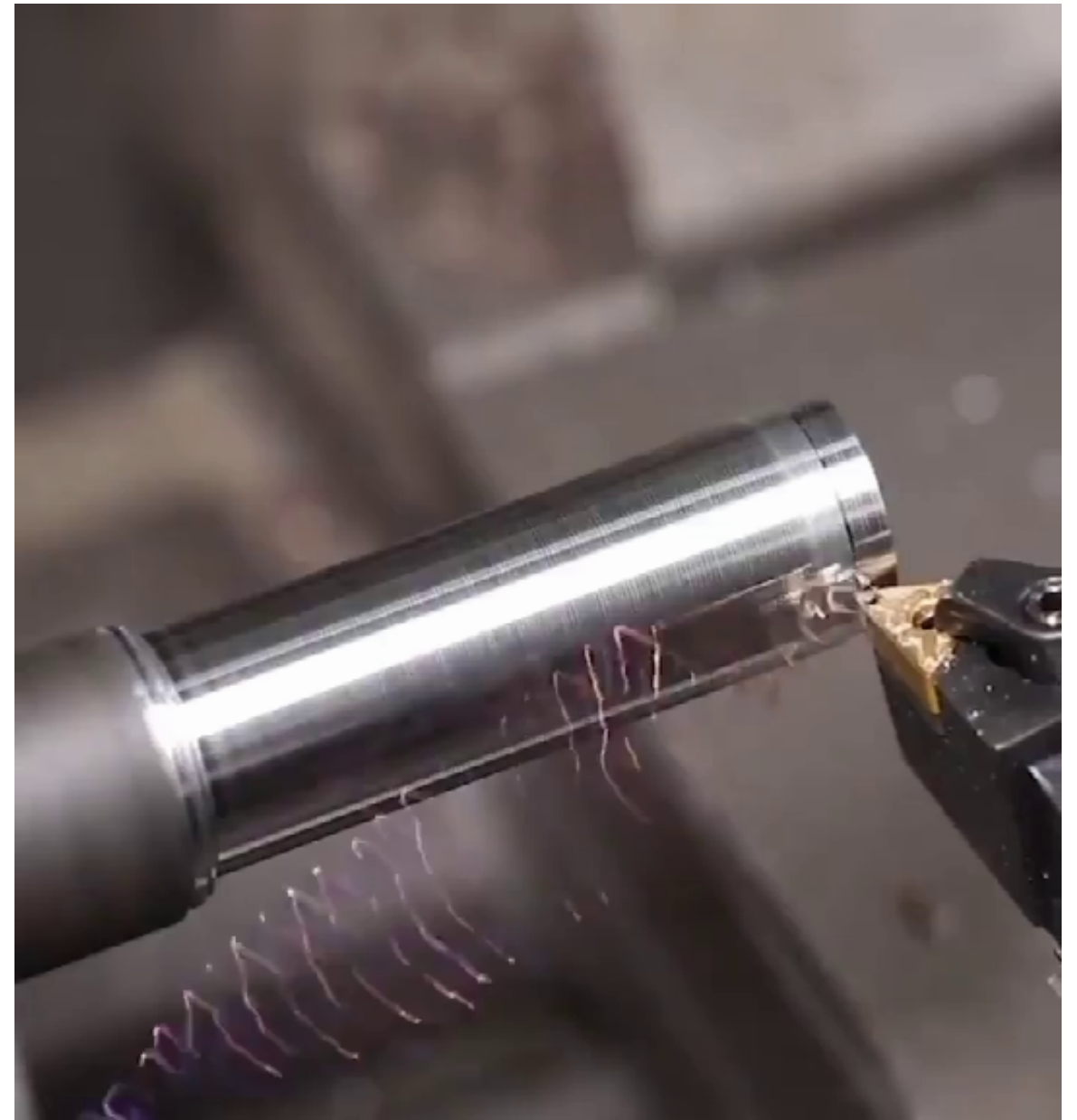
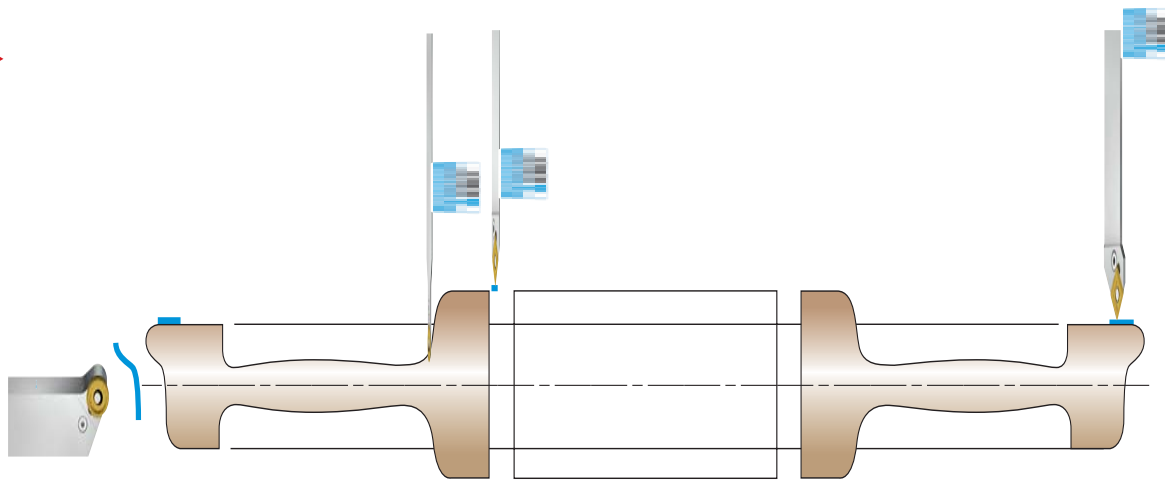


2024 TURNING INSERTS



株洲大有新材料有限公司

地址：湖南省株洲市天元区仙月环路899号新马动力创新园2.1期D研发厂房
电话：+86-731-22283721
传真：+86-731-22283721
邮编：412000
电邮：info@otomotools.com
网址：www.otomotools.com

ZHUZHOU OTOMO ADVANCED MATERIAL CO.,LTD

Add: R&D Factory Plant, D Zone, Xinma Dynamic Innovation Park (China Power Valley), No. 899, XianYue Huan road, TianYuan District, Zhuzhou City, Hunan Province, P.R.CHINA
Tel: +86-731-22283721
Fax: +86-731-22283721
Post code: 412000
E-mail: info@otomotools.com
Website: www.otomotools.com



株洲大有新材料有限公司
ZHUZHOU OTOMO ADVANCED MATERIAL CO.,LTD

ABOUT OTOMO

Located in Zhuzhou China, where a city famous for its tungsten carbide industry, we, Zhuzhou OTOMO Advanced Material Co., Ltd, a Manufacturers Representative Company which has devoted 10 years to overseas market and has a full line supply chain of CNC cutting tools. Our company has a young but dedicated and professional staff group. Our main managements were worked for famous cutting tools factories as technical engineers. The company's tools are mainly applied in the automobile manufacturing industry, mold manufacturing industry, defense industry, steel manufacturing industry, and other special fields. As a developing enterprise, ZHUZHOU OTOMO has always adhered to a high starting point with high standards, and we make every piece of our products in high performance and take every requirements of our customers' seriously. Meanwhile, we can tailored kinds of customized carbide tools according to clients' requirements. Now OTOMO products exported to more than 80 countries and regions of the world.

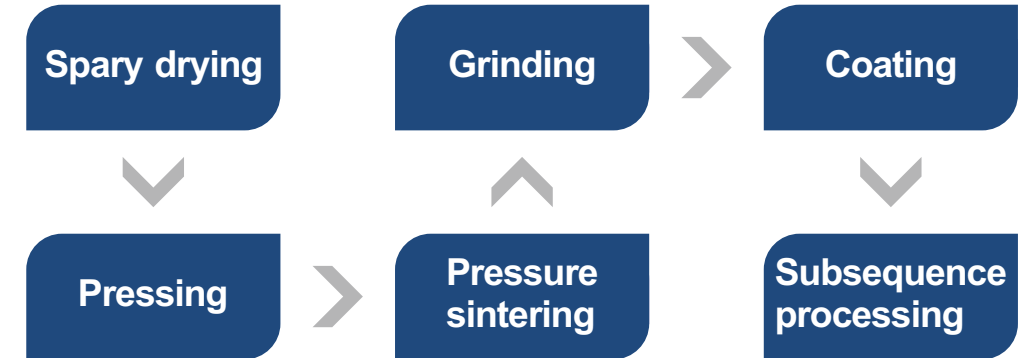
This is where working with a trusted cutting tool & metals supplier who can help to ensure that your requests are covered. By gathering insight from the right individuals and department representatives, accurately calculating the costs and choosing the right cutting tools & accessories & metals, we can ensure that your investment and its outcome will be well worth it.

EQUIPMENT

The company has a full set of high-level producing equipments ranging from raw power material preparation, mould manufacture, pressing, pressure sintering, grinding to post processing. We use spray drying tower in mixing process. Its advanced technique ascertains the best performance behavior of material in physical property and formability.

Using powder compacting press with Electro-Servo Motor Direct Drive, the most advanced machine for press shaping in the world, which meet the high requirements on precision, performance and stability. For sintering, we equipped the most advanced devices to meet the quality requirements on chemical and physical performance.

For grinding and machining, we equipped Fully auto CNC periphery insert grinder, CNC two-wheel flat lapping machine etc. to ensure product shape and precision demand. We also use the most advanced PVD/CVD coating machines. The state-of-the-art subsequence process devices equipped for better performance.

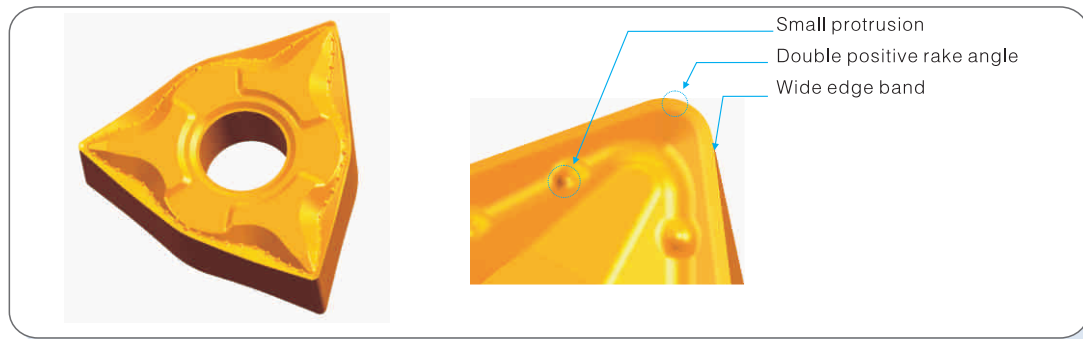


Processing Sword for Stainless Steel

New

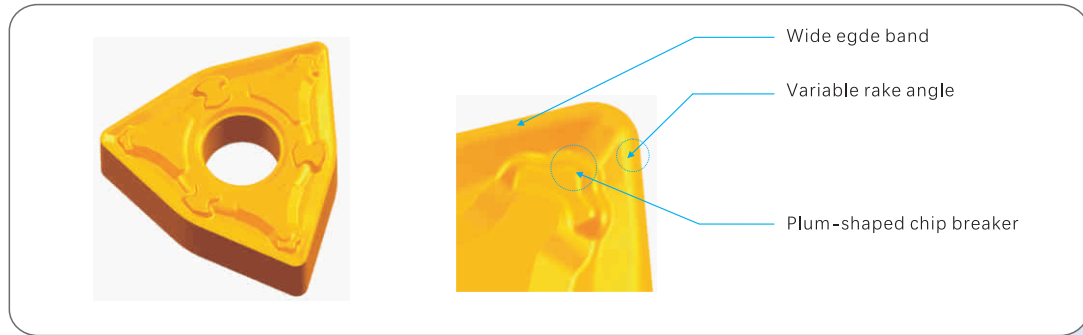
1 Chip Breaker Features of Stainless Steel Finishing -BF

- Double large positive rake angle, fully ensure the sharpness of the edge
- Small protrusions are more conducive to chip breaks
- Large cutting edge inclination can guide the chip flow very well
- Low cutting resistance, high surface finish of machined parts



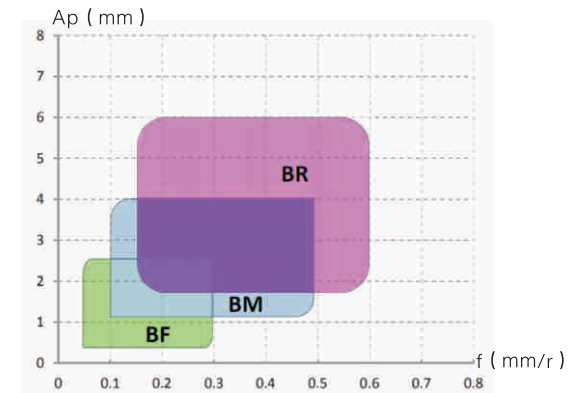
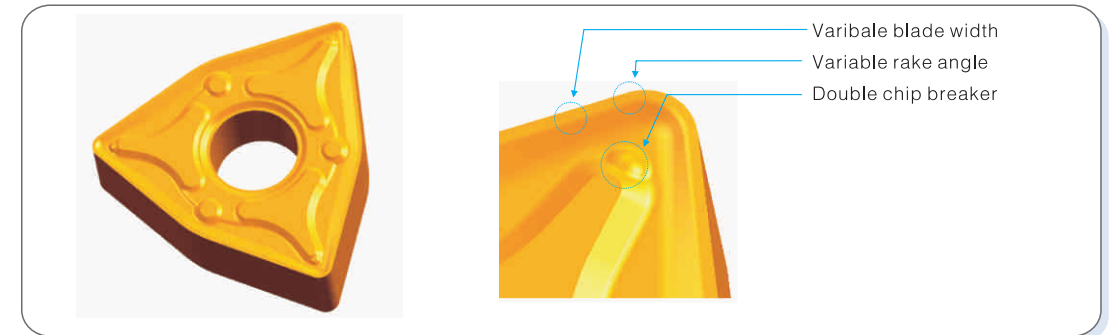
2 Chip Breaker Features of Stainless Steel Semi-Finishing -BM

- The combination of variable blade width and variable rake angle takes into account the sharpness and strength of the cutting edge.
- Plum-shaped chip breaker structure, widen the chip breaking range of the insert
- Suitable for semi-finishing of stainless steel.



