



Catalogue

Version 2018
Drilling



ZCC Cutting Tools Europe GmbH

your Partner | your Value



WELCOME TO ZCC CUTTING TOOLS EUROPE

ZCC-CT, one of the World's leading carbide tooling manufacturers, welcomes you to its products. We are able to offer you a wide product range of high performance cutting tools at economic prices and a good supply service to support the production and productivity at your manufacturing facilities. You will find the main tool types in the various sections of the catalogue, Turning is in section A, Milling in section B and Drilling in section C of the catalogue.

We are looking forward to working with you and developing good cooperation together. Our team at ZCC Cutting Tools Europe is ready to support you in all of your requirements.





Member of Minmetals Group



HAUPTSITZ IN EUROPA:

ZCC Cutting Tools Europe GmbH, Wanheimer Str.57, 40472 Düsseldorf, Germany

Tel.: +49 (0) 211/989240-0, Fax: +49 (0) 211/ 989240-111

E-Mail: info@zccct-europe.com, www.zccct-europe.com, www.zccct.com



Copyright Katalog
©2016 ZCC Cutting Tools Europe GmbH

All rights reserved. All descriptions and pictures are protected by copyright. Usage, modification and reproduction, completely or partially, without written permission are prohibited. Subject to technical changes and changes of the delivery program. Mistakes and printing errors are reserved.



Turning**A**

General turning

A1-A336

Parting & grooving

A337-A402

Threading

A403-A455

Milling**B**

Indexable milling

B1-B248

Solid carbide milling

B249-B462

Drilling**C**

Indexable drills

C1-C24

Solid carbide drills

C25-C126

Solid carbide reamers

C127-C140

Solid carbide threading tools

C141-C182

Technical information**D**

D1-D24

Index**E**

E1-E8

Indexable drills

| | |
|-------------------------------|--------|
| Product overview | C2 |
| Chip breaker overview | C3 |
| Grade overview | C4 |
| Application fields of grades | C5 |
| System code – drilling bodies | C7 |
| Drilling bodies | C8-C17 |
| ISO code – inserts | C18 |
| Inserts | C19-21 |
| Recommended cutting data | C22-24 |



A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

Indexable insert drill



ZD03

ZTD02

ZTD03

ZTD04

ZTD05

16-58

13-50

13-50

13-50

17-50

Diameter

C16

C8

C10

C12

C14

Page

A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

Drilling

PM P M K



For machining of steel, stainless steel and cast iron.

EM P M S



For machining of steel, stainless steel and heat-resistant alloys.

PG P K



For machining of steel and cast iron.

D P M K



For machining of steel, stainless steel and cast iron.

53 P M K N



For machining of steel, stainless steel, cast iron and non-ferrous metals.

A

Turning

B

Milling

C

Drilling

D

Technical
Information



E

Index

A

Turning



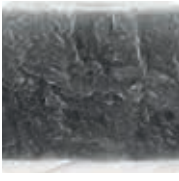
Coated cemented carbide CVD

| Grade | ISO | Micro structure | Grade description |
|---------------|--------------------|---|--|
| YB6338 | P20–P40 K20–K40 |  | CVD coated P20–P40/K20–K40 carbide substrate for operation with higher cutting speed and feed rate in steel and cast iron. |
| 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. |

B

Milling

Coated cemented carbide PVD

| Grade | ISO | Micro structure | Grade description |
|---------------|-------------------------------|---|--|
| YBG202 | P10–P30 M10–M25 |  | PVD coated M10–M25/P10–P30 carbide substrate for finishing to medium application of stainless steel and steel (milling). Good wear resistance in a wide application field. |
| YBG205 | P10–P30 M20–M40 S15–S25 |  | PVD multilayer coated P10–P30/M20–M40/S15–S25 carbide substrate for finishing to medium application of stainless steel, super alloy and steel (milling). Good wear resistance and thermal stability in a wide application field. |
| YBG212 | P25–P35 M25–M35 |  | PVD coated M25–M40/P25–P35 carbide substrate for steel and stainless steel. Especially for inner insert at drilling operation. |

