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| ZDET | L | I.C | S | d |
|-------|------|------|------|------|
| 08 T2 | 8.4 | 6,75 | 2.78 | 2.8 |
| 11 03 | 10.6 | 8.5 | 3.18 | 2.8 |
| 13 T3 | 13.2 | 10.5 | 3.97 | 4.4 |
| 22 04 | 16.1 | 12.7 | 4.76 | 5.56 |

- Ideal machining conditions
- ⊗ Normal machining conditions
- ⊗ Unfavourable machining conditions

Milling inserts

| ZD** milling insert | | | HC ¹ (CVD) | | | | | | HC ¹ (PVD) | | | | | | HT | HC ² | HW | | | | | | | | |
|---------------------|------------------|------|-----------------------|--------|--------|--------|--------|--------|-----------------------|--------|--------|--------|--------|--------|--------|-----------------|--------|--------|--------|--------|--------|--|---------|-------|-------|
| | P | | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | | | | | | | |
| | M | | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | | | | | | | |
| | K | | | | | | | | | | | | | | | | | | | | | | | | |
| | N | | | | | | | | ⊗ | | | | | | | | | | | | | | | | |
| | S | | | ⊗ | ⊗ | | | | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | | | | | | | | | | | |
| | H | | | | | | | | | | | | | | | | | | | | | | | | |
| | ISO | R | YBC302 | YBC301 | YBC401 | YBM253 | YBM251 | YBM351 | YBD152 | YBD252 | YBG101 | YBG102 | YBG202 | YBG212 | YBS203 | YBG205 | YB9320 | YBG302 | YBS303 | YBG252 | YNG151 | | YNG151C | YD101 | YD201 |
| | ZDET13T3CYP16-PM | 16 | | | | ○ | | | | | | | ○ | | | | | | | | | | | | |
| | ZDET08T2CYP10 | 10 | | | | ○ | | | | | | | | | | | | | | | | | | | |
| | ZDET1103CYP12.5 | 12.5 | | | | ○ | | | | | | | | | | | | | | | | | | | |
| | ZPNT2204CY(R20) | 20 | | | | ○ | | | | | | | | | | | | | | | | | | | |
| | ZPNT2204CY(R25) | 25 | | | | ● | | | | | | | | | | | | | | | | | | | |
| | ZPNT2204CY(R31) | 31.5 | | | | ○ | | | | | | | | | | | | | | | | | | | |

● Ex stock ○ On demand

HC¹ Coated carbide
 HT Uncoated cermet
 HC² Coated cermet
 HW Uncoated carbide



S P K N 12 04 ED T21K R – DM

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







Drilling








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



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| Insert shape | |
|---|---|
| A  | C  |
| H  | L  |
| M  | O  |
| P  | R  |
| S  | T  |
| W  | X Special |
| Z Special | |















| Clearance angle | |
|---|---|
| B  | C  |
| D  | E  |
| F  | N  |
| P  | |









| Tolerance class | | | |
|--|---|---|---|
|  |  |  |  |
| Code | I.C [mm] | m [mm] | S [mm] |
| A | ±0,025 | ±0,005 | ±0,025 |
| C | ±0,025 | ±0,013 | ±0,025 |
| E | ±0,025 | ±0,025 | ±0,025 |
| F | ±0,013 | ±0,005 | ±0,025 |
| G | ±0,025 | ±0,025 | ±0,130 |
| H | ±0,013 | ±0,013 | ±0,025 |
| J | ±0,05-0,13 | ±0,005 | ±0,025 |
| K | ±0,05-0,13 | ±0,013 | ±0,025 |
| L | ±0,05-0,13 | ±0,025 | ±0,025 |
| M | ±0,05-0,13 | ±0,08-0,18 | ±0,130 |
| N | ±0,05-0,13 | ±0,08-0,18 | ±0,025 |
| U | ±0,08-0,25 | ±0,13-0,38 | ±0,130 |

