Nine9® Accuracy Coolant Efficiency

# ACE Spot Drill >>>

## Spotting Concept!

Spotting produces a shallow hole to get better hole position enabling to produce more accurate final product. Ideally, the proper spotting angle should have larger point angle than that of your drill, so the center of a drill shall be the first point to contact workpiece to avoid drill walk or movement at drill start.

P M K N

MCC Minimum Consumable Cutting Indicator 5%

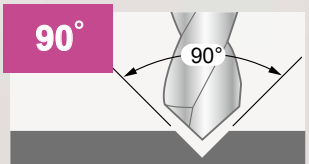
### Dual Clamping Screwed Design

- Ensures vibration free during cutting.

Features >>>

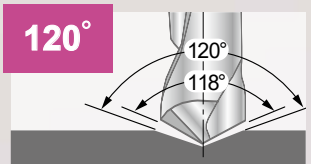
### 3 Angles : 90° / 120° / 142°

**90°**



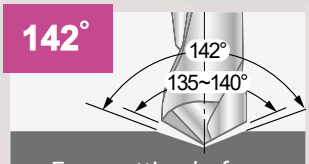

- For 90° point angle drill.

**120°**




- For spotting before drilling by 118° point angle drill.

**142°**



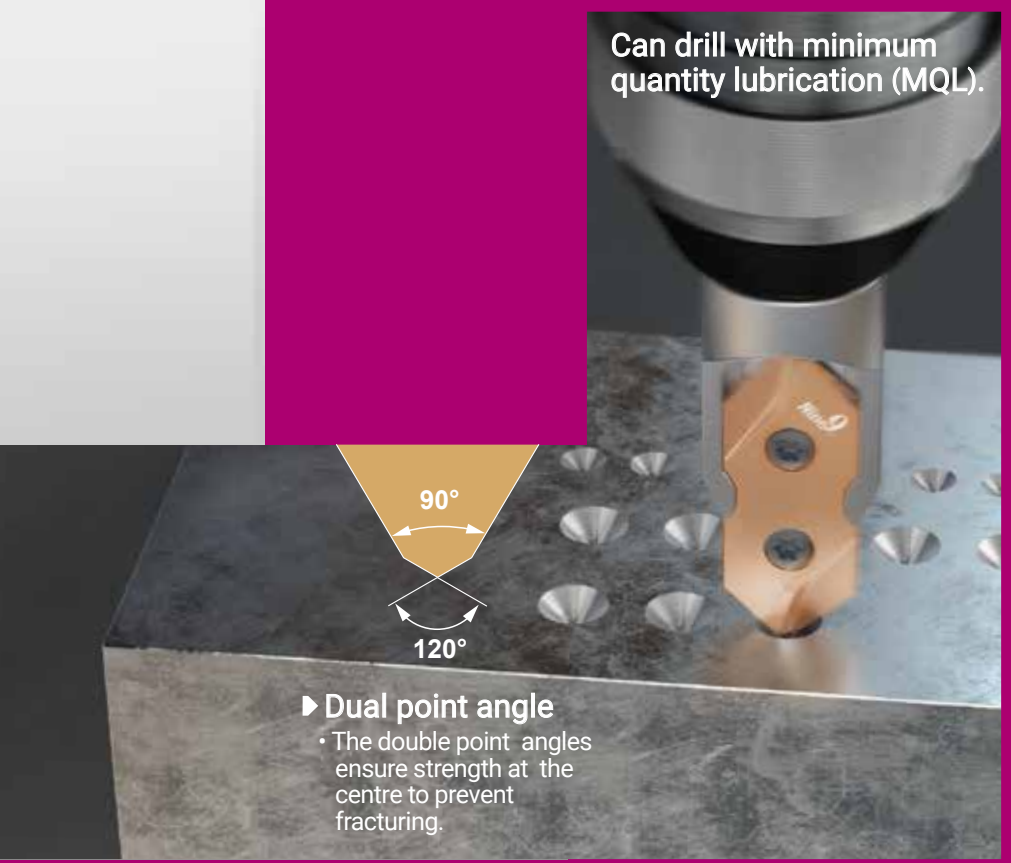

- For spotting before drilling by 135°~140° point angle high performance drill.

