.6 | 0.220 | |
| 16 | 5/8 | 6.12 ° | 9.3 | 0.366 | |
| 20 | 3/4 | 4.36 ° | 13.1 | 0.516 | |

| | | | | | |
|----|-----|---------|-----|-------|------------------------|
| 16 | 5/8 | 13.70 ° | 4.1 | 0.161 | RDHW0803MO□ (d=1mm) |
| 20 | 3/4 | 9.29 ° | 6.1 | 0.240 | |
| 25 | 1 | 6.56 ° | 8.6 | 0.339 | |

| | | | | | |
|-----|--------|---------|------|-------|--------------------------|
| 32 | 1 5/16 | 15.95 ° | 7 | 0.276 | RDKT1204MO-□□ (d=2mm) |
| 40 | 1 3/8 | 10.30 ° | 11 | 0.433 | |
| 50 | 2 | 7.13 ° | 16 | 0.630 | |
| 63 | 2 1/2 | 5.08 ° | 22.5 | 0.886 | |
| 80 | 3 1/4 | 3.69 ° | 31 | 1.220 | |
| 100 | 4 | 2.79 ° | 41 | 1.614 | |
| 125 | 5 | 2.14 ° | 53.5 | 2.106 | |

| | | | | | |
|-----|-------|--------|-------|-------|---|
| 50 | 2 | 7.44 ° | 30.6 | 1.205 | RDHW2006MO□ RDKT2006MO-□□ (d=4mm) |
| 63 | 2 1/2 | 4.97 ° | 45.9 | 1.807 | |
| 80 | 3 1/4 | 3.69 ° | 62.0 | 2.441 | |
| 100 | 4 | 2.72 ° | 84.1 | 3.311 | |
| 125 | 5 | 2.12 ° | 108.0 | 4.252 | |
| 160 | 6 3/8 | 1.57 ° | 145.9 | 5.744 | |

Multy purpose Milling tool

FMR Tools

FMR technical information (major milling machining formula)

■ Cutting speed

$$V = \frac{\pi \times D \times N}{1000} \text{ (m/min)}$$

■ R.P.M.

$$N = \frac{V \times 1000}{\pi \times D} \text{ (rev/min)}$$

■ Feed rate (per tooth)

$$fz = \frac{F}{N \times Z} \text{ (mm/tooth)}$$

■ Feed rate (per minute)

$$F = fz \times N \times Z \text{ (mm/min)}$$

■ Chip removal rate (volume)

$$Q = \frac{a_p \times a_e \times F}{1000} \text{ (cm}^3\text{/min)}$$

■ Machine power

$$W = \frac{Q \times Ks}{60 \times 102 \times \eta} \text{ (kW)}$$

$$H = \frac{W}{0.75} \text{ (Hp)}$$



N = RPM

V = Cutting speed (m/min)

D = Cutting diameter (mm)

F = Feed per minute (mm/min)

fz = Feed per tooth (mm/tooth)

Z = Number of tooth

W = Machine power (kW)

H = Machine power (Hp)

Q = Chip removal rate (cm³/min)

a_e = Width of cut (mm)

a_p = Depth of cut (mm)

Ks = Specific cutting resistance (kg/mm²)

η = Machine efficiency (%)

