

High-Rake, General-Purpose Face Milling Cutter

SEC-WAVEMILL WGX Series

Rev.10

**Unique chipbreaker design
achieves low cutting force and
high-quality surface finish**



Next-Generation Coated Carbide Grades for Milling

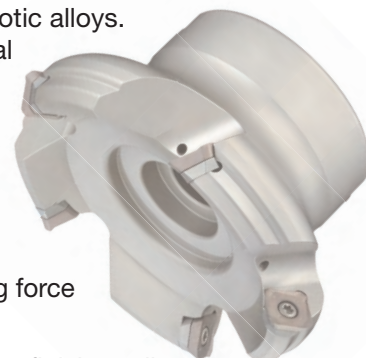
Expansion

XCU2500/XCK2000 now available for WGX series



General Features

SEC-WaveMill WGX Type employs a unique chipbreaker design to provide lower cutting force and higher-quality surface finish than conventional cutters. Lineup of insert grades and chipbreakers has been significantly expanded, and employment of the ACM series enables machining of stainless steel and exotic alloys. Also applicable to any work material using the general-purpose grade ACU2500 or the new generation coated carbide grades XCU2500/XCK2000.

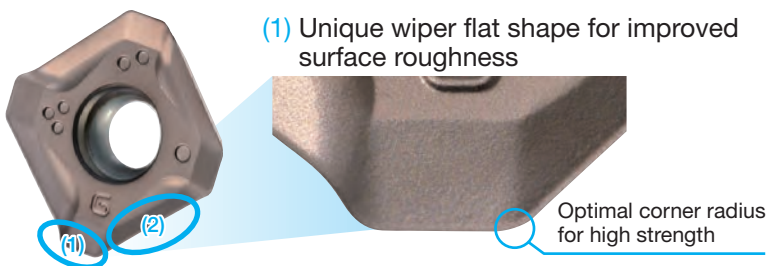


Features

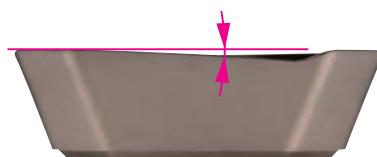
- Reduced Cutting Force
 - High-rake chipbreaker designed for use with the WGX type achieves low cutting force
- High Quality
 - Improved runout precision and unique wiper flat shape ensure excellent surface finish quality
 - Additional edge chamfer reduces burrs and edge chipping
- Wide Ranging Product Lineup
 - A wide selection of grades along with 4 types of chipbreakers and wiper inserts are available.
 - Can be used for a wide variety of machining applications.

Insert Shape Features

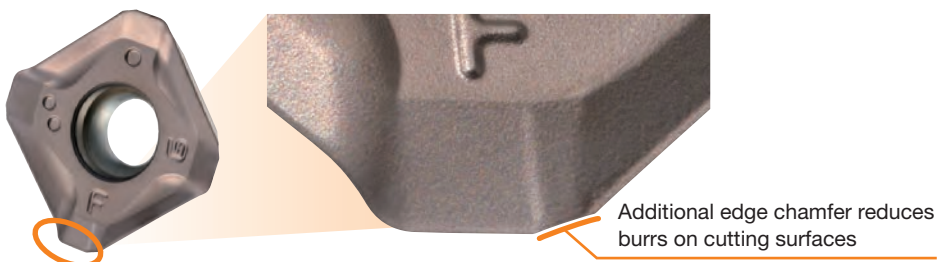
- General-purpose G Type Chipbreaker



- (2) Large rake angle and cutting edge rake angle for improved sharpness



- FG Type Chipbreaker with Low-Burr Design



Product Range

| Type | Cat. No. | Description | Dia. (mm) | | | | | | | | | |
|-------|------------------------------------------------------------------------------------------------|------------------|-----------|-----|-----|-----|-----|------|------|------|------|------|
| | | | ø32 | ø40 | ø50 | ø63 | ø80 | ø100 | ø125 | ø160 | ø200 | ø250 |
| Shell | WGX13000R  | Standard Pitch | | | | | 4 | 5 | 6 | 7 | 8 | 10 |
| | WGX13000RS | Standard Pitch | | 3 | 3 | 4 | 4 | 5 | 6 | 7 | 8 | 10 |
| | WGXM13000R  | Fine Pitch | | | | | 6 | 7 | 8 | 10 | 12 | 14 |
| | WGXM13000RS | Fine Pitch | | | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 14 |
| | WGXF13000R  | Extra Fine Pitch | | | | | 8 | 10 | 12 | 16 | 20 | 24 |
| | WGXF13000RS | Extra Fine Pitch | | | 5 | 6 | 8 | 10 | 12 | 16 | 20 | 24 |
| Shank | WGX13000EW | Shank Type | 3 | 3 | 4 | 5 | | | | | | |

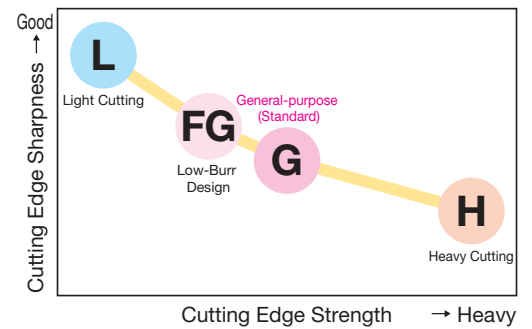
Number in ● shows the number of teeth  Inch Bore Sizes of ø125mm and below have coolant holes



Chipbreaker Selection

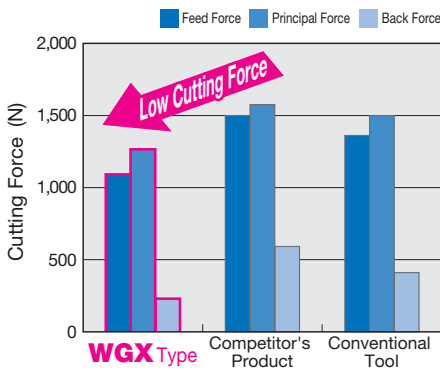
| | | | | | |
|----------------------------|-------------------|-------------------------------------|-----------------|---------------|------------------------------|
| Work Material | P M K S N | P M K S | | | P K |
| Applications | Light Cutting | General-purpose/ Burr Prevention | General-purpose | Heavy Cutting | Surface Finish Emphasised |
| Features | Low Cutting Force | Standard / With Chamfer | Standard | High Strength | Wiper |
| Chipbreaker | L Type | FG Type | G Type | H Type | W Type |
| Cutting Edge Cross Section | 0.05mm 25° | 0.15mm 20° | 0.15mm 20° | 0.2mm 15° | |

