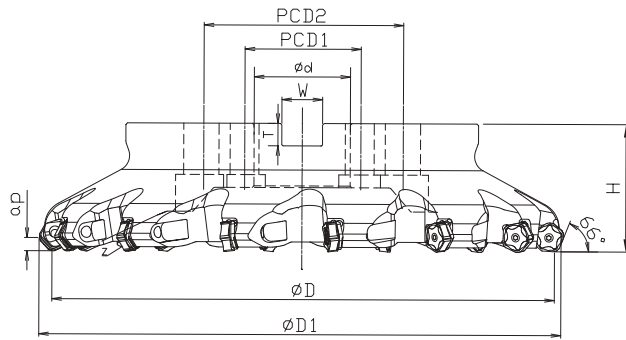


MFPN66 SERIES

66° Face Mill with High Economical and 10 Cutting Edge Insert for Higher Productivity

- ★ Stability and cost efficiency with 10-edge pentagonal inserts.
- ★ Low cutting forces and reduced chattering with a helical cutting edge design.
- ★ Tough and reliable dual cutting edge design.


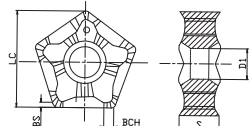

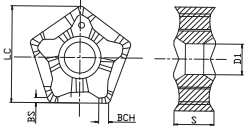

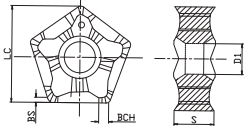


| Designation | Size(mm) | | | | | | | | | | Clamping Screw | Wrench |
|------------------|----------|-----|----|----|------|------|----|-------|-------|--------|----------------|---------|
| | D | D1 | d | H | W | T | Z | PCD 1 | PCD 2 | Max.ap | | |
| MFPN66050R-4T-M | 50 | 58 | 22 | 40 | 10.4 | 6.3 | 4 | - | - | 5 | SB4090 | DTPM-15 |
| MFPN66063R-5T-M | 63 | 71 | 22 | 40 | 10.4 | 6.3 | 5 | - | - | 5 | | |
| MFPN66080R-6T-M | 80 | 88 | 27 | 50 | 12.4 | 7.0 | 6 | - | - | 5 | | |
| MFPN66100R-7T-M | 100 | 108 | 32 | 50 | 12.4 | 8.0 | 7 | - | - | 5 | | |
| MFPN66125R-9T-M | 125 | 133 | 40 | 63 | 16.4 | 9.0 | 9 | - | - | 5 | | |
| MFPN66160R-11T-M | 160 | 168 | 40 | 63 | 16.4 | 9.0 | 11 | - | - | 5 | | |
| MFPN66200R-13T-M | 200 | 208 | 60 | 63 | 25.7 | 14.0 | 13 | 101.6 | - | 5 | | |
| MFPN66250R-15T-M | 250 | 258 | 60 | 63 | 25.7 | 14.0 | 15 | 101.6 | - | 5 | | |
| MFPN66315R-17T-M | 315 | 323 | 60 | 63 | 25.7 | 14.0 | 17 | 101.6 | 177.8 | 5 | | |

MFPN66 SERIES

66° Face Mill with High Economical and 10 Cutting Edge Insert for Higher Productivity

● Applicable Inserts

| Insert | | Insert No. | Size(mm) | | | | | Coated Carbide | | Carbide | | | | | | | |
|---|---|-----------------|----------|------|-----|----|-----|----------------|--------|---------|-------|-------|--|--|--|--|--|
| | | | LC | S | D1 | BS | BCH | TG4025 | TG4035 | TY602 | TI960 | HC200 | | | | | |
|  |  | PNMU0905XNER-UG | 14.6 | 5.56 | 4.7 | 2 | 2 | ● | | | | | | | | | |
|  |  | PNMU0905XNER-SG | 14.6 | 5.56 | 4.7 | 2 | 2 | | ● | | | | | | | | |
|  |  | PNMU0905XNER-TG | 14.6 | 5.56 | 4.7 | 2 | 2 | | | ● | | | | | | | |

| Usage Classification | | P | Steel | ★ | ★ | | | | | | | | | |
|------------------------------|---|----------------|-------|---|---|--|--|--|--|--|--|--|--|--|
| ★ 1st Choice ☆ 2nd Choice | M | Stainless | | ★ | ★ | | | | | | | | | |
| | K | Cast iron | ★ | ★ | | | | | | | | | | |
| | N | Non-ferrous | | | | | | | | | | | | |
| | S | Superalloys | | | ★ | | | | | | | | | |
| | H | Hard materials | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