Multy purpose Milling tool

FMR Tools

FMR technical information

■ Specific cutting force as per workpiece

| Workpiece | Tensile strength (kg/mm ²) | Specific cutting force (kg/mm ²) | | | | | | | | | |
|--------------------|--|--|--------|----------|--------|----------|-------|----------|-------|----------|-------|
| | | 0.1 | | 0.2 | | 0.3 | | 0.4 | | 0.6 | |
| | | mm/tooth | ipt | mm/tooth | ipt | mm/tooth | ipt | mm/tooth | ipt | mm/tooth | ipt |
| Soft steel | 52 | 220 | 8 3/4 | 195 | 7 3/4 | 182 | 7 1/4 | 170 | 6 3/4 | 158 | 6 3/8 |
| Medium steel | 62 | 198 | 7 7/8 | 180 | 7 1/4 | 173 | 6 7/8 | 160 | 6 3/8 | 157 | 6 1/4 |
| Hard steel | 72 | 252 | 10 1/8 | 220 | 8 3/4 | 204 | 8 1/8 | 185 | 7 3/8 | 174 | 7 |
| Tool steel | 67 | 198 | 7 7/8 | 180 | 7 1/4 | 173 | 6 7/8 | 170 | 6 3/4 | 160 | 6 3/8 |
| Tool steel | 77 | 203 | 8 1/8 | 180 | 7 1/4 | 175 | 7 | 170 | 6 3/4 | 158 | 6 3/8 |
| Cr-Mg steel | 77 | 230 | 9 1/4 | 200 | 8 | 188 | 7 1/2 | 175 | 7 | 166 | 6 5/8 |
| Cr-Mg steel | 63 | 275 | 11 | 230 | 9 1/4 | 206 | 8 1/4 | 180 | 7 1/4 | 178 | 7 1/8 |
| Cr-Mo steel | 73 | 254 | 10 1/8 | 225 | 9 | 214 | 8 1/2 | 200 | 8 | 180 | 7 1/4 |
| Cr-Mo steel | 60 | 218 | 8 3/4 | 200 | 8 | 186 | 7 1/2 | 180 | 7 1/4 | 167 | 6 5/8 |
| Ni-Cr-Mo steel | 94 | 200 | 8 | 180 | 7 1/4 | 168 | 6 3/4 | 160 | 6 3/8 | 150 | 6 |
| Ni-Cr-Mo steel | HB352 | 210 | 8 3/8 | 190 | 7 5/8 | 176 | 7 | 170 | 6 3/4 | 153 | 6 1/8 |
| Cast steel | 52 | 280 | 11 1/4 | 250 | 10 | 232 | 9 1/4 | 220 | 8 3/4 | 204 | 8 1/8 |
| Hard cast iron | HRC46 | 300 | 12 | 270 | 10 3/4 | 250 | 10 | 240 | 9 5/8 | 220 | 8 3/4 |
| Cast iron | 36 | 218 | 8 3/4 | 200 | 8 | 175 | 7 | 160 | 6 3/8 | 147 | 5 7/8 |
| Gray cast iron | HB200 | 175 | 7 | 140 | 5 5/8 | 124 | 5 | 105 | 4 1/4 | 97 | 3 7/8 |
| Brass | 50 | 115 | 4 5/8 | 95 | 3 3/4 | 80 | 3 1/4 | 70 | 2 3/4 | 63 | 2 1/2 |
| Hard alloy (Al-Mg) | 16 | 58 | 2 3/8 | 48 | 1 7/8 | 40 | 1 5/8 | 35 | 1 3/8 | 32 | 1 1/4 |
| Hard alloy (Al-Si) | 20 | 70 | 2 3/4 | 60 | 2 3/8 | 52 | 2 1/8 | 45 | 1 3/4 | 39 | 1 1/2 |

■ Machine efficiency(η)

| Power transfer system | Efficiency co-efficient (E) | Note |
|------------------------|-----------------------------|--|
| Direct link operation | 0.90 | |
| Belt operation | 0.85 | 2 link : $0.85 \times 0.85 \cong 0.70$ |
| Gear operation | 0.75 | |
| Oil pressure operation | 0.60~0.90 | |

Multy purpose Milling tool

FMR Tools

Chip removal rate (volume) (cm³/min)

■ RDHW0501M0□

| Workpiece | | Diameter | 8mm | 10mm | 12mm | 15mm | Cutting condition | | | | |
|-----------|--|------------------------------|-------|-----------|----------|----------|-------------------|-----|----------------|----------------|----------------|
| | | | Grade | 5/16 inch | 3/8 inch | 1/2 inch | 5/8 inch | V | f _z | a _p | R _d |
| P | General structure steel (Under 200HB) | PC3535 PC9530 | 4.97 | 9.94 | 9.94 | 14.92 | Metric | 250 | 0.25 | 0.5 | 0.5D |
| | | | Inch | 830 | 0.01 | 0.02 | | | | | |
| | General carbon steel (Under 30HRC) | | 3.97 | 7.95 | 7.95 | 11.93 | Metric | 200 | 0.25 | 0.5 | 0.5D |
| | | | Inch | 660 | 0.01 | 0.02 | | | | | |
| | High carbon steel, alloy steel (30~40HRC) | | 2.86 | 5.72 | 5.72 | 8.59 | Metric | 180 | 0.20 | 0.5 | 0.5D |
| | | | Inch | 600 | 0.008 | 0.02 | | | | | |
| | High carbon steel, alloy steel (40~50HRC) | | 1.24 | 2.48 | 2.48 | 3.72 | Metric | 130 | 0.15 | 0.4 | 0.5D |
| | | | Inch | 430 | 0.006 | 0.016 | | | | | |
| | Alloy steel (Over 50HRC) | | 0.95 | 1.90 | 1.90 | 2.86 | Metric | 100 | 0.15 | 0.4 | 0.5D |
| | | | Inch | 330 | 0.006 | 0.016 | | | | | |
| M | Stainless steel | PC9530 | 2.06 | 4.13 | 4.13 | 6.20 | Metric | 130 | 0.20 | 0.5 | 0.5D |
| | | | Inch | 430 | 0.008 | 0.02 | | | | | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 2.86 | 5.72 | 5.72 | 8.59 | Metric | 180 | 0.20 | 0.5 | 0.5D |
| | | | Inch | 600 | 0.008 | 0.02 | | | | | |

