

# CARBIDEN

2018 EN

## Grooving

### Metric





# ***PROFI*** ***LINE***



## Our product portfolio

### Milling



### Turning



### Grooving



### Multicut



### CBN/PCD/CVD



### Utility Milling



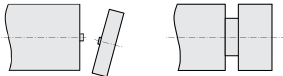


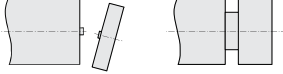


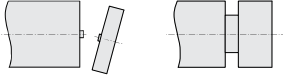




# General Overview



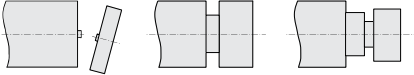


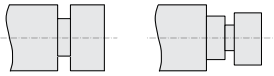


## Parting, Grooving and Longitudinal Turning

### Long size insert – Double sided

| Application   | Drawing   | Description      | Pages   |
|---|---|------------------|---------|
| Parting*, Grooving<br>   | <br>     | <b>GD...-M1</b>  | 21 – 36 |
| Parting*, Grooving<br> | <br> | <b>GD...-F1</b>  | 21 – 36 |
| Parting*, Grooving<br> | <br> | <b>GD...-ST1</b> | 38 – 42 |

\* Blades and holders available in each chapter




| Application   | Drawing   | Description                | Pages   |
|---|---|----------------------------|---------|
| Parting*, Grooving and Turning<br>  |   | <b>GD...-T</b>             | 46 – 52 |
| Grooving and Turning*<br>       |  | <b>GD...-M</b>             | 46 – 52 |
| Available blade   |  | <b>GBL<br/>GBR<br/>GBN</b> | 54      |
| Available tool holders  |  | <b>GMEL<br/>GMER</b>       | 56 – 58 |

\* Blades and holders available in each chapter

## Parting, Grooving

### Long size insert – Single sided


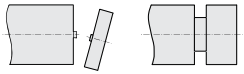

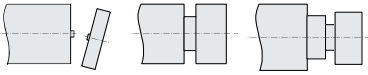

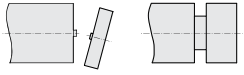

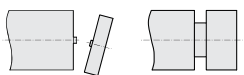
| Application   | Drawing  | Description       | Pages   |
|---|--|-------------------|---------|
| Parting, Deep Grooving, Grooving*<br>   |    | GO...-M1          | 60 – 65 |
| Parting*, Grooving,<br>                 |    | GO...-F1          | 60 – 65 |
| Parting*, Grooving<br>               |  | GO...-ST1         | 66 – 71 |
| Parting*, Grooving and Turning<br>  |  | GO...-T           | 66 – 71 |
| Parting ,Grooving*<br>              |  | GO...-LM          | 72 – 76 |
| Available blade<br>   |  | GBL<br>GBR<br>GBN | 54      |

\* Blades and holders available in each chapter



# Parting, Grooving and Longitudinal Turning

## Small size insert – Single sided





| Application                    |   | Drawing   | Description       | Pages    |
|--------------------------------|---|---|-------------------|----------|
| Parting, Grooving*             |    |    | <b>GS... –M1</b>  | 78 – 84  |
| Parting, Grooving and Turning* |    |   | <b>GS... –M2</b>  | 86 – 92  |
| Parting*, Grooving             |  |  | <b>GS... –ST1</b> | 94– 97   |
| Parting, Grooving*             |  |  | <b>GS... –LM</b>  | 99 – 103 |

\* Blades and holders available in each chapter



## New tools with internal cooling system and clamping bloc Blades and tool holder

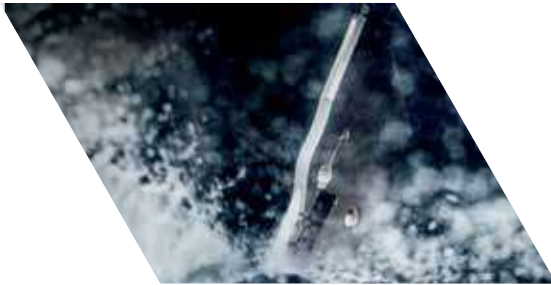


| Application   | Tools   | Description          | pages     |
|---|---|----------------------|-----------|
| Available blade with cooling                          |   | <b>GBN</b>           | 106 – 109 |
| Available tool holder with cooling                    |  | <b>GMER<br/>GMEL</b> | 108 – 109 |
| Clamping bloc without or with internal cooling system |  | <b>SCB</b>           | 110       |
| Technical Information                                 |  |                      | 115 – 120 |





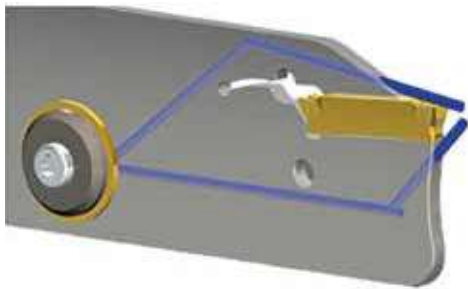
## New tools with internal cooling Double Directional Internal Cooling System



- ▲ Increased lifetime up to 100 %
- ▲ Better chip control

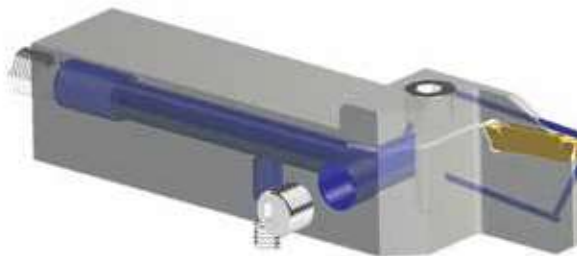


## Parting Application



Blades

## Grooving Application

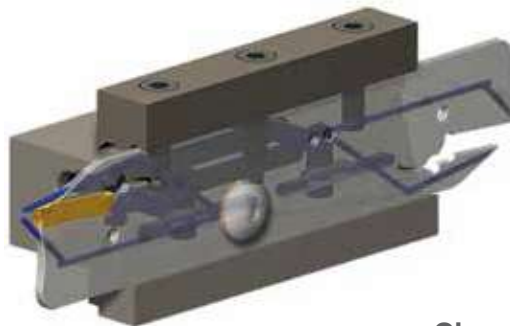


Tool holder





**New clamping bloc**  
**Without or with internal coolant system**



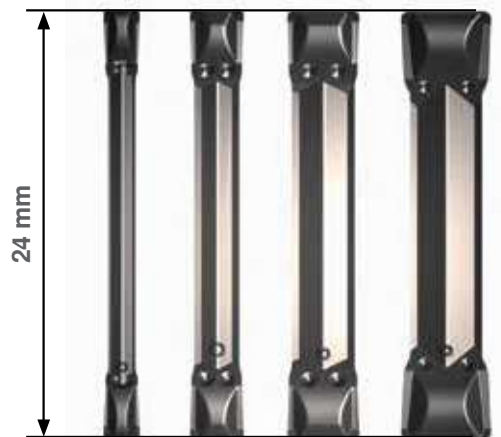
Clamping bloc



**Improved design**  
Better tool life



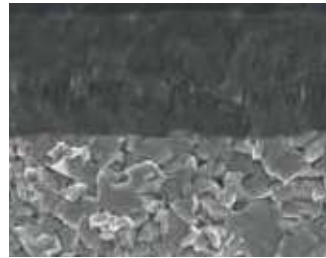
**Same insert length for all widths**





## Monobloc holders

Increased Tmax 13 mm and 25 mm



New P20 grade CTCP320ST



# designation system

## Designation system for inserts

|  |  |   |   |
|--|--|---|---|
| <p>GD Double sided<br/>GO One-sided<br/>GS Single sided<br/>GA Axial</p> <p><b>Insert system</b></p> | <p>R Right<br/>L Left<br/>N Neutral</p> <p><b>Hand</b></p> | <p>15 1.5 mm<br/>20 2 mm<br/>30 3 mm<br/>40 4 mm<br/>50 5 mm<br/>60 6 mm<br/>80 8 mm<br/>100 10 mm</p> <p><b>Insert width</b></p> | <p>00 0°<br/>04 4°<br/>06 6°<br/>15 15°</p> <p><b>Clearance angle</b></p> |
|--|--|---|---|

**GD 24 N T - 30 . 02 - 00 - M1**

|   |  |  |   |
|---|--|--|---|
| <p><b>Insert length</b></p> <p>24 24 mm</p> | <p><b>Insert shape / application</b></p> <p>T Trapezoidal<br/>R Radius<br/>S Special</p> | <p><b>Corner radius</b></p> <p>0.00 00<br/>0.20 02<br/>0.30 03<br/>0.40 04</p> | <p><b>Chipbreaker</b></p> <p><b>GD/GO</b><br/>M1<br/>F1<br/>ST1<br/>T<br/>LM<br/>M (Radius)</p> <p><b>GS</b><br/>M1<br/>M2<br/>ST1<br/>LM</p> |
|---|--|--|---|



## Designation system for monobloc tools

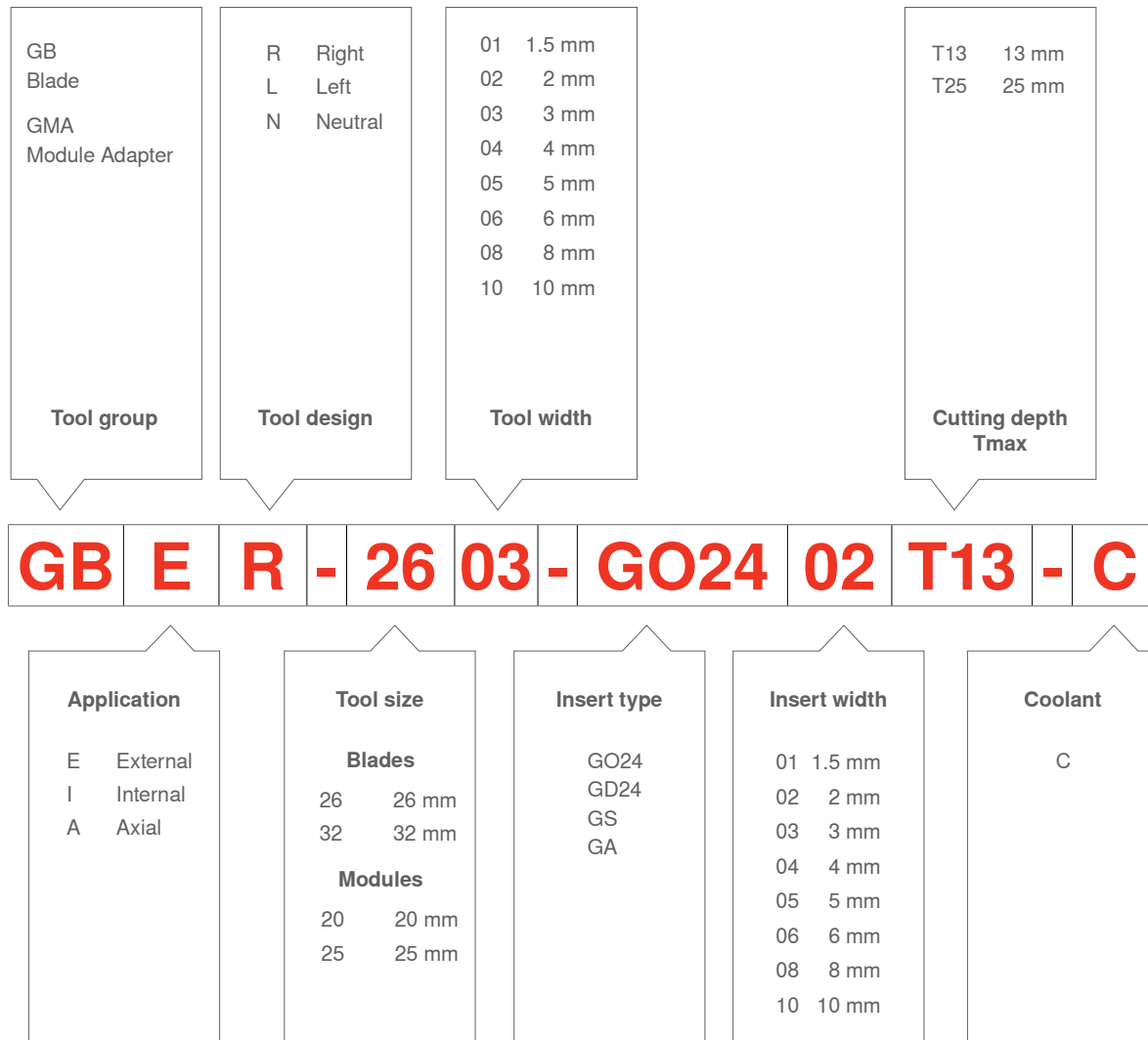
|  |   |  |  |   |
|--|---|--|--|---|
| <p>GM<br/>Monobloc</p> <p>GMM<br/>Monobloc Module</p> <p><b>Tool group</b></p> | <p>R Right<br/>L Left<br/>N Neutral</p> <p><b>Tool design</b></p> | <p>GD24<br/>GO24<br/>GS<br/>GA</p> <p><b>Insert type</b></p> | <p>01 1.5 mm<br/>02 2 mm<br/>03 3 mm<br/>04 4 mm<br/>05 5 mm<br/>06 6 mm<br/>08 8 mm<br/>10 10 mm</p> <p><b>Holder angle</b></p> <p>00 0°<br/>45 45°<br/>90 90°</p> <p><b>Insert width</b></p> | <p>T13 13 mm<br/>T25 25 mm</p> <p><b>Cutting depth<br/>Tmax</b></p> |
|--|---|--|--|---|

**GM E R - 16 - GD24 02 - K - T13 - C**

|  |  |  |                                |
|--|--|--|--------------------------------|
| <p><b>Application</b></p> <p>E External<br/>I Internal<br/>A Axial</p> | <p><b>Tool size</b></p> <p>12 12x12 mm<br/>16 16x16 mm<br/>20 20x20 mm<br/>25 25x25 mm<br/>32 32x32 mm</p> | <p><b>Tool length</b></p> <p>K 125 mm<br/>M 150 mm<br/>J 110 mm<br/>L 140 mm</p> | <p><b>Coolant</b></p> <p>C</p> |
|--|--|--|--------------------------------|



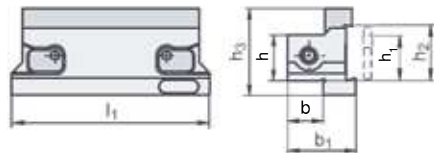
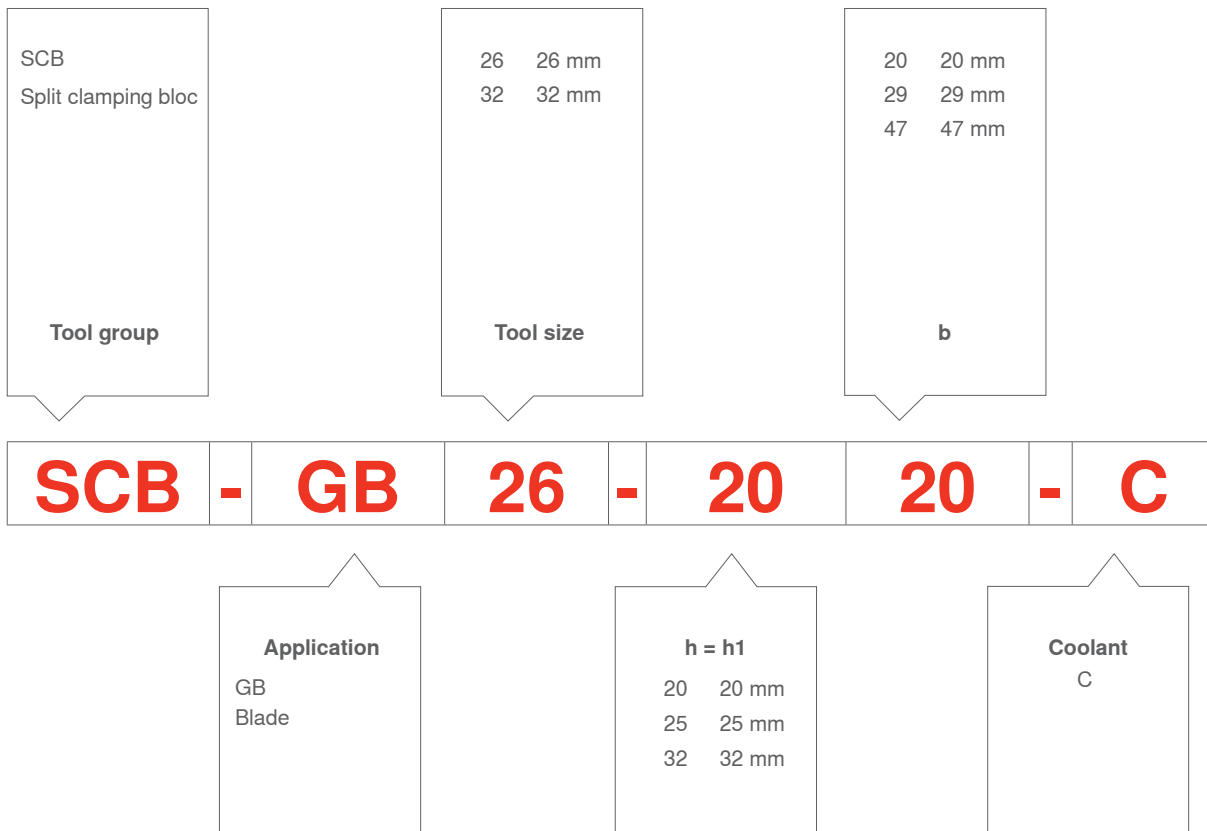
## Designation system for blades and modules