### Excellent Repeatability. No Need Tool Length Re-setting By Insert Type.

### High Rigidity, High Performance Cutting, Ultra-long Tool Life.

- Symmetric 2-flute edge design reducing the lateral force, it enhances ACE Spot drill rigidity enabling to run high feed rate.
- Double point angle makes the insert tip stronger to prolong service life, which results in lower production cost.

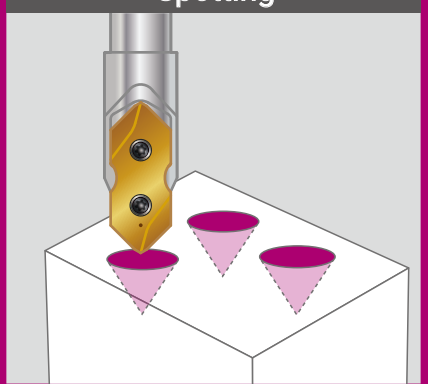
# Applications




## Internal Coolant

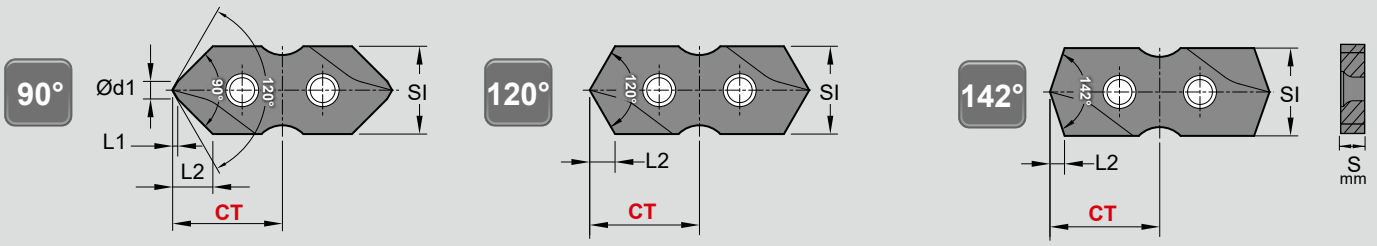

## 2-flutes Edged


## Spotting



"Nine9 spotting tool improves hole position, increases drill feed rate, extends tool life, enhances production efficiency, and ensures uniform hole quality."

# Insert of ACE Spot Drill



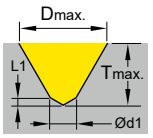



## Inserts >>

NC2057: • Universal grade for alloy steel and cast iron.
• Each insert has 2 cutting edges.

NC5254: • For stainless steel.
• Each insert has 2 cutting edges.

XP9000: • High positive geometry and sharp edge produces excellent surface finish.
• For non-ferrous material such as aluminum, titanium, brass, copper and long cutting chip metal.
• Each insert has 2 cutting edges.

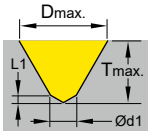



| SI | Angle ±0.02" | Parts No. | | Coating | Grade | Dimensions Ød1 | Dimensions L1 | Dimensions L2 | Dmax. | Tmax. | S | CT ±0.025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06 (0.236) | 90° | S9MT06T1-090 | NC2057 | AlTiN+TiSiN | P35 | 1.2 (0.047") | 0.35 (0.014") | 2.75 (0.108") | 5.5 (0.217") | 2.5 (0.098") | 1.8 (0.071") | 7.5 (0.295") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 120° | S9MT06T1-120 | NC2057 | AlTiN+TiSiN | | - | - | 1.73 (0.068") | 5.5 (0.217") | 1.6 (0.063") | | |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 142° | S9MT06T1-142 | NC2057 | AlTiN+TiSiN | | - | - | 1.03 (0.041") | 5.5 (0.217") | 0.95 (0.037") | | 7.0 (0.276") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| 08 (0.315") | 90° | S9MT0802-090 | NC2057 | AlTiN+TiSiN | P35 | 1.6 (0.063") | 0.46 (0.018") | 3.6 (0.142") | 7.5 (0.295") | 3.4 (0.134") | 2.4 (0.094") | 10 (0.394") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 120° | S9MT0802-120 | NC2057 | AlTiN+TiSiN | | - | - | 2.3 (0.090") | 7.5 (0.295") | 2.2 (0.087") | | |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 142° | S9MT0802-142 | NC2057 | AlTiN+TiSiN | | - | - | 1.38 (0.054") | 7.5 (0.295") | 1.29 (0.051") | | 9 (0.354") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |

The quantity of insert per box.:

| SI 06 | SI 08 | SI 10 | SI 12 | SI 16 | SI 20 |
|---|---|---|---|---|---|
| 5 pcs | 5 pcs | 5 pcs | 5 pcs | 2 pcs | 1 pcs |

# Insert of ACE Spot Drill




## Inserts >>

| SI | Angle ±0.02" | Parts No. | | Coating | Grade | Dimensions Ød1 | Dimensions L1 | Dimensions L2 | Dmax. | Tmax. | S | CT ±0.025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 (0.394") | 90° | S9MT1003-090 | NC2057 | AlTiN+TiSiN | P35 | 2 (0.079") | 0.58 (0.023") | 4.6 (0.181") | 9.5 (0.374") | 4.4 (0.173") | 3.0 (0.118") | 12.50 (0.492") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 120° | S9MT1003-120 | NC2057 | AlTiN+TiSiN | | - | - | 2.9 (0.114") | 9.5 (0.374") | 2.7 (0.106") | | |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 142° | S9MT1003-142 | NC2057 | AlTiN+TiSiN | | - | - | 1.72 (0.068") | 9.5 (0.374") | 1.64 (0.065") | | 11.50 (0.453") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| 12 (0.472") | 90° | S9MT1203-090 | NC2057 | AlTiN+TiSiN | P35 | 2.4 (0.094") | 0.69 (0.027") | 5.5 (0.217") | 11.5 (0.453") | 5.3 (0.209") | 3.0 (0.118") | 15 (0.059") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 120° | S9MT1203-120 | NC2057 | AlTiN+TiSiN | | - | - | 3.5 (0.138") | 11.5 (0.453") | 3.3 (0.130") | | |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 142° | S9MT1203-142 | NC2057 | AlTiN+TiSiN | | - | - | 2.07 (0.081") | 11.5 (0.453") | 1.98 (0.078") | | 13.5 (0.531") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| 16 (0.630") | 90° | S9MT1603-090 | NC2057 | AlTiN+TiSiN | P35 | 3.2 (0.126") | 0.92 (0.036") | 7.3 (0.287") | 15.5 (0.610") | 7.0 (0.276") | 3.18 (0.125") | 20 (0.787") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 120° | S9MT1603-120 | NC2057 | AlTiN+TiSiN | | - | - | 4.6 (0.181") | 15.5 (0.610") | 4.4 (0.173") | | |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 142° | S9MT1603-142 | NC2057 | AlTiN+TiSiN | | - | - | 2.76 (0.109") | 15.5 (0.610") | 2.67 (0.105") | | 18 (0.709") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| 20 (0.787") | 90° | S9MT2004-090 | NC2057 | AlTiN+TiSiN | P35 | 4.0 (0.157") | 1.16 (0.046") | 9.2 (0.362") | 19.5 (0.768") | 8.9 (0.350") | 4.76 (0.187") | 25 (0.984") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 120° | S9MT2004-120 | NC2057 | AlTiN+TiSiN | | - | - | 5.8 (0.228") | 19.5 (0.768") | 5.6 (0.220") | | |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |
| | 142° | S9MT2004-142 | NC2057 | AlTiN+TiSiN | | - | - | 3.44 (0.135") | 19.5 (0.768") | 3.36 (0.132") | | 22 (0.866") |
| | | | NC5254 | Helica | | | | | | | | |
| | | | XP9000 | Uncoated | | | | | | | | |

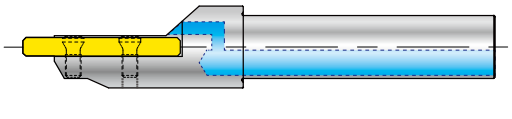
The quantity of insert per box.:

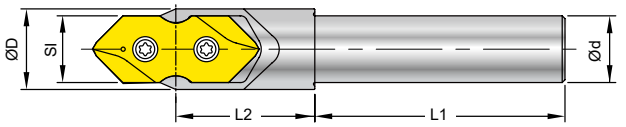
| SI 06 | SI 08 | SI 10 | SI 12 | SI 16 | SI 20 |
|---|---|---|---|---|---|
| 5 pcs | 5 pcs | 5 pcs | 5 pcs | 2 pcs | 1 pcs |