■ RDHW06T1M0□

| Workpiece | | Diameter | 10mm | 12mm | 15mm | 20mm | Cutting condition | | | | |
|-----------|--|------------------------------|-------|----------|----------|----------|-------------------|-----|----------------|----------------|----------------|
| | | | Grade | 3/8 inch | 1/2 inch | 5/8 inch | 3/4 inch | V | f _z | a _p | R _d |
| P | General structure steel (Under 200HB) | PC3535 PC9530 | 9.35 | 18.71 | 28.07 | 28.07 | Metric | 280 | 0.30 | 0.7 | 0.5D |
| | | | Inch | 920 | 0.012 | 0.028 | | | | | |
| | General carbon steel (Under 30HRC) | | 8.35 | 16.71 | 25.06 | 25.06 | Metric | 250 | 0.30 | 0.7 | 0.5D |
| | | | Inch | 830 | 0.012 | 0.028 | | | | | |
| | High carbon steel, alloy steel (30~40HRC) | | 6.68 | 13.36 | 20.05 | 20.05 | Metric | 200 | 0.30 | 0.7 | 0.5D |
| | | | Inch | 660 | 0.012 | 0.028 | | | | | |
| | High carbon steel, alloy steel (40~50HRC) | | 2.86 | 5.72 | 8.59 | 8.59 | Metric | 150 | 0.20 | 0.6 | 0.5D |
| | | | Inch | 500 | 0.008 | 0.024 | | | | | |
| | Alloy steel (Over 50HRC) | | 1.90 | 3.81 | 5.72 | 5.72 | Metric | 100 | 0.20 | 0.6 | 0.5D |
| | | | Inch | 330 | 0.008 | 0.024 | | | | | |
| M | Stainless steel | PC9530 | 4.17 | 8.35 | 12.53 | 12.53 | Metric | 150 | 0.25 | 0.7 | 0.5D |
| | | | Inch | 500 | 0.01 | 0.028 | | | | | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 4.01 | 8.02 | 12.03 | 12.03 | Metric | 180 | 0.20 | 0.7 | 0.5D |
| | | | Inch | 600 | 0.008 | 0.028 | | | | | |

Multy purpose Milling tool

FMR Tools

Chip removal rate (volume) (cm³/min)

■ RDHW0702M0□

| Workpiece | | Diameter Grade | 15mm | 20mm | Cutting condition | | | | |
|-----------|--|------------------------------|----------|----------|-------------------|-----|-------|-------|------|
| | | | 5/8 inch | 3/4 inch | | V | fz | ap | Rd |
| P | General structure steel (Under 200HB) | PC3535 PC9530 | 26.73 | 40.10 | Metric | 300 | 0.35 | 0.8 | 0.5D |
| | | | | | Inch | 990 | 0.014 | 0.032 | |
| | General carbon steel (Under 30HRC) | | 22.28 | 33.42 | Metric | 250 | 0.35 | 0.8 | 0.5D |
| | | | | | Inch | 830 | 0.014 | 0.032 | |
| | High carbon steel, alloy steel (30~40HRC) | | 17.82 | 26.73 | Metric | 200 | 0.35 | 0.8 | 0.5D |
| | | | | | Inch | 660 | 0.014 | 0.032 | |
| | High carbon steel, alloy steel (40~50HRC) | | 11.36 | 17.04 | Metric | 170 | 0.30 | 0.7 | 0.5D |
| | | | | | Inch | 560 | 0.012 | 0.028 | |
| | Alloy steel (Over 50HRC) | | 8.68 | 13.03 | Metric | 130 | 0.30 | 0.7 | 0.5D |
| | | | | | Inch | 430 | 0.012 | 0.028 | |
| M | Stainless steel | PC9530 | 17.82 | 26.73 | Metric | 200 | 0.35 | 0.8 | 0.5D |
| | | | | | Inch | 660 | 0.014 | 0.032 | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 13.75 | 20.62 | Metric | 180 | 0.30 | 0.8 | 0.5D |
| | | | | | Inch | 600 | 0.012 | 0.032 | |

■ RDHW0803M0□

| Workpiece | | Diameter Grade | 16mm | 20mm | 25mm | Cutting condition | | | | |
|-----------|--|------------------------------|----------|----------|--------|-------------------|-----|-------|-------|------|
| | | | 5/8 inch | 3/4 inch | 1 inch | | V | fz | ap | Rd |
| P | General structure steel (Under 200HB) | PC3535 PC9530 | 31.83 | 31.83 | 47.74 | Metric | 300 | 0.40 | 1.0 | 0.5D |
| | | | | | | Inch | 990 | 0.016 | 0.04 | |
| | General carbon steel (Under 30HRC) | | 25.46 | 25.46 | 38.19 | Metric | 250 | 0.40 | 1.0 | 0.5D |
| | | | | | | Inch | 830 | 0.016 | 0.04 | |
| | High carbon steel, alloy steel (30~40HRC) | | 22.91 | 22.91 | 34.37 | Metric | 200 | 0.40 | 1.0 | 0.5D |
| | | | | | | Inch | 660 | 0.016 | 0.04 | |
| | High carbon steel, alloy steel (40~50HRC) | | 11.45 | 11.45 | 17.18 | Metric | 170 | 0.30 | 0.9 | 0.5D |
| | | | | | | Inch | 560 | 0.012 | 0.036 | |
| | Alloy steel (Over 50HRC) | | 7.63 | 7.63 | 11.45 | Metric | 130 | 0.30 | 0.9 | 0.5D |
| | | | | | | Inch | 430 | 0.012 | 0.036 | |
| M | Stainless steel | PC9530 | 16.55 | 16.55 | 24.82 | Metric | 200 | 0.20 | 1.0 | 0.5D |
| | | | | | | Inch | 660 | 0.008 | 0.04 | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 14.32 | 14.32 | 21.48 | Metric | 180 | 0.20 | 1.0 | 0.5D |
| | | | | | | Inch | 600 | 0.008 | 0.04 | |