## Designation system for clamping blocks





## Application

|          |                                   |          |                                 |          |                |
|----------|-----------------------------------|----------|---------------------------------|----------|----------------|
| <b>P</b> | Steel                             | <b>M</b> | Stainless steel                 | <b>K</b> | Cast iron      |
| <b>N</b> | Non-ferrous metals and non-metals | <b>S</b> | Heat-resistant alloys, titanium | <b>H</b> | Hard materials |

### The easy way to success GD/GO

| Material group  | Choice chipbreaker |                        | Grades       |                  |
|-----------------|--------------------|------------------------|--------------|------------------|
|                 | First choice       | Higher wear resistance | First choice | Higher toughness |
| Steel           | M1 – F1            | CTCP320ST              | CTP1340      | CTPP345          |
|                 | T – M              |                        | CTP1340      |                  |
| Stainless steel | ST1 – F1 – T       |                        | CTP1340      | CTPP345          |
| Cast iron       | M1                 | CTCP320ST              | CTP1340      | CTPP345          |
|                 | M                  |                        | CTP1340      |                  |
| Exotic          | ST1                |                        | CTPP345      |                  |

### The easy way to success GS

| Material group     | Choice chipbreaker |                        | Grades       |                  |
|--------------------|--------------------|------------------------|--------------|------------------|
|                    | First choice       | Higher wear resistance | First choice | Higher toughness |
| Steel              | M1 – M2            | CTCP320ST              | CTP1340      | CTPP345          |
| Stainless steel    | ST1                |                        | CTP1340      | CTPP345          |
| Cast iron          | M1 – M2            |                        | CTP1340      | CTPP345          |
| Non-ferrous metals | LM                 |                        | H216T        |                  |



# Products





## Long size insert – Double sided

### GD... –M1, GD... –F1





## Overview (GD... -M1, GD... -F1)

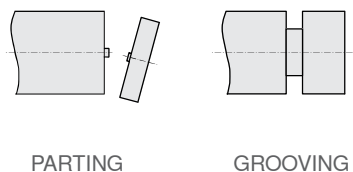
### Which chipbreaker to use?

#### M1 – Medium cutting chipbreaker

- ▲ Insert with narrow negative chamfer
- ▲ Suitable for all steel materials with high strength
- ▲ Suitable for all applications
- ▲ For steel and grey cast iron



#### Application –M1 / – F1



#### F1 – Very soft cutting chipbreaker

- ▲ Excellent cutting chipbreaker with low cutting forces
- ▲ For low or medium strength materials
- ▲ Particularly suitable for parting off tubes and thin-walled work pieces
- ▲ High cutting edge stability
- ▲ Excellent chip control also with low feed
- ▲ Low built up edge



#### Premium grade

##### CTP1340:

- ▲ Excellent suitability for universal application
- ▲ High cutting edge stability

##### CTCP320ST:

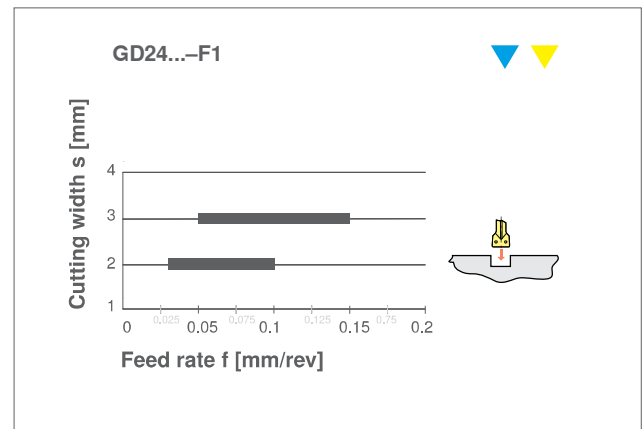
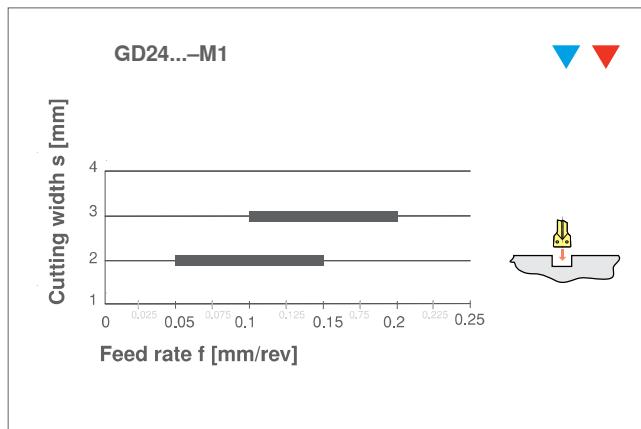
- ▲ Excellent wear resistance
- ▲ Good resistance to oxidation
- ▲ High toughness
- ▲ Good heat resistance

##### CTPP345:

- ▲ Ideal for stainless steel
- ▲ Excellent toughness
- ▲ Good wear resistance
- ▲ High application security

## Long size – Double sided

### Feed rate for parting and grooving (GD24...20... –M1 / –F1)



Hand

GD24... –M1



LNR

Hand

GD24... –F1



LNR









## Cutting data

| Work piece material         | Type of treatment/alloy            | Hardness HB | Coated carbide                    |                                     |                                   |
|-----------------------------|------------------------------------|-------------|-----------------------------------|-------------------------------------|-----------------------------------|
|                             |                                    |             | CTP1340<br>v <sub>c</sub> [m/min] | CTCP320ST<br>v <sub>c</sub> [m/min] | CTPP345<br>v <sub>c</sub> [m/min] |
| <b>P</b><br>Steel           | non alloyed steel 0.15% – 0.45% C  | 150 – 250   | 80 – 180                          | 110 – 190                           | 80 – 150                          |
|                             | low alloyed steel tempered         | 250 – 300   | 60 – 150                          | 110 – 180                           | 70 – 120                          |
|                             | high alloyed steel tempered        | 350         | 50 – 120                          | 70 – 160                            | 60 – 100                          |
|                             | corrosion resistant steel annealed | 200         | 50 – 200                          | 120 – 200                           | 90 – 160                          |
| <b>M</b><br>Stainless steel | annealed pearlitic                 | 200         | 50 – 200                          | 120 – 200                           | 100 – 180                         |
|                             | quenched austenitic                | 180         | 50 – 180                          | 100 – 170                           | 80 – 150                          |
|                             | quenched duplex                    | 230 – 260   | 50 – 100                          | 70 – 110                            | 70 – 110                          |
|                             | hardened martensitic               | 330         | 50 – 80                           | 60 – 90                             | 60 – 90                           |
| <b>K</b><br>Cast iron       | grey cast iron                     | 180         | 100 – 200                         | 90 – 180                            | –                                 |
|                             | spheroidal                         | 160         | 100 – 180                         | 100 – 160                           | –                                 |
|                             | malleable pearlitic                | 130         | 80 – 160                          | 80 – 150                            | –                                 |



## GD24...20... -M1 / -F1

| Insert  | Designation                   | Chipbreaker | Material number | Available |   |
|---|-------------------------------|-------------|-----------------|-----------|---|
|    | GD24LT-20.015-06-M1 CTCP320ST | ... -M1     | 12248387        | •         |   |
|   | GD24LT-20.015-06-M1 CTP1340   |             | 12248382        | •         |   |
|   | GD24LT-20.015-06-M1 CTPP345   |             | 12248392        | •         |   |
|    | GD24NT-20.02-00-M1 CTCP320ST  |             | 12158331        | •         |   |
|   | GD24NT-20.02-00-M1 CTP1340    |             | 12158330        | •         |   |
|   | GD24NT-20.02-00-M1 CTPP345    |             | 12158332        | •         |   |
|    | GD24RT-20.015-06-M1 CTCP320ST |             | 12248400        | •         |   |
|   | GD24RT-20.015-06-M1 CTP1340   |             | 12248396        | •         |   |
|   | GD24RT-20.015-06-M1 CTPP345   |             | 12248401        | •         |   |
|   | GD24LT-20.015-06-F1 CTCP320ST |             | ... -F1         | 12245958  | • |
|   | GD24LT-20.015-06-F1 CTP1340   |             |                 | 12245957  | • |
|   | GD24LT-20.015-06-F1 CTPP345   |             |                 | 12245959  | • |
|  | GD24NT-20.02-00-F1 CTCP320ST  |             |                 | 12218962  | • |
|   | GD24NT-20.02-00-F1 CTP1340    |             |                 | 12218959  | • |
|   | GD24NT-20.02-00-F1 CTPP345    |             |                 | 12218963  | • |
|  | GD24RT-20.015-06-F1 CTCP320ST | 12245961    |                 | •         |   |
|   | GD24RT-20.015-06-F1 CTP1340   | 12245960    |                 | •         |   |
|   | GD24RT-20.015-06-F1 CTPP345   | 12245962    |                 | •         |   |

• available from stock

### Blades \*

### Tools

### Spare parts



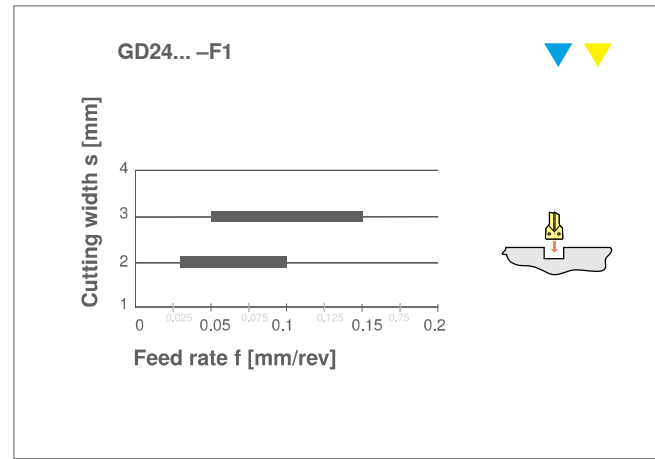
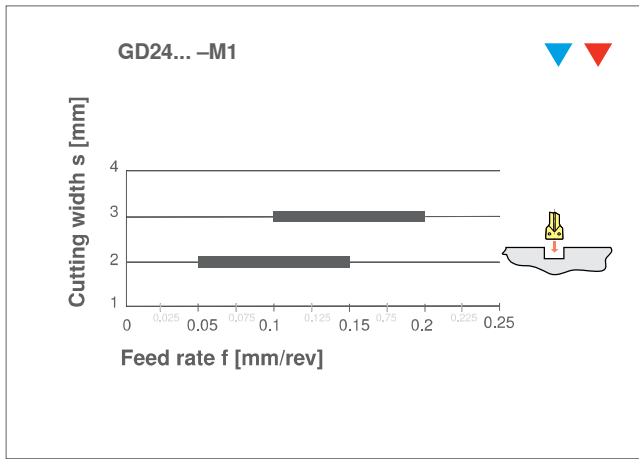
Blades, tools and spare parts, see page 52 – 58





## Long size – Double sided

### Feed rate for parting and grooving (GD24...30... –M1 / –F1)



Hand

GD24... –M1



LNR

Hand

GD24... –F1



LNR









## Cutting data

| Work piece material | Type of treatment/alloy | Hardness HB                        | Coated carbide                    |                                     |                                   |           |
|---------------------|-------------------------|------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-----------|
|                     |                         |                                    | CTP1340<br>v <sub>c</sub> [m/min] | CTCP320ST<br>v <sub>c</sub> [m/min] | CTPP345<br>v <sub>c</sub> [m/min] |           |
| <b>P</b>            | Steel                   | non alloyed steel 0.15% – 0.45% C  | 150 – 250                         | 80 – 180                            | 110 – 190                         | 80 – 150  |
|                     |                         | low alloyed steel tempered         | 250 – 300                         | 60 – 150                            | 110 – 180                         | 70 – 120  |
|                     |                         | high alloyed steel tempered        | 350                               | 50 – 120                            | 70 – 160                          | 60 – 100  |
|                     |                         | corrosion resistant steel annealed | 200                               | 50 – 200                            | 120 – 200                         | 90 – 160  |
| <b>M</b>            | Stainless steel         | annealed pearlitic                 | 200                               | 50 – 200                            | 120 – 200                         | 100 – 180 |
|                     |                         | quenched austenitic                | 180                               | 50 – 180                            | 100 – 170                         | 80 – 150  |
|                     |                         | quenched duplex                    | 230 – 260                         | 50 – 100                            | 70 – 110                          | 70 – 110  |
|                     |                         | hardened martensitic               | 330                               | 50 – 80                             | 60 – 90                           | 60 – 90   |
| <b>K</b>            | Cast iron               | grey cast iron                     | 180                               | 100 – 200                           | 90 – 180                          | –         |
|                     |                         | spheroidal                         | 160                               | 100 – 180                           | 100 – 160                         | –         |
|                     |                         | malleable pearlitic                | 130                               | 80 – 160                            | 80 – 150                          | –         |



## GD24...30... -M1 / -F1

| Insert  | Designation                  | Chipbreaker | Material number | Available |   |
|---|------------------------------|-------------|-----------------|-----------|---|
|    | GD24LT-30.02-06-M1 CTCP320ST | ... -M1     | 12235866        | •         |   |
|   | GD24LT-30.02-06-M1 CTP1340   |             | 12235863        | •         |   |
|   | GD24LT-30.02-06-M1 CTPP345   |             | 12235868        | •         |   |
|    | GD24NT-30.02-00-M1 CTCP320ST |             | 12149223        | •         |   |
|   | GD24NT-30.02-00-M1 CTP1340   |             | 12141178        | •         |   |
|   | GD24NT-30.02-00-M1 CTPP345   |             | 12149224        | •         |   |
|    | GD24RT-30.02-06-M1 CTCP320ST |             | 12235873        | •         |   |
|   | GD24RT-30.02-06-M1 CTP1340   |             | 12235871        | •         |   |
|   | GD24RT-30.02-06-M1 CTPP345   |             | 12235877        | •         |   |
|   | GD24LT-30.02-06-F1 CTCP320ST |             | ...-F1          | 12236951  | • |
|   | GD24LT-30.02-06-F1 CTP1340   |             |                 | 12236949  | • |
|   | GD24LT-30.02-06-F1 CTPP345   |             |                 | 12236952  | • |
|  | GD24NT-30.02-00-F1 CTCP320ST | 12149218    |                 | •         |   |
|   | GD24NT-30.02-00-F1 CTP1340   | 12141176    |                 | •         |   |
|   | GD24NT-30.02-00-F1 CTPP345   | 12149221    |                 | •         |   |
|  | GD24RT-30.02-06-F1 CTCP320ST | 12236947    |                 | •         |   |
|   | GD24RT-30.02-06-F1 CTP1340   | 12236946    |                 | •         |   |
|   | GD24RT-30.02-06-F1 CTPP345   | 12236948    |                 | •         |   |

Blades \*

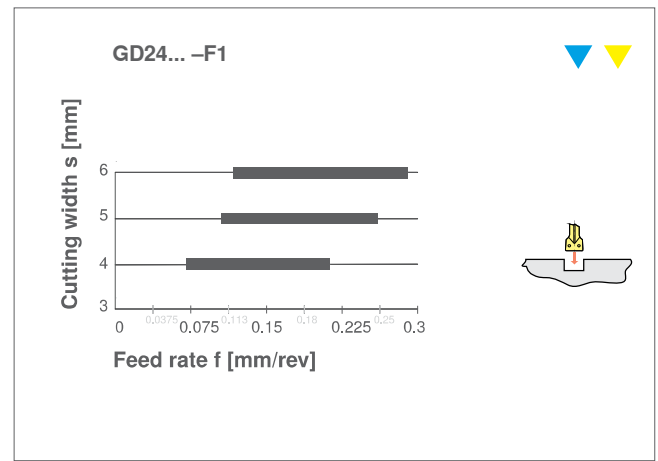
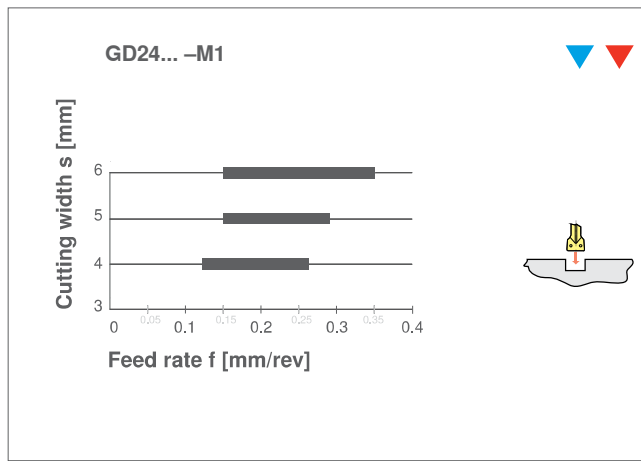
Tools