Chipbreaker Selection Guide



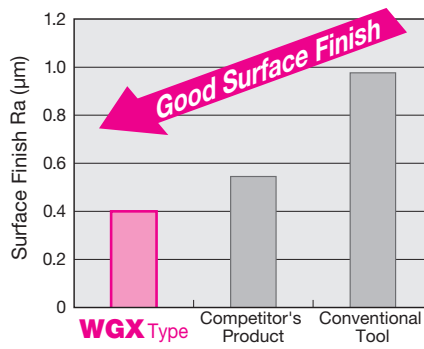
General-purpose G Type Chipbreaker

● Comparison of Cutting Force



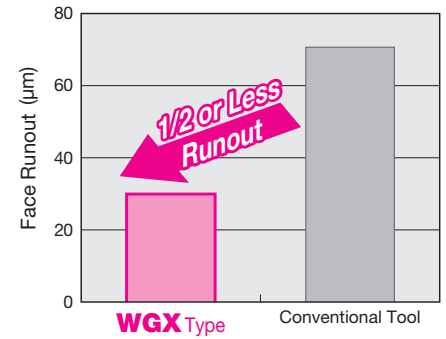
Work Material: S50C, Tool: $\phi 100$
 Cutting Conditions: $v_c = 200\text{m/min}$, $f_z = 0.2\text{mm/t}$, $a_p = 3.0\text{mm}$

● Surface Finish Comparison



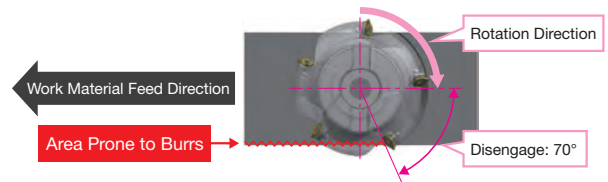
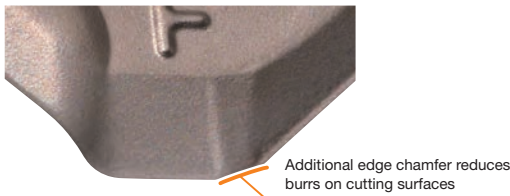
Work Material: S50C, Tool: $\phi 100$
 Cutting Conditions: $v_c = 200\text{m/min}$, $f_z = 0.2\text{mm/t}$, $a_p = 3.0\text{mm}$

● Runout with Insert Attached



Tool: WGXM13100R ($\phi 100$)
 Number of Teeth: 7

FG Type Chipbreaker with Low-Burr Design



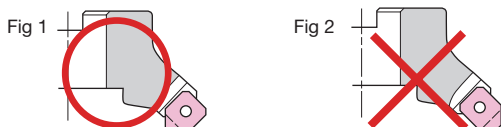
● Machined Surface Comparison

| Work Material | FG Type | G Type | Conventional Tool | Competitor's Product |
|---------------|---------|--------|-------------------|----------------------|
| S50C | | | | |
| SUS304 | | | | |
| SCM440 | | | | |

Machine: Machining Centre BT50
 Tool: WGX13100R ($\phi 100$),
 Insert Grade: ACP200
 Cutting Conditions:
 $v_c = 200\text{m/min}$,
 $f_z = 0.2\text{mm/t}$,
 $a_p = 3.0\text{mm}$,
 $a_e = 80\text{mm Dry}$

Precautions when Using Wiper Inserts with Holes

- When mounting the wiper insert, attach it as shown in Fig 1. When mounted as shown in Fig 2, normal machined surface roughness cannot be obtained.



- The wiper insert has a single corner specification.
- For milling with wiper inserts, see "The Basics of Milling, Milling Edition" in Chapter N of the General Catalogue.

■ **Insert Grades Selection Guide**

New-generation coated carbide grades **XCU2500/XCK2000** now available!
 Enhanced lineup of coated grades in addition to cemented carbide and cermet for milling steel, stainless steel, cast iron, and aluminum alloy

| Work Material | Finishing to Light Cutting | Medium Cutting | Rough to Heavy Cutting |
|-----------------------------|-----------------------------------------------------------|----------------|------------------------|
| P Steel | Coated Carbide ACU2500 XCU2500 ACP100 | ACP200 | ACP300 |
| | Cermet T4500A | | |
| M Stainless Steel | Coated Carbide ACU2500 XCU2500 ACM200 | ACM300 | |
| | Cermet T4500A | | |
| K Cast Iron | Coated Carbide ACU2500 XCU2500 XCK2000 ACK200 | ACK300 | |
| | Cemented Carbide DL1000 | H1 | |

The letters "C" and "P" at the end of each grade indicate the coating type. ▽: CVD ▲: PVD

■ **Grade Features**

New ABSOTECH™ (absolute technology) coating technology that realises absolute stability

ABSOTECH **PVD**

New Super Multi-Layered Structure
 Higher hardness and twice the conventional wear resistance due to a fine crystal structure AlTiCrBN-based nano-layered coating

High Adhesion Strength
 Coating adhesion significantly increased for twice or more the conventional chipping resistance

Applicable Grades: **ACU2500**

ABSOTECH **CVD**

Pure Cubic Crystal AlTiN with High Al Content
 With proprietary structural control technology, differently composed layers of AlTiN are stacked at the nanometre level.
 With a high-Al composition containing over 80% Al on average, it also maintains a cubic crystalline structure to achieve excellent thermal resistance and high hardness.
 Vastly improved wear resistance.

Special Surface Treatment
 Proprietary surface treatment introduces high compression stress to the coating, suppressing the development of cracks.
 Greatly improved fracture and thermal crack resistance.

Applicable Grades: **XCU2500, XCK2000**

ACP200/ACP300/ACK300/ACM300

NEW SUPER ZX COAT

Realises superb stability due to a carbide substrate optimised for steel, cast iron, and stainless steel with a highly chipping-resistant coating.

ACP100/ACK200/ACM200

SUPER FF COAT

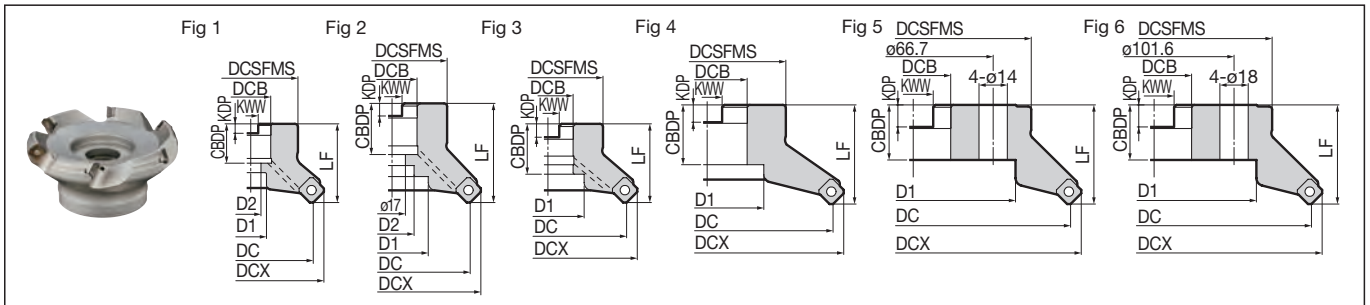
Realises superb stability in high-efficiency machining due to a carbide substrate optimised for steel, cast iron, and stainless steel with a highly wear-resistant coating.