Multy purpose Milling tool

FMR Tools

Chip removal rate (volume) (cm³/min)

■ RDKT10T3M0-□□

| Workpiece | | Diameter | Diameter | | | | | | | | | | Cutting condition | | | |
|-----------|---|--------------------------------------|----------|--------|--------|------------|------------|--------|------------|------------|--------|--------|-------------------|-------|------|------|
| | | | 21mm | 25mm | 26mm | 32mm | 40mm | 50mm | 63mm | 80mm | 100mm | V | fz | ap | Rd | |
| | | Grade | 7/8 inch | 1 inch | 1 inch | 1 1/4 inch | 1 5/8 inch | 2 inch | 2 1/2 inch | 3 1/4 inch | 4 inch | | | | | |
| P | General structure steel (Under 200HB) | NCM325 NCM335 PC3535 PC3545 | 47.74 | 47.74 | 47.74 | 71.61 | 95.49 | 119.36 | 143.23 | 167.11 | 190.98 | Metric | 250 | 0.40 | 1.5 | 0.5D |
| | General carbon steel (Under 30HRC) | | 38.19 | 38.19 | 38.19 | 57.29 | 76.39 | 95.49 | 114.59 | 133.69 | 152.78 | Inch | 830 | 0.016 | 0.06 | |
| | High carbon steel, alloy steel (30~40HRC) | | 34.37 | 34.37 | 34.37 | 51.56 | 68.75 | 85.94 | 103.13 | 120.32 | 137.50 | Metric | 180 | 0.40 | 1.5 | 0.5D |
| | High carbon steel, alloy steel (40~50HRC) | | 14.32 | 14.32 | 14.32 | 21.48 | 28.64 | 35.80 | 42.97 | 50.13 | 57.29 | Inch | 600 | 0.016 | 0.06 | |
| | Alloy steel (Over 50HRC) | | 9.54 | 9.54 | 9.54 | 14.32 | 19.09 | 23.87 | 28.64 | 33.42 | 38.19 | Metric | 100 | 0.30 | 1.0 | 0.5D |
| | Inch | 330 | 0.012 | 0.04 | | | | | | | | | | | | |
| M | Stainless steel | PC9530 | 12.41 | 12.41 | 12.41 | 18.62 | 24.82 | 31.03 | 37.24 | 43.44 | 49.65 | Metric | 130 | 0.20 | 1.5 | 0.5D |
| | | | Inch | 430 | 0.008 | 0.06 | | | | | | | | | | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 21.48 | 21.48 | 21.48 | 32.22 | 42.97 | 53.71 | 64.45 | 75.20 | 85.94 | Metric | 180 | 0.20 | 1.5 | 0.5D |
| | | | Inch | 600 | 0.008 | 0.06 | | | | | | | | | | |

■ RDKT1204M0-□□

| Workpiece | | Diameter | Diameter | | | | | | | | Cutting condition | | | | |
|-----------|---|--------------------------------------|------------|-------------|------------|--------|------------|------------|--------|--------|-------------------|-----|-------|------|------|
| | | | 32mm | 33mm | 40mm | 50mm | 63mm | 80mm | 100mm | 125mm | V | fz | ap | Rd | |
| | | Grade | 1 1/4 inch | 1 5/16 inch | 1 5/8 inch | 2 inch | 2 1/2 inch | 3 1/4 inch | 4 inch | 5 inch | | | | | |
| P | General structure steel (Under 200HB) | NCM325 NCM335 PC3535 PC3545 | 38.19 | 38.19 | 57.29 | 76.39 | 76.39 | 95.49 | 114.59 | 133.69 | Metric | 200 | 0.40 | 1.5 | 0.5D |
| | General carbon steel (Under 30HRC) | | 38.19 | 38.19 | 57.29 | 76.39 | 48.50 | 95.49 | 114.59 | 133.69 | Inch | 660 | 0.016 | 0.06 | |
| | High carbon steel, alloy steel (30~40HRC) | | 34.37 | 34.37 | 51.56 | 68.75 | 43.65 | 85.94 | 103.13 | 120.32 | Metric | 160 | 0.40 | 1.5 | 0.5D |
| | High carbon steel, alloy steel (40~50HRC) | | 14.32 | 14.32 | 21.48 | 22.91 | 28.64 | 35.80 | 42.97 | 50.13 | Inch | 530 | 0.016 | 0.06 | |
| | Alloy steel (Over 50HRC) | | 9.54 | 9.54 | 14.32 | 19.09 | 12.12 | 23.87 | 28.64 | 33.42 | Metric | 100 | 0.30 | 1.0 | 0.5D |
| | | | Inch | 330 | 0.012 | 0.04 | | | | | | | | | |
| M | Stainless steel | PC9530 | 12.41 | 12.41 | 18.62 | 24.82 | 15.76 | 31.03 | 37.24 | 43.44 | Metric | 130 | 0.20 | 1.5 | 0.5D |
| | | | Inch | 430 | 0.008 | 0.06 | | | | | | | | | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 21.48 | 21.48 | 32.22 | 42.97 | 27.28 | 53.71 | 64.45 | 75.20 | Metric | 180 | 0.20 | 1.5 | 0.5D |
| | | | Inch | 600 | 0.008 | 0.06 | | | | | | | | | |