Spare parts



## Long size – Double sided

### Feed rate for parting and grooving (GD24...40... –M1 / –F1)



Hand

GD24... –M1



L N R

Hand

GD24... –F1



L N R









## Cutting data

| Work piece material         | Type of treatment/alloy            | Hardness HB | Coated carbide                    |                                     |                                   |
|-----------------------------|------------------------------------|-------------|-----------------------------------|-------------------------------------|-----------------------------------|
|                             |                                    |             | CTP1340<br>v <sub>c</sub> [m/min] | CTCP320ST<br>v <sub>c</sub> [m/min] | CTPP345<br>v <sub>c</sub> [m/min] |
| <b>P</b><br>Steel           | non alloyed steel 0.15% – 0.45% C  | 150 – 250   | 80 – 180                          | 110 – 190                           | 80 – 150                          |
|                             | low alloyed steel tempered         | 250 – 300   | 60 – 150                          | 110 – 180                           | 70 – 120                          |
|                             | high alloyed steel tempered        | 350         | 50 – 120                          | 70 – 160                            | 60 – 100                          |
|                             | corrosion resistant steel annealed | 200         | 50 – 200                          | 120 – 200                           | 90 – 160                          |
| <b>M</b><br>Stainless steel | annealed pearlitic                 | 200         | 50 – 200                          | 120 – 200                           | 100 – 180                         |
|                             | quenched austenitic                | 180         | 50 – 180                          | 100 – 170                           | 80 – 150                          |
|                             | quenched duplex                    | 230 – 260   | 50 – 100                          | 70 – 110                            | 70 – 110                          |
|                             | hardened martensitic               | 330         | 50 – 80                           | 60 – 90                             | 60 – 90                           |
| <b>K</b><br>Cast iron       | grey cast iron                     | 180         | 100 – 200                         | 90 – 180                            | –                                 |
|                             | spheroidal                         | 160         | 100 – 180                         | 100 – 160                           | –                                 |
|                             | malleable pearlitic                | 130         | 80 – 160                          | 80 – 150                            | –                                 |



## GD24...40... -M1 / -F1

| Insert  | Designation                  | Chipbreaker | Material number | Available   |             |
|---|------------------------------|-------------|-----------------|-------------|-------------|
|    | GD24LT-40.03-04-M1 CTCP320ST | ... -M1     |                 | coming soon |             |
|   | GD24LT-40.03-04-M1 CTP1340   |             |                 | coming soon |             |
|   | GD24LT-40.03-04-M1 CTPP345   |             |                 | coming soon |             |
|    | GD24NT-40.03-00-M1 CTCP320ST |             | 12149566        | •           |             |
|   | GD24NT-40.03-00-M1 CTP1340   |             | 12149565        | •           |             |
|   | GD24NT-40.03-00-M1 CTPP345   |             | 12149567        | •           |             |
|    | GD24RT-40.03-04-M1 CTCP320ST |             |                 |             | coming soon |
|   | GD24RT-40.03-04-M1 CTP1340   |             |                 |             | coming soon |
|   | GD24RT-40.03-04-M1 CTPP345   |             |                 |             | coming soon |
|   | GD24LT-40.03-04-F1 CTCP320ST |             | ...-F1          |             | coming soon |
|   | GD24LT-40.03-04-F1 CTP1340   |             |                 |             | coming soon |
|   | GD24LT-40.03-04-F1 CTPP345   |             |                 |             | coming soon |
|  | GD24NT-40.03-00-F1 CTCP320ST | 12218967    |                 | •           |             |
|   | GD24NT-40.03-00-F1 CTP1340   | 12218965    |                 | •           |             |
|   | GD24NT-40.03-00-F1 CTPP345   | 12218969    |                 | •           |             |
|  | GD24RT-40.03-04-F1 CTCP320ST |             |                 |             | coming soon |
|   | GD24RT-40.03-04-F1 CTP1340   |             |                 |             | coming soon |
|   | GD24RT-40.03-04-F1 CTPP345   |             |                 |             | coming soon |

### Blades \*



### Tools



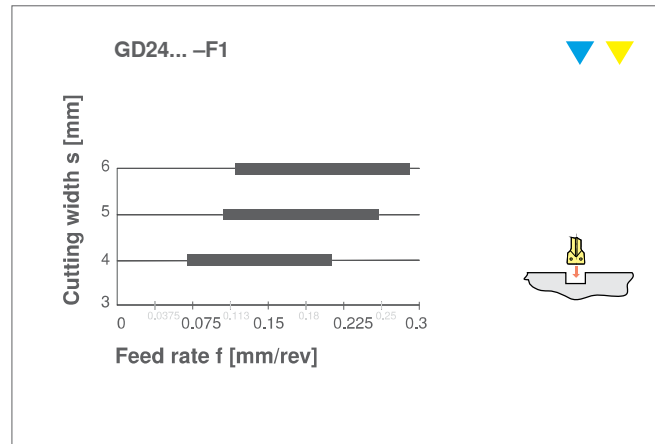
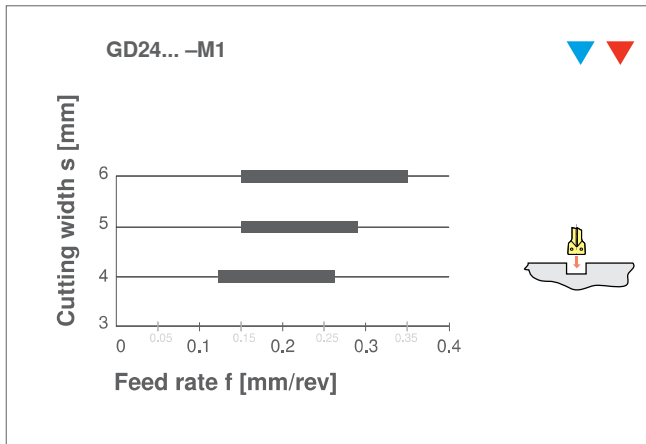
### Spare parts





## Long size – Double sided

### Feed rate for parting and grooving (GD24...50... –M1 / –F1)



Hand

GD24... –M1



L N R

Hand

GD24... –F1



L N R








## Cutting data

| Work piece material         | Type of treatment/alloy            | Hardness HB | Coated carbide                    |                                     |                                   |
|-----------------------------|------------------------------------|-------------|-----------------------------------|-------------------------------------|-----------------------------------|
|                             |                                    |             | CTP1340<br>v <sub>c</sub> [m/min] | CTCP320ST<br>v <sub>c</sub> [m/min] | CTPP345<br>v <sub>c</sub> [m/min] |
| <b>P</b><br>Steel           | non alloyed steel 0.15% – 0.45% C  | 150 – 250   | 80 – 180                          | 110 – 190                           | 80 – 150                          |
|                             | low alloyed steel tempered         | 250 – 300   | 60 – 150                          | 110 – 180                           | 70 – 120                          |
|                             | high alloyed steel tempered        | 350         | 50 – 120                          | 70 – 160                            | 60 – 100                          |
|                             | corrosion resistant steel annealed | 200         | 50 – 200                          | 120 – 200                           | 90 – 160                          |
| <b>M</b><br>Stainless steel | annealed pearlitic                 | 200         | 50 – 200                          | 120 – 200                           | 100 – 180                         |
|                             | quenched austenitic                | 180         | 50 – 180                          | 100 – 170                           | 80 – 150                          |
|                             | quenched duplex                    | 230 – 260   | 50 – 100                          | 70 – 110                            | 70 – 110                          |
|                             | hardened martensitic               | 330         | 50 – 80                           | 60 – 90                             | 60 – 90                           |
| <b>K</b><br>Cast iron       | grey cast iron                     | 180         | 100 – 200                         | 90 – 180                            | –                                 |
|                             | spheroidal                         | 160         | 100 – 180                         | 100 – 160                           | –                                 |
|                             | malleable pearlitic                | 130         | 80 – 160                          | 80 – 150                            | –                                 |





## GD24...50... -M1 / -F1

| Insert  | Designation                  | Chipbreaker | Material number | Available  |
|---|------------------------------|-------------|-----------------|------------|
|    | GD24LT-50.04-04-M1 CTP1340   |             |                 | on request |
|    | GD24NT-50.04-00-M1 CTCP320ST | ... -M1     | 12336861        | •          |
|   | GD24NT-50.04-00-M1 CTP1340   |             | 12336856        | •          |
|   | GD24NT-50.04-00-M1 CTPP345   |             | 12336862        | •          |
|    | GD24RT-50.04-04-M1 CTP1340   |             |                 | on request |
|   | GD24LT-50.04-04-F1 CTP1340   | ... -F1     |                 | on request |
|   | GD24NT-50.04-00-F1 CTCP320ST |             | 12395254        | •          |
|   | GD24NT-50.04-00-F1 CTP1340   |             | 12395243        | •          |
|   | GD24NT-50.04-00-F1 CTPP345   |             | 12395259        | •          |
|  | GD24RT-50.04-04-F1 CTP1340   |             |                 | on request |

### Blades \*



### Tools



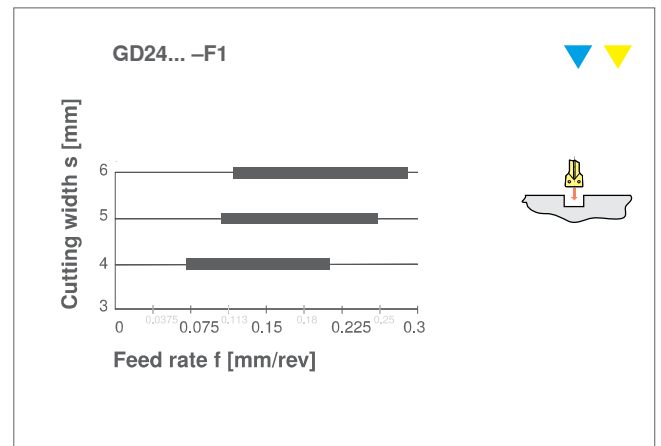
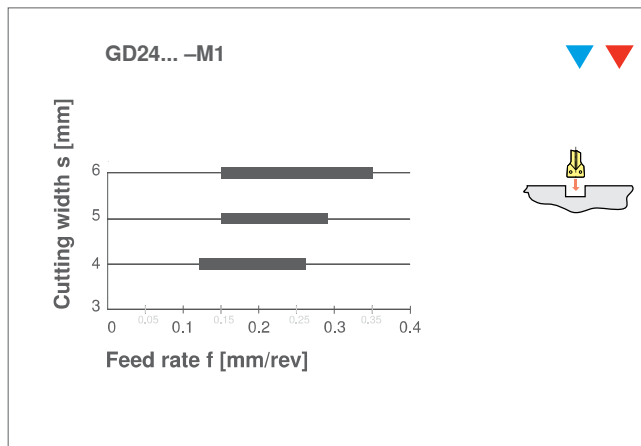
### Spare parts



Blades, tools and spare parts, see page 52 – 58

## Long size – Double sided

### Feed rate for parting and grooving (GD24...60... –M1 / –F1)



Hand

GD24... –M1



L N R

Hand

GD24... –F1



L N R





## Cutting data

| Work piece material         | Type of treatment/alloy            | Hardness HB | Coated carbide                    |                                     |                                   |
|-----------------------------|------------------------------------|-------------|-----------------------------------|-------------------------------------|-----------------------------------|
|                             |                                    |             | CTP1340<br>v <sub>c</sub> [m/min] | CTCP320ST<br>v <sub>c</sub> [m/min] | CTPP345<br>v <sub>c</sub> [m/min] |
| <b>P</b><br>Steel           | non alloyed steel 0.15% – 0.45% C  | 150 – 250   | 80 – 180                          | 110 – 190                           | 80 – 150                          |
|                             | low alloyed steel tempered         | 250 – 300   | 60 – 150                          | 110 – 180                           | 70 – 120                          |
|                             | high alloyed steel tempered        | 350         | 50 – 120                          | 70 – 160                            | 60 – 100                          |
|                             | corrosion resistant steel annealed | 200         | 50 – 200                          | 120 – 200                           | 90 – 160                          |
| <b>M</b><br>Stainless steel | annealed pearlitic                 | 200         | 50 – 200                          | 120 – 200                           | 100 – 180                         |
|                             | quenched austenitic                | 180         | 50 – 180                          | 100 – 170                           | 80 – 150                          |
|                             | quenched duplex                    | 230 – 260   | 50 – 100                          | 70 – 110                            | 70 – 110                          |
|                             | hardened martensitic               | 330         | 50 – 80                           | 60 – 90                             | 60 – 90                           |
| <b>K</b><br>Cast iron       | grey cast iron                     | 180         | 100 – 200                         | 90 – 180                            | –                                 |
|                             | spheroidal                         | 160         | 100 – 180                         | 100 – 160                           | –                                 |
|                             | malleable pearlitic                | 130         | 80 – 160                          | 80 – 150                            | –                                 |



## GD24...60... -M1 / -F1

| Insert  | Designation                | Chipbreaker | Material number | Available   |
|---|----------------------------|-------------|-----------------|-------------|
|  | GD24NT-60.04-00-M1 CTP1340 | ... -M1     |                 | coming soon |
|  | GD24NT-60.04-00-F1 CTP1340 | ... -F1     |                 | coming soon |

| Blades *  | Tools  | Spare parts   |
|---|--|---|
|  |  |  |

Blades, tools and spare parts, see page 52 – 58



# Long size insert – Double sided

## GD... –ST1



## Overview (GD... –ST1)

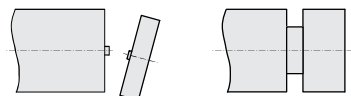
### Which chipbreaker to use?

#### ST1 – Soft cutting chipbreaker

- ▲ Especially for stainless steel
- ▲ Problem solver for steel machining



### Application –ST1



PARTING

GROOVING

### Premium grade

#### CTPP345:

- ▲ Ideal for stainless steel
- ▲ Excellent toughness
- ▲ Good wear resistance
- ▲ High application security

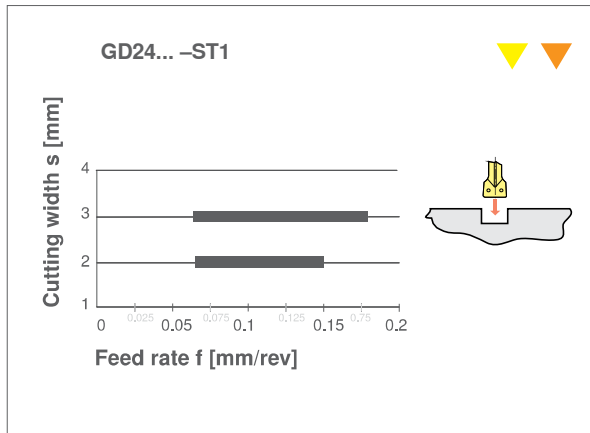
#### CTP1340:

- ▲ Excellent suitability for universal application
- ▲ High cutting edge stability



## Long size – Double sided

### Feed rate for parting and grooving (GD24... –ST1)



Hand

GD24... –ST1



L N R

## Cutting data

| Work piece material         | Type of treatment/alloy | Hardness HB | Coated carbide           |                            |                          |
|-----------------------------|-------------------------|-------------|--------------------------|----------------------------|--------------------------|
|                             |                         |             | CTP1340<br>$v_c$ [m/min] | CTCP320ST<br>$v_c$ [m/min] | CTPP345<br>$v_c$ [m/min] |
| <b>M</b><br>Stainless steel | annealed pearlitic      | 200         | 50 – 200                 | 120 – 200                  | 100 – 180                |
|                             | quenched austenitic     | 180         | 50 – 180                 | 100 – 170                  | 80 – 150                 |
|                             | quenched duplex         | 230 – 260   | 50 – 100                 | 70 – 110                   | 70 – 110                 |
|                             | hardened martensitic    | 330         | 50 – 80                  | 60 – 90                    | 60 – 90                  |
| <b>S</b><br>Exotic          | Fe base                 | 200         | –                        | –                          | 20 – 45                  |
|                             | Nickel or cobalt base   | 250         | –                        | –                          | 15 – 25                  |
|                             | Titanium                | Rm 440      | –                        | –                          | 50 – 120                 |