# Holders of ACE Spot Drill



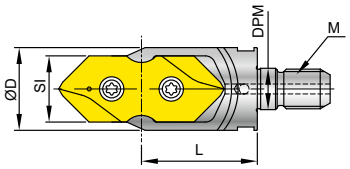

## Cylindrical Shank >>






| Sl | Parts No. | Ød | L1 | L2 | ØD | Screw | Key |
|---|---|---|---|---|---|---|---|
| **06** (0.236) | 99688-Sl06-06 | 6 (0.236") | 27 (1.063") | 14 (0.551") | 8 (0.315") | NS-18037 / 0.6Nm | NK-T6 |
| **08** (0.315") | 99688-Sl08-08 | 8 (0.315") | 36 (1.417") | 19 (0.748") | 10.5 (0.413") | NS-20045 / 0.6Nm | NK-T6 |
| **10** (0.394") | 99688-Sl10-10 | 10 (0.394") | 40 (1.575") | 22.5 (0.886") | 13 (0.512") | NS-25060 / 0.9Nm | NK-T7 |
| **12** (0.472") | 99688-Sl12-12 | 12 (0.472") | 45 (1.772") | 25 (0.984") | 15.5 (0.610") | NS-30072 / 2.0Nm | NK-T9 |
| **16** (0.630") | 99688-Sl16-16 | 16 (0.630") | 48 (1.890") | 32 (1.260") | 21 (0.827") | NS-35080 / 2.5Nm | NK-T15 |
| **20** (0.787") | 99688-Sl20-20 | 20 (0.787") | 50 (1.969") | 35 (1.378") | 26 (1.024") | NS-50125 / 5.5Nm | NK-T20 |

## Screw Fit Cutter >>

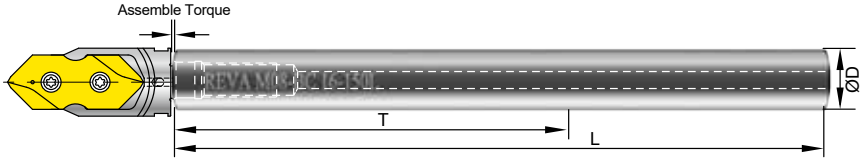



| Sl | Parts No. | ØD | L | M | DPM | Screw | Key |
|---|---|---|---|---|---|---|---|
| **06** (0.236) | 99688-Sl06-M04 | 8 (0.315") | 14.5 (0.571") | M4xP0.7 | 4.5 (0.177") | NS-18037 / 0.6Nm | NK-T6 |
| **08** (0.315") | 99688-Sl08-M05 | 10 (0.394") | 19 (0.748") | M5xP0.8 | 5.5 (0.217") | NS-20045 / 0.6Nm | NK-T6 |
| **10** (0.394") | 99688-Sl10-M06 | 12 (0.472") | 22 (0.866") | M6xP1.0 | 6.5 (0.256") | NS-25060 / 0.9Nm | NK-T7 |
| **12** (0.472") | 99688-Sl12-M08 | 16 (0.630") | 25 (0.984") | M8xP1.25 | 8.5 (0.335") | NS-30072 / 2.0Nm | NK-T9 |
| **16** (0.630") | 99688-Sl16-M10 | 20 (0.787") | 31 (1.220") | M10xP1.5 | 10.5 (0.413") | NS-35080 / 2.5Nm | NK-T15 |
| **20** (0.787") | 99688-Sl20-M12 | 25 (0.984") | 35 (1.378") | M12xP1.75 | 12.5 (0.492") | NS-50125 / 5.5Nm | NK-T20 |

## Extension Bar >>

### Solid Carbide Type >>

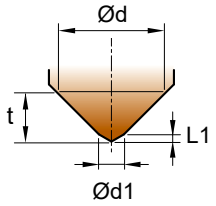
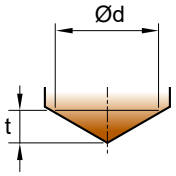
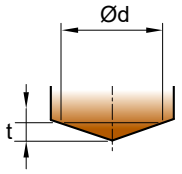
• With internal coolant hole.