1

2

3

| Fastening features (metric) | |
|---|---|
| Insert shape | |
| A  | B  |
| C  | F  |
| G  | H  |
| J  | M  |
| N  | Q  |
| R  | T  |
| U  | W  |
| X Special | |

| Cutting edge length l [mm] | |
|---|---|
| Insert shape | |
|  |  |
| A | C, M |
|  |  |
| H, O, P | L |
|  |  |
| R | S |
|  |  |
| T | W |

4

5

| Insert thickness S [mm] | | | |
|-------------------------|------|------|-------|
| | | | |
| Code | S | Code | S |
| 00 | 0,79 | 05 | 5,56 |
| T0 | 0,99 | T5 | 5,95 |
| 01 | 1,59 | 06 | 6,35 |
| T1 | 1,98 | T6 | 6,75 |
| 02 | 2,38 | 07 | 7,94 |
| T2 | 2,58 | 09 | 9,52 |
| 03 | 3,18 | T9 | 9,72 |
| T3 | 3,97 | 11 | 11,11 |
| 04 | 4,76 | 12 | 12,70 |
| T4 | 4,96 | | |

6

| Angle | | | |
|-------|---------|------|---------|
| | | | |
| Code | Kr | Code | an |
| A | 45° | A | 3° |
| D | 60° | B | 5° |
| E | 75° | C | 7° |
| F | 85° | D | 15° |
| P | 90° | E | 20° |
| Z | Special | F | 25° |
| | | G | 30° |
| | | N | 0° |
| | | P | 11° |
| | | Z | Special |

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| Chamfer | | | | | | | |
|---------|------|------|-------|------|------------|------|----------|
| Code | Type | Code | Angle | Code | Width [mm] | Code | Position |
| F | | 0 | 5° | 0 | 0,10 | K | |
| E | | 1 | 10° | 1 | 0,15 | P | |
| T | | 2 | 15° | 2 | 0,20 | W | |
| S | | 3 | 20° | 3 | 0,25 | - | |
| | | 4 | 25° | 4 | 0,30 | | |
| | | 5 | 30° | 5 | 0,35 | | |
| | | | | 6 | 0,40 | | |
| | | | | 7 | 0,45 | | |

8

| Cutting direction | |
|-------------------|----------------|
| Code | Description |
| R | Right |
| L | Left |
| N | Right and left |

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Chip breaker overview
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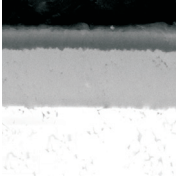
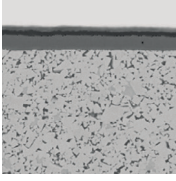
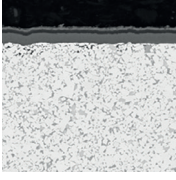
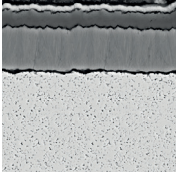
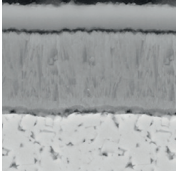
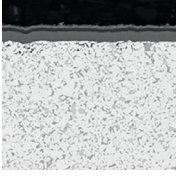
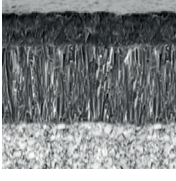

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Chip breaker overview

| | Finishing | Medium machining | Roughing | |
|-----------------------------------|----------------------|------------------|----------|----|
| A Turning | DF | DM | DR | |
| | APF | APM | - | |
| | PF | PM | PR | |
| | GF | GM | GR | |
| | GL | GM | GH | |
| | - | HGR | - | |
| | - | - | ZR | |
| | - | XR | - | |
| B Milling | - | MM | - | |
| | MO-2 | MO-1 | MO-3 | |
| | C Drilling | EF | EM | - |
| | | APF | APM | - |
| | | DF | DM | - |
| | | PF | PM | PR |
| | | GF | GM | GR |
| | | GL | GM | GH |
| - | | HGR | - | |
| E | | E | - | |
| D Technical Information | - | - | ZR | |
| | - | XR | - | |
| | - | MM | - | |
| | CF | CM | CR | |
| | DF | DM | DR | |
| | EDFR | DER | DER | |
| | PF | PM | PR | |
| | GF | GM | GR | |
| E Index | GL | GM | GH | |
| | - | - | ZR | |
| | - | XR | - | |
| | MO-2 | MO-1 | MO-3 | |
| | EF | EM | - | |
| | NM | NM | - | |
| | LH | LH | LH | |
| | ALH | ALH | ALH | |