## GD24...20... -ST1

| Insert | Designation                    | Chipbreaker | Material number | Available |
|--------|--------------------------------|-------------|-----------------|-----------|
|        | GD24LT-20.015-06-ST1 CTCP320ST | ... -ST1    | 12248411        | •         |
|        | GD24LT-20.015-06-ST1 CTP1340   |             | 12248409        | •         |
|        | GD24LT-20.015-06-ST1 CTPP345   |             | 12248413        | •         |
|        | GD24NT-20.02-00-ST1 CTCP320ST  |             | 12158334        | •         |
|        | GD24NT-20.02-00-ST1 CTP1340    |             | 12158333        | •         |
|        | GD24NT-20.02-00-ST1 CTPP345    |             | 12158335        | •         |
|        | GD24RT-20.015-06-ST1 CTCP320ST |             | 12248416        | •         |
|        | GD24RT-20.015-06-ST1 CTP1340   |             | 12248415        | •         |
|        | GD24RT-20.015-06-ST1 CTPP345   |             | 12248418        | •         |

## GD24...30... -ST1

| Insert | Designation                   | Chipbreaker | Material number | Available |
|--------|-------------------------------|-------------|-----------------|-----------|
|        | GD24LT-30.02-06-ST1 CTCP320ST | ... -ST1    | 12236942        | •         |
|        | GD24LT-30.02-06-ST1 CTP1340   |             | 12236941        | •         |
|        | GD24LT-30.02-06-ST1 CTPP345   |             | 12236943        | •         |
|        | GD24NT-30.02-00-ST1 CTCP320ST |             | 12149214        | •         |
|        | GD24NT-30.02-00-ST1 CTP1340   |             | 12141184        | •         |
|        | GD24NT-30.02-00-ST1 CTPP345   |             | 12149216        | •         |
|        | GD24RT-30.02-06-ST1 CTCP320ST |             | 12236937        | •         |
|        | GD24RT-30.02-06-ST1 CTP1340   |             | 12236932        | •         |
|        | GD24RT-30.02-06-ST1 CTPP345   |             | 12236939        | •         |

### Blades \*



### Tools



### Spare parts

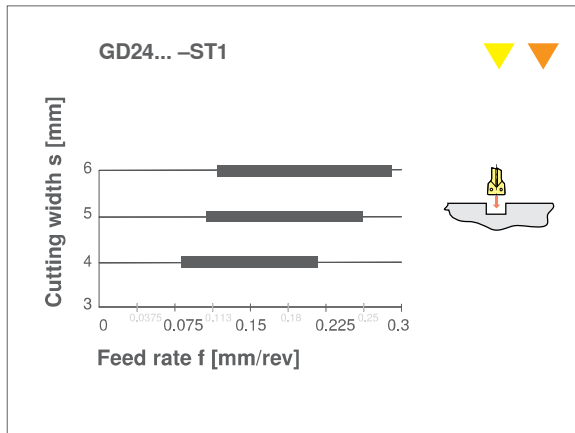






## Long size – Double sided

### Feed rate for parting and grooving (GD24... –ST1)



## Cutting data

| Work piece material | Type of treatment/ally | Hardness HB           | Coated carbide           |                            |                          |           |
|---------------------|------------------------|-----------------------|--------------------------|----------------------------|--------------------------|-----------|
|                     |                        |                       | CTP1340<br>$v_c$ [m/min] | CTCP320ST<br>$v_c$ [m/min] | CTPP345<br>$v_c$ [m/min] |           |
| <b>M</b>            | Stainless steel        | annealed pearlitic    | 200                      | 50 – 200                   | 120 – 200                | 100 – 180 |
|                     |                        | quenched austenitic   | 180                      | 50 – 180                   | 100 – 170                | 80 – 150  |
|                     |                        | quenched duplex       | 230 – 260                | 50 – 100                   | 70 – 110                 | 70 – 110  |
|                     |                        | hardened martensitic  | 330                      | 50 – 80                    | 60 – 90                  | 60 – 90   |
| <b>S</b>            | Exotic                 | Fe base               | 200                      | –                          | –                        | 20 – 45   |
|                     |                        | Nickel or cobalt base | 250                      | –                          | –                        | 15 – 25   |
|                     |                        | Titanium              | Rm 440                   | –                          | –                        | 50 – 120  |



## GD24...40... -ST1

| Insert | Designation                   | Chipbreaker | Material number | Available   |             |
|--------|-------------------------------|-------------|-----------------|-------------|-------------|
|        | GD24LT-40.03-04-ST1 CTCP320ST | ... -ST1    |                 | coming soon |             |
|        | GD24LT-40.03-04-ST1 CTP1340   |             |                 | coming soon |             |
|        | GD24LT-40.03-04-ST1 CTPP345   |             |                 | coming soon |             |
|        | GD24NT-40.04-00-ST1 CTCP320ST |             | 12149563        | •           |             |
|        | GD24NT-40.04-00-ST1 CTP1340   |             | 12149561        | •           |             |
|        | GD24NT-40.04-00-ST1 CTPP345   |             | 12149564        | •           |             |
|        | GD24RT-40.03-04-ST1 CTCP320ST |             |                 |             | coming soon |
|        | GD24RT-40.03-04-ST1 CTP1340   |             |                 |             | coming soon |
|        | GD24RT-40.03-04-ST1 CTPP345   |             |                 |             | coming soon |

## GD24...50... -ST1

| Insert | Designation                 | Chipbreaker | Material number | Available |
|--------|-----------------------------|-------------|-----------------|-----------|
|        | GD24NT-50.04-00-ST1 CTPP345 | ... -ST1    | 12382668        | •         |
|        | GD24NT-50.04-00-ST1 CTP1340 |             | 12382661        | •         |

## GD24...60... -ST1

| Insert | Designation                 | Chipbreaker | Material number | Available   |
|--------|-----------------------------|-------------|-----------------|-------------|
|        | GD24NT-60.04-00-ST1 CTPP345 | ... -ST1    |                 | coming soon |
|        | GD24NT-60.04-00-ST1 CTP1340 |             |                 | coming soon |

### Blades \*



### Tools



### Spare parts





# Long size insert – Double sided

## GD... –T / GD... –M



## Overview (GD... -T, GD... -M)

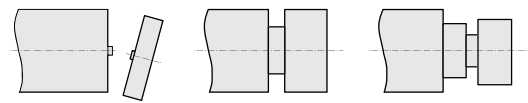
### Which chipbreaker to use?

#### T – Grooving and Turning

- ▲ For grooving and turning
- ▲ Suitable for all steel and stainless steel materials
- ▲ Very good chip control



#### Application –T



PARTING

GROOVING

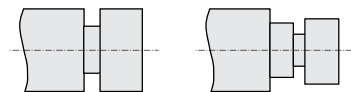
TURNING

#### M – Radius grooves

- ▲ Insert for radius grooves
- ▲ For copy turning
- ▲ Suitable for all steel and cast iron materials



#### Application –M



GROOVING

TURNING

### Premium grade

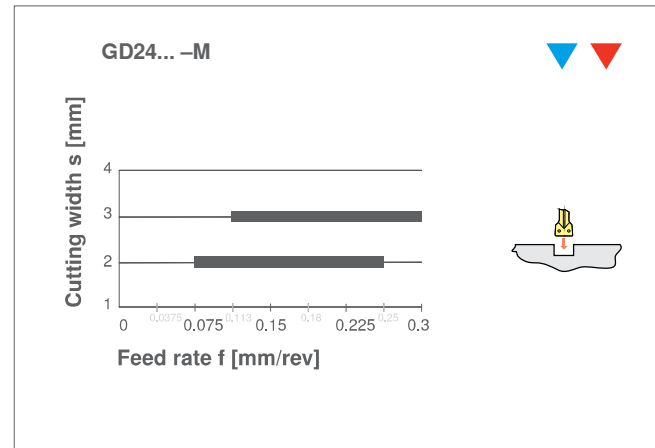
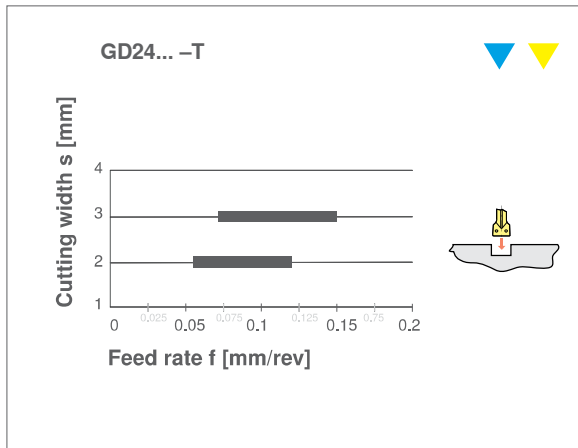
#### CTP1340:

- ▲ Excellent suitability for universal application
- ▲ High cutting edge stability



## Long size – Double sided

### Feed rate for parting and grooving (GD24... –T / –M)



Hand

GD24... –T



L N R

Hand

GD24... –M



N







## Cutting data





| Work piece material | Type of treatment/alloy | Hardness HB                        | Coated carbide           |                            |                          |           |
|---------------------|-------------------------|------------------------------------|--------------------------|----------------------------|--------------------------|-----------|
|                     |                         |                                    | CTP1340<br>$v_c$ [m/min] | CTCP320ST<br>$v_c$ [m/min] | CTPP345<br>$v_c$ [m/min] |           |
| <b>P</b>            | Steel                   | non alloyed steel 0.15% – 0.45% C  | 150 – 250                | 80 – 180                   | 110 – 190                | 80 – 150  |
|                     |                         | low alloyed steel tempered         | 250 – 300                | 60 – 150                   | 110 – 180                | 70 – 120  |
|                     |                         | high alloyed steel tempered        | 350                      | 50 – 120                   | 70 – 160                 | 60 – 100  |
|                     |                         | corrosion resistant steel annealed | 200                      | 50 – 200                   | 120 – 200                | 90 – 160  |
| <b>M</b>            | Stainless steel         | annealed pearlitic                 | 200                      | 50 – 200                   | 120 – 200                | 100 – 180 |
|                     |                         | quenched austenitic                | 180                      | 50 – 180                   | 100 – 170                | 80 – 150  |
|                     |                         | quenched duplex                    | 230 – 260                | 50 – 100                   | 70 – 110                 | 70 – 110  |
|                     |                         | hardened martensitic               | 330                      | 50 – 80                    | 60 – 90                  | 60 – 90   |
| <b>K</b>            | Cast iron               | grey cast iron                     | 180                      | 100 – 200                  | 90 – 180                 | –         |
|                     |                         | spheroidal                         | 160                      | 100 – 180                  | 100 – 160                | –         |
|                     |                         | malleable pearlitic                | 130                      | 80 – 160                   | 80 – 150                 | –         |



## GD24...20... -T / -M

| Insert   | Designation                 | Chipbreaker | Material number | Available |
|--|-----------------------------|-------------|-----------------|-----------|
|   | GD24LT-20.02-06-T CTCP320ST | ...         | 12312069        | •         |
|  | GD24LT-20.02-06-T CTP1340   |             | 12312068        | •         |
|  | GD24LT-20.02-06-T CTPP345   |             | 12312070        | •         |
|   | GD24NT-20.02-00-T CTCP320ST |             | 12158328        | •         |
|  | GD24NT-20.02-00-T CTP1340   |             | 12158327        | •         |
|  | GD24NT-20.02-00-T CTPP345   |             | 12158329        | •         |
|   | GD24RT-20.02-06-T CTCP320ST |             | 12312059        | •         |
|  | GD24RT-20.02-06-T CTP1340   |             | 12312058        | •         |
|  | GD24RT-20.02-06-T CTPP345   |             | 12312060        | •         |
|  | GD24NR-20.00-00-M CTCP320ST | ...         | 12218982        | •         |
|  | GD24NR-20.00-00-M CTP1340   | ... -M      | 12218980        | •         |
|  | GD24NR-20.00-00-M CTPP345   | 12218983    | •               |           |

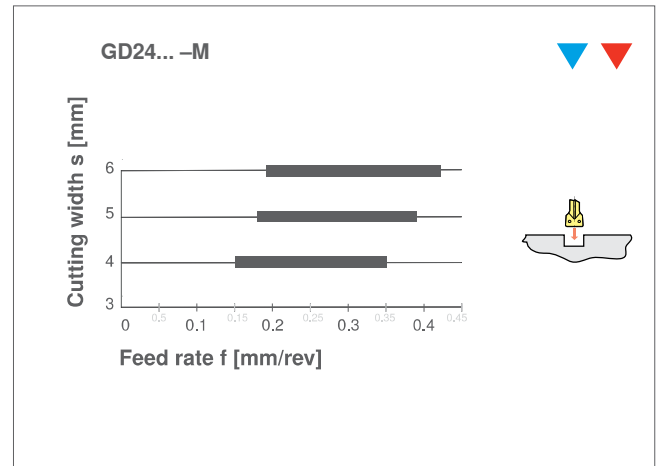
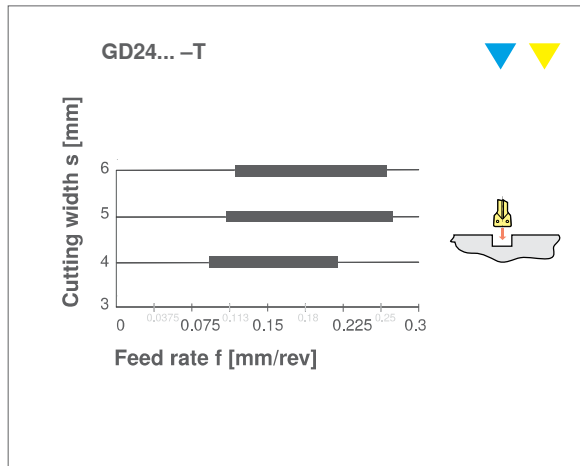
## GD24...30... -T / -M

| Insert  | Designation                 | Chipbreaker | Material number | Available |
|---|-----------------------------|-------------|-----------------|-----------|
|  | GD24LT-30.02-06-T CTCP320ST | ...         | 12312076        | •         |
|   | GD24LT-30.02-06-T CTP1340   |             | 12312075        | •         |
|   | GD24LT-30.02-06-T CTPP345   |             | 12312077        | •         |
|  | GD24NT-30.03-00-T CTCP320ST |             | 12149211        | •         |
|   | GD24NT-30.03-00-T CTP1340   |             | 12141172        | •         |
|   | GD24NT-30.03-00-T CTPP345   |             | 12149213        | •         |
|  | GD24RT-30.02-06-T CTCP320ST |             | 12312073        | •         |
|   | GD24RT-30.02-06-T CTP1340   |             | 12312072        | •         |
|   | GD24RT-30.02-06-T CTPP345   |             | 12312074        | •         |
|  | GD24NR-30.00-00-M CTCP320ST | ...         | 12149207        | •         |
|   | GD24NR-30.00-00-M CTP1340   | ... -M      | 12142965        | •         |
|   | GD24NR-30.00-00-M CTPP345   | 12149210    | •               |           |



## Long size – Double sided

### Feed rate for parting and grooving (GD24... –T / –M)



Hand

GD24... –T



L N R

Hand

GD24... –M



N







## Cutting data



| Work piece material         | Type of treatment/alloy            | Hardness HB | Coated carbide                    |                                     |                                   |
|-----------------------------|------------------------------------|-------------|-----------------------------------|-------------------------------------|-----------------------------------|
|                             |                                    |             | CTP1340<br>v <sub>c</sub> [m/min] | CTCP320ST<br>v <sub>c</sub> [m/min] | CTPP345<br>v <sub>c</sub> [m/min] |
| <b>P</b><br>Steel           | non alloyed steel 0.15% – 0.45% C  | 150 – 250   | 80 – 180                          | 110 – 190                           | 80 – 150                          |
|                             | low alloyed steel tempered         | 250 – 300   | 60 – 150                          | 110 – 180                           | 70 – 120                          |
|                             | high alloyed steel tempered        | 350         | 50 – 120                          | 70 – 160                            | 60 – 100                          |
|                             | corrosion resistant steel annealed | 200         | 50 – 200                          | 120 – 200                           | 90 – 160                          |
| <b>M</b><br>Stainless steel | annealed pearlitic                 | 200         | 50 – 200                          | 120 – 200                           | 100 – 180                         |
|                             | quenched austenitic                | 180         | 50 – 180                          | 100 – 170                           | 80 – 150                          |
|                             | quenched duplex                    | 230 – 260   | 50 – 100                          | 70 – 110                            | 70 – 110                          |
|                             | hardened martensitic               | 330         | 50 – 80                           | 60 – 90                             | 60 – 90                           |
| <b>K</b><br>Cast iron       | grey cast iron                     | 180         | 100 – 200                         | 90 – 180                            | –                                 |
|                             | spheroidal                         | 160         | 100 – 180                         | 100 – 160                           | –                                 |
|                             | malleable pearlitic                | 130         | 80 – 160                          | 80 – 150                            | –                                 |