| Part No. | Type | Ød | T | L | M | Assemble Torque |
|---|---|---|---|---|---|---|
| 99801-08W | BC08-075M04W | 8 (0.315") | 25 (0.984") | 75 (2.953") | M4xP0.7 | 3.5 Nm |
| 99801-10W | BC10-100M05W | 10 (0.394") | 50 (1.969") | 100 (3.937") | M5xP0.8 | 6.5 Nm |
| 99801-12W | BC12-100M06W | 12 (0.472") | 60 (2.362") | 100 (3.937") | M6xP1.0 | 11.0 Nm |
| 99801-16W | BC16-150M08W | 16 (0.630") | 80 (3.150") | 150 (5.906") | M8xP1.25 | 25.0 Nm |
| 99801-20W | BC20-200M10W | 20 (0.787") | 100 (3.937") | 200 (7.874") | M10xP1.5 | 50.0 Nm |
| 99801-25W | BC25-200M12W | 25 (0.984") | 125(4.921") | 200 (7.874") | M12xP1.75 | 60.0 Nm |

# Technical Guide

## From spot diameter "d" to get spotting depth "t"

| 90° | 120° | 142° |
|---|---|---|
|  |  |  |
| t = (Ød-Ød1) X 0.5 + L1 | t = 0.289 X Ød | t = 0.172 X Ød |



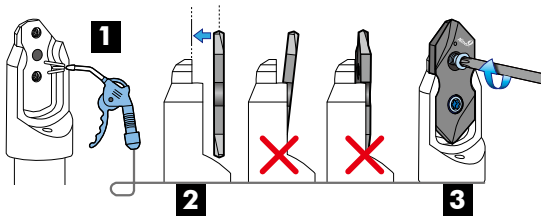
| SI | Angle ±0.02" | Insert | Ød1 | L1 | Tmax. |
|---|---|---|---|---|---|
| **06** (0.236) | **90°** | S9MT06T1-090 | 1.2 (0.047") | 0.35 (0.014") | 2.50 (0.098") |
| | **120°** | S9MT06T1-120 | - | - | 1.60 (0.063") |
| | **142°** | S9MT06T1-142 | - | - | 0.95 (0.037") |
| **08** (0.315") | **90°** | S9MT0802-090 | 1.6 (0.063") | 0.46 (0.018") | 3.40 (0.134") |
| | **120°** | S9MT0802-120 | - | - | 2.20 (0.087") |
| | **142°** | S9MT0802-142 | - | - | 1.29 (0.051") |
| **10** (0.394") | **90°** | S9MT1003-090 | 2.0 (0.079") | 0.58 (0.023") | 4.40 (0.173") |
| | **120°** | S9MT1003-120 | - | - | 2.70 (0.106") |
| | **142°** | S9MT1003-142 | - | - | 1.64 (0.065") |
| **12** (0.472") | **90°** | S9MT1203-090 | 2.4 (0.094") | 0.69 (0.027") | 5.30 (0.209") |
| | **120°** | S9MT1203-120 | - | - | 3.30 (0.130") |
| | **142°** | S9MT1203-142 | - | - | 1.98 (0.078") |
| **16** (0.630") | **90°** | S9MT1603-090 | 3.2 (0.126") | 0.92 (0.036") | 7.00 (0.276") |
| | **120°** | S9MT1603-120 | - | - | 4.40 (0.173") |
| | **142°** | S9MT1603-142 | - | - | 2.67 (0.105") |
| **20** (0.787") | **90°** | S9MT2004-090 | 4.0 (0.157") | 1.16 (0.046") | 8.90 (0.350") |
| | **120°** | S9MT2004-120 | - | - | 5.60 (0.220") |
| | **142°** | S9MT2004-142 | - | - | 3.36 (0.132") |

## Calculate spindle speed and feed rate

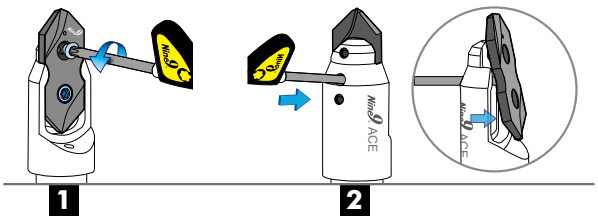
| Metric | |
|---|---|
| $S = \frac{Vc \times 1000}{\pi \times d}$ | d = diameter -mm |
| | S = Spindle Speed -r.p.m. |
| | Vc = Cutting Speed -m/min. |
| **F = S x f** | f = mm/rev. |
| | F = mm/min. |

| Inch | |
|---|---|
| $S = \frac{(3.82 \times SFM)}{d}$ | d = diameter-inch |
| | S = Spindle Speed-r.p.m. |
| **SFM = Vc x 3.28** | SFM = Surface Speed-ft./min. |
| **F = r.p.m. x IPR** | f = IPR = inch/rev. |
| | F = inch/min. |