DL1000

AURORA Coat (DLC (Diamond-like Carbon))

Second only to diamond in terms of hardness, this flat and smooth coating has a low coefficient of friction and provides excellent adhesion resistance to deliver better machined surface quality.

| | | | | |
|------------|--------|--------------|-----|-----|
| Rake Angle | Radial | -20° to -24° | 6mm | 45° |
| | Axial | 20° to 22° | | |



Body (Standard Pitch)

| Cat. No. | Stock | Dia. DC | Max. Dia. DCX | Boss DCSFMS | Height LF | Hole Dia. DCB | Keyway Width KWW | Keyway Depth KDP | Mounting Depth CDBP | Bolt D1 | Bolt D2 | Number of Teeth | Weight (kg) | Dimensions (mm) | |
|--------------------|-------|---------|---------------|-------------|-----------|---------------|------------------|------------------|---------------------|---------|---------|-----------------|-------------|-----------------|-----|
| | | | | | | | | | | | | | | | Fig |
| WGX 13040RS | ● | 40 | 52 | 32 | 40 | 16 | 8.4 | 5.6 | 18 | 14 | 9 | 3 | 0.3 | 1 | |
| 13050RS | ● | 50 | 62 | 40 | 40 | 22 | 10.4 | 6.3 | 20 | 18 | 11 | 3 | 0.4 | 1 | |
| 13063RS | ● | 63 | 76 | 50 | 40 | 22 | 10.4 | 6.3 | 20 | 18 | 11 | 4 | 0.6 | 1 | |
| 13080RS | ● | 80 | 93 | 55 | 50 | 27 | 12.4 | 7 | 25 | 20 | 13.5 | 4 | 1.2 | 1 | |
| 13100RS | ● | 100 | 113 | 70 | 50 | 32 | 14.4 | 8.5 | 32 | 46 | — | 5 | 1.6 | 3 | |
| 13125RS | ● | 125 | 138 | 80 | 63 | 40 | 16.4 | 9.5 | 29 | 52 | 29 | 6 | 2.8 | 1 | |
| 13160RS | ● | 160 | 173 | 130 | 63 | 40 | 16.4 | 9.5 | 29 | 88 | — | 7 | 4.5 | 5 | |
| 13200RS | ● | 200 | 213 | 150 | 63 | 60 | 25.7 | 14 | 35 | 130 | — | 8 | 7.1 | 6 | |
| 13250RS | ● | 250 | 263 | 190 | 63 | 60 | 25.7 | 14 | 35 | 160 | — | 10 | 11.2 | 6 | |
| WGX 13080R | ● | 80 | 93 | 60 | 50 | 25.4 | 9.5 | 6 | 25 | 20 | 13 | 4 | 1.2 | 1 | |
| 13100R | ● | 100 | 113 | 70 | 63 | 31.75 | 12.7 | 8 | 32.5 | 46 | 28 | 5 | 2.3 | 2 | |
| 13125R | ● | 125 | 138 | 80 | 63 | 38.1 | 15.9 | 10 | 35.5 | 55 | 30 | 6 | 2.9 | 1 | |
| 13160R | ● | 160 | 173 | 100 | 63 | 50.8 | 19.1 | 11 | 38 | 72 | — | 7 | 4.5 | 4 | |
| 13200R | ● | 200 | 213 | 150 | 63 | 47.625 | 25.4 | 14 | 35 | 130 | — | 8 | 7.1 | 6 | |
| 13250R | ● | 250 | 263 | 190 | 63 | 47.625 | 25.4 | 14 | 35 | 150 | — | 10 | 11.2 | 6 | |

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter. Sizes ≥ 160 mm and above do not have coolant holes.

For mounting the $\phi 80$ and $\phi 100$ mm sized cutters marked with * to an arbor, use a JIS B1176 hex socket bolt ($\phi 80$: M12 x 30 to 35mm, $\phi 100$: M16 x 40 to 45mm).

Insert

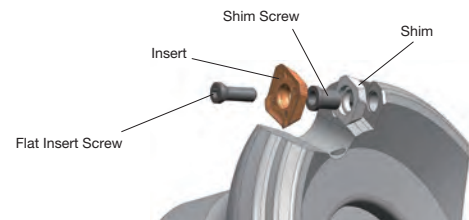
| Grade Classification | Coated Carbide | | | | | | Cemented Carbide | DLC | Cermet | Application | | Fig | | | |
|-------------------------|------------------|----------------|----------|--------|--------|---------|------------------|--------|--------|-------------|----|--------|--------|----------------------------------------|---|
| | High-speed/Light | Medium Cutting | Roughing | | | | | | | | | | | | |
| Cat. No. | ACU2500 | XCU2500 | ACP100 | ACP200 | ACP300 | XCK2000 | ACK200 | ACK300 | ACM200 | ACM300 | H1 | DL1000 | T4500A | | |
| SEET 13T3AGFR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Light Cutting (For Non-Ferrous Metals) | 1 |
| 13T3AGSR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Light Cutting | 1 |
| 13T3AGSR-G | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | General-purpose | 1 |
| SEMT 13T3AGSR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Light Cutting | 1 |
| 13T3AGSR-G | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | General-purpose | 1 |
| 13T3AGSR-H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Heavy Cutting | 1 |
| 13T3AGSR-FG | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Low-burr Design | 2 |
| XEEW 13T3AGER-WR | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Wiper Insert | 3 |

The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance. Refer to P3 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Identification Code

WGX 13 040 R S

Series Insert Size Cutter Dia. Feed Direction Metric Bore



Parts

| Applicable Cutter | Shim | Shim Screw | Wrench | Flat Insert Screw | Integrated Wrench | Detachable Wrench | | Anti-seizure Cream |
|-----------------------------------------|---------|------------|--------|-------------------|---------------------------|-------------------|---------|--------------------|
| | | | | | | Handle Grip | Bit | |
| DC $\phi 40$ to 125 Other than above | WGCS13R | BW0507F | LH035 | BFTX03512IP | Nm 3.0 TRDR151P | HPS1015 | TRB151P | SUMI-P |