C

Drilling

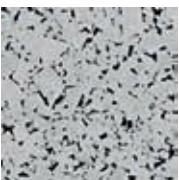
D

Technical Information

E

Index

Uncoated carbide

| Grade | ISO | Micro structure | Grade description |
|--------------|--------------------|---|---|
| YD201 | K10–K30 N10–N30 |  | Uncoated N10–N30/K10–K30 carbide substrate for medium application in aluminum and other material. |

Application fields of grades – Indexable drills

| | ISO | HC ¹ (CVD) | HC ¹ (PVD) | HT | HW | PCBN & PCD |
|----------|-----|-----------------------|-----------------------|----|-------|------------|
| P | P01 | | | | | |
| | P10 | | | | | |
| | P20 | YBD252 | YBG202 | | | |
| | P30 | YB6338 | YBG205 | | | |
| | P40 | | YBG212 | | | |
| M | M01 | | | | | |
| | M10 | | YBG202 | | | |
| | M20 | | YBG205 | | | |
| | M30 | | | | | |
| | M40 | | | | | |
| K | K01 | | | | | |
| | K10 | YBD252 | YBG202 | | | |
| | K20 | YB6338 | YBG205 | | | |
| | K30 | | | | | |
| | K40 | | | | | |
| N | N01 | | | | | |
| | N10 | | | | | |
| | N20 | | | | YD201 | |
| | N30 | | | | | |
| S | S01 | | | | | |
| | S10 | | YBG202 | | | |
| | S20 | | YBG205 | | | |
| | S30 | | | | | |
| H | H01 | | | | | |
| | H10 | | | | | |
| | H20 | | | | | |
| | H30 | | | | | |

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

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

HC¹ Coated cemented carbide
 HT Uncoated cermet
 HW Uncoated cemented carbide

A
Turning

B
Milling

C
Drilling

D
Technical Information

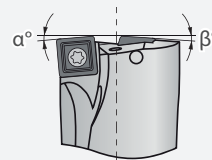
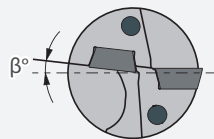
E
Index

ZTD series

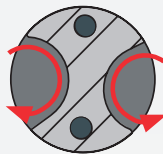
Indexable drills ZTD02/03/04/05

- For machining of steel, stainless steel, cast iron and heat-resistant alloys.
- Drilling bodies with PVD coated surfaces.
- Big chip pocket for better chip removal.
- Optional adapter for inner cooling in conventional machines.
- Diameter range 13.0–50.0 mm

ZTD02



Precise insert seat and stable insert clamping



Big chip pocket



Adapter for inner cooling

Insert grades

YB6338

CVD
P15–P35

YBG205

PVD
P10–P30
M20–M30
S15–S35

YBG212

PVD
M10–M25

Chip breakers

-PM



• Steel and cast iron

-EM



• Stainless steel and heat-resistant alloys

ZD – 03 300 – XP – 32 W C 05 – 02

1

2

3

4

5

6

7

8

9

| Type | |
|------|-------------------------|
| Code | Description |
| ZD | Indexable drill (WCMX*) |
| ZTD | Indexable drill (SPGT*) |

1

| L/D relation | |
|--------------|-------------|
| Code | Description |
| 02 | 2xD |
| 03 | 3xD |
| 04 | 4xD |
| 05 | 5xD |

2

| Diameter [mm] | |
|---------------|-------------|
| Code | Description |
| 130 | 13 |
| ... | |



3

| Shank type | |
|------------|--------------|
| Code | Description |
| XP | Weldon shank |

4

| |
|--------------------|
| Coupling size [mm] |
|--------------------|



5

| Insert shape | |
|--------------|---|
| W |  |
| S |  |

6

| Clearance angle | |
|-----------------|-------------|
| Code | Description |
| C | 7° |
| P | 11° |

7

| Cutting edge length [mm] | | |
|--------------------------|---|---|
| Code | Insert shape | |
| |  W |  S |
| 03 | 3.8 | |
| 04 | 4.3 | |
| 05 | 5.4 | 5 |
| 06 | 6.5 | 6 |
| 08 | 8.7 | 7.94 |
| 09 | | 9.8 |
| 11 | | 11.5 |
| 12 | | 12.7 |
| 14 | | 14.3 |