## Clamping insert




## Loosen insert



# Cutting Data

## *SI06*- S9MT06T1

| | Workpiece Material | SFM | IPR (inch/rev.) | | | Grade of insert |
|---|---|---|---|---|---|---|
| | | | 90° | 120° | 142° | |
| P | Carbon steel C<0.3% | 390 ~ 820 | 0.0008” ~ 0.0031” | 0.0008” ~ 0.0039” | 0.0008” ~ 0.0039” | NC5254 |
| P | Carbon steel C>0.3% | 330 ~ 720 | | | | NC2057 |
| P | Low alloy steel C<0.3% | 330 ~ 660 | 0.0008” ~ 0.0028” | 0.0008” ~ 0.0031” | 0.0008” ~ 0.0031” | NC5254 |
| P | High alloy steel | 265 ~ 590 | 0.0008” ~ 0.0024” | 0.0008” ~ 0.0028” | 0.0008” ~ 0.0028” | NC2057 |
| M | Stainless steel | 100 ~ 265 | 0.0004” ~ 0.0012” | 0.0004” ~ 0.0012” | 0.0004” ~ 0.0012” | NC5254 |
| K | Cast iron | 265 ~ 590 | 0.0008” ~ 0.0031” | 0.0008” ~ 0.0039” | 0.0008” ~ 0.0039” | NC2057 |
| N | Non-ferrous metal | 500 ~ 985 | 0.0012” ~ 0.0039” | 0.0012” ~ 0.0047” | 0.0012” ~ 0.0047” | XP9000 |

## *SI08* - S9MT0802

| | Workpiece Material | SFM | IPR (inch/rev.) | | | Grade of insert |
|---|---|---|---|---|---|---|
| | | | 90° | 120° | 142° | |
| P | Carbon steel C<0.3% | 390 ~ 820 | 0.0012” ~ 0.0039” | 0.0012” ~ 0.0047” | 0.0012” ~ 0.0047” | NC5254 |
| P | Carbon steel C>0.3% | 330 ~ 720 | | | | NC2057 |
| P | Low alloy steel C<0.3% | 330 ~ 660 | 0.0012” ~ 0.0031” | 0.0012” ~ 0.0039” | 0.0012” ~ 0.0039” | NC5254 |
| P | High alloy steel | 265 ~ 590 | 0.0012” ~ 0.0028” | 0.0012” ~ 0.0031” | 0.0012” ~ 0.0031” | NC2057 |
| M | Stainless steel | 100 ~ 265 | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | NC5254 |
| K | Cast iron | 265 ~ 590 | 0.0012” ~ 0.0039” | 0.0012” ~ 0.0047” | 0.0012” ~ 0.0047” | NC2057 |
| N | Non-ferrous metal | 500 ~ 985 | 0.0012” ~ 0.0047” | 0.0012” ~ 0.0059” | 0.0012” ~ 0.0059” | XP9000 |

## *SI10* - S9MT1003

| | Workpiece Material | SFM | IPR (inch/rev.) | | | Grade of insert |
|---|---|---|---|---|---|---|
| | | | 90° | 120° | 142° | |
| P | Carbon steel C<0.3% | 390 ~ 820 | 0.0016” ~ 0.0059” | 0.0020” ~ 0.0079” | 0.0020” ~ 0.0079” | NC5254 |
| P | Carbon steel C>0.3% | 330 ~ 720 | | | | NC2057 |
| P | Low alloy steel C<0.3% | 330 ~ 660 | 0.0012” ~ 0.0047” | 0.0020” ~ 0.0059” | 0.0020” ~ 0.0059” | NC5254 |
| P | High alloy steel | 265 ~ 590 | 0.0012” ~ 0.0039” | 0.0016” ~ 0.0047” | 0.0016” ~ 0.0047” | NC2057 |
| M | Stainless steel | 100 ~ 265 | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | NC5254 |
| K | Cast iron | 265 ~ 590 | 0.0012” ~ 0.0047” | 0.0020” ~ 0.0059” | 0.0020” ~ 0.0059” | NC2057 |
| N | Non-ferrous metal | 500 ~ 985 | 0.0016” ~ 0.0079” | 0.0020” ~ 0.0098” | 0.0020” ~ 0.0098” | XP9000 |