## GD24...40... -T / -M

| Insert  | Designation                 | Chipbreaker | Material number | Available |
|---|-----------------------------|-------------|-----------------|-----------|
|  | GD24NT-40.04-00-T CTCP320ST |             | 12149559        | ●         |
|   | GD24NT-40.04-00-T CTP1340   | ... -T      | 12149558        | ●         |
|   | GD24NT-40.04-00-T CTPP345   |             | 12149560        | ●         |
|  | GD24NR-40.00-00-M CTCP320ST |             | 12218975        | ●         |
|   | GD24NR-40.00-00-M CTP1340   | ... -M      | 12218974        | ●         |
|   | GD24NR-40.00-00-M CTPP345   |             | 12218977        | ●         |

## GD24...50... -T / -M

| Insert  | Designation               | Chipbreaker | Material number | Available |
|---|---------------------------|-------------|-----------------|-----------|
|  | GD24NT-50.04-00-T CTP1340 | ... -T      | 12391945        | ●         |
|  | GD24NR-50.00-00-M CTP1340 | ... -M      | 12391847        | ●         |

## GD24...60... -T / -M

| Insert  | Designation               | Chipbreaker | Material number | Available   |
|---|---------------------------|-------------|-----------------|-------------|
|  | GD24NT-60.04-00-T CTP1340 | ... -T      |                 | coming soon |
|  | GD24NR-60.00-00-M CTP1340 | ... -M      |                 | coming soon |

Blades, tools and spare parts, see page 52 – 58



# Available range blades





## GD24






## Available range blades GD24

### Blades / Spare parts GD24

| Blades   |  | Designation     | Tmax [mm] | Material number | Available   |
|--|---|-----------------|-----------|-----------------|-------------|
|   | GD24... 20  | GBL-2602-GO2402 | 21        | 12295514        | •           |
|  |   | GBL-3202-GO2402 | 21        | 12295534        | •           |
|  |   | GBR-2602-GO2402 | 21        | 12295505        | •           |
|  |   | GBR-3202-GO2402 | 21        | 12295510        | •           |
|   | GD24... 30  | GBN-2603-GO2403 | 21        | 12167262        | •           |
|  |   | GBN-3203-GO2403 | 21        | 12167255        | •           |
|  | GD24... 40  | GBN-2604-GO2404 | 21        | 12167260        | •           |
|  |   | GBN-3204-GO2404 | 21        | 12167253        | •           |
|  | GD24... 50  | GBN-2605-GO2405 | 21        |                 | coming soon |
|  |   | GBN-3205-GO2405 | 21        |                 | coming soon |

| Spare parts *   | Designation                                  | Material number |
|---|--|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width)    | 12154231        |
|   | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        |

\* How to use the system? Page 113




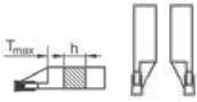

## Available range tool holders



### GD24





## Available range tool holders GD24...20...


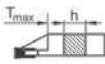


| Tool  |  |  | h  |   | Designation          | Material number | Available |
|---|---|---|----|---|----------------------|-----------------|-----------|
|   |   |   | L  | R |                      |                 |           |
|  | GD24...20...  | 13  | 12 | L | GMEL-12-GD2402-K-T13 | 12162709        | •         |
|   |   |   |    | R | GMER-12-GD2402-K-T13 | 12162706        | •         |
|   |   |   | 16 | L | GMEL-16-GD2402-K-T13 | 12162703        | •         |
|   |   |   |    | R | GMER-16-GD2402-K-T13 | 12162693        | •         |
|   |   |   | 20 | L | GMEL-20-GD2402-K-T13 | 12162691        | •         |
|   |   |   |    | R | GMER-20-GD2402-K-T13 | 12162690        | •         |



| Spare parts   | Designation              | Material number | Available |
|---|--------------------------|-----------------|-----------|
|  | Key T15                  | 12016556        | •         |
|   | Key T20                  | 12016558        | •         |
|  | M3.5X14,0/T15 (for h=12) | 11081190        | •         |
|   | M4.0X16/T20 (for h=16)   | 12003031        | •         |
|   | M4.0X18/T20 (for h=20)   | 11007006        | •         |

\* How to use the system? Page 113



## Available range tool holders GD24...30...


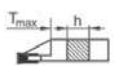




| Tool  |  |  |  | Designation |    | Material number      | Available            |          |   |
|---|---|---|---|-------------|----|----------------------|----------------------|----------|---|
|   |   |   |   | L           | R  |                      |                      |          |   |
|  | GD24... 30.0...   |   |   | 12          | L  | GMEL-12-GD2403-K-T13 | 12148458             | •        |   |
|   |   |   |   |             | R  | GMER-12-GD2403-K-T13 | 12148456             | •        |   |
|   |   |   |   | 16          | L  | GMEL-16-GD2403-K-T13 | 12148455             | •        |   |
|   |   |   |   |             | R  | GMER-16-GD2403-K-T13 | 12148450             | •        |   |
|   |   |   |   | 20          | L  | GMEL-20-GD2403-K-T13 | 12148443             | •        |   |
|   |   |   |   |             | R  | GMER-20-GD2403-K-T13 | 12148440             | •        |   |
|   |   |   |   | 25          | L  | GMEL-25-GD2403-K-T13 | 12148436             | •        |   |
|   |   |   |   |             | R  | GMER-25-GD2403-K-T13 | 12148434             | •        |   |
|   |   |   |   | 25          | 16 | L                    | GMEL-16-GD2403-K-T25 | 12148452 | • |
|   |   |   |   |             |    | R                    | GMER-16-GD2403-K-T25 | 12148445 | • |
|   |   |   |   |             | 20 | L                    | GMEL-20-GD2403-K-T25 | 12148441 | • |
|   |   |   |   |             |    | R                    | GMER-20-GD2403-K-T25 | 12148437 | • |
|   |   |   |   |             | 25 | L                    | GMEL-25-GD2403-K-T25 | 12148435 | • |
|   |   |   |   |             |    | R                    | GMER-25-GD2403-K-T25 | 12148433 | • |






| Spare parts   | Designation               | Material number | Available |
|---|---------------------------|-----------------|-----------|
|  | Key T15                   | 12016556        | •         |
|   | Key T20                   | 12016558        | •         |
|  | M3.5X14.0/T15 (for h=12)  | 11081190        | •         |
|   | M4.0X16/T20 (for h=16)    | 12003031        | •         |
|   | M4.0X18/T20 (for h=20/25) | 11007006        | •         |
|   |                           |                 |           |

\* How to use the system? Page 113



## GD24... 40/50/60

| Tool  |                      |  |  | Designation          |                      | Material number | Available   |
|---|---|---|---|----------------------|----------------------|-----------------|-------------|
|   |   |   |   | Tmax                 | h                    |                 |             |
|  | GD24...40.0...  | 25  | 16  | L                    | GMEL-16-GD2404-K-T25 | 12162689        | •           |
|   |   |   |   | R                    | GMER-16-GD2404-K-T25 | 12162737        | •           |
|   |   |   |   | L                    | GMEL-20-GD2404-K-T25 | 12162734        | •           |
|   |   |   |   | R                    | GMER-20-GD2404-K-T25 | 12162729        | •           |
|   |   |   |   | L                    | GMEL-25-GD2404-K-T25 | 12162726        | •           |
|   |   |   |   | R                    | GMER-25-GD2404-K-T25 | 12162714        | •           |
|   | GD24...50.0...<br>   | 25  | 20  | L                    | GMEL-20-GD2405-M-T25 |                 | coming soon |
|   |   |   |   | R                    | GMER-20-GD2405-M-T25 |                 | coming soon |
|   |   |   | 25  | L                    | GMEL-25-GD2405-M-T25 | 12376613        | •           |
|   |   |   |   | R                    | GMER-25-GD2405-M-T25 | 12376612        | •           |
|   | GD24...60.0...<br> | 25  | 20  | L                    | GMEL-20-GD2406-M-T25 |                 | coming soon |
|   |   |   |   | R                    | GMER-20-GD2406-M-T25 |                 | coming soon |
| 25  |   |   | L   | GMEL-25-GD2406-M-T25 |                      | coming soon     |             |
|   |   |   | R   | GMER-25-GD2406-M-T25 |                      | coming soon     |             |

| Spare parts   | Designation               | Material number | Available |
|---|---------------------------|-----------------|-----------|
|  | Key T20                   | 12016558        | •         |
|  | M4.0X16 T20 (for h=16)    | 12003031        | •         |
|  | M4.0X18/T20 (for h=20/25) | 11007006        | •         |
|  | Key SW5 (50.0 + 60.0)     | 4496            | •         |
|  | M6.0X20 (50.0 + 60.0)     | 4493            | •         |





## Long size insert – Single sided





## Overview

### Long size insert – Single sided

The benefit of **GO-24 system**, is the possibility to groove past the length of the insert **without damaging the surface finish!**



Excellent surface finish



## Long size insert – Single sided

### GO... –M1, GO... –F1





## Overview (GO... -M1, GO... -F1)

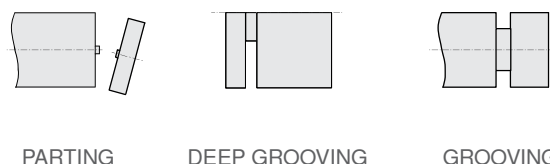
### Which chipbreaker to use?

#### M1 – Medium cutting chipbreaker

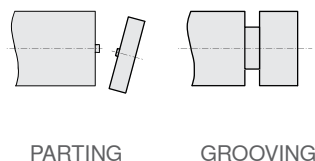
- ▲ Single side insert with narrow negative chamfer
- ▲ Suitable for all steel materials with high strength
- ▲ Suitable for all applications
- ▲ For steel and grey cast iron
- ▲ Good stability for deep grooving



#### Application –M1



#### Application –F1



#### F1 – Very soft cutting chipbreaker

- ▲ Excellent cutting chipbreaker with low cutting forces
- ▲ For low or medium strength materials
- ▲ Particularly suitable for parting off tubes and thin-walled work pieces
- ▲ High cutting edge stability
- ▲ Excellent chip control also with low feed
- ▲ Low built up edge



### Premium grade

#### CTP1340:

- ▲ Excellent suitability for universal application
- ▲ High cutting edge stability

#### CTCP320ST:

- ▲ Excellent wear resistance
- ▲ Good resistance to oxidation
- ▲ High toughness
- ▲ Good heat resistance

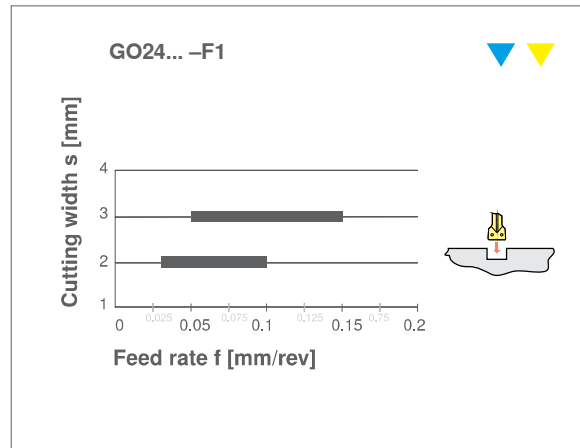
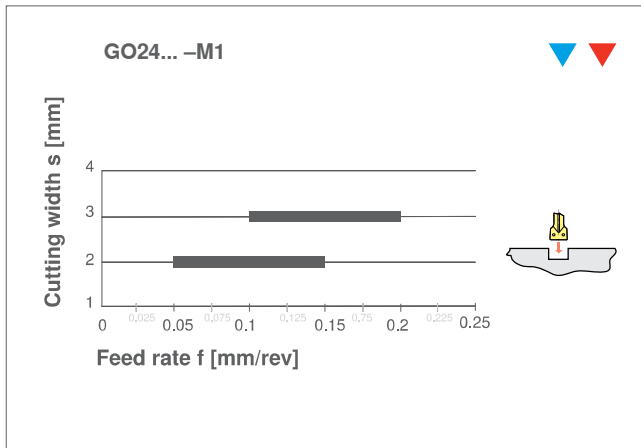
#### CTPP345:

- ▲ Ideal for stainless steel
- ▲ Excellent toughness
- ▲ Good wear resistance
- ▲ High application security



# Long size – Single sided

## Feed rate for parting and grooving (GO24... –M1 / –F1)



Hand

GO24... –M1



N

Hand

GO24... –F1



N





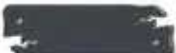
## Cutting data


| Work piece material | Type of treatment/alloy | Hardness HB                        | Coated carbide                    |                                     |                                   |           |
|---------------------|-------------------------|------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-----------|
|                     |                         |                                    | CTP1340<br>v <sub>c</sub> [m/min] | CTCP320ST<br>v <sub>c</sub> [m/min] | CTPP345<br>v <sub>c</sub> [m/min] |           |
| <b>P</b>            | Steel                   | non alloyed steel 0.15% – 0.45% C  | 150 – 250                         | 80 – 180                            | 110 – 190                         | 80 – 150  |
|                     |                         | low alloyed steel tempered         | 250 – 300                         | 60 – 150                            | 110 – 180                         | 70 – 120  |
|                     |                         | high alloyed steel tempered        | 350                               | 50 – 120                            | 70 – 160                          | 60 – 100  |
|                     |                         | corrosion resistant steel annealed | 200                               | 50 – 200                            | 120 – 200                         | 90 – 160  |
| <b>M</b>            | Stainless steel         | annealed pearlitic                 | 200                               | 50 – 200                            | 120 – 200                         | 100 – 180 |
|                     |                         | quenched austenitic                | 180                               | 50 – 180                            | 100 – 170                         | 80 – 150  |
|                     |                         | quenched duplex                    | 230 – 260                         | 50 – 100                            | 70 – 110                          | 70 – 110  |
|                     |                         | hardened martensitic               | 330                               | 50 – 80                             | 60 – 90                           | 60 – 90   |
| <b>K</b>            | Cast iron               | grey cast iron                     | 180                               | 100 – 200                           | 90 – 180                          | –         |
|                     |                         | spheroidal                         | 160                               | 100 – 180                           | 100 – 160                         | –         |
|                     |                         | malleable pearlitic                | 130                               | 80 – 160                            | 80 – 150                          | –         |



## GO24...20... -M1 / -F1



| Insert  | Designation                  | Chipbreaker | Material number | Available |
|---|------------------------------|-------------|-----------------|-----------|
|  | GO24NT-20.02-00-M1 CTCP320ST |             | 12193962        | •         |
|   | GO24NT-20.02-00-M1 CTP1340   | ... -M1     | 12193961        | •         |
|   | GO24NT-20.02-00-M1 CTPP345   |             | 12193963        | •         |
|  | GO24NT-20.02-00-F1 CTCP320ST |             | 12330133        | •         |
|   | GO24NT-20.02-00-F1 CTP1340   | ... -F1     | 12330130        | •         |
|   | GO24NT-20.02-00-F1 CTPP345   |             | 12330135        | •         |


| Blades  | Designation     | Tmax [mm] | Material number | Available |
|---|-----------------|-----------|-----------------|-----------|
|  | GBL-2602-GO2402 | 25        | 12295514        | •         |
|   | GBR-2602-GO2402 | 25        | 12295505        | •         |
|   | GBL-3202-GO2402 | 25        | 12295534        | •         |
|   | GBR-3202-GO2402 | 25        | 12295510        | •         |


| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



## GO24...30... -M1 / -F1

| Insert  | Designation                  | Chipbreaker | Material number | Available |
|---|------------------------------|-------------|-----------------|-----------|
|  | GO24NT-30.02-00-M1 CTCP320ST |             | 12193971        | •         |
|   | GO24NT-30.02-00-M1 CTP1340   | ... -M1     | 12143095        | •         |
|   | GO24NT-30.02-00-M1 CTPP345   |             | 12193973        | •         |
|  | GO24NT-30.02-00-F1 CTCP320ST |             | 12330168        | •         |
|   | GO24NT-30.02-00-F1 CTP1340   | ... -F1     | 12330167        | •         |
|   | GO24NT-30.02-00-F1 CTPP345   |             | 12330170        | •         |



| Blades  | Designation     | Tmax [mm] | Material number | Available |
|---|-----------------|-----------|-----------------|-----------|
|  | GBN-2603-GO2403 | 35        | 12167262        | •         |
|   | GBN-3203-GO2403 | 50        | 12167255        | •         |


| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |






## GO24...40... -M1 / -F1

| Insert  | Designation                  | Chipbreaker | Material number | Available |
|---|------------------------------|-------------|-----------------|-----------|
|  | GO24NT-40.03-00-M1 CTCP320ST |             | 12193967        | •         |
|   | GO24NT-40.03-00-M1 CTP1340   | ... -M1     | 12193966        | •         |
|   | GO24NT-40.03-00-M1 CTPP345   |             | 12193969        | •         |
|  | GO24NT-40.03-00-F1 CTCP320ST |             | 12330181        | •         |
|   | GO24NT-40.03-00-F1 CTP1340   | ... -F1     | 12330180        | •         |
|   | GO24NT-40.03-00-F1 CTPP345   |             | 12330183        | •         |

| Blades  | Designation     | Tmax [mm] | Material number | Available |
|---|-----------------|-----------|-----------------|-----------|
|  | GBN-2604-GO2404 | 40        | 12167260        | •         |
|   | GBN-3204-GO2404 | 50        | 12167253        | •         |

| Spare parts *   | Designation                                  | Material number |
|---|--|-----------------|
|  | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        |



## Overview (GO... –ST1, GO... –T)

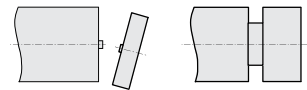
### Which chipbreaker to use?