3 Chip Breaker Features of Stainless Steel Finishing -BR

- Variable blade width and variable rake angle design, taking into account the sharpness and strength of the blade
- Large chip breaker and chip pocket design provides excellent chip breaking effect.
- Double chip breaker design expands the backbreaking range.
- Suitable for semi-finishing to rough machining of stainless steel



Case No.1

Workpiece material:stainless steel SUS304

Workpiece: Flange

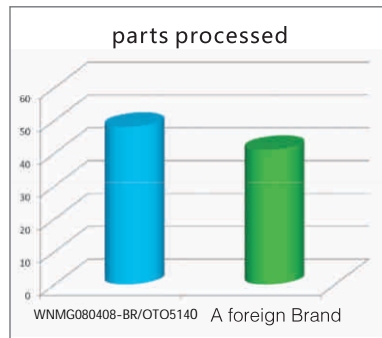
Cooling type:Fluid cooling

Original blade:A foreign brand

OTO insert:WNMG080408-BR/OTO5140

Cutting parameter:Vc:153m/min, F:0.2mm/r, Ap:1 –2mm

Conclusion: Used for boring, uneven cutting allowance, our inserts processed 48 pieces, a foreign brand processed 41 pieces, tool life increased by 17%, and has the advantage of cost performance.



Case No.3

Workpiece material:stainless steel SUS304

Workpiece: Flange

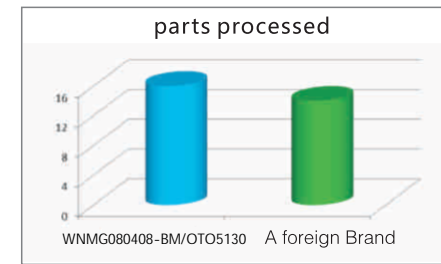
Cooling type:Fluid cooling

Original blade:A foreign brand

OTO insert:WNMG080408-BM/OTO5130

Cutting parameter:Vc:220m/min F:0.2–0.3mm/r Ap:0.8–1.5mm

Conclusion: processing flange outer circle, our inserts processed 16 pieces, a foreign brand processed 14 pieces, tool life increased by 14%, and our inserts processing work piece surface finish better than competitors.



Case No.2

Workpiece material:stainless steel SUS304

Workpiece:Flange

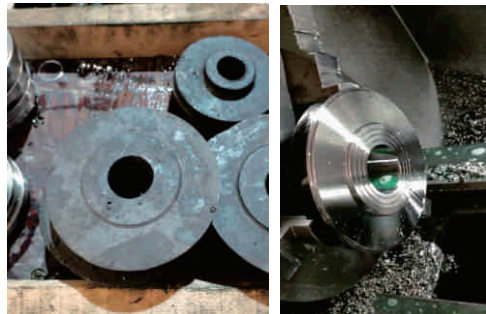
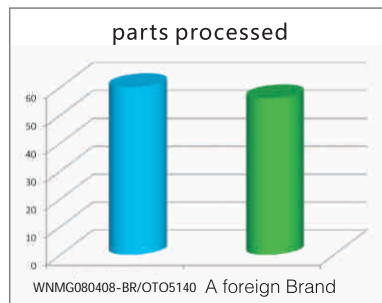
Cooling type:Fluid cooling

Original blade:A foreign brand

OTO insert:WNMG080408-BR/OTO5140

Cutting parameter:Vc:170m/min, F:0.2mm/r, Ap:1–1.5mm

Conclusion: Processing stainless steel flange end face, our inserts processed 69 pieces, a foreign brand processed 56 pieces, tool life increased by 23%, the advantage is obvious and the customer is very satisfied.



Case No.4

Workpiece material:stainless steel SUS304

Workpiece:pipe joint

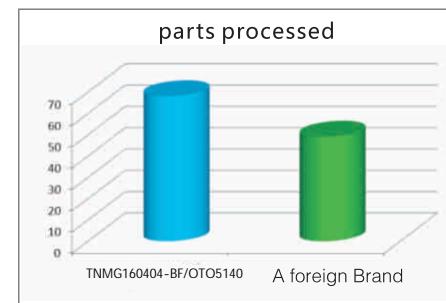
Cooling type:Fluid cooling

Original blade:A foreign brand

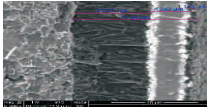
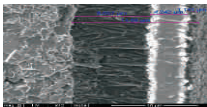
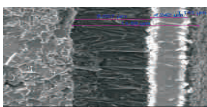
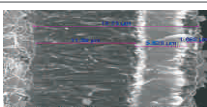
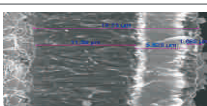
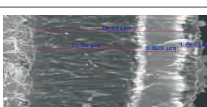
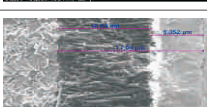
OTO insert:TNMG160404-BF/OTO5140

Cutting parameter:Vc:47m/min F:0.1mm/rAp:1mm

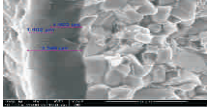
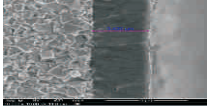
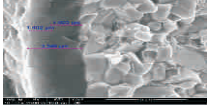
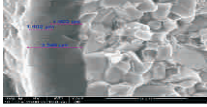
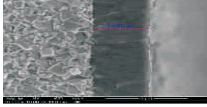
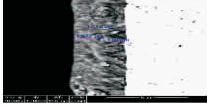
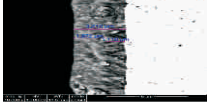
Conclusion: Machining the outer circle of pipe joint, our inserts processed 68 pieces, a foreign brand processed 49 pieces, the tool life increased by 39%, the cost performance advantage is obvious.



The Features of CVD Coating

| ISO | Grade | Colour | Coating structure | Electron microscopy images | Features.Application |
|----------------|---------|--------------|---|---|--|
| P Steel | OTO8215 | Yellow Black | TiCN+Al ₂ O ₃ + (TiN) |  | Wear-resistant substrate with resistance to plastic deformation, strong and tough coating with excellent bonding force. High-speed, high-efficiency turning of finishing-roughing steel. |
| | OTO8225 | Yellow Black | TiCN+Al ₂ O ₃ + (TiN) |  | A matrix with both wear resistance and chipping resistance, and a tough coating with excellent adhesion. Intermittent steel – the first choice for general turning operations. |
| | OTO8235 | Yellow Black | TiCN+Al ₂ O ₃ + (TiN) |  | High toughness substrate, strong and tough coating with excellent bonding force, extremely high processing safety. Heavy-duty machining of steel and interrupted turning. |
| | OTO8315 | Yellow | TiCN+Al ₂ O ₃ +TiN |  | Wear-resistant substrate that resists plastic deformation, thickened high-hardness and tough coating. High-speed, high-efficiency turning of finishingroughing steel. |
| | OTO8325 | Yellow | TiCN+Al ₂ O ₃ +TiN |  | Both wear-resistant and chipping-resistant substrate, thickened high-hardness and tough coating. Longer life steel interruptions – general turning, easy to use for heavy duty machining. |
| K Cast Iron | OTO3315 | Yellow | TiCN+Al ₂ O ₃ +TiN |  | Extremely wear-resistant material after Optimized, nano thick film CVD coating. Continuous or lightly interrupted turning of Grey and Ductile cast iron, easy to wear to identify the yellow surface. |
| | OTO3415 | Yellow Black | TiCN+Al ₂ O ₃ + (TiN) |  | Extremely wear-resistant material after Optimized, nano-thick film CVD coating. Continuous or lightly interrupted turning of Grey and Ductile cast iron. |



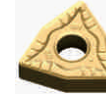
















The Features of PVD Coating

| ISO | Grade | Colour | Coating structure | | Electron microscopy images | Features.Application |
|---------------------------------|---------|--------------|-------------------|--|---|--|
| M Stainless Steel | OTO5133 | Bronze | AlTiMeN | |  | Ultra-fine grain matrix with special strength and toughness, enhanced red hardness, and the latest high wear-resistant coating. Universal high-performance machining for efficient milling of steel, stainless steel and heat-resistant alloys, as well as turning of stainless steel. |
| | OTO5525 | Purple Black | AlTiMeN | |  | Ultra-fine grain matrix, nano-multilayer coating with good wear resistance and oxidation resistance. Stable, long-life milling of steel and stainless steel. |
| | OTO5130 | Bronze | AlTiMeN | |  | Ultra-fine grain matrix, newly upgraded nano-composite coating with high heat resistance and high toughness. Suitable for general milling of cast iron, steel and stainless steel, with better wear resistance. Supplementary grade for stainless steel turning. |
| | OTO5140 | Bronze | AlTiMeN | |  | Submicron matrix, newly upgraded nanocomposite coating with high heat resistance and high toughness. The grade of choice for turning stainless steels and can also be used for complementary machining of milder steels. |
| S Heat Resistant Alloy | OTO1010 | Black | AlTiN | |  | The ultra-fine grain matrix strengthened by the bonding phase has excellent heat resistance and wear resistance. It is suitable for finishing/semi-finishing turning of heat-resistant alloys and hardened materials, and general-purpose milling. |
| | OTO1520 | Purple Black | AlTiMeN | |  | Improved thermal conductivity and toughness of the substrate, nano multilayer coating with good wear resistance and oxidation resistance. It is suitable for machining turbine shell, as well as titanium alloys and high-temp alloys. |
| | OTO1525 | Purple Black | AlTiMeN | |  | Ultra-fine grain matrix with optimized heat resistance and toughness, nano-multilayer coating with good wear resistance and oxidation resistance. The first choice for general processing of heat-resistant alloys. |