8

| |
|--------------|
| No. of teeth |
|--------------|

9

A

Turning

B

Milling

C

Drilling

D

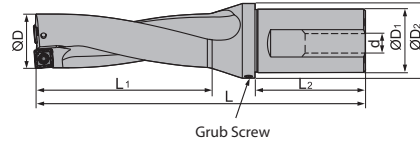
Technical Information

E

Index

Indexable drills series

ZTD02



| Article | * | Stock | Dimensions [mm] | | | | | | | kg | Inserts | Adapter |
|------------------------|---|-------|-----------------|-----|-----|----|----|-----|-------------|-------|------------|---------------|
| | | | ØD | ØD1 | ØD2 | L1 | L2 | L | d | | | |
| ZTD02-130-XP20-SP05-02 | * | ● | 13 | 20 | 25 | 31 | 50 | 98 | M13×1 | 0.165 | SPGT0502** | ZTD-XP20-Thin |
| ZTD02-140-XP20-SP05-02 | * | ● | 14 | 20 | 25 | 33 | 50 | 100 | M13×1 | 0.171 | SPGT0502** | ZTD-XP20-Thin |
| ZTD02-150-XP20-SP05-02 | * | ● | 15 | 20 | 25 | 35 | 50 | 102 | M13×1 | 0.176 | SPGT0502** | ZTD-XP20-Thin |
| ZTD02-160-XP20-SP05-02 | * | ● | 16 | 20 | 25 | 37 | 50 | 104 | M13×1 | 0.184 | SPGT0502** | ZTD-XP20-Thin |
| ZTD02-170-XP25-SP06-02 | * | ● | 17 | 25 | 32 | 39 | 56 | 117 | M16×1,5 | 0.325 | SPGT0602** | ZTD-XP20-Thin |
| ZTD02-180-XP25-SP06-02 | * | ● | 18 | 25 | 32 | 41 | 56 | 119 | M16×1,5 | 0.332 | SPGT0602** | ZTD-XP25-Thin |
| ZTD02-190-XP25-SP06-02 | * | ● | 19 | 25 | 32 | 43 | 56 | 121 | M16×1,5 | 0.342 | SPGT0602** | ZTD-XP25-Thin |
| ZTD02-200-XP25-SP06-02 | * | ● | 20 | 25 | 32 | 45 | 56 | 123 | M16×1,5 | 0.353 | SPGT0602** | ZTD-XP25-Thin |
| ZTD02-210-XP25-SP06-02 | * | ● | 21 | 25 | 32 | 47 | 56 | 125 | M16×1,5 | 0.35 | SPGT0602** | ZTD-XP25-Thin |
| ZTD02-220-XP25-SP07-02 | * | ● | 22 | 25 | 32 | 49 | 56 | 127 | M16×1,5 | 0.367 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD02-230-XP25-SP07-02 | * | ● | 23 | 25 | 32 | 51 | 56 | 129 | M16×1,5 | 0.38 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD02-240-XP25-SP07-02 | * | ● | 24 | 25 | 32 | 53 | 56 | 131 | M16×1,5 | 0.443 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD02-250-XP25-SP07-02 | * | ● | 25 | 25 | 32 | 55 | 56 | 133 | M16×1,5 | 0.41 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD02-260-XP25-SP07-02 | * | ● | 26 | 25 | 32 | 57 | 56 | 135 | M16×1,5 | 0.454 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD02-270-XP25-SP07-02 | * | ● | 27 | 25 | 32 | 59 | 56 | 137 | M16×1,5 | 0.445 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD02-280-XP32-SP09-02 | * | ● | 28 | 32 | 37 | 61 | 60 | 146 | M22×2 | 0.661 | SPGT0904** | ZTD-XP32-Thin |
| ZTD02-290-XP32-SP09-02 | * | ● | 29 | 32 | 37 | 63 | 60 | 148 | M22×2 | 0.682 | SPGT0904** | ZTD-XP32-Thin |
| ZTD02-300-XP32-SP09-02 | * | ● | 30 | 32 | 37 | 65 | 60 | 150 | M22×2 | 0.702 | SPGT0904** | ZTD-XP32-Thin |
| ZTD02-310-XP32-SP09-02 | * | ● | 31 | 32 | 37 | 67 | 60 | 152 | M22×2 | 0.759 | SPGT0904** | ZTD-XP32-Thin |
| ZTD02-320-XP32-SP09-02 | * | ● | 32 | 32 | 37 | 69 | 60 | 154 | M22×2 | 0.742 | SPGT0904** | ZTD-XP32-Thin |
| ZTD02-330-XP32-SP09-02 | * | ● | 33 | 32 | 37 | 71 | 60 | 156 | M22×2 | 0.774 | SPGT0904** | ZTD-XP32-Thin |
| ZTD02-340-XP40-SP11-02 | * | ● | 34 | 40 | 47 | 73 | 70 | 173 | (BSPT)RC1/4 | 1.2 | SPGT1104** | |
| ZTD02-350-XP40-SP11-02 | * | ● | 35 | 40 | 47 | 75 | 70 | 175 | (BSPT)RC1/4 | 1.23 | SPGT1104** | |
| ZTD02-360-XP40-SP11-02 | * | ● | 36 | 40 | 47 | 77 | 70 | 177 | (BSPT)RC1/4 | 1.26 | SPGT1104** | |
| ZTD02-370-XP40-SP11-02 | * | ● | 37 | 40 | 47 | 79 | 70 | 179 | (BSPT)RC1/4 | 1.29 | SPGT1104** | |
| ZTD02-380-XP40-SP11-02 | * | ● | 38 | 40 | 47 | 81 | 70 | 181 | (BSPT)RC1/4 | 1.33 | SPGT1104** | |
| ZTD02-390-XP40-SP11-02 | * | ● | 39 | 40 | 47 | 83 | 70 | 183 | (BSPT)RC1/4 | 1.39 | SPGT1104** | |
| ZTD02-400-XP40-SP11-02 | * | ● | 40 | 40 | 47 | 85 | 70 | 185 | (BSPT)RC1/4 | 1.43 | SPGT1104** | |
| ZTD02-410-XP40-SP11-02 | * | ● | 41 | 40 | 47 | 87 | 70 | 187 | (BSPT)RC1/4 | 1.44 | SPGT1104** | |
| ZTD02-420-XP40-SP14-02 | * | ● | 42 | 40 | 52 | 89 | 70 | 199 | (BSPT)RC1/4 | 1.62 | SPGT1405** | |
| ZTD02-430-XP40-SP14-02 | * | ● | 43 | 40 | 52 | 91 | 70 | 201 | (BSPT)RC1/4 | 1.67 | SPGT1405** | |
| ZTD02-440-XP40-SP14-02 | * | ● | 44 | 40 | 52 | 93 | 70 | 203 | (BSPT)RC1/4 | 1.71 | SPGT1405** | |
| ZTD02-450-XP40-SP14-02 | * | ● | 45 | 40 | 52 | 95 | 70 | 205 | (BSPT)RC1/4 | 1.76 | SPGT1405** | |