Multy purpose Milling tool

FMR Tools

Chip removal rate (volume) (cm³/min)

■ RDHW1605M0□ / RDKT1605M0-MM

| Workpiece | | Diameter Grade | 40mm | 50mm | 63mm | 80mm | 100mm | 125mm | Cutting condition | | | | |
|---|---|--|---------------|-----------|---------------|---------------|-----------|-----------|-------------------|------|-------|------|------|
| | | | 1 5/8 inch | 2 inch | 2 1/2 inch | 3 1/4 inch | 4 inch | 5 inch | V | fz | ap | Rd | |
| P | General structure steel (Under 200HB) | NCM325 NCM335 PC3535 PC3545 PC9530 | 128.11 | 192.17 | 256.23 | 320.29 | 384.35 | 448.41 | Metric | 230 | 0.50 | 3.5 | 0.5D |
| | | | | | | | | | Inch | 760 | 0.02 | 0.14 | |
| | General carbon steel (Under 30HRC) | | 111.40 | 167.11 | 222.81 | 278.52 | 334.22 | 389.92 | Metric | 200 | 0.50 | 3.5 | 0.5D |
| | | | | | | | | | Inch | 660 | 0.02 | 0.14 | |
| | High carbon steel, alloy steel (30~40HRC) | | 85.94 | 103.13 | 171.88 | 214.85 | 257.83 | 300.80 | Metric | 200 | 0.50 | 3.5 | 0.5D |
| | | | | | | | | | Inch | 200 | 0.50 | 3.5 | |
| High carbon steel, alloy steel (40~50HRC) | 57.29 | 68.75 | 114.59 | 143.23 | 171.88 | 200.53 | Metric | 180 | 0.50 | 3.0 | 0.5D | | |
| | | | | | | | Inch | 600 | 0.02 | 0.12 | | | |
| Alloy steel (Over 50HRC) | 31.83 | 47.74 | 63.66 | 79.57 | 95.49 | 111.40 | Metric | 100 | 0.40 | 2.5 | 0.5D | | |
| | | | | | | | Inch | 330 | 0.016 | 0.10 | | | |
| M | Stainless steel | PC9530 | 72.41 | 108.62 | 144.83 | 181.03 | 217.24 | 253.45 | Metric | 130 | 0.50 | 3.5 | 0.5D |
| | | | | | | | | | Inch | 430 | 0.02 | 0.14 | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 68.75 | 103.13 | 137.50 | 171.88 | 206.26 | 240.64 | Metric | 180 | 0.40 | 3.0 | 0.5D |
| | | | | | | | | | Inch | 600 | 0.016 | 0.12 | |