Product and Chip Breaker

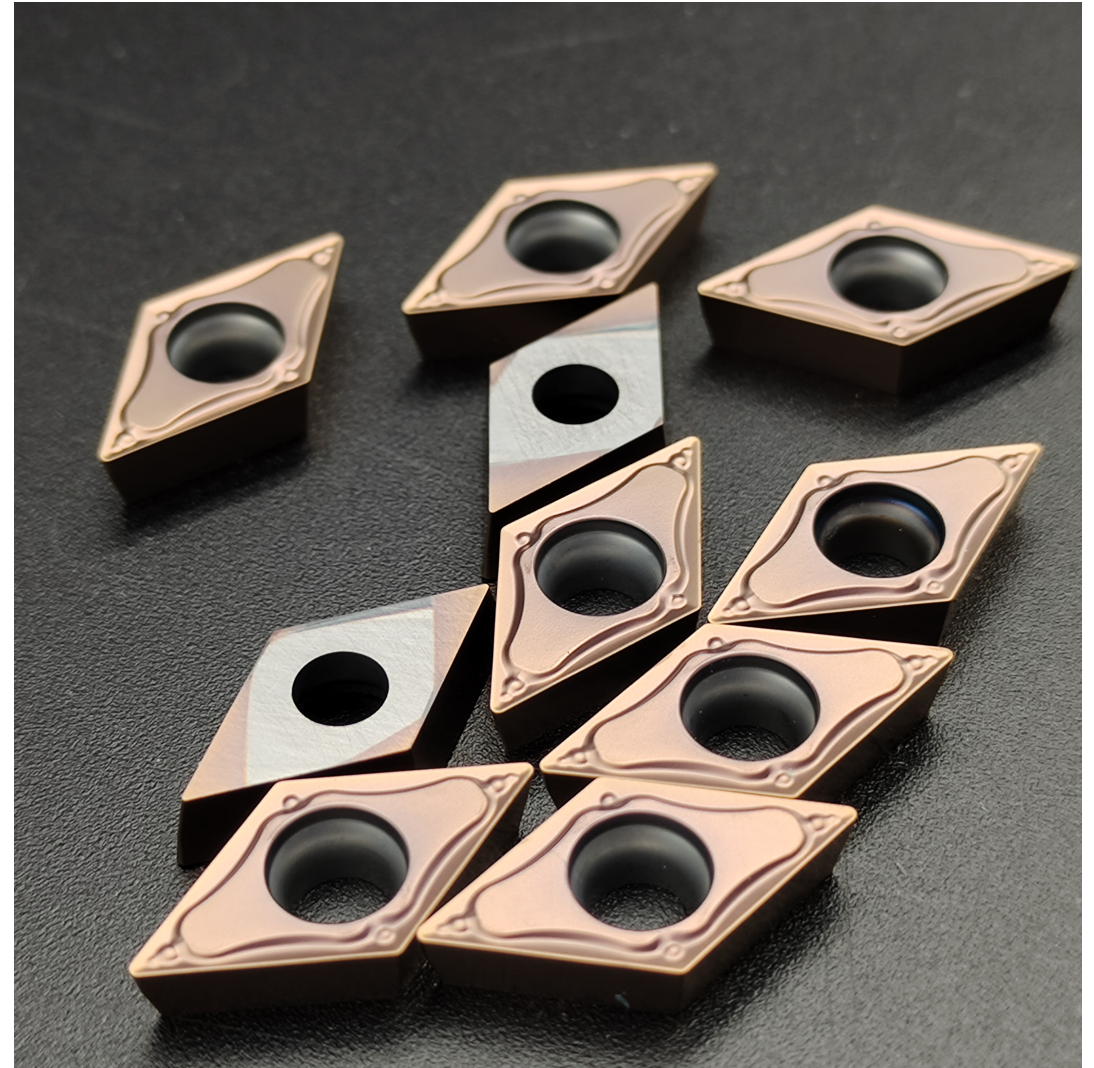
| | | | | | | |
|----------------|---|---|---|---|--|---|
| Finishing |  |  |  |  |  |  |
| | CNMG-AF | DNMG-AF | SNMG-AF | TNMG-AF | VNMG-AF | WNMG-AF |
| Length | 09、12 | 15 | 12 | 16 | 16 | 08 |
| | | - | - | - | - | - |
| Finishing |  |  |  |  |  |  |
| | CNMG-BF | DNMG-BF | SNMG-BF | TNMG-BF | VNMG-BF | WNMG-BF |
| Length | 09、12 | 15 | 12 | 16 | 16 | 06、08 |
| | | | | | | |
| Semi-finishing |  |  |  |  |  |  |
| | CNMG-AS | CNMG-BM | CNMG-CM | CNMG-DM | DNMG-AS | DNMG-BM |
| Length | 12、16、19 | 12、16 | 12、16、19 | 12 | 15 | 15 |
| | | | | | | |
| Semi-finishing |  |  |  |  |  |  |
| | DNMG-CM | DNMG-DM | SNMG-AS | SNMG-BM | SNMG-CM | SNMG-DM |
| Length | 15 | 15 | 12、15 | 12、15 | 12 | 12、15 |
| | | | | | | |
| Semi-finishing |  |  |  |  |  |  |
| | TNMG-AS | TNMG-BM | TNMG-CM | VNMG-AS | VNMG-CM | WNMG-AS |
| Length | 16、22 | 16、22 | 16、22 | 11、16 | 16 | 08 |
| | | | | | | |

Product and Chip Breaker

| | | | | | | |
|----------------|---|---|---|---|---|---|
| Semi-finishing |  |  |  | | | |
| | WNMG-BM | WNMG-CM | WNMG-DM | | | |
| Length | 06、08 | 08 | 08 | | | |
| | - | - | - | | | |
| Roughing |  |  |  |  |  |  |
| | CNMG-AR | CNMG-BR | DNMG-AR | DNMG-BR | SNMG-AR | SNMG-BR |
| Length | 12、16、19 | 12、16 | 15 | 15 | 12、15、19 | 12、15 |
| | | | | | | |
| Roughing |  |  |  |  | | |
| | TNMG-AR | TNMG-BR | WNMG-AR | WNMG-BR | | |
| Length | 16、22 | 16、22 | 06、08 | 06、08 | | |
| | | | | | | |
| Heavy-load |  |  | | | | |
| | CNMM-AR | SNMM-AR | | | | |
| Length | 19、25 | 19、25 | | | | |
| | | | | | | |
| Semi-finishing |  |  |  |  | | |
| | CCMT-GM | DCMT-GM | SCMT-GM | TCMT-GM | | |
| Length | 06、09、12 | 07、11 | 09、12 | 09、11、16 | | |
| | | | | | | |

Product and Chip Breaker





| | | | | | | |
|---------------------------|---|---|---|---|--|--|
| M Finishing |  |  |  |  | | |
| | CCMT-GF | DCMT-GF | SCMT-GF | TCMT-GF | | |
| Length | 06、09 | 07、11 | 09 | 09、11、16 | | |
| | | | | | | |
| Train Wheel Hub Machining |  |  |  |  | | |
| | RCMX | 175.32-22 | 175.32-24 | 175.32-28 | | |
| Length | 08-32 | 19 | 19 | 19 | | |
| | | | | | | |







Recommended Turning Insert Grade

| ISO | Classification | CVD | | | | PVD | | |
|---------------------------------|----------------|---------|---------|---------|---------|---------|---------|--|
| P Steel | 01 | | | | | | | |
| | 10 | OT08215 | | OT08315 | | | | |
| | 20 | OT08225 | | OT08325 | | | | |
| | 30 | | OT08235 | | | | | |
| | 40 | | | | | | | |
| M Stainless Steel | 01 | | | | | | | |
| | 10 | | | | OT05133 | OT05525 | OT05140 | |
| | 20 | | | | | | | |
| | 30 | | | | | | | |
| | 40 | | | | | | | |
| K Cast Iron | 01 | | | | | | | |
| | 10 | OT03315 | | OT03415 | | | | |
| | 20 | | | | | | | |
| | 30 | | | | | | | |
| | 40 | | | | | | | |
| S Heat Resistant Alloy | 01 | | | | | | | |
| | 10 | | | | OT01010 | | | |
| | 20 | | | | | OT05133 | OT01525 | |
| | 30 | | | | | | | |
| | 40 | | | | | | | |



General Turning Insert

| Item No. | Application | Chipbreaker | Feature/Shape of insert |
|----------|-------------------------|---|--|
| 1 | Steel Finishing | AF | P-type Material Finishing |
| | |  | M-level double-sided chipbreaker, two-stage bump effect for stable chip handling in a wide range of feeds. |
| 2 | Steel Semi-finishing | AS | P-type Material Semi-finishing |
| | |  | M-level double-sided chipbreaker, negative chamfer design, high edge strength, suitable for semi-finishing occasions with unstable working conditions. |
| 3 | Steel Roughing | AR | P-type Material Roughing |
| | |  | The preferred chip breaker for lightload roughing, wide margin design, good edge strength, high metal removal rate, good wear resistance and cutting life. |
| 4 | Steel Heavy-load | AR (Single Side) | P-type Material Heavy-load |
| | |  | M-level single-sided chipbreaker, negative chamfer design, under the large cutting depth and large feed processing parameters, high edge strength and high metal removal rate can be obtained. |



General Turning Insert

| Item No. | Application | Chipbreaker | Feature/Shape of insert |
|----------|---------------------------------------|---|--|
| 5 | Stainless steel finishing | BF | M type material finishing |
| | |  | M-level double-sided chipbreaker, small edge width + double positive rake angle, sharp blade edge, low cutting resistance, special edge inclination design, can obtain high-quality machined surface. |
| 6 | Stainless steel semi-finishing | BM | M type material semi-finishing |
| | |  | M-level double-sided chipbreaker, double positive rake angle, higher edge strength, widely application for the general processing of stainless steel. |
| 7 | Stainless steel roughing | BR | M type material roughing |
| | |  | M-level double-sided chipbreaker, variable blade width + variable rake angle design, suitable for semi-finishing and roughing of stainless steel |
| 8 | High temperature alloy semi-finishing | DM | S type material semi-finishing |
| | |  | M-level double-sided chipbreaker. Adopting the double positive rake angle combines the sharpness and strength of the insert; the cutting resistance is small, and the wider chipbreaker ensures enough space for chip deformation, reducing groove wear. |

General Inner Hole Turning Insert

| Item No. | Application | Chipbreaker | Feature/Shape of insert |
|----------|---------------------------|---|---|
| 9 | General semi-finishing | GM | General chipbreaker |
| | |  | M-level single-sided chipbreaker, suitable for semi-finishing of inner holes and outer circles of P, M and K type materials |
| 10 | Stainless steel finishing | GF | M type material finishing |
| | |  | M-level single-sided chipbreaker, suitable for inner hole and outer circle finishing of stainless steel. |

Special Turning Insert

| Item No. | Application | Chipbreaker | Feature/Shape of insert |
|----------|---------------------------|---|---|
| 11 | Train wheel hub machining | 175.32 series | Chipbreaker for finishing of P type material |
| | |  | M-level double-sided chipbreaker, vertical cutting inserts, especially suitable for the trimming of train wheels. |
| 12 | | RCMX series | Chipbreaker for heavy-load machining of P type material |
| | |  | M-level single-sided chipbreaker, negative chamfer design, high edge strength, first choice for profiling. |

Turning Insert Code Key

| | | | | | | | | | | |
|----------------|-------------|---------------|--------------------------------|------|-------------|--------------|----------------|-----|--------|--------------|
| | | | B | Y | N | | N | N | N | |
| | | | H | Y | Single | | R | N | Single | |
| | | | J | Y | Double | | A | Y | N | |
| | | | W | Y | N | | M | Y | Single | |
| | | | T | Y | Single | | G | Y | Double | |
| | | Others | Q | Y | N | | X | --- | --- | Special Type |
| | | | U | Y | Double | | | | | |
| 1.Shape | | | 4.Chip Breaker and Hole | | | | | | | |
| Code | Center Hole | Chip Breaker | Insert Profile | Code | Center Hole | Chip Breaker | Insert Profile | | | |

| | | | | | | | | | | |
|--------------------------------|----|----|----|----|----|----|----|----|--|--|
| 32.00 | | | 32 | | | | | | | |
| 31.75 | | | 31 | 32 | | | | | | |
| 25.40 | | | 25 | 25 | | | | | | |
| 25.00 | 25 | 25 | 25 | | | | | | | |
| 20.00 | | | 20 | | | | | | | |
| 19.05 | 19 | | 19 | 19 | 33 | | | | | |
| 16.00 | | 19 | 16 | | | | | | | |
| 15.875 | 16 | | 15 | 15 | 27 | | | | | |
| 12.70 | 12 | 15 | 12 | 12 | 22 | 22 | 08 | | | |
| 12.00 | | | 12 | | | | | | | |
| 10.00 | | | 10 | | | | | | | |
| 9.525 | 09 | 11 | 09 | 09 | 16 | 16 | 06 | 16 | | |
| 8.00 | | | 08 | | | | | | | |
| 6.35 | 06 | 07 | | | 11 | 11 | | | | |
| 6.00 | | | 06 | | | | | | | |
| 5.56 | | | | | 09 | | | | | |
| 5.50 | | | 05 | | | | | | | |
| 3.97 | | | | | 06 | | | | | |
| Inscribed Circle diameter (mm) | | | | | | | | | | |
| Insert Shape | | | | | | | | | | |
| 5.Cutting Edge Length | | | | | | | | | | |

| | |
|--------------------|---------------|
| 12 | 12.70 |
| 10 | 11.11 |
| T9 | 9.72 |
| 09 | 9.52 |
| 07 | 7.94 |
| T6 | 6.75 |
| 06 | 6.35 |
| 05 | 5.56 |
| T4 | 4.96 |
| 04 | 4.76 |
| T3 | 3.97 |
| 03 | 3.18 |
| T2 | 2.78 |
| 02 | 2.38 |
| T1 | 1.98 |
| 01 | 1.59 |
| T0 | 0.99 |
| 00 | 0.79 |
| Code | Thickness(mm) |
| | |
| 6.Thickness | |