● Recommended Cutting Conditions

| ISO | Workpiece material | Hardness | Grade | Cutting Speed | | Feed | |
|-----|--------------------|-----------|--------------|---------------|-----------|------|--|
| | | | | Vc (m/min) | fz (mm/t) | | |
| P | Carbon Steel | < HB300 | TG4025/TY602 | 120-250 | 0.10-0.30 | | |
| | Alloy Steel | HB200-300 | | 100-220 | 0.10-0.30 | | |
| | Mold Steel | < HB300 | | 80-180 | 0.10-0.25 | | |
| M | Stainless Steel | < HB200 | TG4035/TY602 | 100-200 | 0.06-0.20 | | |
| K | Gray Cast Iron | HB150-250 | TY602 | 120-260 | 0.06-0.20 | | |
| | Ductile Cast Iron | HB150-250 | TY602 | 100-200 | 0.06-0.15 | | |

Face Milling
MFPN66 Series

High-Feed Milling
M-F Series

Shoulder Milling
TAN90 Series

Profile Milling
TRD Series

Slot Milling
TLXFD/SD Series

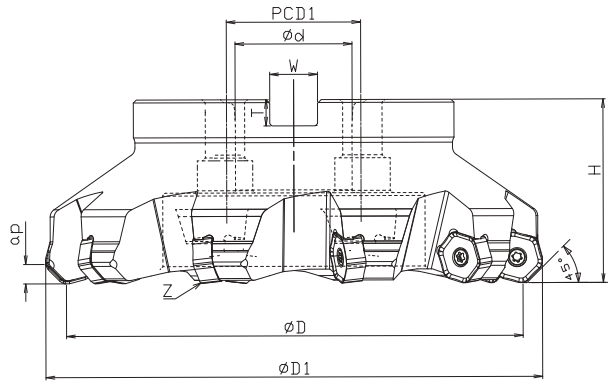
Multi-Functional Milling
Modular Bapm Series

THN45 SERIES



45° Face Mill with High Economical and 12 Cutting Edge Insert for Higher Productivity

- ★ Enhanced cutting edge for cutting stability and high feed machining.
- ★ Acute cutter pocket design and inclined screw clamping enables robust clamping.
- ★ High helical cutting edges for smooth machining double-sided 12 corner insert.


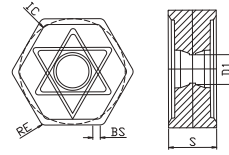

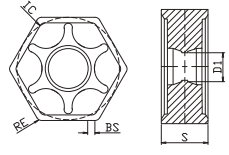


| Designation | Size(mm) | | | | | | | | | Clamping Screw | Wrench |
|---------------------|----------|-------|----|----|------|-----|----|------|--------|----------------|--------|
| | D | D1 | d | H | W | T | Z | PCD1 | Max.ap | | |
| THN45-50R04HN09M22 | 50 | 61.4 | 22 | 40 | 10.4 | 6.3 | 4 | - | 5 | TH3009 | THP09 |
| THN45-63R06HN09M22 | 63 | 74.4 | 22 | 40 | 10.4 | 6.3 | 6 | - | 5 | | |
| THN45-80R06HN09M27 | 80 | 91.4 | 27 | 50 | 12.4 | 7.0 | 6 | - | 5 | | |
| THN45-100R06HN09M32 | 100 | 111.4 | 32 | 50 | 14.4 | 8.0 | 6 | - | 5 | | |
| THN45-125R08HN09M40 | 125 | 136.4 | 40 | 63 | 16.4 | 9.0 | 8 | - | 5 | | |
| THN45-160R10HN09M40 | 160 | 171.4 | 40 | 63 | 16.4 | 9.0 | 10 | 66.7 | 5 | TH3009 | TTL15P |