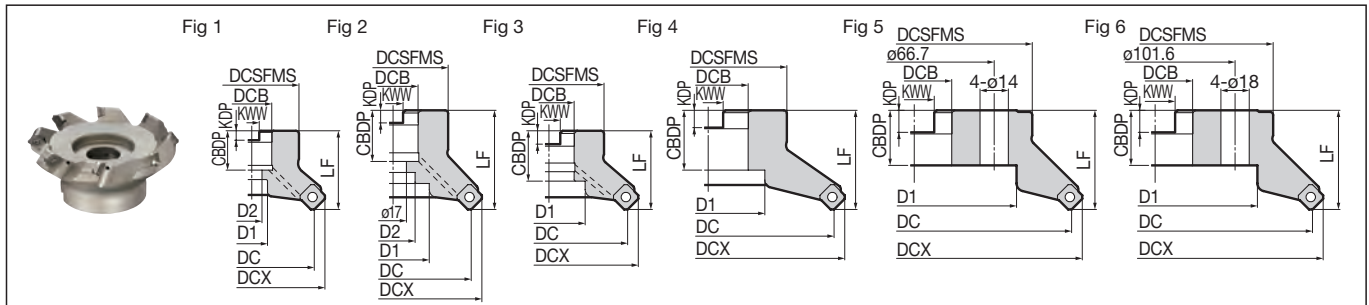
Nm Recommended Tightening Torque (N-m) ● mark: Standard stocked item ● mark: Standard stocked item (expanded item) Blank: Made-to-order item

Recommended Cutting Conditions

| ISO | Work Material | Hardness | Cutting Speed v_c (m/min) Min. - Optimum - Max | Feed Rate f_z (mm/t) Min. - Optimum - Max. | Insert Grade |
|-----|-------------------|---------------|-----------------------------------------------------|-------------------------------------------------|-----------------------------------------|
| P | General Steel | 180 to 280 HB | 150-200-250 | 0.10-0.20-0.30 | ACU2500 |
| | Mild Steel | ≤ 180 HB | 180-270-350 | 0.10-0.25-0.40 | ACP200 |
| | Die Steel | 200 to 220 HB | 100-150-200 | 0.15-0.20-0.25 | XCU2500 |
| M | Stainless Steel | — | 160-210-250 | 0.15-0.23-0.30 | ACU2500 ACM300 |
| K | Cast Iron | 250HB | 100-180-250 | 0.15-0.23-0.30 | ACU2500 ACK200 XCU2500 XCK2000 |
| N | Non-Ferrous Alloy | — | 500-750-1,000 | 0.15-0.23-0.30 | DL1000 |
| S | Exotic Alloy | — | 30-50-80 | 0.10-0.20-0.30 | ACU2500 ACM300 |

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

| | | | |
|-------|--------|--------------|--|
| Rake | Radial | -20° to -24° | |
| Angle | Axial | 20° to 22° | |



Body (Fine Pitch)

Dimensions (mm)

| Cat. No. | Stock | Dia. DC | Max. Dia. DCX | Boss DCSFMS | Height LF | Hole Dia. DCB | Keyway Width KWW | Keyway Depth KDP | Mounting Depth CDBP | Bolt D1 | Bolt D2 | Number of Teeth | Weight (kg) | Fig |
|---------------|-------|---------|---------------|-------------|-----------|---------------|------------------|------------------|---------------------|---------|---------|-----------------|-------------|-----|
| | | | | | | | | | | | | | | |
| Metric | | | | | | | | | | | | | | |
| WGXM 13050RS | ● | 50 | 62 | 40 | 40 | 22 | 10.4 | 6.3 | 20 | 18 | 11 | 4 | 0.4 | 1 |
| 13063RS | ● | 63 | 77 | 50 | 40 | 22 | 10.4 | 6.3 | 20 | 18 | 11 | 5 | 0.6 | 1 |
| 13080RS | ● | 80 | 94 | 55 | 50 | 27 | 12.4 | 7 | 25 | 20 | 13.5 | 6 | 1.1 | 1 |
| 13100RS | ● | 100 | 114 | 70 | 50 | 32 | 14.4 | 8.5 | 32 | 46 | — | 7 | 1.6 | 3 |
| 13125RS | ● | 125 | 139 | 80 | 63 | 40 | 16.4 | 9.5 | 29 | 52 | 29 | 8 | 2.8 | 1 |
| 13160RS | ● | 160 | 174 | 130 | 63 | 40 | 16.4 | 9.5 | 29 | 88 | — | 10 | 4.5 | 5 |
| 13200RS | ● | 200 | 214 | 150 | 63 | 60 | 25.7 | 14 | 35 | 130 | — | 12 | 7.0 | 6 |
| 13250RS | ● | 250 | 264 | 190 | 63 | 60 | 25.7 | 14 | 35 | 160 | — | 14 | 11.1 | 6 |
| Inch | | | | | | | | | | | | | | |
| WGXM 13080R | ● | 80 | 94 | 60 | 50 | 25.4 | 9.5 | 6 | 25 | 20 | 13 | 6 | 1.1 | 1 |
| 13100R | ● | 100 | 114 | 70 | 63 | 31.75 | 12.7 | 8 | 32.5 | 46 | 28 | 7 | 2.2 | 2 |
| 13125R | ● | 125 | 139 | 80 | 63 | 38.1 | 15.9 | 10 | 35.5 | 55 | 30 | 8 | 2.9 | 1 |
| 13160R | ● | 160 | 174 | 100 | 63 | 50.8 | 19.1 | 11 | 38 | 72 | — | 10 | 4.5 | 4 |
| 13200R | ● | 200 | 214 | 150 | 63 | 47.625 | 25.4 | 14 | 35 | 130 | — | 12 | 7.0 | 6 |
| 13250R | ● | 250 | 264 | 190 | 63 | 47.625 | 25.4 | 14 | 35 | 150 | — | 14 | 11.1 | 6 |

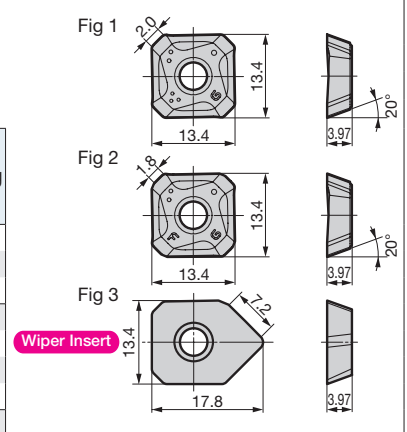
Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter. Sizes ø160mm and above do not have coolant holes.