C N M G

| 2.Clearance Angle | | | |
|-------------------|-----------------|------|-----------------|
| Code | Clearance Angle | Code | Clearance Angle |
| A | 3° | B | 5° |
| C | 7° | D | 15° |
| E | 20° | F | 25° |
| G | 30° | N | 0° |
| P | 11° | O | Others |

| 3.Tolerance | | | | | | | | | | |
|-------------|------------|------------|--------|-------------------------------------|------------------|--------|-------------|-------------|-------------|-------|
| | | | | | | | | | | |
| Code | m(mm) | d=I.C | S (mm) | Inscribed Circle | Regular Triangle | Square | 80° Rhombus | 55° Rhombus | 35° Rhombus | |
| A | ±0.005 | ±0.025 | ±0.025 | 6.35 | ±0.08 | ±0.08 | ±0.08 | ±0.11 | ±0.16 | --- |
| F | ±0.005 | ±0.013 | ±0.025 | 9.525 | ±0.08 | ±0.08 | ±0.08 | ±0.11 | ±0.16 | --- |
| C | ±0.013 | ±0.025 | ±0.025 | 12.7 | ±0.13 | ±0.13 | ±0.13 | ±0.15 | --- | --- |
| H | ±0.013 | ±0.013 | ±0.025 | 15.875 | ±0.15 | ±0.15 | ±0.15 | ±0.18 | --- | --- |
| E | ±0.025 | ±0.025 | ±0.025 | 19.05 | ±0.15 | ±0.15 | ±0.15 | ±0.18 | --- | --- |
| G | ±0.025 | ±0.025 | ±0.13 | 25.4 | --- | ±0.18 | --- | --- | --- | --- |
| J | ±0.005 | ±0.05±0.13 | ±0.025 | • Tolerance of Inscribed Circle(mm) | | | | | | |
| K | ±0.013 | ±0.05±0.13 | ±0.025 | Inscribed Circle | Regular Triangle | Square | 80° Rhombus | 55° Rhombus | 35° Rhombus | |
| L | ±0.025 | ±0.05±0.13 | ±0.025 | 6.35 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | --- |
| M | ±0.08±0.18 | ±0.05±0.13 | ±0.13 | 9.525 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 |
| N | ±0.08±0.18 | ±0.05±0.13 | ±0.025 | 12.7 | ±0.08 | ±0.08 | ±0.08 | ±0.08 | --- | ±0.08 |
| U | ±0.13±0.38 | ±0.08±0.25 | ±0.13 | 15.875 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | --- | ±0.10 |
| | | | | 19.05 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | --- | ±0.10 |
| | | | | 25.4 | --- | ±0.13 | --- | --- | --- | ±0.13 |

12 04 12 - MA (ISO)

4 4 3 (Inch)

| 5.Inscribed Circle | |
|--------------------|-------------------------------|
| Code | Inscribed Circle diameter(mm) |
| 2 | 6.35 |
| 3 | 9.525 |
| 4 | 12.7 |
| 5 | 15.875 |
| 6 | 19.05 |
| 8 | 25.4 |

| 6.Thickness | |
|-------------|----------------|
| Code | Thickness (mm) |
| 2 | 3.18 |
| 3 | 4.76 |
| 4 | 6.35 |
| 5 | 7.94 |
| 6 | 9.52 |

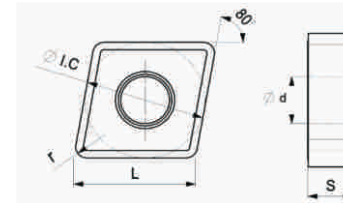
| 7.Corner Radius | |
|-----------------|--------------------|
| Code | Corner Radius (mm) |
| 0 | 0.2 |
| 1 | 0.4 |
| 2 | 0.8 |
| 3 | 1.2 |
| 4 | 1.6 |
| 5 | 2.0 |
| 6 | 2.4 |

| 7.Corner Radius | |
|--------------------------|--------------------|
| Code | Corner Radius (mm) |
| 00 | |
| 02 | 0.2 |
| 04 | 0.4 |
| 08 | 0.8 |
| 12 | 1.2 |
| 16 | 1.6 |
| 20 | 2.0 |
| 24 | 2.4 |
| 32 | 3.2 |
| X | |
| Insert Diameter (Metric) | Circle Insert |

| 8.Chip Breaker | | |
|----------------|----|------------------|
| AF | AS | AR |
| | | |
| BF | BM | BR |
| | | |
| CM | DM | AR (single-side) |
| | | |




Negative Inserts



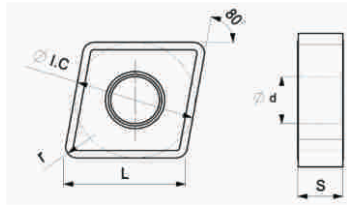
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 9 | 9.525 | 3.18 | 3.81 | 0.4-0.8 |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.2 |

80° CN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | |
|---|---------------|----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | | | | CVD | | | | | | PVD | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO1010 | OTO1525 | |
|  | CNMG090304-AF | 0.26-3.2 | 0.05-0.15 | ● | ○ | ● | | ○ | ○ | | | | | | |
| | CNMG090308-AF | 0.52-3.2 | 0.1-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | |
| | CNMG120404-AF | 0.26-3.2 | 0.05-0.15 | ● | ○ | ● | | ○ | ○ | | | | | | |
| | CNMG120408-AF | 0.52-3.2 | 0.1-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | |
| | CNMG120412-AF | 0.78-3.2 | 0.15-0.45 | ● | ○ | ● | | ○ | ○ | | | | | | |
| P Finishing | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



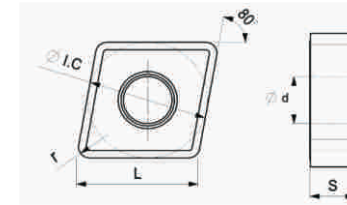
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |
| 16 | 15.875 | 6.35 | 6.35 | 0.8-1.6 |
| 19 | 19.05 | 6.35 | 7.94 | 0.8-1.6 |

80° CN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | |
|---------------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|
| | | | | CVD | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | |
| P Semi-finishing | CNMG120404-AS | 0.60-6.40 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | CNMG120408-AS | 1.20-6.40 | 0.20-0.60 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | CNMG120412-AS | 1.80-6.40 | 0.30-0.90 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | CNMG120416-AS | 2.40-6.40 | 0.12-0.40 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | CNMG160608-AS | 1.20-8.10 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | CNMG160612-AS | 1.80-8.10 | 0.20-0.60 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | CNMG160616-AS | 2.40-8.10 | 0.30-0.90 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | CNMG190608-AS | 1.20-9.70 | 0.20-0.60 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | CNMG190612-AS | 1.80-9.70 | 0.30-0.90 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | CNMG190616-AS | 2.40-9.70 | 0.40-1.20 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



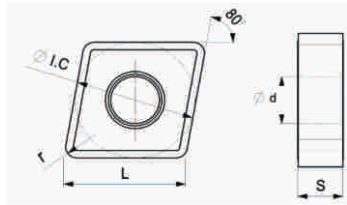
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.8-1.6 |
| 16 | 15.875 | 6.35 | 6.35 | 0.8-1.6 |
| 19 | 19.05 | 6.35 | 7.94 | 0.8-2.4 |

80° CN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | |
|---------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|
| | | | | CVD | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | |
| P Roughing | CNMG120408-AR | 1.45-5.20 | 0.15-0.32 | | | ● | ○ | | | | | | | | | | | | | | |
| | CNMG120412-AR | 2.15-5.20 | 0.25-0.50 | | | ● | ○ | | | | | | | | | | | | | | |
| | CNMG120416-AR | 2.90-5.20 | 0.30-0.65 | | | ● | ○ | | | | | | | | | | | | | | |
| | CNMG160608-AR | 1.45-6.40 | 0.15-6.35 | | | ● | ○ | | | | | | | | | | | | | | |
| | CNMG160612-AR | 2.15-6.40 | 0.24-0.50 | | | ● | ○ | | | | | | | | | | | | | | |
| | CNMG160616-AR | 2.90-6.40 | 0.30-0.65 | | | ● | ○ | | | | | | | | | | | | | | |
| | CNMG190608-AR | 1.45-7.70 | 0.15-0.35 | | | ● | ○ | | | | | | | | | | | | | | |
| | CNMG190612-AR | 2.15-7.70 | 0.25-0.50 | | | ● | ○ | | | | | | | | | | | | | | |
| | CNMG190616-AR | 2.90-7.70 | 0.30-0.65 | | | ● | ○ | | | | | | | | | | | | | | |
| | CNMG190624-AR | 4.30-7.70 | 0.45-0.95 | | | ● | ○ | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



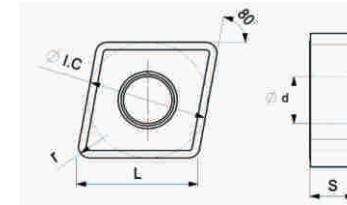
| Length | Size(mm) | | | |
|--------|----------|-----------|------|---------|
| | IC | S | d | r |
| 19 | 19.05 | 6.35 | 7.94 | 1.2-2.4 |
| 25 | 25.4 | 7.94-9.52 | 9.12 | 2.4-3.2 |

80° CN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|--|---------------|------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | | |
|  P Heavy -load | CNMM190612-AR | 2.40-9.70 | 0.25-0.60 | | | ● | ○ | ● | | | | | | | | | | | | | | | |
| | CNMM190616-AR | 3.20-9.70 | 0.35-0.80 | | | ● | ○ | ● | | | | | | | | | | | | | | | |
| | CNMM190624-AR | 4.80-9.70 | 0.50-1.20 | | | ● | ○ | ● | | | | | | | | | | | | | | | |
| | CNMM250724-AR | 4.80-12.90 | 0.50-1.20 | | | ● | ○ | ● | | | | | | | | | | | | | | | |
| | CNMM250924-AR | 4.80-12.90 | 0.50-1.20 | | | ● | ○ | ● | | | | | | | | | | | | | | | |
| | CNMM250932-AR | 4.80-12.90 | 0.50-1.20 | | | ● | ○ | ● | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



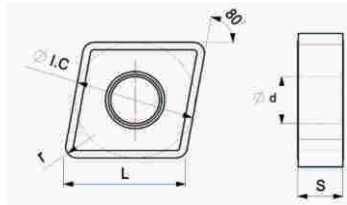
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 9 | 9.525 | 3.18 | 3.81 | 0.4-0.8 |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.2 |

80° CN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | | | | | | | |
|  M Finishing | CNMG090304-BF | 0.25-2.40 | 0.05-0.15 | | | | | | | | | | | | | | | | | | | | |
| | CNMG090308-BF | 0.50-2.40 | 0.10-0.30 | | | | | | | | | | | | | | | | | | | | |
| | CNMG120404-BF | 0.25-3.20 | 0.05-0.15 | | | | | | | | | | | | | | | | | | | | |
| | CNMG120408-BF | 0.50-3.20 | 0.10-0.30 | | | | | | | | | | | | | | | | | | | | |
| | CNMG120412-BF | 0.75-3.20 | 0.15-0.45 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



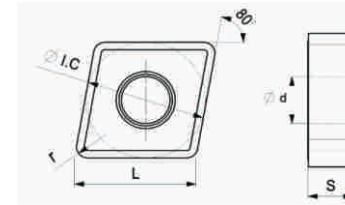
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.2 |
| 16 | 15.875 | 6.35 | 6.35 | 0.8-1.6 |

80° CN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | |
|---------------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | | | | CVD | | | | PVD | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | |
| M Semi-finishing | CNMG120404-BM | 0.30-4.30 | 0.08-0.25 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | CNMG120408-BM | 0.65-4.30 | 0.15-0.45 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | CNMG120412-BM | 0.95-4.30 | 0.20-0.65 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | CNMG160608-BM | 0.65-5.30 | 0.15-0.45 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | CNMG160612-BM | 0.95-5.30 | 0.25-0.65 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | CNMG160616-BM | 1.30-5.30 | 0.30-0.90 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |

Note: ●Recommended grade ready to stock

Negative Inserts



| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |
| 16 | 15.875 | 6.35 | 6.35 | 0.8-1.6 |
| 19 | 19.05 | 6.35 | 7.94 | 0.8-1.6 |

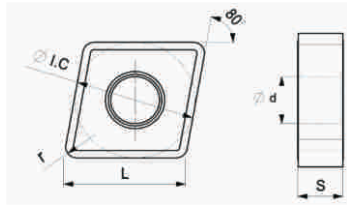
80° CN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | |
|---------------------|---------------|-----------|-------------|---------|---------|--|--|-----|--|--|--|---|--|--|--|--|
| | | | | CVD | | | | PVD | | | | | | | | |
| | | | | OTO3315 | OTO3415 | | | | | | | | | | | |
| K Semi-finishing | CNMG120404-CM | 0.40-4.30 | 0.08-0.25 | | | | | | | | | ● | | | | |
| | CNMG120408-CM | 0.80-4.30 | 0.15-0.45 | | | | | | | | | ● | | | | |
| | CNMG120412-CM | 1.20-4.30 | 0.20-0.65 | | | | | | | | | ● | | | | |
| | CNMG160612-CM | 1.20-5.30 | 0.25-0.65 | | | | | | | | | ● | | | | |
| | CNMG160616-CM | 1.60-5.30 | 0.30-0.90 | | | | | | | | | ● | | | | |
| | CNMG190612-CM | 1.20-6.40 | 0.25-0.65 | | | | | | | | | ● | | | | |