■ RDHW2006M0□ / RDKT2006M0-MM

| Workpiece | | Diameter Grade | 50mm | 63mm | 80mm | 100mm | 125mm | 160mm | Cutting condition | | | | |
|---|---|--|-----------|---------------|---------------|-----------|-----------|---------------|-------------------|------|-------|------|------|
| | | | 2 inch | 2 1/2 inch | 3 1/4 inch | 4 inch | 5 inch | 6 3/8 inch | V | fz | ap | Rd | |
| P | General structure steel (Under 200HB) | NCM325 NCM335 PC3535 PC3545 PC9530 | 190.98 | 254.64 | 318.30 | 381.97 | 445.63 | 509.29 | Metric | 200 | 0.50 | 4.0 | 0.5D |
| | | | | | | | | | Inch | 660 | 0.02 | 0.16 | |
| | General carbon steel (Under 30HRC) | | 171.88 | 229.18 | 286.47 | 343.77 | 401.07 | 458.36 | Metric | 180 | 0.50 | 4.0 | 0.5D |
| | | | | | | | | | Inch | 600 | 0.02 | 0.16 | |
| | High carbon steel, alloy steel (30~40HRC) | | 152.78 | 203.71 | 254.64 | 305.57 | 356.50 | 407.43 | Metric | 160 | 0.50 | 4.0 | 0.5D |
| | | | | | | | | | Inch | 530 | 0.02 | 0.16 | |
| High carbon steel, alloy steel (40~50HRC) | 93.58 | 124.77 | 155.97 | 187.16 | 218.36 | 249.55 | Metric | 140 | 0.40 | 3.5 | 0.5D | | |
| | | | | | | | Inch | 460 | 0.016 | 0.14 | | | |
| Alloy steel (Over 50HRC) | 57.29 | 76.39 | 95.49 | 114.59 | 133.69 | 152.78 | Metric | 100 | 0.40 | 3.0 | 0.5D | | |
| | | | | | | | Inch | 330 | 0.016 | 0.12 | | | |
| M | Stainless steel | PC9530 | 124.14 | 165.52 | 206.90 | 248.28 | 289.662 | 331.04 | Metric | 130 | 0.50 | 4.0 | 0.5D |
| | | | | | | | | | Inch | 430 | 0.02 | 0.16 | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 137.50 | 183.34 | 229.18 | 275.01 | 320.85 | 366.69 | Metric | 180 | 0.40 | 4.0 | 0.5D |
| | | | | | | | | | Inch | 600 | 0.016 | 0.16 | |

Multy purpose Milling tool

FMR Tools

Power of machine required (Hp)

$$P_{kW} = 0.75 \times P_{hp}$$

■ RDKT10T3M0-□□

(Hp)

| Workpiece | | Diameter | 21mm | 25mm | 26mm | 32mm | 40mm | 50mm | 63mm | 80mm | 100mm | Cutting condition | | | | |
|---|---|--------------------------------------|-------|----------|--------|--------|------------|------------|--------|------------|------------|-------------------|-----|------|-----|------|
| | | | Grade | 7/8 inch | 1 inch | 1 inch | 1 1/4 inch | 1 5/8 inch | 2 inch | 2 1/2 inch | 3 1/4 inch | 4 inch | V | fz | ap | Rd |
| P | General structure steel (Under 200HB) | NCM325 NCM335 PC3535 PC3545 | 2.2 | 2.2 | 2.2 | 3.3 | 4.4 | 5.5 | 6.6 | 7.7 | 8.8 | Metric | 250 | 0.40 | 1.5 | 0.5D |
| | Inch | | 830 | 0.016 | 0.06 | | | | | | | | | | | |
| | General carbon steel (Under 30HRC) | | 2.1 | 2.1 | 2.1 | 3.1 | 4.1 | 5.2 | 6.2 | 7.3 | 8.3 | Metric | 200 | 0.40 | 1.5 | 0.5D |
| | Inch | | 660 | 0.016 | 0.06 | | | | | | | | | | | |
| | High carbon steel, alloy steel (30~40HRC) | | 2.2 | 2.2 | 2.2 | 3.3 | 4.5 | 5.6 | 6.7 | 7.9 | 9.0 | Metric | 180 | 0.40 | 1.5 | 0.5D |
| Inch | 600 | 0.016 | 0.06 | | | | | | | | | | | | | |
| High carbon steel, alloy steel (40~50HRC) | 1.1 | 1.1 | 1.1 | 1.6 | 2.1 | 2.6 | 3.2 | 3.7 | 4.2 | Metric | 150 | 0.30 | 1.0 | 0.5D | | |
| Inch | 500 | 0.012 | 0.04 | | | | | | | | | | | | | |
| Alloy steel (Over 50HRC) | 0.7 | 0.7 | 0.7 | 1.1 | 1.4 | 1.7 | 2.1 | 2.4 | 2.8 | Metric | 100 | 0.30 | 1.0 | 0.5D | | |
| Inch | 330 | 0.012 | 0.04 | | | | | | | | | | | | | |
| M | Stainless steel | PC9530 | 0.6 | 0.6 | 0.6 | 0.8 | 1.2 | 1.5 | 1.7 | 2.0 | 2.3 | Metric | 130 | 0.20 | 1.5 | 0.5D |
| Inch | 430 | 0.008 | 0.06 | | | | | | | | | | | | | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 0.6 | 0.6 | 0.6 | 0.9 | 1.2 | 1.5 | 1.8 | 2.1 | 2.4 | Metric | 180 | 0.20 | 1.5 | 0.5D |
| Inch | 600 | 0.008 | 0.06 | | | | | | | | | | | | | |