For mounting the ø80 and ø100mm sized cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

| Grade Classification | Coated Carbide | | | | | | | | Cemented Carbide | DLC | Cermets | Application | Fig |
|----------------------|------------------|----------------|----------|---------|---------|--------|--------|--------|------------------|-----|---------|----------------------------------------|-----|
| | High-speed/Light | Medium Cutting | Roughing | ACU2500 | XCU2500 | ACP100 | ACP200 | ACP300 | | | | | |
| Process | High-speed/Light | Medium Cutting | Roughing | | | | | | | | | | |
| Cat. No. | | | | | | | | | | | | | |
| SEET 13T3AGFR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Light Cutting (For Non-Ferrous Metals) | 1 |
| 13T3AGSR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Light Cutting | 1 |
| 13T3AGSR-G | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | General-purpose | 1 |
| SEMT 13T3AGSR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Light Cutting | 1 |
| 13T3AGSR-G | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | General-purpose | 1 |
| 13T3AGSR-H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Heavy Cutting | 1 |
| 13T3AGSR-FG | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Low-burr Design | 2 |
| XEEW 13T3AGER-WR | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Wiper Insert | 3 |

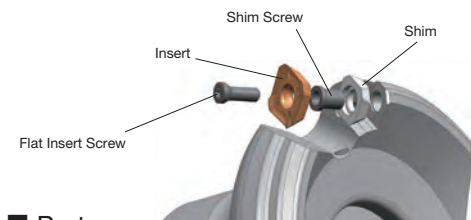


The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance. Refer to P3 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Identification Code

WGXM 13050RS

Series Fine Pitch Insert Size Cutter Dia. Feed Metric Direction Bore



Parts

| Applicable Cutter | Shim | Shim Screw | Wrench | Flat Insert Screw | Integrated Wrench | Detachable Wrench | | Anti-seizure Cream |
|-------------------|---------|------------|--------|-------------------|-------------------|-------------------|---------|--------------------|
| | | | | | | Handle Grip | Bit | |
| DC ø50 to 125 | WGCS13R | BW0507F | LH035 | BFTX03512IP | — | HPS1015 | TRB15IP | SUMI-P |
| Other than above | | | | | TRDR15IP | — | — | |

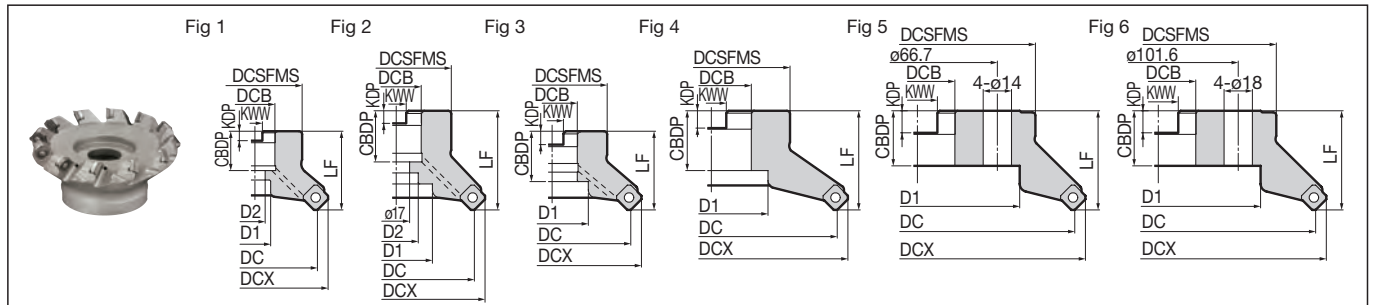
Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (expanded item) Blank: Made-to-order item

Recommended Cutting Conditions

| ISO | Work Material | Hardness | Cutting Speed v _c (m/min) | | Feed Rate f _z (mm/t) | | Insert Grade |
|-----|-------------------|---------------|--------------------------------------|----------------|---------------------------------|----------------|--------------|
| | | | Min. | Optimum - Max. | Min. | Optimum - Max. | |
| P | General Steel | 180 to 280 HB | 150-200 | 250 | 0.10-0.20 | 0.30 | ACU2500 |
| | Mild Steel | ≤ 180HB | 180-270 | 350 | 0.10-0.25 | 0.40 | ACP200 |
| | Die Steel | 200 to 220 HB | 100-150 | 200 | 0.15-0.20 | 0.25 | XCU2500 |
| M | Stainless Steel | — | 160-210 | 250 | 0.15-0.23 | 0.30 | ACU2500 |
| K | Cast Iron | 250HB | 100-180 | 250 | 0.15-0.23 | 0.30 | ACU2500 |
| | | | | | | | XCU2500 |
| | | | | | | | XCK2000 |
| N | Non-Ferrous Alloy | — | 500-750 | 1,000 | 0.15-0.23 | 0.30 | DL1000 |
| S | Exotic Alloy | — | 30-50 | 80 | 0.10-0.20 | 0.30 | ACU2500 |
| | | | | | | | ACM300 |

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

| | | | |
|------------|--------|--------------|--|
| Rake Angle | Radial | -20° to -24° | |
| | Axial | 20° to 22° | |



■ Body (Extra Fine Pitch)

| Cat. No. | Stock | Dia. DC | Max. Dia. DCX | Boss DCSFMS | Height LF | Hole Dia. DCB | Keyway Width KWW | Keyway Depth KDP | Mounting Depth CBDBP | Bolt D1 | Bolt D2 | Number of Teeth | Weight (kg) | Dimensions (mm) |
|---------------------|-------|---------|---------------|-------------|-----------|---------------|------------------|------------------|----------------------|---------|---------|-----------------|-------------|-----------------|
| | | | | | | | | | | | | | | Fig |
| WGXF 13050RS | ● | 50 | 62 | 40 | 40 | 22 | 10.4 | 6.3 | 20 | 18 | 11 | 5 | 0.4 | 1 |
| 13063RS | ● | 63 | 77 | 50 | 40 | 22 | 10.4 | 6.3 | 20 | 18 | 11 | 6 | 0.6 | 1 |
| 13080RS | ● | 80 | 94 | 55 | 50 | 27 | 12.4 | 7 | 25 | 20 | 13.5 | 8 | 1.1 | 1 |
| 13100RS | ● | 100 | 114 | 70 | 50 | 32 | 14.4 | 8.5 | 32 | 46 | — | 10 | 1.5 | 3 |
| 13125RS | ● | 125 | 139 | 80 | 63 | 40 | 16.4 | 9.5 | 29 | 52 | 29 | 12 | 2.7 | 1 |
| 13160RS | ● | 160 | 174 | 130 | 63 | 40 | 16.4 | 9.5 | 29 | 88 | — | 16 | 4.5 | 5 |
| 13200RS | ● | 200 | 214 | 150 | 63 | 60 | 25.7 | 14 | 35 | 130 | — | 20 | 6.9 | 6 |
| 13250RS | ● | 250 | 264 | 190 | 63 | 60 | 25.7 | 14 | 35 | 160 | — | 24 | 11.0 | 6 |
| WGXF 13080R | ● | 80 | 94 | 60 | 50 | 25.4 | 9.5 | 6 | 25 | 20 | 13 | 8 | 1.1 | 1 |
| 13100R | ● | 100 | 114 | 70 | 63 | 31.75 | 12.7 | 8 | 32.5 | 46 | 28 | 10 | 2.1 | 2 |
| 13125R | ● | 125 | 139 | 80 | 63 | 38.1 | 15.9 | 10 | 35.5 | 55 | 30 | 12 | 2.8 | 1 |
| 13160R | ● | 160 | 174 | 100 | 63 | 50.8 | 19.1 | 11 | 38 | 72 | — | 16 | 4.5 | 4 |
| 13200R | ● | 200 | 214 | 150 | 63 | 47.625 | 25.4 | 14 | 35 | 130 | — | 20 | 6.9 | 6 |
| 13250R | ● | 250 | 264 | 190 | 63 | 47.625 | 25.4 | 14 | 35 | 150 | — | 24 | 11.0 | 6 |

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter. Sizes ø160mm and above do not have coolant holes.