● Ex stock ○ On demand

* Internal cooling

System code > C7

Grade selection > C5




Technical info > C165

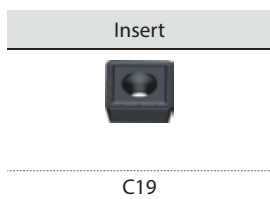
Cutting data > C22

| Article | * | Stock | Dimensions [mm] | | | | | | | kg | Inserts | Adapter |
|------------------------|---|-------|-----------------|-----|-----|-----|----|-----|-------------|------|------------|---------|
| | | | ØD | ØD1 | ØD2 | L1 | L2 | L | d | | | |
| ZTD02-460-XP40-SP14-02 | * | ● | 46 | 40 | 52 | 97 | 70 | 207 | (BSPT)RC1/4 | 1.81 | SPGT1405** | |
| ZTD02-470-XP40-SP14-02 | * | ● | 47 | 40 | 52 | 99 | 70 | 209 | (BSPT)RC1/4 | 1.87 | SPGT1405** | |
| ZTD02-480-XP40-SP14-02 | * | ● | 48 | 40 | 52 | 101 | 70 | 211 | (BSPT)RC1/4 | 1.92 | SPGT1405** | |
| ZTD02-490-XP40-SP14-02 | * | ● | 49 | 40 | 52 | 103 | 70 | 213 | (BSPT)RC1/4 | 1.98 | SPGT1405** | |
| ZTD02-500-XP40-SP14-02 | * | ● | 50 | 40 | 52 | 105 | 70 | 215 | (BSPT)RC1/4 | 2.05 | SPGT1405** | |