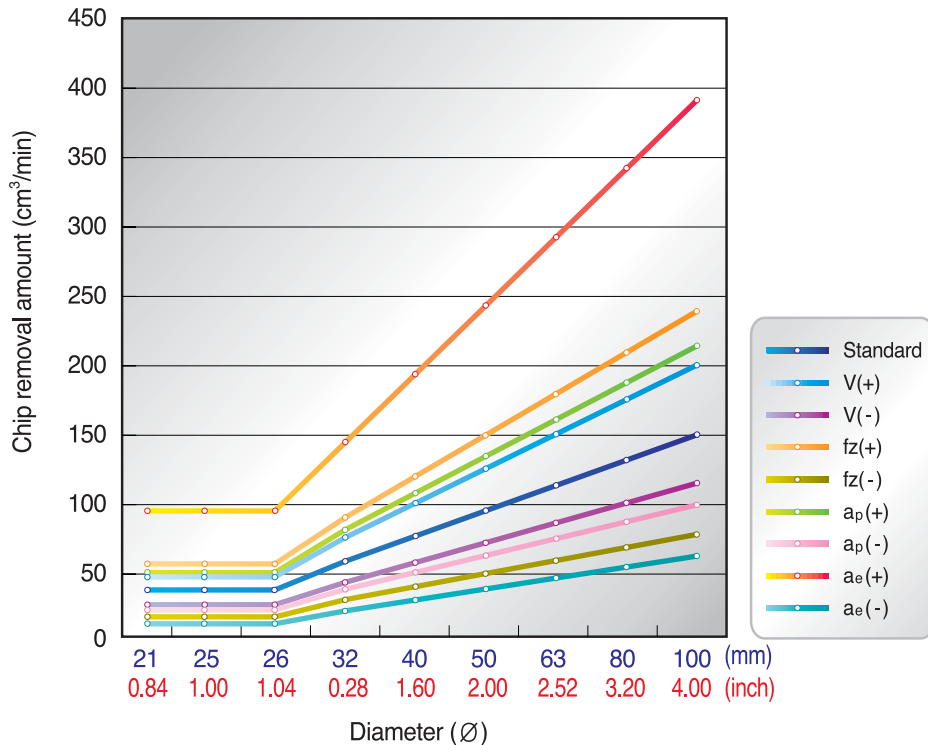
■ RDKT1204M0-□□

(Hp)

| Workpiece | | Diameter | 32mm | 33mm | 40mm | 50mm | 63mm | 80mm | 100mm | 125mm | Cutting condition | | | | |
|---|---|--------------------------------------|-------|------------|-------------|------------|--------|------------|------------|--------|-------------------|-----|------|-----|------|
| | | | Grade | 1 1/4 inch | 1 5/16 inch | 1 5/8 inch | 2 inch | 2 1/2 inch | 3 1/4 inch | 4 inch | 5 inch | V | fz | ap | Rd |
| P | General structure steel (Under 200HB) | NCM325 NCM335 PC3535 PC3545 | 1.7 | 1.7 | 2.6 | 3.5 | 3.5 | 4.4 | 5.3 | 6.1 | Metric | 200 | 0.40 | 1.5 | 0.5D |
| | Inch | | 660 | 0.016 | 0.06 | | | | | | | | | | |
| | General carbon steel (Under 30HRC) | | 2.0 | 2.0 | 3.1 | 4.1 | 2.6 | 5.2 | 6.2 | 7.2 | Metric | 180 | 0.40 | 1.5 | 0.5D |
| | Inch | | 600 | 0.016 | 0.06 | | | | | | | | | | |
| | High carbon steel, alloy steel (30~40HRC) | | 2.2 | 2.2 | 3.3 | 4.4 | 2.8 | 5.6 | 6.7 | 7.8 | Metric | 160 | 0.40 | 1.5 | 0.5D |
| Inch | 530 | 0.016 | 0.06 | | | | | | | | | | | | |
| High carbon steel, alloy steel (40~50HRC) | 1.0 | 1.0 | 1.5 | 1.6 | 2.1 | 2.6 | 3.1 | 3.6 | Metric | 140 | 0.30 | 1.0 | 0.5D | | |
| Inch | 460 | 0.012 | 0.04 | | | | | | | | | | | | |
| Alloy steel (Over 50HRC) | 0.7 | 0.7 | 1.0 | 1.4 | 0.8 | 1.7 | 2.1 | 2.4 | Metric | 100 | 0.30 | 1.0 | 0.5D | | |
| Inch | 330 | 0.012 | 0.04 | | | | | | | | | | | | |
| M | Stainless steel | PC9530 | 0.5 | 0.5 | 0.8 | 1.1 | 0.7 | 1.4 | 1.7 | 2.0 | Metric | 130 | 0.20 | 1.5 | 0.5D |
| Inch | 430 | 0.008 | 0.06 | | | | | | | | | | | | |
| K | Gray cast iron Ductile cast iron | NCM310K NCM320K PC6510 | 0.6 | 0.6 | 0.9 | 1.2 | 0.7 | 1.5 | 1.8 | 2.1 | Metric | 180 | 0.20 | 1.5 | 0.5D |
| Inch | 600 | 0.008 | 0.06 | | | | | | | | | | | | |