For mounting the ø80 and ø100mm sized cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

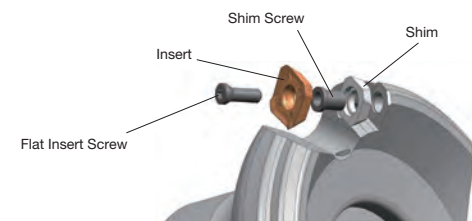
■ Insert

| Grade Classification | Coated Carbide | | | | | | | | Cemented Carbide | DLC | Cermet | Application | Fig | |
|-------------------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|--------|--------|-------------|--------|----------------------------------------|
| | High-speed/Light | Medium Cutting | High-speed/Light | Medium Cutting | High-speed/Light | Medium Cutting | High-speed/Light | Medium Cutting | | | | | | |
| Cat. No. | ACU2500 | XCU2500 | ACP100 | ACP200 | ACP300 | XCK2000 | ACK200 | ACK300 | ACM200 | ACM300 | H1 | DL1000 | T4500A | |
| SEET 13T3AGFR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Light Cutting (For Non-Ferrous Metals) |
| 13T3AGSR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Light Cutting |
| 13T3AGSR-G | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | General-purpose |
| SEMT 13T3AGSR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Light Cutting |
| 13T3AGSR-G | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | General-purpose |
| 13T3AGSR-H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Heavy Cutting |
| 13T3AGSR-FG | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Low-burr Design |
| XEET 13T3AGER-WR | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Wiper Insert |

The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance. Refer to P3 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

■ Identification Code

WGXF 13050RS
 Series: WGXF, Extra Fine Pitch: F, Insert Size: 13, Cutter Dia.: 050, Feed Direction: R, Metric Bore: S



■ Parts

| Applicable Cutter | Shim | Shim Screw | Wrench | Flat Insert Screw | Integrated Wrench | Detachable Wrench | | Anti-seizure Cream |
|-----------------------------------|---------|------------|--------|-------------------|-------------------|-------------------|---------|--------------------|
| | | | | | | Handle Grip | Bit | |
| DC ø50 to 125 Other than above | WGCS13R | BW0507F | LH035 | BFTX03512IP | 3.0 TRDR15IP | HPS1015 | TRB15IP | SUMI-P |

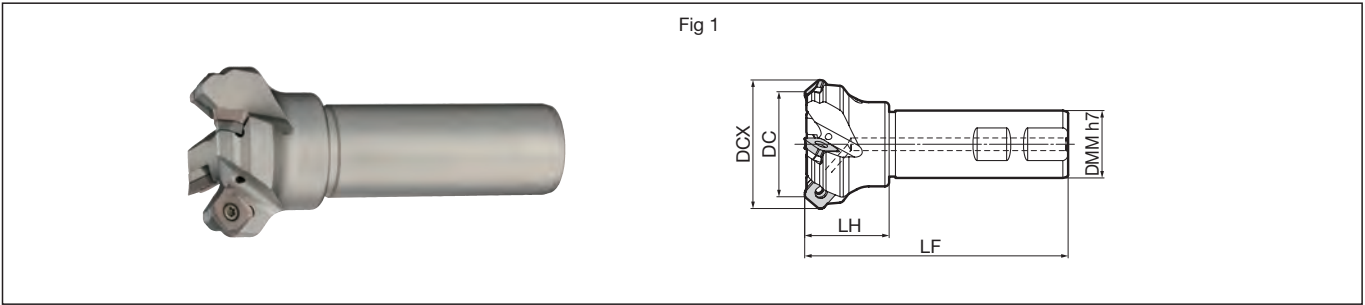
Recommended Tightening Torque (N-m) ● mark: Standard stocked item ● mark: Standard stocked item (expanded item) Blank: Made-to-order item

■ Recommended Cutting Conditions

| ISO | Work Material | Hardness | Cutting Speed v_c (m/min) Min. - Optimum - Max. | Feed Rate f_z (mm/t) Min. - Optimum - Max. | Insert Grade |
|----------|-------------------|---------------|------------------------------------------------------|-------------------------------------------------|-----------------------------------------|
| P | General Steel | 180 to 280 HB | 150-200-250 | 0.10-0.20-0.30 | ACU2500 |
| | Mild Steel | ≤ 180HB | 180-270-350 | 0.10-0.25-0.40 | ACP200 |
| | Die Steel | 200 to 220 HB | 100-150-200 | 0.15-0.20-0.25 | XCU2500 |
| M | Stainless Steel | — | 160-210-250 | 0.15-0.23-0.30 | ACU2500 ACM300 |
| K | Cast Iron | 250HB | 100-180-250 | 0.15-0.23-0.30 | ACU2500 ACK200 XCU2500 XCK2000 |
| N | Non-Ferrous Alloy | — | 500-750-1,000 | 0.15-0.23-0.30 | DL1000 |
| S | Exotic Alloy | — | 30-50-80 | 0.10-0.20-0.30 | ACU2500 ACM300 |

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

| | | | | |
|------------|--------|--------------|-----|-----|
| Rake Angle | Radial | -20° to -24° | 6mm | 45° |
| | Axial | 20° to 22° | | |



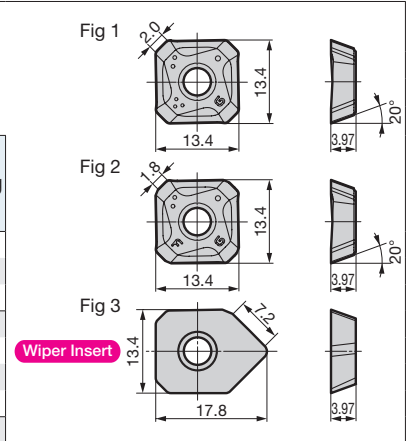
Body (Shank Type)

| | | | | | | | | Dimensions (mm) | |
|--------------------|-------|---------|---------------|-----------|---------|-------------------|-----------------|-----------------|--|
| Cat. No. | Stock | Dia. DC | Max. Dia. DCX | Shank DMM | Head LH | Overall Length LF | Number of Teeth | Fig | |
| WGX 13032EW | ● | 32 | 44 | 32 | 40 | 125 | 3 | 1 | |
| 13040EW | ● | 40 | 52 | 32 | 40 | 125 | 3 | 1 | |
| 13050EW | ● | 50 | 62 | 32 | 40 | 125 | 4 | 1 | |
| 13063EW | ● | 63 | 76 | 32 | 40 | 125 | 5 | 1 | |

Inserts are sold separately. ø32mm size does not have shims.