THN45 SERIES

45° Face Mill with High Economical and 12 Cutting Edge Insert for Higher Productivity

● Applicable Inserts

| Insert | | Insert No. | Size(mm) | | | | | Coated Carbide | | | | Carbide | | | | | |
|---|---|-----------------|----------|------|----|-----|-----|----------------|-------|-------|-------|---------|--|--|--|--|--|
| | | | IC | S | D1 | BS | RE | TY602 | TY615 | TY625 | TI960 | HC200 | | | | | |
|  |  | HNMU0906ANSN-GR | 16.5 | 6.36 | 5 | 1.5 | 1.2 | ● | | | | | | | | | |
|  |  | HNMU0906ANSN-TR | 16.5 | 6.36 | 5 | 1.5 | 0.8 | | ● | | | | | | | | |

| Usage Classification | P | Steel | ★ | | | | | | | | | | | | | | |
|------------------------------|---|----------------|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ★ 1st Choice ☆ 2nd Choice | M | Stainless | ★ | ★ | | | | | | | | | | | | | |
| | K | Cast iron | ★ | | | | | | | | | | | | | | |
| | N | Non-ferrous | | | | | | | | | | | | | | | |
| | S | Superalloys | | ☆ | | | | | | | | | | | | | |
| | H | Hard materials | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

● Recommended Cutting Conditions

| ISO | Workpiece material | Hardness | Grade | Cutting Speed | Feed |
|-----|-----------------------------|-----------|-------------|---------------|-----------|
| | | | | Vc (m/min) | fz (mm/t) |
| P | Low Carbon Steel | ≤HB180 | TY602 | 200-300 | 0.20-0.40 |
| | High Carbon and Alloy Steel | HB180-280 | | 100-250 | 0.15-0.25 |
| | Alloy Steel | HB280-350 | | 100-180 | 0.20-0.40 |
| M | Stainless Steel | ≤HB200 | TY602/TY615 | 100-200 | 0.10-0.30 |
| K | Gray Cast Iron | HB150-250 | TY602 | 130-230 | 0.20-0.40 |
| | Ductile Cast Iron | HB150-250 | | 120-220 | 0.10-0.30 |

Face Milling
THN45 Series

High-Feed Milling
M-H-Series

Shoulder Milling
TAN90 Series

Profile Milling
TRD Series

Slot Milling
TLXFD/SD Series

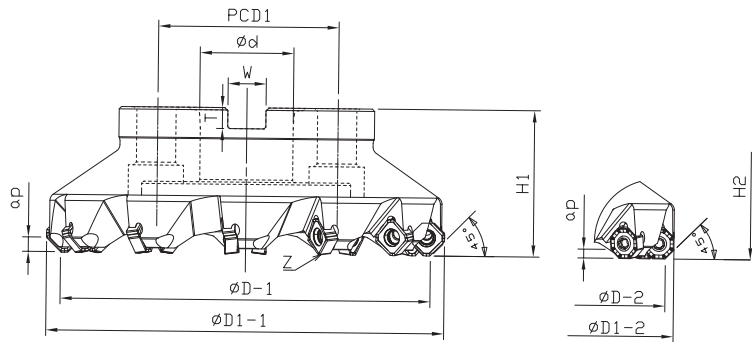
Multi-Functional Milling
Modular Bapm Series

TSON45 SERIES



45° Face Mill Offers Advantage of Using Square, Octagonal Inserts in the Same Pocket

- ★SNMU insert offers double-sided, square inserts with eight cutting edges.
- ★Most suitable for a large depth of cut and free cutting inserts with excellent chip control.
- ★ONMU inserts offers double-sided, octagonal insert with 16 cutting edges – high economy inserts.
- ★Light cutting force due to excellent chip control.
- ★The optimized cutting edge creates barrel-formed chips for easy removal, allowing an operation at higher feed rate.