Multy purpose Milling tool FMR Tools

Chip removal rate by condition change



Variation of cutting condition

| | ISO | ASA |
|---------------------------|--------------------------------------|--|
| Standard Condition | V=200 fz=0.4 ap=1.5 ae=0.5D | V=660 fz=0.016 ap=0.06 ae=0.02D |
| V (+) | 250 | 830 |
| V (-) | 150 | 500 |
| fz (+) | 0.6 | 0.024 |
| fz (-) | 0.2 | 0.008 |
| ap (+) | 2 | 0.08 |
| ap (-) | 1 | 0.04 |
| ae (+) | D | D |
| ae (-) | 0.2D | 0.008D |

Cutting time comparative example

- Maker : SEIKI, HR5BS
- Workpiece : S45C, AISI1045, Ck45

| | Vc | fz | ap | Rd | Tooth |
|--------|-----|-------|------|----|-------|
| Metric | 200 | 0.4 | 2.0 | D | 5 |
| inch | 660 | 0.016 | 0.08 | D | |

- Slotting
- Designation : FMRCM4050RD
① **FMR (RDKT12)**

- Maker : SEIKI, HR5BS
- Workpiece : S45C, AISI1045, Ck45

| | Vc | fz | ap | Rd | Tooth |
|--------|-----|--------|-----|----|-------|
| Metric | 200 | 0.14 | 7.0 | D | 5 |
| inch | 660 | 0.0056 | 1/4 | D | |

- Slotting
- T maker (ø50mm)
② **APKT (T-maker)**

| Section | N (rev/min) | F | Q (cm³/min) | P | Cutting time | Chip thickness |
|----------------------|-------------|------------|-------------|----------|---------------|----------------|
| ① FMR- RDKT12 | 1273 | 2546 m/min | 254 | 8.51 kW | 9.9min | 0.3 mm |
| | | 8400 sfm | | 11.34 Hp | | 0.012 inch |
| ② APKT | 1273 | 700 m/min | 245 | 8.51 kW | 36min | 0.11 mm |
| | | 2310 sfm | | 11.34 Hp | | 0.0044 inch |

FMR : Improvement more than 3 times by high feed cutting

Multy purpose Milling tool

FMR Tools

FMR code system (shank & cutter)

FMRC(M)4063R(D)-H(2)

Brand name
Future- Mill

Cutter type
C = Cutter
S = Shank

Insert geometry
Round type

| Metric or Inch type | | |
|---------------------|--------|--------|
| | ∅D | ∅d |
| Not shown | Metric | Inch |
| (M) | Metric | Metric |
| (A) | Inch | Inch |

Insert I/C
10 = 05 size insert
15 = 06 size insert
20 = 07 size insert
25 = 08 size insert
30 = 10 size insert
40 = 12 size insert
50 = 16 size insert
60 = 20 size insert

Diameter
63 mm

Direction of rotation
R = Right
L = Left

Clearance angle
(D) = D-Posi

Length of holder (shank type)
S = Standard type
M = Middle type
L = Long type

Pitch (cutter type)
None = coarse pitch
M = close pitch
H = extra close pitch



FMR code system (modular)

F M R M 2 5 2 0 R D - M 1 0

Brand name
Future- Mill

Cutter type
M = Modular

Diameter
20 mm

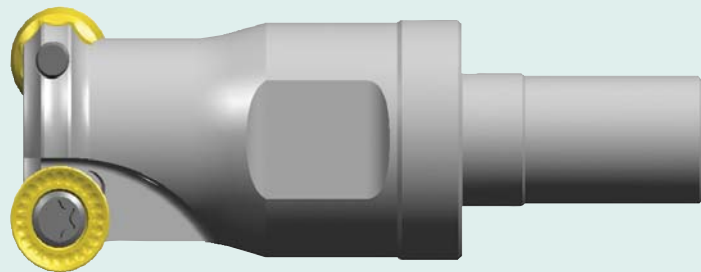
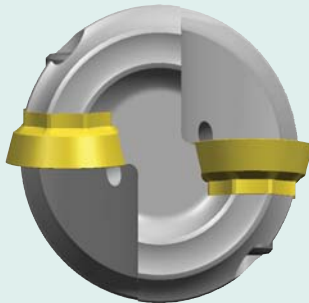
Clearance angle
(D) = D-Posi

Modular head screw
M10

Insert geometry
Round type

Insert I/C
10 = 05 size insert
15 = 06 size insert
20 = 07 size insert
25 = 08 size insert
30 = 10 size insert
40 = 12 size insert
50 = 16 size insert

Direction of rotation
R = Right
L = Left



■ Note

- 1) Use safety glasses, face cover and other protection equipment. If cutting condition and use method are inaccurate, you may be injured by broken tools or scattering of chips.
- 2) Excessive cutting load may have bad influence both tool and machine.
Make suitable tool replacement cycle for preventing failure of machining.
- 3) After machine stopped, clean remaining chip from machine by using special cleaning equipment.
- 4) Keep safety distances from scattering of acute and hot chip during machining.
- 5) Make preparation to fire prevention countermeasures in advance if you use insoluble cutting oil.
- 6) Assembled parts may be scattered at high speed cutting. Please use protection equipment.



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