Coated cemented carbide CVD

| Grade | ISO | Micro structure | Grade description |
|---------------|------------------------|---|--|
| YBC302 | P20 - P35 |  | CVD coated P20-P35 carbide grade for medium operation to roughing of steel at higher cutting speed. Optimal performance of wear resistance and toughness for a wide application field. |
| YBC301 | P20 - P35 |  | CVD coated P20-P35 carbide grade for medium operation to roughing of steel at lower cutting speed. |
| YBC401 | P30 - P50 M30 - M40 |  | CVD coated P30-P50/M30-M40 carbide grade for roughing operation of steel at lower cutting speed and unstable condition. |
| YBM251 | P20 - P30 M15 - M35 |  | CVD coated P20-P30/M15-M35 carbide grade for medium to roughing operation in stainless steel and steel with wide application field. Good wear resistance and capability against plastic deformation at normal cutting speed. |
| YBM253 | M15 - M35 |  | CVD coated M15-M35 carbide grade for medium to roughing operation in stainless steel with wide application field. High wear resistance and capability against plastic deformation at higher cutting speed. |
| YBM351 | P25 - P40 M20 - M40 |  | CVD coated P25-P40/M25-M40 carbide grade for roughing operation in stainless steel and steel. Good wear resistance and edge stability at normal cutting speed. |
| YBD152 | K10 - K25 |  | CVD coated K10-K25 carbide substrate. Optimized for medium to roughing operation of cast iron. Good wear resistance and toughness at higher cutting speed. |
| YBD252 | K20 - K35 |  | CVD coated K20-K35 carbide substrate. Optimized for medium to roughing operation of cast iron and Steel. Good wear resistance and toughness at higher cutting speed. |

A

Turning

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Milling

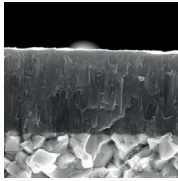
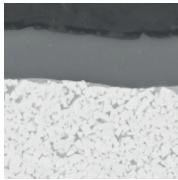
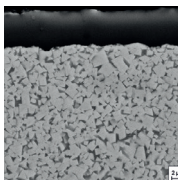
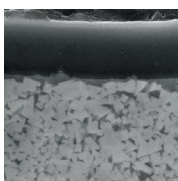
C

Drilling

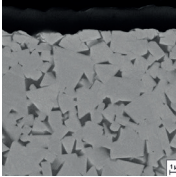
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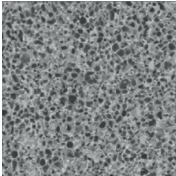
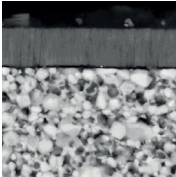
Coated cemented carbide PVD

| Grade | ISO | Micro structure | Grade description |
|----------------------------|------------------------|---|--|
| A Turning | YBG101 | N05–N20 |  <p>PVD coated N05–N20 carbide substrate for finishing to semi-finishing in aluminium materials. Coating only on the top face, in combination with the aluminium chip breakers, prevents built-up edges and gives a smooth cut.</p> |
| | | | |
| B Milling | YBG202 | P10 - P30 M10-M25 |  <p>PVD coated P10–P30/M10–M25 carbide substrate for finishing to medium application of stainless steel and steel (milling). Good wear resistance in a wide application field.</p> |
| | | | |
| D Technical Information | YBS203 | S15 – S25 |  <p>Turning and milling grades for processing heat-resistant materials. A special carbon substrate and the latest PVD coating technology enable a very good wear behaviour, high fracture toughness and high thermal stability.</p> |
| | | | |
| YBG302 | P15 - P30 M25 - M40 |  <p>PVD multilayer coated P10–P30/M10–M25 carbide substrate for finishing to medium machining of stainless steel, super alloys and steel (grooving/milling). Optimised coating stability for higher wear resistance and thermal stability in a wide range of applications.</p> | |
| | | | YBG302 |