Note: ●Recommended grade ready to stock

A Turning Inserts

Negative Inserts



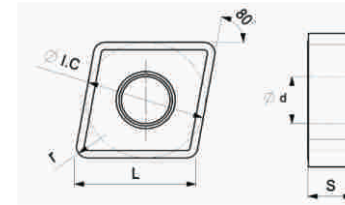
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.2 |
| 16 | 15.875 | 6.35 | 6.35 | 0.8-1.6 |

80° CN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | |
|---------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | | | | CVD | | | | PVD | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5140 | OTO1010 | OTO1525 | |
| M Roughing | CNMG120404-BR | 0.30-4.30 | 0.08-0.25 | | | | | ○ | ○ | ○ | ● | | ○ | |
| | CNMG120408-BR | 0.65-4.30 | 0.15-0.45 | | | | | ○ | ○ | ○ | ● | | ○ | |
| | CNMG120412-BR | 0.95-4.30 | 0.25-0.65 | | | | | ○ | ○ | ○ | ● | | ○ | |
| | CNMG160608-BR | 0.65-5.30 | 0.15-0.45 | | | | | ○ | ○ | ○ | ● | | ○ | |
| | CNMG160612-BR | 0.95-5.30 | 0.25-0.65 | | | | | ○ | ○ | ○ | ● | | ○ | |
| | CNMG160616-BR | 1.25-5.30 | 0.30-0.90 | | | | | ○ | ○ | ○ | ● | | ○ | |

Note: ●Recommended grade ready to stock

Negative Inserts



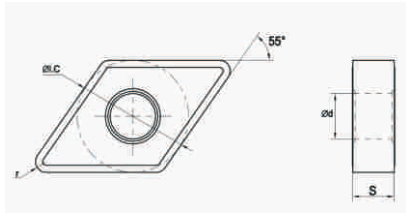
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |
| | | | | |

80° CN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | |
|---------------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | CVD | | | | PVD | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 |
| S Semi-finishing | CNMG120404-DM | 0.40-4.30 | 0.08-0.25 | | | | | ○ | | | | ○ | ○ | ● |
| | CNMG120408-DM | 0.80-4.30 | 0.15-0.45 | | | | | ○ | | | | ○ | ○ | ● |
| | CNMG120412-DM | 1.20-4.30 | 0.25-0.65 | | | | | ○ | | | | ○ | ○ | ● |
| | CNMG120416-DM | 1.60-4.30 | 0.30-0.90 | | | | | ○ | | | | ○ | ○ | ● |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



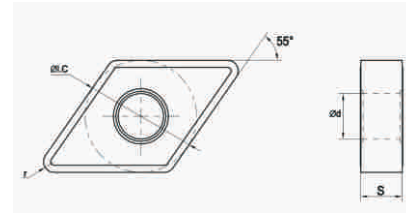
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 15 | 12.7 | 4.76 | 5.16 | 0.8-1.2 |
| 15 | 12.7 | 6.35 | 5.16 | 0.4-1.2 |

55° DN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | |
|----------------|---------------|----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO1010 | OTO1525 | | | | | | | |
| P Finishing | DNMG150404-AF | 0.26-3.1 | 0.05-0.15 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150408-AF | 0.52-3.1 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150412-AF | 0.78-3.1 | 0.15-0.45 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150604-AF | 0.26-3.1 | 0.05-0.15 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150608-AF | 0.52-3.1 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150612-AF | 0.78-3.1 | 0.15-0.45 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



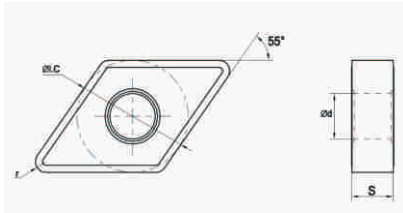
| Length | Size(mm) | | | |
|--------|----------|-----------|------|---------|
| | IC | S | d | r |
| 15 | 12.7 | 4.76-6.35 | 5.16 | 0.4-1.2 |
| | | | | |

55° DN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | |
|---------------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | |
| P Semi-finishing | DNMG150404-AS | 0.60-5.40 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150408-AS | 1.20-5.40 | 0.20-0.60 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150412-AS | 1.80-5.40 | 0.30-0.90 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150604-AS | 0.60-5.40 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150608-AS | 1.20-5.40 | 0.20-0.60 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |
| | DNMG150612-AS | 1.80-5.40 | 0.30-0.90 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



| Length | Size(mm) | | | |
|--------|----------|-----------|------|---------|
| | IC | S | d | r |
| 15 | 12.7 | 4.76–6.35 | 5.16 | 0.8–1.2 |

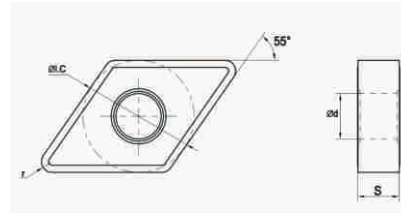
55° DN□□ With Hole

| | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|---------------|---------------|----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO1010 | OTO1525 | | | | | | | | | |
| P Roughing | DNMG150408-AR | 0.80-4.0 | 0.15-0.50 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | DNMG150412-AR | 1.20-4.0 | 0.15-0.65 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | DNMG150608-AR | 0.80-4.0 | 0.15-0.50 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | DNMG150612-AR | 1.20-4.0 | 0.15-0.65 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



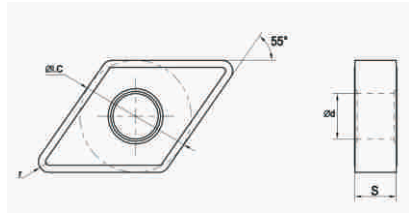
| Length | Size(mm) | | | |
|--------|----------|-----------|------|---------|
| | IC | S | d | r |
| 15 | 12.7 | 4.76–6.35 | 5.16 | 0.4–1.2 |

55° DN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|----------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | | | | | | | |
| M Finishing | DNMG150404-BF | 0.25-2.90 | 0.05-0.15 | | | | | | | | ● | ○ | ● | | ○ | | | | | | | | |
| | DNMG150408-BF | 0.50-2.90 | 0.10-0.30 | | | | | | | | ● | ○ | ● | | ○ | | | | | | | | |
| | DNMG150412-BF | 0.75-2.90 | 0.15-0.45 | | | | | | | | ● | ○ | ● | | ○ | | | | | | | | |
| | DNMG150604-BF | 0.25-2.90 | 0.05-0.15 | | | | | | | | ● | ○ | ● | | ○ | | | | | | | | |
| | DNMG150608-BF | 0.50-2.90 | 0.10-0.30 | | | | | | | | ● | ○ | ● | | ○ | | | | | | | | |
| | DNMG150612-BF | 0.75-2.90 | 0.15-0.45 | | | | | | | | ● | ○ | ● | | ○ | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



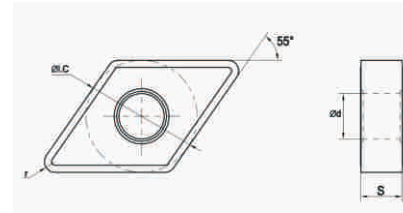
| Length | Size(mm) | | | |
|--------|----------|-----------|------|---------|
| | IC | S | d | r |
| 15 | 12.7 | 4.76-6.35 | 5.16 | 0.4-1.2 |

55° DN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | |
|---------------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | | | | CVD | | | | PVD | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | |
| M Semi-finishing | DNMG150404-BM | 0.30-3.90 | 0.08-0.25 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | DNMG150408-BM | 0.65-3.90 | 0.15-0.45 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | DNMG150412-BM | 0.95-3.90 | 0.25-0.65 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | DNMG150604-BM | 0.30-3.90 | 0.08-0.20 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | DNMG150608-BM | 0.65-3.90 | 0.15-0.45 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | DNMG150612-BM | 0.95-3.90 | 0.25-0.65 | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



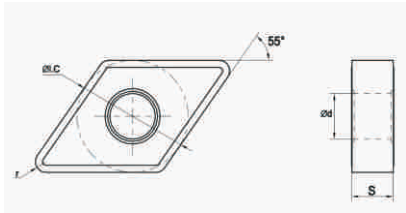
| Length | Size(mm) | | | |
|--------|----------|-----------|------|---------|
| | IC | S | d | r |
| 15 | 12.7 | 4.76-6.35 | 5.16 | 0.4-1.2 |

55° DN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | |
|---------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|--|
| | | | | CVD | | | | PVD | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5140 | OTO1010 | OTO1525 | | |
| M Roughing | DNMG150404-BR | 0.30-3.90 | 0.08-0.25 | | | | | | ○ | ○ | ○ | ● | | ○ | |
| | DNMG150408-BR | 0.65-3.90 | 0.15-0.45 | | | | | | ○ | ○ | ○ | ● | | ○ | |
| | DNMG150412-BR | 0.95-3.90 | 0.25-0.65 | | | | | | ○ | ○ | ○ | ● | | ○ | |
| | DNMG150604-BR | 0.30-3.90 | 0.08-0.20 | | | | | | ○ | ○ | ○ | ● | | ○ | |
| | DNMG150608-BR | 0.65-3.90 | 0.15-0.45 | | | | | | ○ | ○ | ○ | ● | | ○ | |
| | DNMG150612-BR | 0.95-3.90 | 0.25-0.65 | | | | | | ○ | ○ | ○ | ● | | ○ | |
| | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



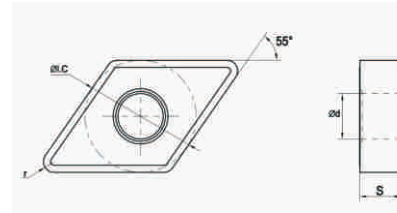
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 15 | 12.7 | 6.35 | 5.16 | 0.8-1.2 |

55° DN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | |
|---|---------------|-----------|-------------|-------|---------|---------|--|-----|--|--|--|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | PVD | | | | | | | | | | | |
| | | | | | OTO3315 | OTO3415 | | | | | | | | | | | | | |
|  | DNMG150404-CM | 0.40-3.90 | 0.08-0.25 | | ● | ○ | | | | | | | | | | | | | |
| | DNMG150408-CM | 0.80-3.90 | 0.15-0.45 | | ● | ○ | | | | | | | | | | | | | |
| | DNMG150412-CM | 1.20-3.90 | 0.25-0.65 | | ● | ○ | | | | | | | | | | | | | |
| | DNMG150604-CM | 0.40-3.90 | 0.08-0.20 | | ● | ○ | | | | | | | | | | | | | |
| | DNMG150608-CM | 0.80-3.90 | 0.15-0.45 | | ● | ○ | | | | | | | | | | | | | |
| | DNMG150612-CM | 1.20-3.90 | 0.25-0.65 | | ● | ○ | | | | | | | | | | | | | |
| K Semi-finishing | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



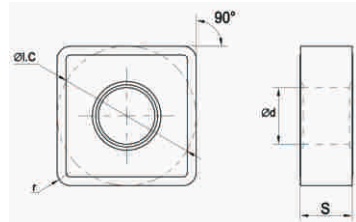
| Length | Size(mm) | | | |
|--------|----------|-----------|------|---------|
| | IC | S | d | r |
| 15 | 12.7 | 4.76-6.35 | 5.16 | 0.4-1.2 |

55° DN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|--|--|--|--|
| | | | | CVD | | | | PVD | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | | | | |
|  | DNMG150404-DM | 0.40-3.90 | 0.08-0.25 | | | | | | ○ | | | ○ | ○ | | ● | | | | |
| | DNMG150408-DM | 0.80-3.90 | 0.15-0.45 | | | | | | ○ | | | ○ | ○ | | ● | | | | |
| | DNMG150412-DM | 1.20-3.90 | 0.25-0.65 | | | | | | ○ | | | ○ | ○ | | ● | | | | |
| | DNMG150604-DM | 0.40-3.90 | 0.08-0.20 | | | | | | ○ | | | ○ | ○ | | ● | | | | |
| | DNMG150608-DM | 0.80-3.90 | 0.15-0.45 | | | | | | ○ | | | ○ | ○ | | ● | | | | |
| | DNMG150612-DM | 1.20-3.90 | 0.25-0.65 | | | | | | ○ | | | ○ | ○ | | ● | | | | |
| S Semi-finishing | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



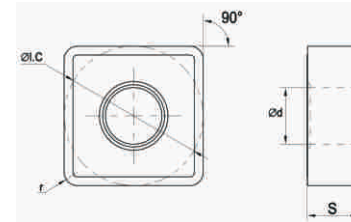
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.8-1.2 |
| | | | | |

90° SN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | |
|---|---------------|----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO1010 | OTO1525 | | | | | | | | |
|  P Finishing | SNMG120404-AF | 0.26-3.2 | 0.05-0.15 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | SNMG120408-AF | 0.52-3.2 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | SNMG120412-AF | 0.78-3.2 | 0.15-0.45 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



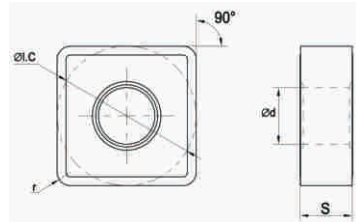
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.8-1.6 |
| 15 | 15.875 | 6.35 | 6.35 | 0.8-1.2 |