| Designation | Size (mm) | | | | | | | | | | | Clamping Screw | Wrench |
|-----------------------|-----------|-------|-------|-------|----|----|-------|------|-----|----|------|----------------|----------|
| | D -1 | D -2 | D1 -1 | D1 -2 | d | H1 | H2 | W | T | Z | PCD1 | | |
| TSO45-50R04S13O05M22 | 50 | 52.3 | 62.5 | 62 | 22 | 40 | 38.77 | 10.4 | 6.3 | 4 | - | TSO1013 | TSOP1305 |
| TSO45-63R06S13O05M22 | 63 | 65.3 | 75.5 | 75 | 22 | 40 | 38.77 | 10.4 | 6.3 | 6 | - | | |
| TSO45-80R06S13O05M27 | 80 | 82.3 | 92.5 | 92 | 27 | 50 | 48.77 | 12.4 | 7.0 | 6 | - | | |
| TSO45-100R08S13O05M32 | 100 | 102.3 | 112.5 | 112 | 32 | 50 | 48.77 | 14.4 | 8.0 | 8 | - | | |
| TSO45-125R10S13O05M40 | 125 | 127.3 | 137.5 | 137 | 40 | 63 | 61.77 | 16.4 | 9.0 | 10 | - | | |
| TSO45-160R12S13O05M40 | 160 | 162.3 | 172.5 | 172 | 40 | 63 | 61.77 | 16.4 | 9.0 | 12 | 66.7 | | |

TSON45 SERIES

45° Face Mill Offers Advantage of Using Square, Octagonal Inserts in the Same Pocket

● Applicable Inserts

| Insert | Insert No. | Size(mm) | | | | | | | Coated Carbide | | | | Carbide | |
|--------|---------------|----------|-----------------|-----|-----|-----|--------|-------|----------------|-------|-------|-------|---------|--|
| | | IC | S | D1 | BS | RE | Max.ap | TY602 | TY622 | TY625 | TI960 | HC200 | | |
| | | | SNMU1305ANTR-PR | 13 | 5.5 | 5.6 | 3 | 0.8 | 4.5 | ● | | | | |
| | ONMU050505-PR | 13 | 5.5 | 5.6 | 5 | 0.5 | 2.5 | ● | | | | | | |

| Usage Classification | P | Steel | ★ | | | | | | | | | | | |
|------------------------------|---|----------------|---|--|--|--|--|--|--|--|--|--|--|--|
| ★ 1st Choice ☆ 2nd Choice | M | Stainless | ★ | | | | | | | | | | | |
| | K | Cast iron | ★ | | | | | | | | | | | |
| | N | Non-ferrous | | | | | | | | | | | | |
| | S | Superalloys | | | | | | | | | | | | |
| | H | Hard materials | | | | | | | | | | | | |

● Recommended Cutting Conditions

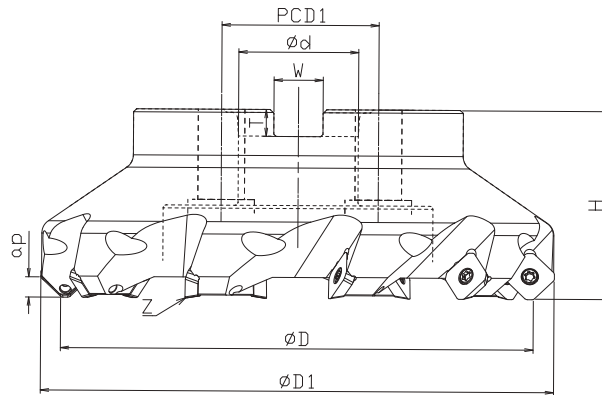
| ISO | Workpiece material | Hardness | Grade | Cutting Speed | | Feed | |
|-----|-----------------------------|-----------|-------|---------------|-----------|------|--|
| | | | | Vc (m/min) | fz (mm/t) | | |
| P | Low Carbon Steel | ≤HB180 | TY602 | 120-250 | 0.10-0.50 | | |
| | High Carbon and Alloy Steel | HB180-280 | | 100-180 | 0.15-0.40 | | |
| | Alloy Steel | HB280-350 | | 70-150 | 0.15-0.40 | | |
| M | Stainless Steel | ≤HB200 | | 100-200 | 0.10-0.30 | | |
| K | Gray Cast Iron | HB150-250 | | 100-180 | 0.10-0.50 | | |
| | Ductile Cast Iron | HB150-250 | | 100-180 | 0.10-0.30 | | |