#### ST1 – Soft cutting chipbreaker

- ▲ Especially for stainless steel
- ▲ Problem solver for steel machining



#### Application –ST1



PARTING

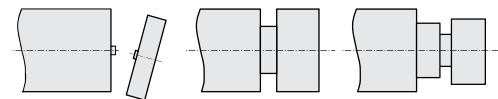
GROOVING

#### T – Grooving and Turning

- ▲ For grooving and turning
- ▲ Suitable for all steel and stainless steel materials
- ▲ Very good chip control



#### Application –T



PARTING

GROOVING

TURNING

### Premium grade

#### CTPP345:

- ▲ Ideal for stainless steel
- ▲ Excellent toughness
- ▲ Good wear resistance
- ▲ High application security

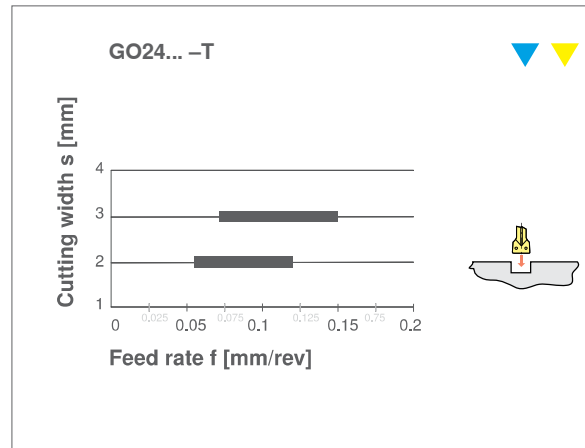
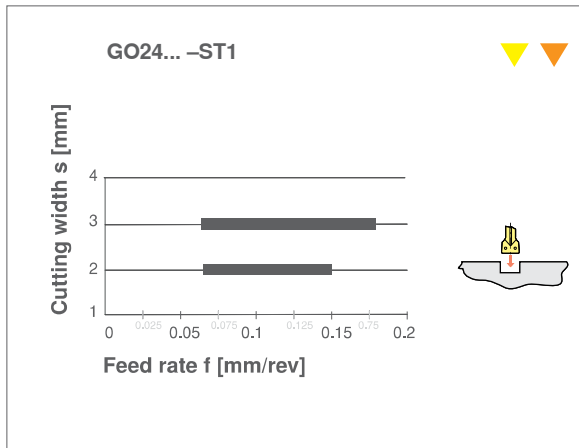
#### CTP1340:

- ▲ Excellent suitability for universal application
- ▲ High cutting edge stability



## Long size – Single sided

### Feed rate for parting and grooving (GO24... –ST1 / T)



Hand

GO24... –ST1



N

Hand

GO24... –T



N






## Cutting data


| Work piece material | Type of treatment/alloy | Hardness HB                        | Coated carbide                    |                                     |                                   |           |
|---------------------|-------------------------|------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-----------|
|                     |                         |                                    | CTP1340<br>v <sub>c</sub> [m/min] | CTCP320ST<br>v <sub>c</sub> [m/min] | CTPP345<br>v <sub>c</sub> [m/min] |           |
| <b>P</b>            | Steel                   | non alloyed steel 0.15% – 0.45% C  | 150 – 250                         | 80 – 180                            | 110 – 190                         | 80 – 150  |
|                     |                         | low alloyed steel tempered         | 250 – 300                         | 60 – 150                            | 110 – 180                         | 70 – 120  |
|                     |                         | high alloyed steel tempered        | 350                               | 50 – 120                            | 70 – 160                          | 60 – 100  |
|                     |                         | corrosion resistant steel annealed | 200                               | 50 – 200                            | 120 – 200                         | 90 – 160  |
| <b>M</b>            | Stainless steel         | annealed pearlitic                 | 200                               | 50 – 200                            | 120 – 200                         | 100 – 180 |
|                     |                         | quenched austenitic                | 180                               | 50 – 180                            | 100 – 170                         | 80 – 150  |
|                     |                         | quenched duplex                    | 230 – 260                         | 50 – 100                            | 70 – 110                          | 70 – 110  |
|                     |                         | hardened martensitic               | 330                               | 50 – 80                             | 60 – 90                           | 60 – 90   |
| <b>K</b>            | Cast iron               | grey cast iron                     | 180                               | 100 – 200                           | 90 – 180                          | –         |
|                     |                         | spheroidal                         | 160                               | 100 – 180                           | 100 – 160                         | –         |
|                     |                         | malleable pearlitic                | 130                               | 80 – 160                            | 80 – 150                          | –         |



## GO24...20... -ST1 / T



| Insert  | Designation                   | Chipbreaker | Material number | Available |
|---|-------------------------------|-------------|-----------------|-----------|
|  | GO24NT-20.02-00-ST1 CTCP320ST |             | 12330151        | •         |
|   | GO24NT-20.02-00-ST1 CTP1340   | ... -ST1    | 12330143        | •         |
|   | GO24NT-20.02-00-ST1 CTPP345   |             | 12330152        | •         |
|  | GO24NT-20.02-00-T CTCP320ST   |             | 12330165        | •         |
|   | GO24NT-20.02-00-T CTP1340     | ... -T      | 12330163        | •         |
|   | GO24NT-20.02-00-T CTPP345     |             | 12330166        | •         |


| Blades  | Designation     | Tmax [mm] | Material number | Available |
|---|-----------------|-----------|-----------------|-----------|
|  | GBL-2602-GO2402 | 25        | 12295514        | •         |
|   | GBR-2602-GO2402 | 25        | 12295505        | •         |
|   | GBL-3202-GO2402 | 25        | 12295534        | •         |
|   | GBR-3202-GO2402 | 25        | 12295510        | •         |


| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



## GO24...30... -ST1 / T



| Insert  | Designation                   | Chipbreaker | Material number | Available   |
|---|-------------------------------|-------------|-----------------|-------------|
|  | GO24NT-30.03-00-ST1 CTCP320ST |             |                 | on request  |
|   | GO24NT-30.03-00-ST1 CTP1340   | ... -ST1    |                 | coming soon |
|   | GO24NT-30.03-00-ST1 CTPP345   |             |                 | on request  |
|  | GO24NT-30.03-00-T CTCP320ST   |             |                 | on request  |
|   | GO24NT-30.03-00-T CTP1340     | ... -T      |                 | coming soon |
|   | GO24NT-30.03-00-T CTPP345     |             |                 | on request  |


| Blades  | Designation     | Tmax [mm] | Material number | Available |
|---|-----------------|-----------|-----------------|-----------|
|  | GBN-2603-GO2403 | 35        | 12167262        | •         |
|   | GBN-3203-GO2403 | 50        | 12167255        | •         |

| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



## GO24...40... -ST1 / T

| Insert  | Designation                   | Chipbreaker | Material number | Available   |
|---|-------------------------------|-------------|-----------------|-------------|
|  | GO24NT-40.04-00-ST1 CTCP320ST |             |                 | on request  |
|   | GO24NT-40.04-00-ST1 CTP1340   | ...- ST1    |                 | coming soon |
|   | GO24NT-40.04-00-ST1 CTPP345   |             |                 | on request  |
|  | GO24NT-40.04-00-T CTCP320ST   |             |                 | on request  |
|   | GO24NT-40.04-00-T CTP1340     | ... -T      |                 | coming soon |
|   | GO24NT-40.04-00-T CTPP345     |             |                 | on request  |

| Blades  | Designation     | Tmax [mm] | Material number | Available |
|---|-----------------|-----------|-----------------|-----------|
|  | GBN-2604-GO2404 | 35        | 12167260        | •         |
|   | GBN-3204-GO2404 | 50        | 12167253        | •         |

| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154233        |



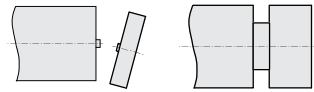
## Overview (GO... –LM)

### LM – First choice in case of aluminum and non ferrous metals

- ▲ Insert with highly positive cutting chipbreaker and sharp cutting edge
- ▲ Extra-smooth rake face through "microfinish"
- ▲ Reduced built-up edge



### Application –LM



PARTING

GROOVING

### Premium grade

#### H216T:

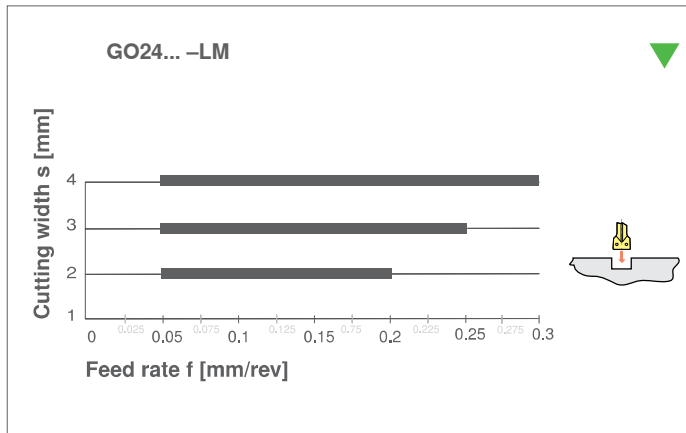
- ▲ Optimal suitable for aluminum
- ▲ High wear resistance
- ▲ High heat resistance
- ▲ Low tendency to adhesion





## Long size – Single sided

### Feed rate for parting and grooving (GO24... –LM)





### Cutting data


| Work piece material | Type of treatment/alloy       | Hardness HB | Uncoated carbide       |
|---------------------|-------------------------------|-------------|------------------------|
|                     |                               |             | H216T<br>$v_c$ [m/min] |
| <b>N</b>            | Non-ferrous                   |             |                        |
|                     | Aluminum wrought alloys       | 100         | 200 – 2000             |
|                     | Aluminum cast alloys < 12% Si | 90          | 400 – 1500             |
|                     | Copper alloys (bronze)        | 90          | 200 – 600              |



## GO24...20...-LM


| Insert  | Designation              | Chipbreaker | Material number | Available |
|---|--------------------------|-------------|-----------------|-----------|
|  | GO24NT-20.02-00-LM H216T | ...-LM      | 12272311        | •         |


| Blades  | Designation     | Tmax [mm] | Material number | Available |
|---|-----------------|-----------|-----------------|-----------|
|  | GBL-2602-GO2402 | 25        | 12295514        | •         |
|   | GBR-2602-GO2402 | 25        | 12295505        | •         |
|   | GBL-3202-GO2402 | 25        | 12295534        | •         |
|   | GBR-3202-GO2402 | 25        | 12295510        | •         |


| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



## GO24...30... -LM


| Insert  | Designation              | Chipbreaker | Material number | Available |
|---|--------------------------|-------------|-----------------|-----------|
|  | GO24NT-30.03-00-LM H216T | ... -LM     | 12272432        | •         |


| Blades  | Designation     | Tmax [mm] | Material number | Available |
|---|-----------------|-----------|-----------------|-----------|
|  | GBN-2603-GO2403 | 35        | 12167262        | •         |
|   | GBN-3203-GO2403 | 50        | 12167255        | •         |

| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



## GO24...40...-LM

| Insert  | Designation              | Chipbreaker | Material number | Available |
|---|--------------------------|-------------|-----------------|-----------|
|  | GO24NT-40.04-00-LM H216T | ...-LM      | 12272427        | •         |

| Blades  | Designation     | Tmax [mm] | Material number | Available |
|---|-----------------|-----------|-----------------|-----------|
|  | GBN-2604-GO2404 | 40        | 12167260        | •         |
|   | GBN-3204-GO2404 | 50        | 12167253        | •         |

| Spare parts *   | Designation                                  | Material number |
|---|--|-----------------|
|  | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        |



# Small size insert – Single sided

## GS... –M1



## Overview (GS... –M1)

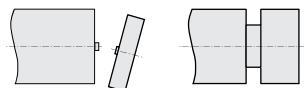
### Which chipbreaker to use?

#### M1 – First choice for part-off on steel and cast iron

- ▲ Insert with narrow negative chamfer
- ▲ Suitable for all steel materials with high strength
- ▲ Suitable for all applications
- ▲ For steel and grey cast iron



### Application –M1



PARTING

GROOVING

### Premium grade

#### CTCP320ST:

- ▲ Excellent wear resistance
- ▲ Good resistance to oxidation
- ▲ High toughness
- ▲ Good heat resistance

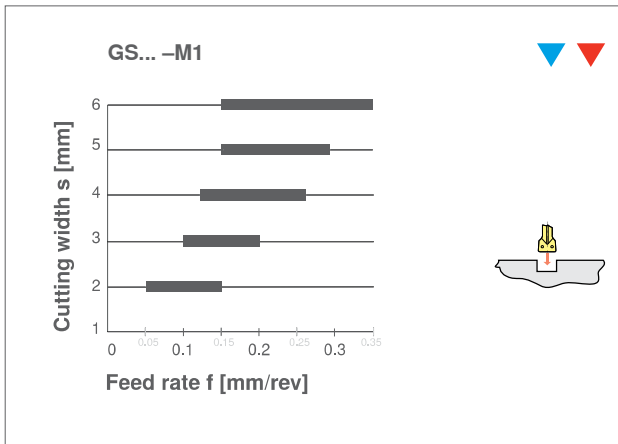
#### CTPP345:

- ▲ Ideal for stainless steel
- ▲ Excellent toughness
- ▲ Good wear resistance
- ▲ High application security



## Small size – Single sided

### Feed rate for parting and grooving (GS... –M1)





## Cutting data


| Work piece material | Type of treatment/alloy            | Hardness HB | Coated carbide           |                            |                          |
|---------------------|------------------------------------|-------------|--------------------------|----------------------------|--------------------------|
|                     |                                    |             | CTP1340<br>$v_c$ [m/min] | CTCP320ST<br>$v_c$ [m/min] | CTPP345<br>$v_c$ [m/min] |
| <b>P</b> Steel      | non alloyed steel 0.15% – 0.45% C  | 150 – 250   | 80 – 180                 | 110 – 190                  | 80 – 150                 |
|                     | low alloyed steel tempered         | 250 – 300   | 60 – 150                 | 110 – 180                  | 70 – 120                 |
|                     | high alloyed steel tempered        | 350         | 50 – 120                 | 70 – 160                   | 60 – 100                 |
|                     | corrosion resistant steel annealed | 200         | 50 – 200                 | 120 – 200                  | 90 – 160                 |
| <b>K</b> Cast iron  | grey cast iron                     | 180         | 100 – 200                | 90 – 180                   | –                        |
|                     | spheroidal                         | 160         | 100 – 180                | 100 – 160                  | –                        |
|                     | malleable pearlitic                | 130         | 80 – 160                 | 80 – 150                   | –                        |



## GS...20... -M1

| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-20.02-00-M1 CTCP320ST |             | 12220987        | •         |
|   | GSNT-20.02-00-M1 CTPP345   | ... -M1     | 12122435        | •         |
|   | GSNT-20.02-00-M1 CTP1340   |             | 12331961        | •         |


| Blades   | Designation   | Tmax [mm] | Material number | Available |
|--|---------------|-----------|-----------------|-----------|
|  | GBR-2602-GS02 | 25        | 12167546        | •         |
|  | GBL-2602-GS02 | 25        | 12167544        | •         |
|  | GBR-3202-GS02 | 25        | 12167553        | •         |
|  | GBL-3202-GS02 | 25        | 12167550        | •         |

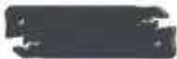
| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |






## GS...30... -M1


| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-30.02-00-M1 CTCP320ST |             | 12220994        | •         |
|   | GSNT-30.02-00-M1 CTPP345   | ... -M1     | 11888187        | •         |
|   | GSNT-30.02-00-M1 CT1340    |             | 12331985        | •         |

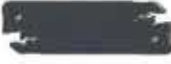
| Blades   | Designation   | Tmax [mm] | Material number | Available |
|--|---------------|-----------|-----------------|-----------|
|  | GBN-2603-GS03 | 35        | 11896198        | •         |
|  | GBN-3203-GS03 | 50        | 11896189        | •         |


| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



## GS...40... -M1


| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-40.03-00-M1 CTCP320ST |             | 12220998        | •         |
|   | GSNT-40.03-00-M1 CTPP345   | ... -M1     | 11888182        | •         |
|   | GSNT-40.03-00-M1 CTP1340   |             | 12332006        | •         |

| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBN-2604-GS04 | 40        | 11896196        | •         |
|   | GBN-3204-GS04 | 50        | 11896181        | •         |


| Spare parts *   | Designation                                  | Material number |
|---|--|-----------------|
|  | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        |