90° SN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | |
|  P Semi-finishing | SNMG120404-AS | 1.00-5.00 | 0.12-0.40 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | SNMG120408-AS | 1.20-5.00 | 0.15-0.55 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | SNMG120412-AS | 1.50-5.00 | 0.20-0.55 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | SNMG150612-AS | 2.00-7.00 | 0.30-0.65 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



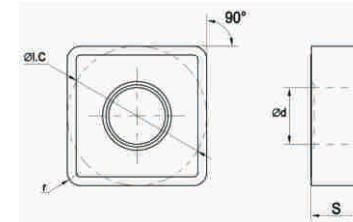
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.8-1.6 |
| 15 | 15.875 | 6.35 | 6.35 | 0.8-1.2 |
| 19 | 19.05 | 6.35 | 7.94 | 1.2-1.6 |

90° SN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | |
|  P Roughing | SNMG120408-AR | 2.50-6.00 | 0.25-0.70 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMG120412-AR | 2.50-6.00 | 0.30-0.70 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMG120416-AR | 2.50-6.00 | 0.40-0.70 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMG150612-AR | 2.15-6.40 | 0.25-0.50 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMG190612-AR | 2.15-6.40 | 0.25-0.50 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMG190616-AR | 2.85-7.60 | 0.30-0.65 | | | ● | ○ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



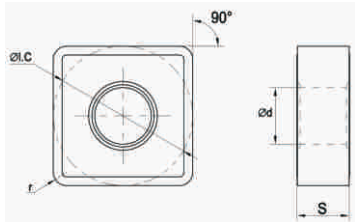
| Length | Size(mm) | | | |
|--------|----------|-----------|------|---------|
| | IC | S | d | r |
| 19 | 19.05 | 6.35 | 7.94 | 1.2-2.4 |
| 25 | 25.4 | 7.94-9.52 | 9.12 | 2.4-3.2 |

90° SN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | |
|--|---------------|------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | |
|  P Heavy-load | SNMM190612-AR | 2.40-9.50 | 0.25-0.60 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMM190616-AR | 3.20-9.50 | 0.35-0.80 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMM190624-AR | 4.80-9.50 | 0.53-1.20 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMM250724-AR | 4.80-12.70 | 0.53-1.20 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMM250732-AR | 4.80-12.70 | 0.53-1.20 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMM250924-AR | 4.35-12.70 | 0.53-1.20 | | | ● | ○ | | | | | | | | | | | | | | | |
| | SNMM250932-AR | 4.35-12.70 | 0.53-1.20 | | | ● | ○ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



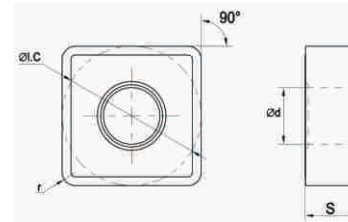
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.2 |
| | | | | |

90° SN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | CVD | | | | PVD | | | | | | |
|----------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 |
| | SNMG120404-BF | 0.25-3.20 | 0.05-0.15 | | | | | ● | ○ | ● | ○ | ○ | ○ | |
| | SNMG120408-BF | 0.50-3.20 | 0.10-0.30 | | | | | ● | ○ | ● | ○ | ○ | ○ | |
| | SNMG120412-BF | 0.75-3.20 | 0.15-0.45 | | | | | ● | ○ | ● | ○ | ○ | ○ | |
| M Finishing | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



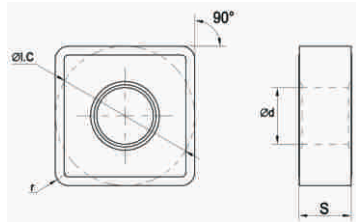
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.2 |
| 15 | 15.875 | 6.35 | 6.35 | 0.8-1.2 |

90° SN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | CVD | | | | PVD | | | | | | | | | |
|---------------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|---|
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | |
| | SNMG120404-BM | 0.30-4.20 | 0.08-0.25 | | | | | | | | | ○ | ○ | ○ | ● | ○ | ○ |
| | SNMG120408-BM | 0.65-4.20 | 0.15-0.45 | | | | | | | | | ○ | ○ | ○ | ● | ○ | ○ |
| | SNMG120412-BM | 0.95-4.20 | 0.25-0.65 | | | | | | | | | ○ | ○ | ○ | ● | ○ | ○ |
| | SNMG150608-BM | 0.65-5.20 | 0.15-0.45 | | | | | | | | | ○ | ○ | ○ | ● | ○ | ○ |
| | SNMG150612-BM | 0.95-5.20 | 0.25-0.65 | | | | | | | | | ○ | ○ | ○ | ● | ○ | ○ |
| M Semi-finishing | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



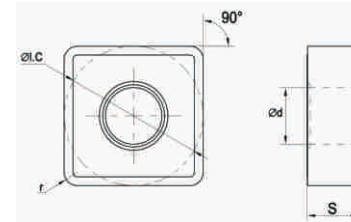
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.2 |
| 15 | 15.875 | 6.35 | 6.35 | 0.8-1.2 |

90° SN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | CVD | | | | PVD | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5140 | OTO1010 | OTO1525 |
|  M Roughing | SNMG120404-BR | 0.30-4.20 | 0.08-0.25 | | | | | ○ | ○ | ○ | ● | | ○ |
| | SNMG120408-BR | 0.65-4.20 | 0.15-0.45 | | | | | ○ | ○ | ○ | ● | | ○ |
| | SNMG120412-BR | 0.95-4.20 | 0.23-0.66 | | | | | ○ | ○ | ○ | ● | | ○ |
| | SNMG150608-BR | 0.65-5.20 | 0.15-0.44 | | | | | ○ | ○ | ○ | ● | | ○ |
| | SNMG150612-BR | 0.95-5.20 | 0.23-0.66 | | | | | ○ | ○ | ○ | ● | | ○ |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



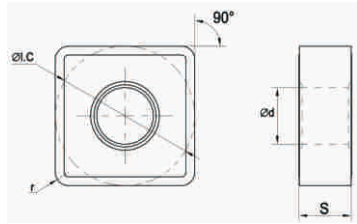
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |

90° SN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | |
|--|---------------|-----------|-------------|-------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | | | | | |
| | | | | | OTO3315 | OTO3415 | | | | | | | | |
|  K Semi-finishing | SNMG120404-CM | 0.40-4.20 | 0.08-0.25 | | ● | ○ | | | | | | | | |
| | SNMG120408-CM | 0.80-4.20 | 0.15-0.45 | | ● | ○ | | | | | | | | |
| | SNMG120412-CM | 1.20-4.20 | 0.25-0.65 | | ● | ○ | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



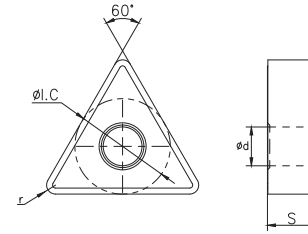
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 12 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |
| 15 | 15.875 | 6.35 | 6.35 | 0.8-1.6 |

90° SN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | | | | CVD | | | | | PVD | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | |
|  S Semi-finishing | SNMG120404-DM | 0.40-3.90 | 0.08-0.25 | | | | | | ○ | | | ○ | ○ | ● | |
| | SNMG120408-DM | 0.80-3.90 | 0.15-0.45 | | | | | | ○ | | | ○ | ○ | ● | |
| | SNMG120412-DM | 1.20-3.90 | 0.25-0.65 | | | | | | ○ | | | ○ | ○ | ● | |
| | SNMG120416-DM | 1.80-3.90 | 0.30-0.90 | | | | | | ○ | | | ○ | ○ | ● | |
| | SNMG150608-DM | 0.80-3.90 | 0.15-0.45 | | | | | | ○ | | | ○ | ○ | ● | |
| | SNMG150612-DM | 1.20-3.90 | 0.25-0.65 | | | | | | ○ | | | ○ | ○ | ● | |
| | SNMG150616-DM | 1.80-3.90 | 0.30-0.90 | | | | | | ○ | | | ○ | ○ | ● | |


Note: ●Recommended grade ready to stock

Negative Inserts



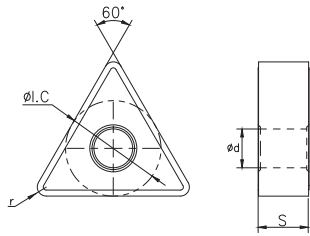
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-1.2 |

60° TN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | |
|---|---------------|----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | | | | CVD | | | | | PVD | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO1010 | OTO1525 | |
|  P Finishing | TNMG160404-AF | 0.26-3.1 | 0.05-0.15 | ● | ○ | ● | | | ○ | ○ | | | | | |
| | TNMG160408-AF | 0.52-3.1 | 0.10-0.30 | ● | ○ | ● | | | ○ | ○ | | | | | |
| | TNMG160412-AF | 0.78-3.1 | 0.15-0.45 | ● | ○ | ● | | | ○ | ○ | | | | | |
| | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



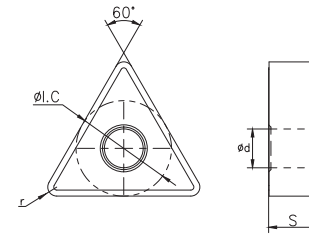
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-1.2 |
| 22 | 12.7 | 4.76 | 5.16 | 0.8-1.6 |

60° TN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | |
|  P Semi-finishing | TNMG160404-AS | 0.60-5.80 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | TNMG160408-AS | 1.20-5.80 | 0.20-0.60 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | TNMG160412-AS | 1.80-5.80 | 0.30-0.90 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | TNMG220408-AS | 1.20-7.70 | 0.20-0.60 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | TNMG220412-AS | 1.80-7.70 | 0.30-0.90 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |
| | TNMG220416-AS | 2.40-7.70 | 0.40-1.20 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



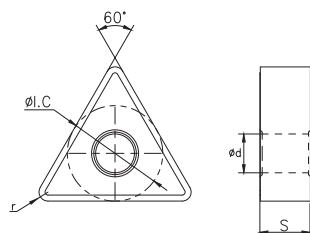
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.8-1.2 |
| 22 | 12.7 | 4.76 | 5.16 | 0.8-1.6 |

60° TN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | |
|  P Roughing | TNMG160408-AR | 2.00-5.00 | 0.25-0.65 | | | ● | ○ | | | | | | | | | | | | | | | |
| | TNMG220408-AR | 2.50-7.00 | 0.25-0.65 | | | ● | ○ | | | | | | | | | | | | | | | |
| | TNMG220412-AR | 2.50-7.00 | 0.25-0.65 | | | ● | ○ | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



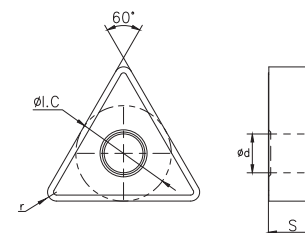
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-1.2 |
| | | | | |

60° TN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | | | | CVD | | | | PVD | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | |
|  M Finishing | TNMG160404-BF | 0.25-3.10 | 0.05-0.15 | | | | | | ● | ○ | ● | | ○ | | ○ | |
| | TNMG160408-BF | 0.50-3.10 | 0.10-0.30 | | | | | | ● | ○ | ● | | ○ | | ○ | |
| | TNMG160412-BF | 0.75-3.10 | 0.10-0.30 | | | | | | ● | ○ | ● | | ○ | | ○ | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



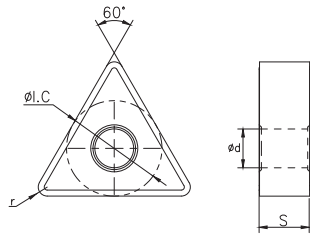
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-1.2 |
| 22 | 12.7 | 4.76 | 5.16 | 0.8-1.6 |

60° TN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|---|---|---|---|
| | | | | CVD | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5125 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | | | | |
|  M Semi-finishing | TNMG160404-BM | 0.30-4.10 | 0.08-0.25 | | | | | | | | | | ○ | ○ | ○ | ● | ○ | | ○ | |
| | TNMG160408-BM | 0.65-4.10 | 0.15-0.45 | | | | | | | | | | | ○ | ○ | ○ | ● | ○ | | ○ |
| | TNMG160412-BM | 0.95-4.10 | 0.25-0.65 | | | | | | | | | | | ○ | ○ | ○ | ● | ○ | | ○ |
| | TNMG220408-BM | 0.65-4.90 | 0.15-0.45 | | | | | | | | | | | ○ | ○ | ○ | ● | ○ | | ○ |
| | TNMG220412-BM | 0.95-4.90 | 0.25-0.65 | | | | | | | | | | | ○ | ○ | ○ | ● | ○ | | ○ |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



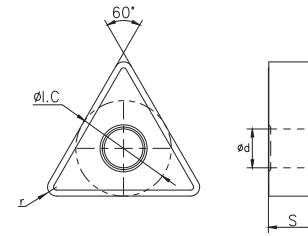
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-1.2 |
| 22 | 12.7 | 4.76 | 5.16 | 0.8-1.6 |