TSE45 SERIES



45° Face Mill with High Precision and 4 Cutting Edge Insert for Higher Productivity

- ★ 4 cutting edges on one insert for highly economical machining.
- ★ Optimized relief geometry on the positive insert ensures low cutting force and minimal chattering.
- ★ Helical cutting edges and optimized positioning on cutter provide high wall accuracy and surface quality.
- ★ Sharp and tough rake geometry reduces fracture of cutting edges.


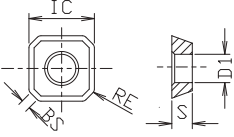

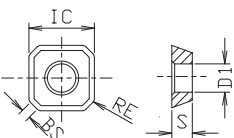


| Designation | Size(mm) | | | | | | | | | Clamping Screw | Wrench |
|---------------------|----------|-------|----|----|------|-----|----|------|--------|----------------|--------|
| | D | D1 | d | H | W | T | Z | PCD1 | Max.ap | | |
| TSE45-50R04SE12M22 | 50 | 62.9 | 22 | 40 | 10.4 | 6.3 | 4 | - | 6.5 | TS2012 | TSP12 |
| TSE45-63R05SE12M22 | 63 | 75.9 | 22 | 40 | 10.4 | 6.3 | 5 | - | 6.5 | | |
| TSE45-80R06SE12M27 | 80 | 92.9 | 27 | 50 | 12.4 | 7.0 | 6 | - | 6.5 | | |
| TSE45-100R07SE12M32 | 100 | 112.9 | 32 | 50 | 14.4 | 8.0 | 7 | - | 6.5 | | |
| TSE45-125R08SE12M40 | 125 | 137.9 | 40 | 63 | 16.4 | 9.0 | 8 | - | 6.5 | TS3512 | TTL15 |
| TSE45-160R10SE12M40 | 160 | 172.8 | 40 | 63 | 16.4 | 9.0 | 10 | 66.7 | 6.5 | | |

TSE45 SERIES

45° Face Mill with High Precision and 4 Cuttig Edge Insert for Higher Productivty

● Applicable Inserts

| Insert | | Insert No. | Size(mm) | | | | | Coated Carbide | | Carbide | | | | | | | | | | |
|---|---|--------------|----------|---|-----|-----|-----|----------------|-------|---------|-------|-------|--|--|--|--|--|--|--|---|
| | | | IC | S | D1 | BS | RE | TY602 | TY622 | TY625 | TI960 | HC200 | | | | | | | | |
|  |  | SEKT12T3AGTN | 13.4 | 4 | 5.5 | 1.3 | 1.5 | ● | | | | | | | | | | | | |
|  |  | SEHT12T3-HL | 13.4 | 4 | 5.5 | 1.3 | 1.5 | | | | | | | | | | | | | ● |

● Recommended Cutting Conditions

| ISO | Workpiece material | Hardness | Grade | Cutting Speed | Feed |
|-----|-----------------------------|-----------|-------|---------------|-----------|
| | | | | Vc (m/min) | fz (mm/t) |
| P | Low Carbon Steel | ≤HB180 | TY602 | 120-220 | 0.15-0.30 |
| | High Carbon and Alloy Steel | HB180-280 | | 70-150 | 0.15-0.30 |
| | Alloy Steel | HB280-350 | | 70-150 | 0.15-0.30 |
| M | Stainless Steel | ≤HB200 | | 120-200 | 0.15-0.30 |
| K | Gray Cast Iron | HB150-250 | | 140-220 | 0.15-0.30 |
| | Ductile Cast Iron | HB150-250 | | 150-240 | 0.15-0.30 |
| N | Aluminum | — | HC200 | 300-800 | 0.07-0.55 |