Insert

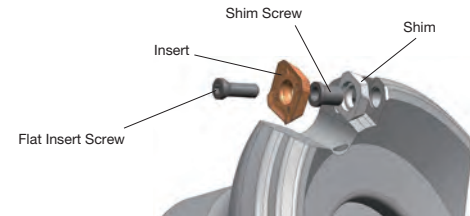
| Grade Classification | | Coated Carbide | | | | | | | | Cemented Carbide | DLC | Cermet | | | | |
|-------------------------|------------------|----------------|---------|--------|--------|--------|---------|--------|--------|------------------|--------|--------|--------|--------|----------------------------------------|-----|
| Process | High-speed/Light | | | | | | | | | | | | | | Application | Fig |
| | Medium Cutting | | | | | | | | | | | | | | | |
| | Roughing | | | | | | | | | | | | | | | |
| Cat. No. | | ACU2500 | XCU2500 | ACP100 | ACP200 | ACP300 | XCK2000 | ACK200 | ACK300 | ACM200 | ACM300 | H1 | DL1000 | T4500A | | |
| SEET 13T3AGFR-L | | | | | | | | | | | | ● | ● | | Light Cutting (For Non-Ferrous Metals) | 1 |
| 13T3AGSR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | Light Cutting | 1 |
| 13T3AGSR-G | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | General-purpose | 1 |
| SEMT 13T3AGSR-L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | Light Cutting | 1 |
| 13T3AGSR-G | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | General-purpose | 1 |
| 13T3AGSR-H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | Heavy Cutting | 1 |
| 13T3AGSR-FG | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | Low-burr Design | 2 |
| XEEW 13T3AGER-WR | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | Wiper Insert | 3 |



The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance. Refer to P3 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Identification Code

WGX Series **13** Insert Size **032** Cutter Dia. **EW** Shank Type



Recommended Cutting Conditions

| ISO | Work Material | Hardness | Cutting Speed v_c (m/min) Min. - Optimum - Max. | Feed Rate f_z (mm/t) Min. - Optimum - Max. | Insert Grade |
|----------|-------------------|---------------|------------------------------------------------------|-------------------------------------------------|-------------------|
| P | General Steel | 180 to 280 HB | 150-200-250 | 0.10-0.20-0.30 | ACU2500 |
| | Mild Steel | ≤ 180HB | 180-270-350 | 0.10-0.25-0.40 | ACP200 |
| | Die Steel | 200 to 220 HB | 100-150-200 | 0.15-0.20-0.25 | XCU2500 |
| M | Stainless Steel | — | 160-210-250 | 0.15-0.23-0.30 | ACU2500 |
| | | | | | ACM300 |
| K | Cast Iron | 250HB | 100-180-250 | 0.15-0.23-0.30 | ACK200 |
| | | | | | XCU2500 |
| | | | | | XCK2000 |
| N | Non-Ferrous Alloy | — | 500-750-1,000 | 0.15-0.23-0.30 | DL1000 |
| S | Exotic Alloy | — | 30-50-80 | 0.10-0.20-0.30 | ACU2500 ACM300 |

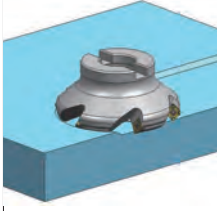
Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

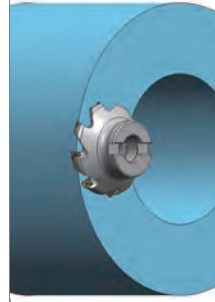
| Applicable Cutter | Shim | Shim Screw | Wrench | Flat Insert Screw | Wrench | Anti-seizure Cream |
|-------------------|---------|------------|--------|-------------------|--------|--------------------|
| WGX13032EW Type | — | — | — | BFTX03512IP | 3.0 | TRDR15IP |
| Other than above | WGCS13R | BW0507F | LH035 | — | — | SUMI-P |

■ Application Examples

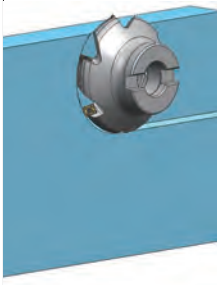
| Cr-Mo Steel SCM420 Block Material | Sumitomo | Competitor's Product |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Tool | WGX13125R | — |
| Grade | ACP200 | — |
| Chipbreaker | G | — |
| Cutter Dia. (mm) | 125 | 125 |
| Number of Teeth | 6 | 6 |
| v_c (m/min) | 220 | 220 |
| v_f (mm/min) | 840 | 840 |
| f_z (mm/t) | 0.25 | 0.25 |
| a_p (mm) | 2.0 | 2.0 |
| a_e (mm) | 125 | 125 |
| Coolant | Dry | Dry |
| Results | Surface roughness was significantly improved. Cutting force was reduced. Stable cutting can be performed with a low cutting load. | |



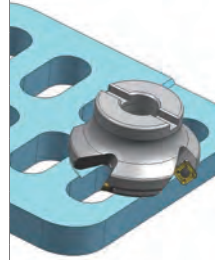
| Pipe Steel St52 Pipe | Sumitomo | Conventional Tool |
|----------------------|-------------------------------------------------------|-------------------|
| Tool | WGXM13125R | — |
| Grade | ACP200 | — |
| Chipbreaker | G | — |
| Cutter Dia. (mm) | 125 | 125 |
| Number of Teeth | 8 | 8 |
| v_c (m/min) | 300 | 300 |
| v_f (mm/min) | 730 | 730 |
| f_z (mm/t) | 0.12 | 0.12 |
| a_p (mm) | 4.0 | 4.0 |
| a_e (mm) | 100 | 100 |
| Coolant | Wet | Wet |
| Results | Tool life improved by more than 1.4 times per corner. | |