60° TN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|-------|--|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
|  K Semi-finishing | TNMG160404-CM | 0.40-4.10 | 0.08-0.25 | | | ● | ○ | | | | | | | | | | | | | |
| | TNMG160408-CM | 0.80-4.10 | 0.15-0.45 | | | ● | ○ | | | | | | | | | | | | | |
| | TNMG160412-CM | 1.20-4.10 | 0.25-0.65 | | | ● | ○ | | | | | | | | | | | | | |
| | TNMG220412-CM | 1.20-4.90 | 0.25-0.65 | | | ● | ○ | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



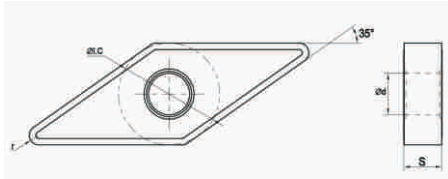
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-1.2 |
| 22 | 12.7 | 4.76 | 5.16 | 0.8-1.2 |

60° TN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|---|--|--|--|--|
| | | | | CVD | | | | PVD | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5140 | OTO1010 | OTO1525 | | | | | | |
|  M Roughing | TNMG160404-BR | 0.30-4.10 | 0.08-0.25 | | | | | | | ○ | ○ | ○ | ● | | ○ | | | | |
| | TNMG160408-BR | 0.65-4.10 | 0.15-0.45 | | | | | | | ○ | ○ | ○ | ● | | ○ | | | | |
| | TNMG160412-BR | 0.95-4.10 | 0.25-0.65 | | | | | | | ○ | ○ | ○ | ● | | ○ | | | | |
| | TNMG220408-BR | 0.65-4.90 | 0.15-0.45 | | | | | | | ○ | ○ | ○ | ● | | ○ | | | | |
| | TNMG220412-BR | 0.95-4.90 | 0.25-0.65 | | | | | | | ○ | ○ | ○ | ● | | ○ | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



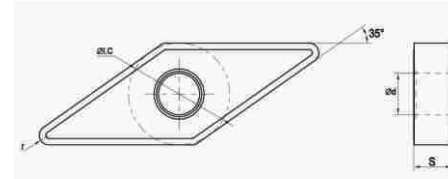
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-1.2 |

35° VN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | |
|---------------------|---------------|-----------|-------------|-------|---------|---------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | | | | | | | | | | | |
| | | | | | OTO3315 | OTO3415 | | | | | | | | | | | | | | |
| | VNMG160404-CM | 0.40-3.30 | 0.08-0.25 | | ● | ○ | | | | | | | | | | | | | | |
| | VNMG160408-CM | 0.80-3.30 | 0.15-0.45 | | ● | ○ | | | | | | | | | | | | | | |
| | VNMG160412-CM | 1.20-3.30 | 0.25-0.65 | | ● | ○ | | | | | | | | | | | | | | |
| K Semi-finishing | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



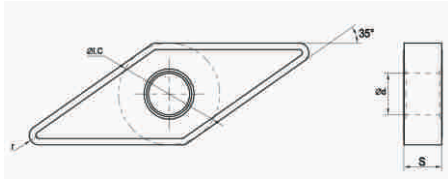
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-1.2 |

35° VN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | |
|----------------|---------------|----------|-------------|---------|---------|---------|---------|---------|---------|---------|--------|---------|---------|---------|---------|--|--|--|--|--|
| | | | | CVD | | | | | PVD | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | |
| | VNMG160404-AF | 0.26-2.1 | 0.05-0.15 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | |
| | VNMG160408-AF | 0.52-2.1 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | |
| | VNMG160412-AF | 0.78-2.1 | 0.15-0.45 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | |
| P Finishing | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



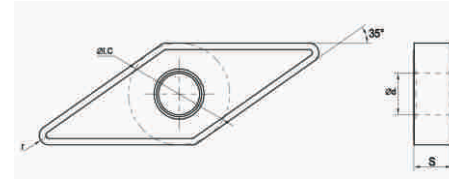
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 11 | 6.35 | 4.76 | 2.26 | 0.4-0.8 |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-0.8 |

35° VN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | | |
|  | VNMG110404-AS | 0.80-2.50 | 0.15-0.36 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | VNMG110408-AS | 1.00-2.50 | 0.17-0.36 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | VNMG160404-AS | 0.80-3.00 | 0.15-0.36 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | VNMG160408-AS | 1.00-2.50 | 0.17-0.36 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| P Semi-finishing | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



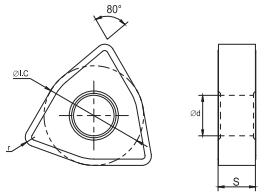
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 16 | 9.525 | 4.76 | 3.81 | 0.4-1.2 |
| | | | | |

35° VN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | | | | | | | |
|  | VNMG160404-BF | 0.25-3.30 | 0.05-0.15 | | | | | | | | | ● | ○ | ● | | ○ | | | | | | | |
| | VNMG160408-BF | 0.55-3.30 | 0.10-0.30 | | | | | | | | | ● | ○ | ● | | ○ | | | | | | | |
| | VNMG160412-BF | 0.75-3.30 | 0.15-0.45 | | | | | | | | | ● | ○ | ● | | ○ | | | | | | | |
| M Finishing | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



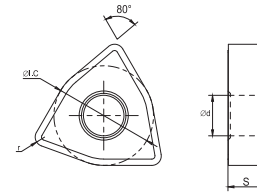
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 8 | 12.7 | 4.76 | 5.16 | 0.4-1.2 |

80° WN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|---|---------------|----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | | |
|  | WNMG080404-AF | 0.26-2.2 | 0.05-0.15 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | WNMG080408-AF | 0.52-2.2 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | WNMG080412-AF | 0.78-2.2 | 0.15-0.45 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| P Finishing | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



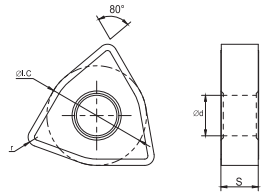
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 8 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |

80° WN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | | |
|  | WNMG080404-AS | 0.60-4.30 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | WNMG080408-AS | 1.20-4.30 | 0.20-0.60 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | WNMG080412-AS | 1.80-4.30 | 0.30-0.90 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| | WNMG080416-AS | 2.40-4.30 | 0.40-1.20 | ● | ○ | ● | | ○ | ○ | | | | | | | | | | | | | | |
| P Semi-finishing | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



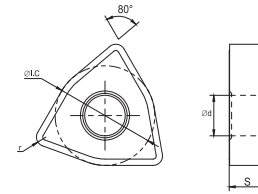
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 6 | 9.525 | 4.76 | 3.81 | 0.8-1.2 |
| 8 | 12.7 | 4.76 | 5.16 | 0.8-1.2 |

80° WN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|---------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | | | | | | | | |
| P Roughing | WNMG060408-AR | 0.80-4.00 | 0.15-0.50 | | | ● | ○ | | | | | | | | | | | | | | | | |
| | WNMG060412-AR | 0.80-4.00 | 0.15-0.50 | | | ● | ○ | | | | | | | | | | | | | | | | |
| | WNMG080408-AR | 0.80-4.50 | 0.15-0.55 | | | ● | ○ | | | | | | | | | | | | | | | | |
| | WNMG080412-AR | 0.80-4.50 | 0.20-0.55 | | | ● | ○ | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Negative Inserts



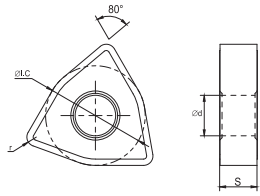
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 6 | 9.525 | 4.76 | 3.81 | 0.4-0.8 |
| 8 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |

80° WN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | |
|----------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | | | | | | | |
| M Finishing | WNMG060404-BF | 0.25-2.40 | 0.05-0.15 | | | | | | | | | | | | | | | | | | | | |
| | WNMG060408-BF | 0.50-2.40 | 0.10-0.30 | | | | | | | | | | | | | | | | | | | | |
| | WNMG080404-BF | 0.25-3.20 | 0.05-0.15 | | | | | | | | | | | | | | | | | | | | |
| | WNMG080408-BF | 0.50-3.20 | 0.10-0.30 | | | | | | | | | | | | | | | | | | | | |
| | WNMG080412-BF | 0.75-3.20 | 0.15-0.45 | | | | | | | | | | | | | | | | | | | | |
| | WNMG080416-BF | 1.05-3.20 | 0.20-0.60 | | | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



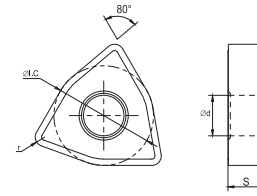
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 6 | 9.525 | 4.76 | 3.81 | 0.4-0.8 |
| 8 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |

80° WN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|
| | | | | CVD | | | | PVD | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | |
|  M Semi-finishing | WNMG060404-BM | 0.30-2.10 | 0.10-0.30 | | | | | | | | | | | | | | |
| | WNMG060408-BM | 0.65-2.10 | 0.15-0.45 | | | | | | | | | | | | | | |
| | WNMG080404-BM | 0.30-2.90 | 0.10-0.30 | | | | | | | | | | | | | | |
| | WNMG080408-BM | 0.65-2.90 | 0.15-0.45 | | | | | | | | | | | | | | |
| | WNMG080412-BM | 0.95-2.90 | 0.20-0.60 | | | | | | | | | | | | | | |
| | WNMG080416-BM | 1.25-2.90 | 0.25-0.75 | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



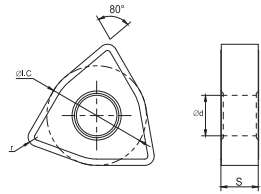
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 6 | 9.525 | 4.76 | 3.81 | 0.4-0.8 |
| 8 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |

80° WN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|
| | | | | CVD | | | | PVD | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5140 | OTO1010 | OTO1525 | | | | |
|  M Roughing | WNMG060404-BR | 0.30-2.10 | 0.10-0.30 | | | | | | | | | | | | | | |
| | WNMG060408-BR | 0.65-2.10 | 0.15-0.45 | | | | | | | | | | | | | | |
| | WNMG080404-BR | 0.30-2.90 | 0.10-0.30 | | | | | | | | | | | | | | |
| | WNMG080408-BR | 0.65-2.90 | 0.15-0.45 | | | | | | | | | | | | | | |
| | WNMG080412-BR | 0.95-2.90 | 0.20-0.60 | | | | | | | | | | | | | | |
| | WNMG080416-BR | 1.25-2.90 | 0.25-0.75 | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



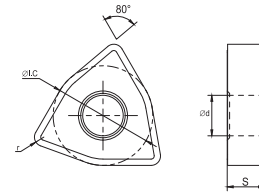
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 8 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |

80° WN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|-------|---------|---------|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | | | | | | | | | |
| | | | | | OTO3315 | OTO3415 | | | | | | | | | | | | |
|  K Semi-finishing | WNMG080404-CM | 0.08-0.25 | 0.40-2.90 | | ● | ● | | | | | | | | | | | | |
| | WNMG080408-CM | 0.15-0.45 | 0.80-2.90 | | ● | ● | | | | | | | | | | | | |
| | WNMG080412-CM | 0.25-0.66 | 1.20-2.90 | | ● | ● | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Negative Inserts



| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 8 | 12.7 | 4.76 | 5.16 | 0.4-1.6 |

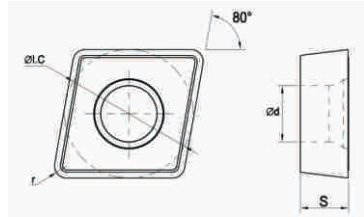
80° WN□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|--|--|
| | | | | CVD | | | | PVD | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | | |
|  S Semi-finishing | WNMG080404-DM | 0.40-4.30 | 0.08-0.25 | | | | | | ○ | | | ○ | ○ | | ● | | |
| | WNMG080408-DM | 0.80-4.30 | 0.15-0.45 | | | | | | ○ | | | ○ | ○ | | ● | | |
| | WNMG080412-DM | 1.20-4.30 | 0.25-0.66 | | | | | | ○ | | | ○ | ○ | | ● | | |
| | WNMG080416-DM | 1.60-4.30 | 0.30-0.90 | | | | | | ○ | | | ○ | ○ | | ● | | |

Note: ●Recommended grade ready to stock


A Turning Inserts

Positive Inserts



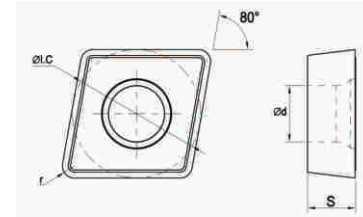
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 6 | 3.65 | 2.38 | 2.8 | 0.4-0.8 |
| 9 | 9.525 | 3.97 | 4.4 | 0.4-0.8 |
| 12 | 12.7 | 4.76 | 5.56 | 0.4-1.2 |