Face Milling
TSE45 Series

High-Speed Milling
MFH-Series

Shoulder Milling
TAN90 Series

Profile Milling
TRD Series

Slot Milling
TLXFD/SD Series

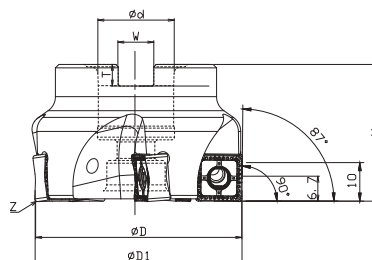
Multi-Functional Milling
Modular Bapm Series

TSN SERIES



Shoulder Milling Cutter with 8 Double-Sided Cutting Edge and Low Cutting Forces for Reduced Chattering and Superior Fracture Resistance


- ★ The insert is double-sided eight cutting edge type, which is economical. The large front angle of the insert is designed to cut easily.
- ★ There are M and ML grooves to meet the processing requirements under different working conditions



| Designation | Size(mm) | | | | | | | | Coolant Hole | Insert | Clamping Screw | Wrench |
|---------------------|----------|--------|----|----|------|-----|----|--------|--------------|------------|----------------|--------|
| | D | D1 | d | H | W | T | Z | MAX.ap | | | | |
| TSN90-50R05SN13M22 | 50 | 50.84 | 22 | 40 | 10.4 | 6.3 | 5 | 6.7/10 | ● | SNGX130608 | TSN1306 | TSNL13 |
| TSN90-63R06SN13M22 | 63 | 63.52 | 22 | 40 | 10.4 | 6.3 | 6 | 6.7/10 | ● | | | |
| TSN90-80R07SN13M27 | 80 | 80.6 | 27 | 50 | 12.4 | 7.0 | 7 | 6.7/10 | ● | | | |
| TSN90-100R08SN13M32 | 100 | 100.58 | 32 | 50 | 14.4 | 8.0 | 8 | 6.7/10 | ● | | | |
| TSN90-125R10SN13M40 | 125 | 125.72 | 40 | 63 | 16.4 | 9.0 | 10 | 6.7/10 | ● | | | |

● Applicable Inserts

| Usage Classification | P | Steel | ★ | | | | | | | |
|----------------------|------------------------------|----------------|-----------|---|--|--|--|--|--|--|
| | ★ 1st Choice ☆ 2nd Choice | M | Stainless | ★ | | | | | | |
| K | | Cast iron | | ★ | | | | | | |
| N | | Non-ferrous | | | | | | | | |
| S | | Superalloys | ☆ | ★ | | | | | | |
| H | | Hard materials | | | | | | | | |
| | | | | | | | | | | |

| Insert | Insert No. | Size(mm) | | | | Coated Carbide | | Carbide | | |
|---|---------------|----------|-----|-----|-----|----------------|-------|---------|-------|-------|
| | | IC | S | D1 | RE | TE620 | TY720 | TS320 | TI960 | HC200 |
|  | SNGX130608-ML | 13.5 | 6.9 | 5.4 | 0.8 | ● | ● | ● | | |
| | SNGX130608-M | 13.5 | 6.9 | 5.4 | 0.8 | ● | ● | | | |

● Recommended Cutting Conditions

| ISO | Workpiece material | Hardness | Priority | | Cutting Speed Vc (m/min) | Feed fz (mm/t) |
|-----|------------------------------|-----------|-------------|-------|-----------------------------|-------------------|
| | | | Chipbreaker | Grade | | |
| P | Low Carbon Steel | ≤ HB180 | M | TE620 | 180-300 | 0.10-0.20 |
| | High Carbon and Alloy Steel | HB180-280 | M | | 130-210 | 0.10-0.20 |
| | Alloy Steel | HB280-350 | M | | 100-180 | 0.10-0.20 |
| M | Stainless Steel | ≤ HB200 | M | | 120-300 | 0.10-0.20 |
| K | Gray Cast Iron | HB150-250 | M | TY720 | 100-280 | 0.13-0.25 |
| | Ductile Cast Iron | HB150-250 | M | | 100-180 | 0.13-0.25 |
| S | Ni-base Heat Resistant Alloy | — | ML | TS320 | 30-80 | 0.10-0.20 |
| | Titanium Alloy | — | ML | | 35-90 | 0.10-0.20 |