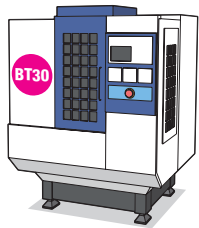
| General Structural Steel SS400 Machine Component | Sumitomo | Conventional Tool |
|--------------------------------------------------|-----------------------------------------|-------------------|
| Tool | WGX13125R | — |
| Grade | ACP200 | — |
| Chipbreaker | FG | — |
| Cutter Dia. (mm) | 125 | 125 |
| Number of Teeth | 6 | 6 |
| v_c (m/min) | 200 | 200 |
| v_f (mm/min) | 610 | 610 |
| f_z (mm/t) | 0.2 | 0.2 |
| a_p (mm) | 1.0 | 1.0 |
| a_e (mm) | 100 | 100 |
| Coolant | Wet | Wet |
| Results | Suppresses chatter. Reduces exit burrs. | |



| Cr-Mo Steel SCM440 Machine Component | Sumitomo | Competitor's Product |
|--------------------------------------|--------------------------------------------------------------------------------------------------|----------------------|
| Tool | WGX13080R | — |
| Grade | ACP200 | — |
| Chipbreaker | H | — |
| Cutter Dia. (mm) | 80 | 80 |
| Number of Teeth | 4 | 4 |
| v_c (m/min) | 200 | 200 |
| v_f (mm/min) | 480 | 480 |
| f_z (mm/t) | 0.15 | 0.15 |
| a_p (mm) | 3.0 | 3.0 |
| a_e (mm) | — | — |
| Coolant | Dry | Dry |
| Results | In heavy interrupted cutting, this tool achieved a longer tool life with good surface roughness. | |



| Carbon Steel S50C Machine Component M/C BT30 | Sumitomo | Competitor's Product |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Tool | WGX13063RS | — |
| Grade | ACP200 | — |
| Chipbreaker | L | — |
| Cutter Dia. (mm) | 63 | 63 |
| Number of Teeth | 4 | 4 |
| v_c (m/min) | 300 | 300 |
| v_f (mm/min) | 610 | 610 |
| f_z (mm/t) | 0.1 | 0.1 |
| a_p (mm) | 4.0 | 4.0 |
| a_e (mm) | 10.0 to 40.0 | 10.0 to 20.0 |
| Coolant | Dry | Dry |
| Results | Stable cutting was achieved even with low-rigidity machines. Machining was also possible with lateral depth of cut 30 to 40mm. | |



Low-rigidity Machine

| SUS309S Liquid Level Gauge Component | Sumitomo | Conventional Tool |
|--------------------------------------|---------------------------------------|-------------------------|
| Tool | WGX13160R | Single-Sided, 4 Corners |
| Grade | ACU2500 | — |
| Chipbreaker | G | — |
| Cutter Dia. (mm) | 160 | 160 |
| Number of Teeth | 7 | 7 |
| v_c (m/min) | 180 | 180 |
| v_f (mm/min) | 333 | 333 |
| f_z (mm/t) | 0.13 | 0.13 |
| a_p (mm) | 1.5 | 1.5 |
| a_e (mm) | — | — |
| Coolant | Dry | Dry |
| Results | Tool life extension of 300% achieved. | |

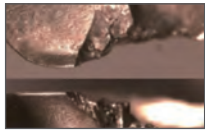


| Stainless Steel SUS304 Machine Component | Sumitomo | Competitor's Product |
|------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------|
| Tool | WGX13100RS | — |
| Grade | ACM300 | — |
| Chipbreaker | G | — |
| Cutter Dia. (mm) | 100 | 100 |
| Number of Teeth | 5 | 5 |
| v_c (m/min) | 150 | 150 |
| v_f (mm/min) | 360 | 360 |
| f_z (mm/t) | 0.15 | 0.15 |
| a_p (mm) | 2.0 | 2.0 |
| a_e (mm) | 20.0 | 20.0 |
| Coolant | Dry | Dry |
| Results | High hardness and the superior oxidation resistance of PVD coating provides at least double the tool life. | |

Cutting Distance: 3.75m



WGX Series



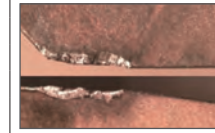
Competitor's Product

| Stainless Steel SUS630/H900 Machine Component | Sumitomo | Competitor's Product |
|-----------------------------------------------|---------------------------------------------------------------------------------|----------------------|
| Tool | WGX13100RS | — |
| Grade | ACM200 | — |
| Chipbreaker | G | — |
| Cutter Dia. (mm) | 100 | 100 |
| Number of Teeth | 5 | 5 |
| v_c (m/min) | 150 | 150 |
| v_f (mm/min) | 240 | 240 |
| f_z (mm/t) | 0.1 | 0.1 |
| a_p (mm) | 1.0 | 1.0 |
| a_e (mm) | 75.0 | 75.0 |
| Coolant | Dry | Dry |
| Results | The high wear resistance of CVD coating provides at least double the tool life. | |

Cutting Distance: 7.5m



WGX Series



Competitor's Product

| Boron Steel SWCHB Automotive Component | Sumitomo | Conventional Tool |
|----------------------------------------|--------------------------------------------------------------|-------------------|
| Tool | WGX13080RS | — |
| Grade | XCU2500 | — |
| Chipbreaker | G | — |
| Cutter Dia. (mm) | 80 | 80 |
| Number of Teeth | 6 | 6 |
| v_c (m/min) | 332 | 332 |
| v_f (mm/min) | 1,190 | 1,190 |
| f_z (mm/t) | 0.15 | 0.15 |
| a_p (mm) | 4.0 | 4.0 |
| a_e (mm) | 45 | 45 |
| Coolant | Dry | Dry |
| Results | Excellent wear resistance achieves 2 times longer tool life. | |



| Ductile Cast Iron FCD450 Hydraulic Component | Sumitomo | Conventional Tool |
|----------------------------------------------|----------------------------------------------------------------|-------------------|
| Tool | WGX13080RS | — |
| Grade | XCK2000 | — |
| Chipbreaker | G | — |
| Cutter Dia. (mm) | 160 | 160 |
| Number of Teeth | 10 | 10 |
| v_c (m/min) | 250 | 250 |
| v_f (mm/min) | 996 | 996 |
| f_z (mm/t) | 0.2 | 0.2 |
| a_p (mm) | 1.5 | 1.5 |
| a_e (mm) | 80 | 80 |
| Coolant | Dry | Dry |
| Results | Excellent wear resistance achieves 2.5 times longer tool life. | |



MEMO

A large grid of dotted lines for writing a memo. The grid consists of 20 columns and 30 rows of small squares, providing a structured space for text entry.

MEMO

A large grid of dotted lines for writing a memo. The grid consists of 20 columns and 30 rows of small squares, providing a structured space for text entry.

Sumitomo Electric Cutting Tools Official Apps for iOS/Android



Cutting calculation app

SumiTool Calculator



Grade & chipbreaker comparison app

SumiTool Converter



< SAFETY NOTES >



- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.
- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.
- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

 Sumitomo Electric Industries, Ltd.

Hardmetal Division

Global Marketing Department : 1-1-1, Koyakita, Itami, Hyogo 664-0016, Japan

<https://www.sumitool.com/global>