80° CC□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | CVD | | | | | PVD | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | OTO1010 | OTO1525 |
|  General Semi-finishing | CCMT060204-GM | 0.40-2.10 | 0.05-0.18 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | CCMT060208-GM | 0.80-2.10 | 0.10-0.35 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | CCMT09T304-GM | 0.40-3.80 | 0.05-0.18 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | CCMT09T308-GM | 0.80-3.20 | 0.10-0.35 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | CCMT120404-GM | 0.40-4.30 | 0.05-0.18 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | CCMT120408-GM | 0.80-4.30 | 0.10-0.35 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | CCMT120412-GM | 1.20-4.30 | 0.15-0.55 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |


Note: ●Recommended grade ready to stock

Positive Inserts



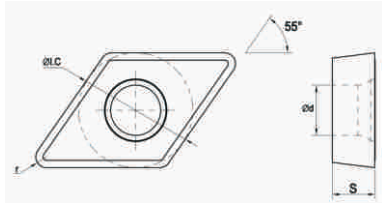
| Length | Size(mm) | | | |
|--------|----------|------|-----|---------|
| | IC | S | d | r |
| 6 | 3.65 | 2.38 | 2.8 | 0.4-0.8 |
| 9 | 9.525 | 3.97 | 4.4 | 0.4-0.8 |
| | | | | |

80° CC□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|---|--|--|
| | | | | CVD | | | | | PVD | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | | | | |
|  M Finishing | CCMT060204-GF | 0.30-1.60 | 0.05-0.15 | | | | | | | | ● | ○ | ● | | ○ | ○ | | |
| | CCMT060208-GF | 0.60-1.60 | 0.10-0.30 | | | | | | | | ● | ○ | ● | | ○ | ○ | | |
| | CCMT09T304-GF | 0.30-2.20 | 0.05-0.15 | | | | | | | | ● | ○ | ● | | ○ | ○ | | |
| | CCMT09T308-GF | 0.60-2.40 | 0.10-0.30 | | | | | | | | ● | ○ | ● | | ○ | ○ | | |
| | | | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Positive Inserts



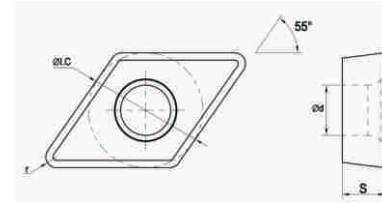
| Length | Size(mm) | | | |
|--------|----------|------|-----|---------|
| | IC | S | d | r |
| 7 | 6.35 | 2.38 | 2.8 | 0.4-0.8 |
| 11 | 9.525 | 3.97 | 4.4 | 0.4-1.2 |

55° DC□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | |
|------------------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | CVD | | | | | PVD | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | OTO1010 | OTO1525 |
| General Semi-finishing | DCMT070204-GM | 0.40-2.30 | 0.05-0.20 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | DCMT070208-GM | 0.80-2.30 | 0.10-0.35 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | DCMT11T304-GM | 0.40-3.50 | 0.05-0.20 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | DCMT11T308-GM | 0.80-3.50 | 0.20-0.35 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | DCMT11T312-GM | 1.20-3.50 | 0.25-0.55 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Positive Inserts



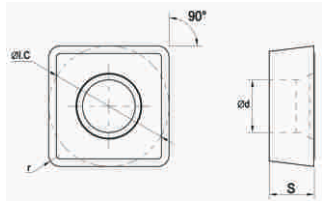
| Length | Size(mm) | | | |
|--------|----------|------|-----|---------|
| | IC | S | d | r |
| 7 | 6.35 | 2.38 | 2.8 | 0.4-0.8 |
| 11 | 9.525 | 3.97 | 4.4 | 0.4-1.2 |

55° DC□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | |
|-------------|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|
| | | | | CVD | | | | | PVD | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | |
| M Finishing | DCMT070204-GF | 0.30-1.50 | 0.05-0.15 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | DCMT070208-GF | 0.60-1.50 | 0.05-0.20 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | DCMT11T304-GF | 0.30-2.30 | 0.02-0.10 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | DCMT11T308-GF | 0.60-2.30 | 0.05-0.26 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | DCMT11T312-GF | 0.90-2.30 | 0.20-0.30 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Positive Inserts



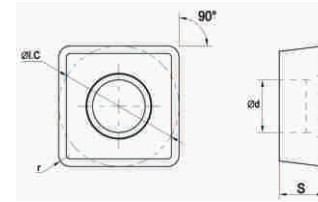
| Length | Size(mm) | | | |
|--------|----------|------|------|---------|
| | IC | S | d | r |
| 9 | 9.525 | 3.97 | 4.4 | 0.4-0.8 |
| 12 | 12.7 | 4.76 | 5.56 | 0.4-1.2 |

90° SC□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | CVD | | | | | PVD | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | OTO1010 | OTO1525 |
|  | SCMT09T304-GM | 0.40-3.10 | 0.05-0.20 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | SCMT09T308-GM | 0.80-3.10 | 0.10-0.35 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | SCMT120404-GM | 0.40-4.20 | 0.05-0.20 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | SCMT120408-GM | 0.80-4.20 | 0.10-0.30 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | SCMT120412-GM | 1.20-4.20 | 0.15-0.55 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| General Semi-finishing | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Positive Inserts



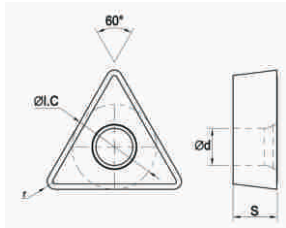
| Length | Size(mm) | | | |
|--------|----------|------|-----|---------|
| | IC | S | d | r |
| 9 | 9.525 | 3.97 | 4.4 | 0.4-0.8 |

90° SC□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|
| | | | | CVD | | | | | PVD | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | |
|  | SCMT09T304-GF | 0.30-2.40 | 0.05-0.15 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | SCMT09T308-GF | 0.60-2.40 | 0.10-0.30 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| M Finishing | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Positive Inserts



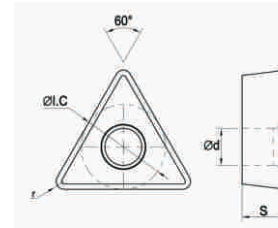
| Length | Size(mm) | | | |
|--------|----------|------|-----|---------|
| | IC | S | d | r |
| 9 | 5.56 | 2.38 | 2.2 | 0.4-0.8 |
| 11 | 6.35 | 2.38 | 2.8 | 0.4-1.2 |
| 16 | 9.525 | 3.97 | 4.4 | 0.4-1.2 |

60° TC□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | |
|---|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | CVD | | | | | PVD | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | OTO1010 | OTO1525 |
|  General Semi-finishing | TCMT090204-GM | 0.40-2.90 | 0.05-0.20 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | TCMT090208-GM | 0.80-2.90 | 0.10-0.35 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | TCMT110204-GM | 0.40-3.30 | 0.05-0.20 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | TCMT110208-GM | 0.80-3.30 | 0.10-0.35 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | TCMT110212-GM | 1.20-3.30 | 0.15-0.55 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | TCMT16T304-GM | 0.40-4.90 | 0.05-0.20 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | TCMT16T308-GM | 0.80-4.90 | 0.10-0.35 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | TCMT16T312-GM | 1.20-4.90 | 0.15-0.55 | ● | ○ | ● | | ○ | ○ | | ● | ○ | | ○ |
| | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Positive Inserts



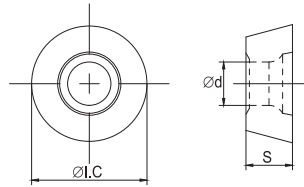
| Length | Size(mm) | | | |
|--------|----------|------|-----|---------|
| | IC | S | d | r |
| 9 | 5.56 | 2.38 | 2.2 | 0.4-0.8 |
| 11 | 6.35 | 2.38 | 2.8 | 0.4-1.2 |
| 16 | 9.525 | 3.97 | 4.4 | 0.4-1.2 |

60° TC□□ With Hole

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | |
|--|---------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|
| | | | | CVD | | | | | PVD | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO5120 | OTO5525 | OTO5133 | OTO5130 | OTO5140 | OTO1010 | OTO1520 | OTO1525 | |
|  M Finishing | TCMT090204-GF | 0.30-1.80 | 0.05-0.15 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | TCMT090208-GF | 0.60-2.20 | 0.10-0.30 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | TCMT110204-GF | 0.30-2.20 | 0.05-0.15 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | TCMT110208-GF | 0.60-3.30 | 0.10-0.30 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | TCMT110212-GF | 1.20-3.30 | 0.20-0.40 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | TCMT16T304-GF | 0.30-3.30 | 0.05-0.15 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | TCMT16T308-GF | 0.60-3.30 | 0.10-0.30 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | TCMT16T312-GF | 1.20-3.30 | 0.10-0.40 | | | | | | | | ● | ○ | ● | | ○ | ○ |
| | | | | | | | | | | | | | | | | |


Note: ●Recommended grade ready to stock

Train Wheel Turning Inserts



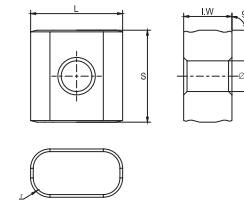
| Length | Size(mm) | | |
|--------|----------|------|------|
| | IC | S | d |
| 8 | 8 | 3.18 | 3.36 |
| 10 | 10 | 3.18 | 4.4 |
| 12 | 12.7 | 4.76 | 4.4 |
| 16 | 16 | 6.35 | 5.5 |
| 20 | 20 | 6.35 | 6.5 |
| 25 | 25 | 7.94 | 7.2 |
| 32 | 32 | 9.52 | 9.5 |

RC□□ With Hole


| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | |
|--|------------|------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | | | | | | | | |
|  Train Wheel Profiling | RCMX0803MO | 0.50-3.00 | 0.15-0.40 | ● | | ● | | | | | | | | | | | | | | | |
| | RCMX1003MO | 1.50-4.00 | 0.25-0.50 | ● | | ● | | | | | | | | | | | | | | | |
| | RCMX1204MO | 2.50-5.00 | 0.30-0.60 | ● | | ● | | | | | | | | | | | | | | | |
| | RCMX1606MO | 3.00-7.00 | 0.40-0.75 | ● | | ● | | | | | | | | | | | | | | | |
| | RCMX2006MO | 3.50-9.00 | 0.48-0.90 | ● | | ● | | | | | | | | | | | | | | | |
| | RCMX2507MO | 4.00-12.00 | 0.55-1.20 | ● | | ● | | | | | | | | | | | | | | | |
| | RCMX3209MO | 5.00-15.00 | 0.65-1.50 | ● | | ● | | | | | | | | | | | | | | | |

Note: ● Recommended grade ready to stock

Train Wheel Turning Inserts

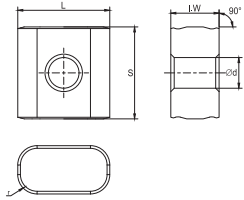


| Length | Size(mm) | | | | |
|--------|----------|-----|-------|------|---|
| | L | I.W | S | d | r |
| 19 | 19.05 | 10 | 19.05 | 6.35 | 4 |
| | | | | | |
| | | | | | |


| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | |
|---|------------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|
| | | | | CVD | | | | | PVD | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | | | | | | |
|  Train Wheel Trimming | 175.32-191940-28 | 2.00-5.00 | 0.20-0.60 | ● | | ● | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
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Note: ● Recommended grade ready to stock

Train Wheel Turning Inserts

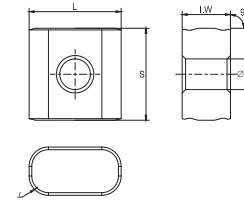


| Length | Size(mm) | | | | |
|--------|----------|-----|-------|------|---|
| | L | I.W | S | d | r |
| 19 | 19.05 | 10 | 19.05 | 6.35 | 4 |
| | | | | | |
| | | | | | |


| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | | |
|---|------------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | | | | | | | | | |
|  Train Wheel Trimming | 175.32-191940-22 | 2.00-5.00 | 0.20-0.60 | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | |

Note: ●Recommended grade ready to stock

Train Wheel Turning Inserts



| Length | Size(mm) | | | | |
|--------|----------|-----|-------|------|---|
| | L | I.W | S | d | r |
| 19 | 19.05 | 10 | 19.05 | 6.35 | 4 |
| | | | | | |
| | | | | | |

| Shape | Type | Ap (mm) | Fn (mm/rev) | Grade | | | | | | | | | | | | | | | | | | | | |
|---|------------------|-----------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|--|--|
| | | | | CVD | | | | | | PVD | | | | | | | | | | | | | | |
| | | | | OTO8215 | OTO8315 | OTO8225 | OTO8325 | OTO8235 | OTO8335 | OTO8235 | OTO8335 | OTO5120 | OTO5525 | OTO5130 | OTO5140 | | | | | | | | | |
|  Train Wheel Trimming | 175.32-191940-24 | 2.00-5.00 | 0.20-0.60 | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
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Note: ●Recommended grade ready to stock