## GS...50... -M1

| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-50.03-00-M1 CTCP320ST |             | 12169163        | •         |
|   | GSNT-50.03-00-M1 CTPP345   | ... -M1     | 12169161        | •         |
|   | GSNT-50.03-00-M1 CTP1340   |             | 12332013        | •         |

| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBN-3205-GS05 | 55        | 12170445        | •         |


| Spare parts *   | Designation                                  | Material number | Available |
|---|--|-----------------|-----------|
|  | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        | •         |


| Monobloc  | Designation        | Tmax [mm] | Material number | Available |
|---|--------------------|-----------|-----------------|-----------|
|  | GMEL-25-GS05-M-T25 | 25        | 12172251        | •         |
|   | GMER-25-GS05-M-T25 | 25        | 12172252        | •         |


| Spare parts   | Designation              | Material number | Available |
|---|--------------------------|-----------------|-----------|
|  | Key T20                  | 12016558        | •         |
|   | M4.0X18/T20 (for h=0750) | 11007006        | •         |






## GS...60... -M1

| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-60.04-00-M1 CTCP320ST |             | 12169145        | •         |
|   | GSNT-60.04-00-M1 CTPP345   | ... -M1     | 12169142        | •         |
|   | GSNT-60.04-00-M1 CTP1340   |             | 12332029        | •         |

| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBN-3206-GS06 | 60        | 12170446        | •         |

| Spare parts *   | Designation                                  | Material number | Available |
|---|--|-----------------|-----------|
|  | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        | •         |

| Monobloc  | Designation        | Tmax [mm] | Material number | Available |
|---|--------------------|-----------|-----------------|-----------|
|  | GMEL-25-GS06-M-T32 | 32        | 12172246        | •         |
|   | GMER-25-GS06-M-T32 | 32        | 12172249        | •         |

| Spare parts *   | Designation              | Material number | Available |
|---|--------------------------|-----------------|-----------|
|  | Key T20                  | 12016558        | •         |
|  | M4.0X18/T20 (for h=0750) | 11007006        | •         |



# Small size insert – Single sided

GS... –M2





## Overview (GS... –M2)

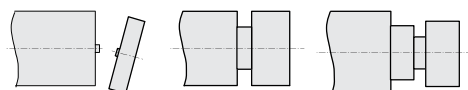
### Which chipbreaker to use?

#### M2 – First choice in case of varying materials

- ▲ For grooving and turning
- ▲ Suitable for all steel and cast iron materials
- ▲ Very good chip control



### Application –M2



PARTING

GROOVING

TURNING

### Premium grade

#### CTCP320ST:

- ▲ Excellent wear resistance
- ▲ Good resistance to oxidation
- ▲ High toughness
- ▲ Good heat resistance

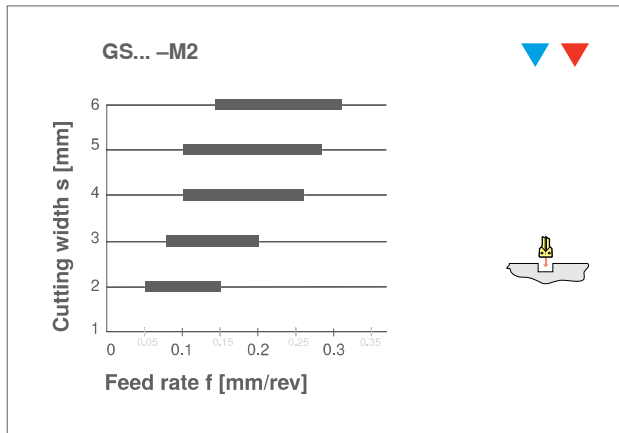
#### CTPP345:

- ▲ Ideal for stainless steel
- ▲ Excellent toughness
- ▲ Good wear resistance
- ▲ High application security



## Small size – Single sided

### Feed rate for parting and grooving (GS... –M2)





## Cutting data


| Work piece material   | Type of treatment/ally             | Hardness HB | Coated carbide           |                            |                          |
|-----------------------|------------------------------------|-------------|--------------------------|----------------------------|--------------------------|
|                       |                                    |             | CTP1340<br>$v_c$ [m/min] | CTCP320ST<br>$v_c$ [m/min] | CTPP345<br>$v_c$ [m/min] |
| <b>P</b><br>Steel     | non alloyed steel 0.15% - 0.45% C  | 150 – 250   | 80 – 180                 | 110 – 190                  | 80 – 150                 |
|                       | low alloyed steel tempered         | 250 – 300   | 60 – 150                 | 110 – 180                  | 70 – 120                 |
|                       | high alloyed steel tempered        | 350         | 50 – 120                 | 70 – 160                   | 60 – 100                 |
|                       | corrosion resistant steel annealed | 200         | 50 – 200                 | 120 – 200                  | 90 – 160                 |
| <b>K</b><br>Cast iron | grey cast iron                     | 180         | 100 – 200                | 90 – 180                   | –                        |
|                       | spheroidal                         | 160         | 100 – 180                | 100 – 160                  | –                        |
|                       | malleable pearlitic                | 130         | 80 – 160                 | 80 – 150                   | –                        |



## GS...20... -M2

| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-20.02-00-M2 CTCP320ST |             | 12220991        | •         |
|   | GSNT-20.02-00-M2 CTPP345   | ... -M2     | 12122433        | •         |
|   | GSNT-20.02-00-M2 CTP1340   |             | 12331971        | •         |


| Blades   | Designation   | Tmax [mm] | Material number | Available |
|--|---------------|-----------|-----------------|-----------|
|  | GBR-2602-GS02 | 25        | 12167546        | •         |
|  | GBL-2602-GS02 | 25        | 12167544        | •         |
|  | GBR-3202-GS02 | 25        | 12167553        | •         |
|  | GBL-3202-GS02 | 25        | 12167550        | •         |


| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |






## GS...30... -M2


| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-30.03-00-M2 CTCP320ST |             | 12220996        | •         |
|   | GSNT-30.03-00-M2 CTPP345   | ... -M2     | 11888973        | •         |
|   | GSNT-30.03-00-M2 CTP1340   |             | 12331988        | •         |


| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBN-2603-GS03 | 35        | 11896198        | •         |
|   | GBN-3203-GS03 | 50        | 11896189        | •         |

| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



## GS...40... -M2


| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-40.04-00-M2 CTCP320ST |             | 12220999        | •         |
|   | GSNT-40.04-00-M2 CTPP345   | ... -M2     | 11888968        | •         |
|   | GSNT-40.04-00-M2 CTP1340   |             | 12332008        | •         |

| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBN-2604-GS04 | 40        | 11896196        | •         |
|   | GBN-3204-GS04 | 50        | 11896181        | •         |


| Spare parts *   | Designation                                  | Material number |
|---|--|-----------------|
|  | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        |






## GS...50... -M2

| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-50.04-00-M2 CTCP320ST |             | 12169158        | •         |
|   | GSNT-50.04-00-M2 CTPP345   | ... -M2     | 12169151        | •         |
|   | GSNT-50.04-00-M2 CTP1340   |             | 12332021        | •         |

| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBN-3205-GS05 | 55        | 12170445        | •         |

| Spare parts *   | Designation                                  | Material number | Available |
|---|--|-----------------|-----------|
|  | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        | •         |


| Monobloc  | Designation        | Tmax [mm] | Material number | Available |
|---|--------------------|-----------|-----------------|-----------|
|  | GMEL-25-GS05-M-T25 | 25        | 12172251        | •         |
|   | GMER-25-GS05-M-T25 | 25        | 12172252        | •         |

| Spare parts   | Designation                     | Material number | Available |
|---|---------------------------------|-----------------|-----------|
|  | Key T20                         | 12016558        | •         |
|  | M4.0X18/T20<br>(for h=0750/100) | 11007006        | •         |


\* How to use the system? Page 113






## GS...60... -M2

| Insert  | Designation                | Chipbreaker | Material number | Available |
|---|----------------------------|-------------|-----------------|-----------|
|  | GSNT-60.05-00-M2 CTCP320ST |             | 12169139        | •         |
|   | GSNT-60.05-00-M2 CTPP345   | ... -M2     | 12169134        | •         |
|   | GSNT-60.05-00-M2 CTP1340   |             | 12332036        | •         |

| Blades  | Designation   | Tmax [in] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBN-3206-GS06 | 2.36      | 12170446        | •         |

| Spare parts   | Designation                                  | Material number | Available |
|---|--|-----------------|-----------|
|  | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        | •         |

| Monobloc  | Designation        | Tmax [mm] | Material number | Available |
|---|--------------------|-----------|-----------------|-----------|
|  | GMEL-25-GS06-M-T32 | 32        | 12172246        | •         |
|   | GMER-25-GS06-M-T32 | 32        | 12172249        | •         |

| Spare parts   | Designation            | Material number | Available |
|---|------------------------|-----------------|-----------|
|  | Key T20                | 12016558        | •         |
|  | M4.0X18/T20 (for h=20) | 11007006        | •         |



# Small size insert – Single sided

## GS... –ST1



## Overview (GS... –ST1)

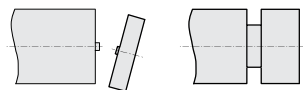
### Which chipbreaker to use?

#### ST1 – Soft cutting chipbreaker

- ▲ Especially for stainless steel
- ▲ Problem solver for steel machining



### Application –ST1



PARTING

GROOVING

### Premium grade

#### CTPP345:

- ▲ Ideal for stainless steel
- ▲ Excellent toughness
- ▲ Good wear resistance
- ▲ High application security

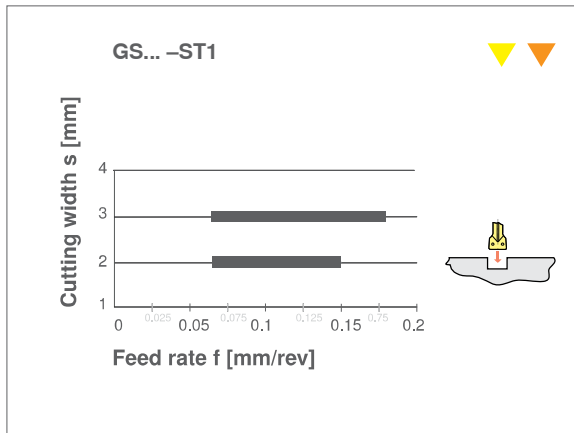
#### CTP1340:

- ▲ Excellent suitability for universal application
- ▲ High cutting edge stability



## Small size – Single sided

### Feed rate for parting and grooving (GS... –ST1)





## Cutting data


| Work piece material | Type of treatment/alloy | Hardness HB           | Coated carbide                    |                                     |                                   |           |
|---------------------|-------------------------|-----------------------|-----------------------------------|-------------------------------------|-----------------------------------|-----------|
|                     |                         |                       | CTP1340<br>v <sub>c</sub> [m/min] | CTCP320ST<br>v <sub>c</sub> [m/min] | CTPP345<br>v <sub>c</sub> [m/min] |           |
| <b>M</b>            | Stainless steel         | annealed pearlitic    | 200                               | 50 – 200                            | 120 – 200                         | 100 – 180 |
|                     |                         | quenched austenitic   | 180                               | 50 – 180                            | 100 – 170                         | 80 – 150  |
|                     |                         | quenched duplex       | 230 – 260                         | 50 – 100                            | 70 – 110                          | 70 – 110  |
|                     |                         | hardened martensitic  | 330                               | 50 – 80                             | 60 – 90                           | 60 – 90   |
| <b>S</b>            | Exotic                  | Fe base               | 200                               | –                                   | –                                 | 20 – 45   |
|                     |                         | Nickel or cobalt base | 250                               | –                                   | –                                 | 15 – 25   |
|                     |                         | Titanium              | Rm 440                            | –                                   | –                                 | 50 – 120  |



## GS...20...-ST1

| Insert  | Designation                 | Chipbreaker | Material number | Available |
|---|-----------------------------|-------------|-----------------|-----------|
|  | GSNT-20.02-00-ST1 CTP1340   |             | 12262689        | ●         |
|   | GSNT-20.02-00-ST1 CTCP320ST | ...-ST1     | 12262690        | ●         |
|   | GSNT-20.02-00-ST1 CTPP345   |             | 12262692        | ●         |


| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBR-2602-GS02 | 25        | 12167546        | ●         |
|   | GBL-2602-GS02 | 25        | 12167544        | ●         |
|   | GBR-3202-GS02 | 25        | 12167553        | ●         |
|   | GBL-3202-GS02 | 25        | 12167550        | ●         |

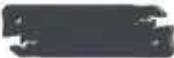
| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |






## GS...30...-ST1

| Insert  | Designation                 | Chipbreaker | Material number | Available |
|---|-----------------------------|-------------|-----------------|-----------|
|  | GSNT-30.02-00-ST1 CTP1340   |             | 12262694        | •         |
|   | GSNT-30.02-00-ST1 CTCP320ST | ...-ST1     | 12262695        | •         |
|   | GSNT-30.02-00-ST1 CTPP345   |             | 12262696        | •         |

| Blades   | Designation   | Tmax [mm] | Material number | Available |
|--|---------------|-----------|-----------------|-----------|
|  | GBN-2603-GS03 | 35        | 11896198        | •         |
|  | GBN-3203-GS03 | 50        | 11896189        | •         |

| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



# Small size insert – Single sided GS... –LM





## Overview (GS... -LM)

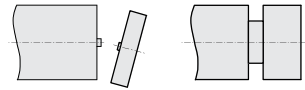
### Which chipbreaker to use?

#### LM – First choice in case of aluminum and non ferrous metals

- ▲ Insert with highly positive cutting chipbreaker and sharp cutting edge
- ▲ Extra-smooth rake face through “microfinish”
- ▲ Reduced built-up edge



### Application –LM



PARTING

GROOVING

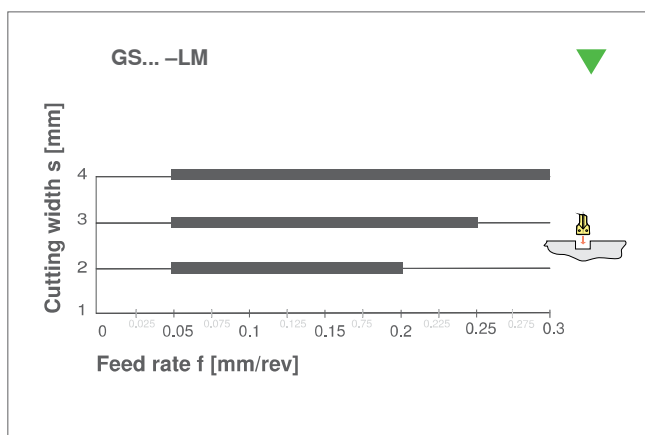
### Premium grade

#### H216T:

- ▲ Optimal suitable for aluminum
- ▲ High wear resistance
- ▲ High heat resistance
- ▲ Low tendency to adhesion

## Small size – Single sided

### Feed rate for parting and grooving (GS... –LM)





## Cutting data


| Work piece material     | Type of treatment/alloy       | Hardness HB | Uncoated carbide<br>H216T<br>$v_c$ [m/min] |
|-------------------------|-------------------------------|-------------|--|
| <b>N</b><br>Non-ferrous | Aluminum wrought alloys       | 100         | 200 – 2000                                 |
|                         | Aluminum cast alloys < 12% Si | 90          | 400 – 1500                                 |
|                         | Copper alloys (bronze)        | 90          | 200 – 600                                  |



## GS...20... -LM


| Insert  | Designation            | Chipbreaker | Material number | Available |
|---|------------------------|-------------|-----------------|-----------|
|  | GSNT-20.02-00-LM H216T | ... -LM     | 12132858        | •         |

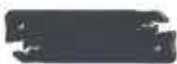
| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBR-2602-GS02 | 25        | 12167546        | •         |
|   | GBL-2602-GS02 | 25        | 12167544        | •         |
|   | GBR-3202-GS02 | 25        | 12167553        | •         |
|   | GBL-3202-GS02 | 25        | 12167550        | •         |


| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



## GS...30... -LM


| Insert  | Designation            | Chipbreaker | Material number | Available |
|---|------------------------|-------------|-----------------|-----------|
|  | GSNT-30.03-00-LM H216T | ... -LM     | 11889728        | •         |


| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBN-2603-GS03 | 35        | 11896198        | •         |
|   | GBN-3203-GS03 | 50        | 11896189        | •         |

| Spare parts *   | Designation                               | Material number |
|---|---|-----------------|
|  | GK-3 (for the blades of 2 and 3 mm width) | 12154231        |



## GS...40... -LM

| Insert  | Designation            | Chipbreaker | Material number | Available |
|---|------------------------|-------------|-----------------|-----------|
|  | GSNT-40.04-00-LM H216T | ... -LM     | 11889730        | •         |

| Blades  | Designation   | Tmax [mm] | Material number | Available |
|---|---------------|-----------|-----------------|-----------|
|  | GBN-2604-GS04 | 40        | 11896196        | •         |
|   | GBN-3204-GS04 | 50        | 11896181        | •         |

| Spare parts *   | Designation                                  | Material number |
|---|--|-----------------|
|  | GK-4 (for the blades of 4, 5 and 6 mm width) | 12154233        |

\* How to use the system? Page 113



# Tools with internal cooling

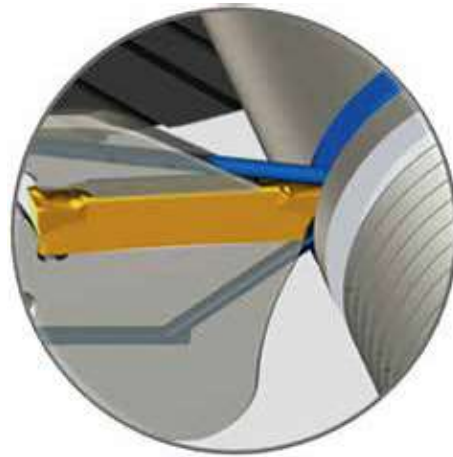
## Blades and tool holders







## Internal cooling system



- ▲ This system allows the coolant to arrive directly on the cutting edge of the insert, which increases the lifetime up 100 %.