# Cutting Data

## *SI12* - S9MT1203

| | Workpiece Material | SFM | IPR (inch/rev.) | | | Grade of insert |
|---|---|---|---|---|---|---|
| | | | 90° | 120° | 142° | |
| P | Carbon steel C<0.3% | 390 ~ 820 | 0.0020” ~ 0.0080” | 0.0024” ~ 0.0098” | 0.0024” ~ 0.0098” | NC5254 |
| P | Carbon steel C>0.3% | 330 ~ 720 | | | | NC2057 |
| P | Low alloy steel C<0.3% | 330 ~ 660 | 0.0016” ~ 0.0059” | 0.0020” ~ 0.0080” | 0.0020” ~ 0.0079” | NC5254 |
| P | High alloy steel | 265 ~ 590 | 0.0016” ~ 0.0047” | 0.0020” ~ 0.0063” | 0.0020” ~ 0.0063” | NC2057 |
| M | Stainless steel | 100 ~ 265 | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | NC5254 |
| K | Cast iron | 265 ~ 590 | 0.0016” ~ 0.0059” | 0.0020” ~ 0.0080” | 0.0020” ~ 0.0080” | NC2057 |
| N | Non-ferrous metal | 500 ~ 985 | 0.0020” ~ 0.0087” | 0.0024” ~ 0.0098” | 0.0024” ~ 0.0098” | XP9000 |

## *SI16* - S9MT1603

| | Workpiece Material | SFM | IPR (inch/rev.) | | | Grade of insert |
|---|---|---|---|---|---|---|
| | | | 90° | 120° | 142° | |
| P | Carbon steel C<0.3% | 390 ~ 820 | 0.0020” ~ 0.0079” | 0.0024” ~ 0.0098” | 0.0024” ~ 0.0098” | NC5254 |
| P | Carbon steel C>0.3% | 330 ~ 720 | | | | NC2057 |
| P | Low alloy steel C<0.3% | 330 ~ 660 | 0.0016” ~ 0.0060” | 0.0020” ~ 0.0079” | 0.0020” ~ 0.0079” | NC5254 |
| P | High alloy steel | 265 ~ 590 | 0.0016” ~ 0.0047” | 0.0020” ~ 0.0063” | 0.0020” ~ 0.0063” | NC2057 |
| M | Stainless steel | 100 ~ 265 | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | NC5254 |
| K | Cast iron | 265 ~ 590 | 0.0016” ~ 0.0060” | 0.0020” ~ 0.0079” | 0.0020” ~ 0.0079” | NC2057 |
| N | Non-ferrous metal | 500 ~ 985 | 0.0020” ~ 0.0098” | 0.0024” ~ 0.0098” | 0.0024” ~ 0.0098” | XP9000 |

## *SI20* - S9MT2004

| | Workpiece Material | SFM | IPR (inch/rev.) | | | Grade of insert |
|---|---|---|---|---|---|---|
| | | | 90° | 120° | 142° | |
| P | Carbon steel C<0.3% | 390 ~ 820 | 0.0020” ~ 0.0098” | 0.0024” ~ 0.0118” | 0.0024” ~ 0.0118” | NC5254 |
| P | Carbon steel C>0.3% | 330 ~ 720 | | | | NC2057 |
| P | Low alloy steel C<0.3% | 330 ~ 660 | 0.0016” ~ 0.0079” | 0.0020” ~ 0.0098” | 0.0020” ~ 0.0098” | NC5254 |
| P | High alloy steel | 265 ~ 590 | 0.0016” ~ 0.0060” | 0.0020” ~ 0.0079” | 0.0020” ~ 0.0079” | NC2057 |
| M | Stainless steel | 100 ~ 265 | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | 0.0004” ~ 0.0016” | NC5254 |
| K | Cast iron | 265 ~ 590 | 0.0016” ~ 0.0079” | 0.0020” ~ 0.0098” | 0.0020” ~ 0.0098” | NC2057 |
| N | Non-ferrous metal | 500 ~ 985 | 0.0020” ~ 0.0118” | 0.0024” ~ 0.0118” | 0.0024” ~ 0.0118” | XP9000 |