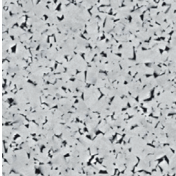
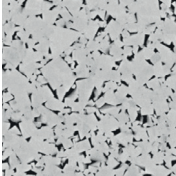
Coated cemented carbide PVD

| Grade | ISO | Micro structure | Grade description |
|---------------|-----------|---|---|
| YBS303 | S25 - S35 |  | Milling grade for machining titanium alloys. A tough carbide substrate and the latest PVD coating technology with increased impact resistance and high thermal stability. |

Cermet

| Grade | ISO | Micro structure | Grade description |
|----------------|-----------|--|--|
| YNG151 | P05 - P15 |  | Uncoated P05-P15 cermet grade for fine finishing operation of steel and stainless steel. Good resistance against plastic deformation for good surface finishing. |
| YNG151C | P05 - P15 |  | PVD coated P05-P15 cermet grade for fine finishing operation of steel and stainless steel. Good wear resistance and capability against plastic deformation for good surface roughness. |

Uncoated cemented carbide

| Grade | ISO | Micro structure | Grade description |
|--------------|------------------------|---|---|
| YD101 | N05 - N25 K05 - K20 |  | Uncoated K05-K20/N05-N20 carbide substrate for fine to medium application in aluminum and other material. |
| YD201 | K10 - K30 N10 - N30 |  | Uncoated K10-K30/N10-N30 carbide substrate for medium application in aluminum and other material. |

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Application fields of grades – indexable milling

| | ISO | HC ¹ (CVD) | HC ¹ (PVD) | HT | HC ² | HW | PCBN/PCD |
|----------|-----|-----------------------|-----------------------|--------|-----------------|-------|----------|
| P | P01 | | YBG102 | | YNG151C | | |
| | P10 | | YBG202 | YNG151 | | | |
| | P20 | YBC301 | YBG205 | | | | |
| | P30 | YBC401 | YBG302 | | | YC305 | |
| | P40 | YBM351 | YB9320 | | | | |
| M | M01 | | YBG102 | | YNG151C | | |
| | M10 | YBM251 | YBG202 | YNG151 | | | |
| | M20 | YBM253 | YBG205 | | | | |
| | M30 | YBM351 | YBG302 | | | YC305 | |
| | M40 | YBC401 | YB9320 | | | | |
| K | K01 | | YBG102 | | | | |
| | K10 | YBD152 | YBG152 | | | | |
| | K20 | YBD252 | YBG202 | | | YD201 | |
| | K30 | | | | | | |
| | K40 | | | | | | |
| N | N01 | | | | | YD051 | |
| | N10 | | YBG101 | | | YD101 | |
| | N20 | | YBG202 | | | | YD201 |
| | N30 | | | | | | |
| S | S01 | | YBG102 | | | | |
| | S10 | | YBG202 | | | | |
| | S20 | | YBG205 | | | | |
| | S30 | | YBS203 | | | | |
| | | | YBS303 | | | | |
| H | H01 | | YBG102 | | | | |
| | H10 | | | | | | |
| | H20 | | | | | | |
| | H30 | | | | | | |

| | |
|----------|-----------------|
| P | Steel |
| M | Stainless steel |
| K | Cast iron |

| | |
|----------|-----------------------|
| N | Non-ferrous metals |
| S | Heat-resistant alloys |
| H | Hardened materials |

| | |
|-----------------|------------------|
| HC ¹ | Coated carbide |
| HT | Uncoated cermet |
| HC ² | Coated carbide |
| HW | Uncoated carbide |