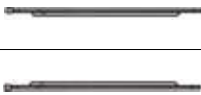



## New tools with internal cooling

### Double Directional Internal Cooling System









### Blade (GS...-20/30/40)

| Blades  |  | Designation     | Tmax [mm] | Material number | Available |
|---|--|-----------------|-----------|-----------------|-----------|
|  | GS02   | GBL-2602-GS02-C | 25        | 12258634        | •         |
|   |  | GBL-3202-GS02-C | 25        | 12258689        | •         |
|   |  | GBR-2602-GS02-C | 25        | 12258498        | •         |
|   |  | GBR-3202-GS02-C | 25        | 12258693        | •         |
|  | GS03   | GBN-2603-GS03-C | 35        | 12258695        | •         |
|   |  | GBN-3203-GS03-C | 50        | 12258698        | •         |
|   | GS04   | GBN-2604-GS04-C | 40        | 12260542        | •         |
|   |  | GBN-3204-GS04-C | 50        | 12260546        | •         |



## Blade (GO...-20/30)

| Blades  |  | Designation       | Tmax [mm] | Material number | Available   |
|---|---|-------------------|-----------|-----------------|-------------|
|  | GO02  | GBL-2602-GO2402-C | 25        |                 | coming soon |
|   |   | GBL-3202-GO2402-C | 25        |                 | coming soon |
|  |   | GBR-2602-GO2402-C | 25        |                 | coming soon |
|   |   | GBR-3202-GO2402-C | 25        |                 | coming soon |
|  |   | GBN-2602-GO2402-C | 25        |                 | coming soon |
|   |   | GBN-3202-GO2402-C | 25        | 12295549        | •           |
|  | GO03  | GBN-2603-GO2403-C | 35        | 12154026        | •           |
|   | GBN-3203-GO2403-C   | 50                | 12154027  | •               |             |

| Spare parts   | Designation             | Material number | Available |
|---|-------------------------|-----------------|-----------|
|  | Key T15 58MM            | 7095086600      | •         |
|  | Coolant screw plug M4X3 | 11998618        | •         |

\* How to use the system? Page 113








## New tools with internal cooling





### Double Directional Internal Cooling System





#### Tool holder (GD...-20/30/40/50/60...)



| Tool  |  | Tmax | h  |  | Designation            | Material number | Available |
|---|---|------|----|---|------------------------|-----------------|-----------|
|   | GD24... 20.0...   | 13   | 16 | L   | GMEL-16-GD2402-K-T13-C | 12317045        | •         |
|   |   |      |    | R   | GMER-16-GD2402-K-T13-C | 12317044        | •         |
|   |   |      | 25 | L   | GMEL-20-GD2402-K-T13-C | 12317048        | •         |
|   |   |      |    | R   | GMER-20-GD2402-K-T13-C | 12317046        | •         |
|  | GD24... 30.0...   | 25   | 16 | L   | GMEL-16-GD2403-K-T25-C | 12213519        | •         |
|   |   |      |    | R   | GMER-16-GD2403-K-T25-C | 12213518        | •         |
|   |   |      | 20 | L   | GMEL-20-GD2403-K-T25-C | 12213516        | •         |
|   |   |      |    | R   | GMER-20-GD2403-K-T25-C | 12213513        | •         |
|   |   |      | 25 | L   | GMEL-25-GD2403-K-T25-C | 12213509        | •         |
|   |   |      |    | R   | GMER-25-GD2403-K-T25-C | 12213508        | •         |
|  | GD24... 40.0...   | 25   | 16 | L   | GMEL-16-GD2404-K-T25-C | 12317036        | •         |
|   |   |      |    | R   | GMER-16-GD2404-K-T25-C | 12317035        | •         |
|   |   |      | 20 | L   | GMEL-20-GD2404-K-T25-C | 12317041        | •         |
|   |   |      |    | R   | GMER-20-GD2404-K-T25-C | 12317040        | •         |
|   |   |      | 25 | L   | GMEL-25-GD2404-K-T25-C | 12317034        | •         |
|   |   |      |    | R   | GMER-25-GD2404-K-T25-C | 12317043        | •         |



| Tool  |  | Tmax | h  |  | Designation            | Material number | Available   |
|---|---|------|----|---|------------------------|-----------------|-------------|
|  | GD24... 50.0...   | 25   | 20 | L   | GMEL-20-GD2405-M-T25-C |                 | coming soon |
|   |   |      |    | R   | GMER-20-GD2405-M-T25-C |                 | coming soon |
|   |   |      | 25 | L   | GMEL-25-GD2405-M-T25-C |                 | coming soon |
|   |   |      |    | R   | GMER-25-GD2405-M-T25-C |                 | coming soon |
|  | GD24... 60.0...   | 25   | 20 | L   | GMEL-20-GD2406-M-T25-C |                 | coming soon |
|   |   |      |    | R   | GMER-20-GD2406-M-T25-C |                 | coming soon |
|   |   |      | 25 | L   | GMEL-25-GD2406-M-T25-C |                 | coming soon |
|   |   |      |    | R   | GMER-25-GD2406-M-T25-C |                 | coming soon |

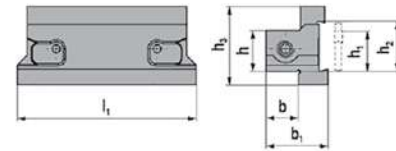
| Spare parts   | Designation           | Material number | Available |
|---|-----------------------|-----------------|-----------|
|  | Key SW5 (50.0 + 60.0) | 4496            | •         |
|  | M6.0x20 (50.0 + 60.0) | 4493            | •         |
|  | M6x6 DIN 913          | 11040843        | •         |
|  | G1/8 DIN 913          | 12089802        | •         |

\* How to use the system? Page 113




## Clamping bloc

### Available clamping bloc without internal cooling system



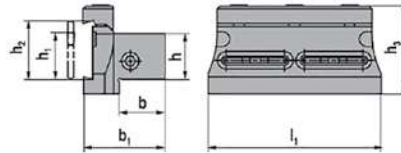
| Designation   | Material | Available | h2 [mm] | h [mm] | h1 [mm] | h3 [mm] | l1 [mm] | b [mm] | b1 [mm] | For blade   |
|---------------|----------|-----------|---------|--------|---------|---------|---------|--------|---------|-------------|
| SCB-GB26-2020 | 12279141 | •         | 26      | 20     | 20      | 43      | 90      | 20     | 37      | GBN...26... |
| SCB-GB32-2520 | 12279142 | •         | 32      | 25     | 25      | 49      | 110     | 20     | 38      | GBN...32... |

## Spare part for clamping bloc without cooling

| Spare parts   | Designation            | Material number | Available |
|---|------------------------|-----------------|-----------|
|  | Clamping screw M6.0x25 | 22485           | •         |





## Available clamping bloc with internal cooling system



| Designation     | Material | Available | h2 [mm] | h [mm] | h1 [mm] | h3 [mm] | l1 [mm] | b [mm] | b1 [mm] | For blade   |
|-----------------|----------|-----------|---------|--------|---------|---------|---------|--------|---------|-------------|
| SCB-GB26-2020-C | 12279139 | •         | 26      | 20     | 20      | 43      | 82      | 20     | 40      | GBN...26... |
| SCB-GB32-2525-C | 12279137 | •         | 32      | 25     | 25      | 49      | 95      | 25     | 44.5    | GBN...32... |

## Spare part for clamping bloc with cooling

| Spare parts   | Designation            | Material number | Available |
|---|------------------------|-----------------|-----------|
|  | Grub screw M6.0x8      | 11960993        | •         |
|  | Clamping screw M6.0x12 | 11776816        | •         |

\* How to use the system? Page 113



# Technical Information







## How to use the system?



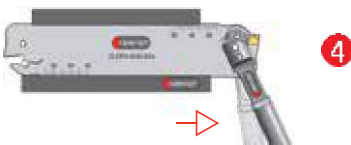
Insert mounting key with handle towards the front into the 2 tool location points



When moving the mounting key in the direction of the arrows the insert seat is opened



Position the insert pressing it against the location face

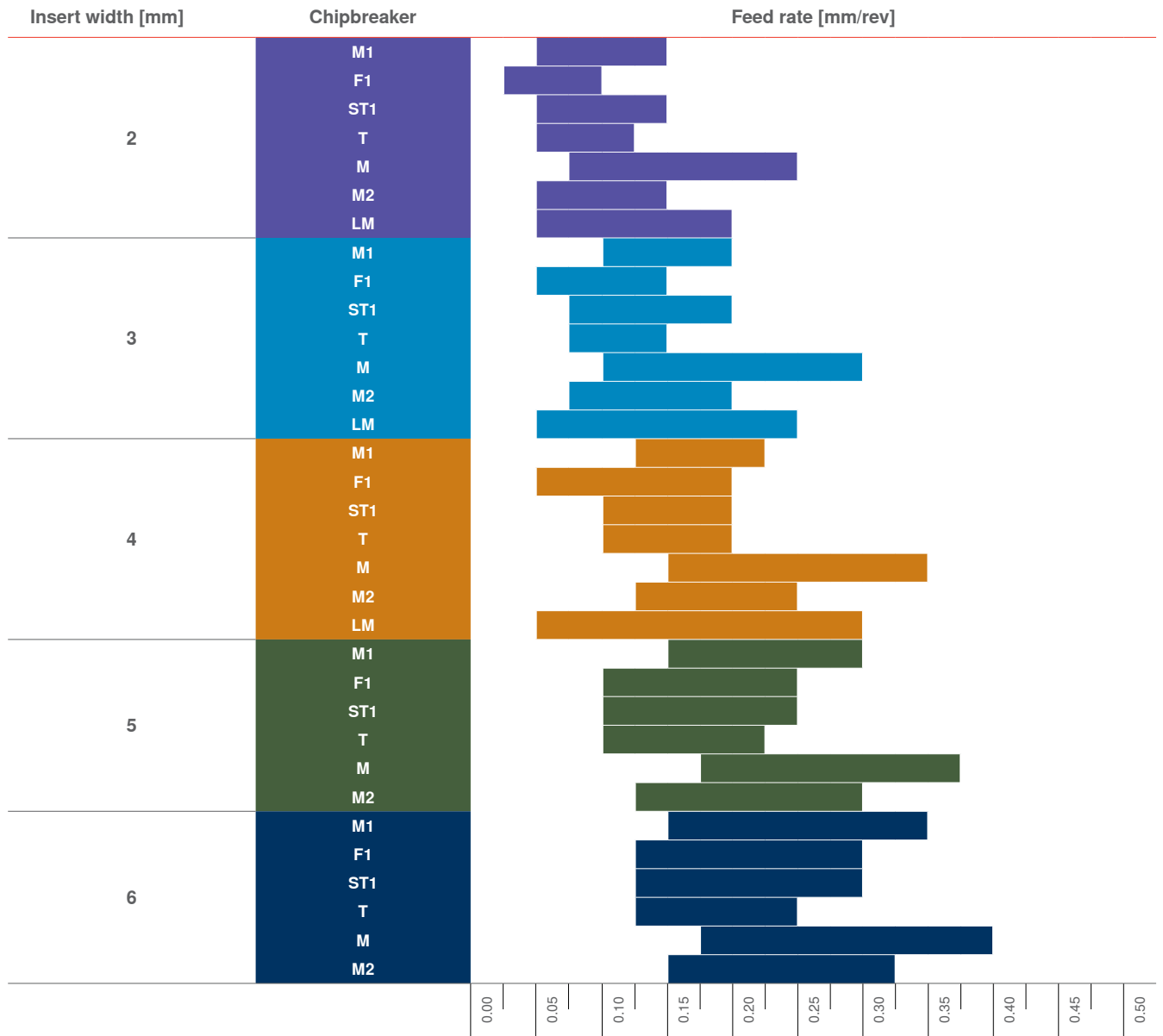


Moving the mounting key forward the insert seat locks and insert is clamped securely





## Cutting parameters overview





# Grades







## Grade description

### CTP1340

HC-P30 | HC-M25 | HC-K30 | HC-S30



**Specification:**

Composition: Co 9.0 %; mixed carbides 2.0 %; WC balance | Grain size: 0.7-1  $\mu\text{m}$  |  
Hardness: HV<sub>30</sub> 1590 | Coating specification: PVD TiAlN

**Recommended application:**

The universal high-performance grade for steel, austenitic steel, cast iron and heat-resistant alloys.

### CTCP320ST

HC-P35 | HC-K35 | HC-M30



**Specification:**

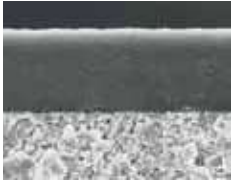
Composition: Co 10.5 %; mixed carbides 2.0 %; WC balance | Grain size: 1  $\mu\text{m}$  | Hardness: HV<sub>30</sub> 1400 |  
Coating specification: CVD TiCN-Al<sub>2</sub>O<sub>3</sub> multi-layer

**Recommended application:**

The reliable choice for the machining of steel and cast iron.

### CTPP345

HC-P45 | HC-M40 | HC-S40



**Specification:**

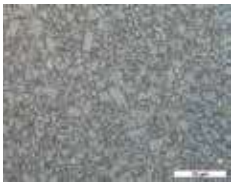
Composition: Co 12.5 %; mixed carbides 2.0 %; WC balance | Grain size: 1-1.5  $\mu\text{m}$  |  
Hardness: HV<sub>30</sub> 1380 | Coating specification: PVD TiAlTaN

**Recommended application:**

The reliable solution for steel and austenitic steels under unstable conditions.

### H216T

HW-N15 | HW-K15



**Specification:**

Composition: Co 6.0 %; WC balance | Grain size: 1  $\mu\text{m}$  | Hardness: HV<sub>30</sub> 1630

**Recommended application:**

The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.



# Production



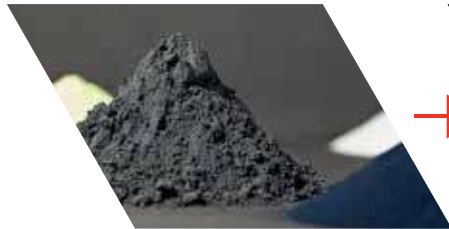


## The carbide formula for success

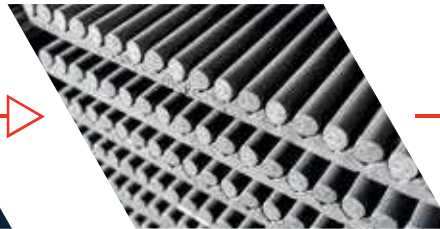
The tungsten carbide grains have an average size of 0.5 up to several micrometres ( $\mu\text{m}$ ). The cobalt fills the gaps between the carbide grains. On the one hand, when extremely high toughness is required, the cobalt content can amount up to 30 %. On the other, the cobalt content is reduced and the grain size decreased to the submicron range (for example 0.3  $\mu\text{m}$ ), in order to guarantee maximum wear resistance.



## Carbide production



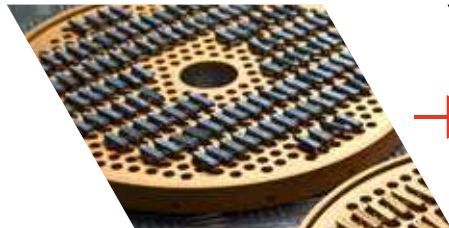
Preparation and mixing of the power



Forming / Pressing



Sintering



Finishing



Dispatching



Recycling





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## Notes