● Ex stock ○ On demand

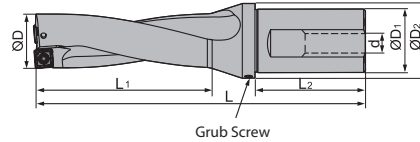
* Internal cooling

| Spare parts | | | | | | | |
|---|------------|------------|-------------|------------|------------|------------|------------|
| | Insert | SPGT0502** | SPGT0602** | SPGT07T3** | SPGT0904** | SPGT1104** | SPGT1405** |
|  | Grub screw | | | | | M6x6 | M8x8 |
|  | Screw | I60M2x4,3 | I60M2,2x5,5 | I60M3*10 | I60M3,5x8 | I60M4x10 | I60M5x13 |
|  | Wrench | WT06IP | WT07IP | WT07IP | WT15IP | WT15IP | WT20IP |



Indexable drills series

ZTD03



| Article | * | Stock | Dimensions [mm] | | | | | | | kg | Inserts | Adapter |
|------------------------|---|-------|-----------------|-----|-----|-----|----|-----|-------------|-------|------------|---------------|
| | | | ØD | ØD1 | ØD2 | L1 | L2 | L | d | | | |
| ZTD03-130-XP20-SP05-02 | * | ● | 13 | 20 | 25 | 44 | 50 | 111 | M13×1 | 0.179 | SPGT0502** | ZTD-XP20-Thin |
| ZTD03-140-XP20-SP05-02 | * | ● | 14 | 20 | 25 | 47 | 50 | 114 | M13×1 | 0.186 | SPGT0502** | ZTD-XP20-Thin |
| ZTD03-150-XP20-SP05-02 | * | ● | 15 | 20 | 25 | 50 | 50 | 117 | M13×1 | 0.195 | SPGT0502** | ZTD-XP20-Thin |
| ZTD03-160-XP20-SP05-02 | * | ● | 16 | 20 | 25 | 53 | 50 | 120 | M13×1 | 0.214 | SPGT0502** | ZTD-XP20-Thin |
| ZTD03-170-XP25-SP06-02 | * | ● | 17 | 25 | 32 | 56 | 56 | 134 | M16×1,5 | 0.32 | SPGT0602** | ZTD-XP25-Thin |
| ZTD03-180-XP25-SP06-02 | * | ● | 18 | 25 | 32 | 59 | 56 | 137 | M16×1,5 | 0.331 | SPGT0602** | ZTD-XP25-Thin |
| ZTD03-190-XP25-SP06-02 | * | ● | 19 | 25 | 32 | 62 | 56 | 140 | M16×1,5 | 0.342 | SPGT0602** | ZTD-XP25-Thin |
| ZTD03-200-XP25-SP06-02 | * | ● | 20 | 25 | 32 | 65 | 56 | 143 | M16×1,5 | 0.356 | SPGT0602** | ZTD-XP25-Thin |
| ZTD03-210-XP25-SP06-02 | * | ● | 21 | 25 | 32 | 68 | 56 | 146 | M16×1,5 | 0.391 | SPGT0602** | ZTD-XP25-Thin |
| ZTD03-220-XP25-SP07-02 | * | ● | 22 | 25 | 32 | 71 | 56 | 149 | M16×1,5 | 0.391 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD03-230-XP25-SP07-02 | * | ● | 23 | 25 | 32 | 74 | 56 | 152 | M16×1,5 | 0.442 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD03-240-XP25-SP07-02 | * | ● | 24 | 25 | 32 | 77 | 56 | 155 | M16×1,5 | 0.485 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD03-250-XP25-SP07-02 | * | ● | 25 | 25 | 32 | 80 | 56 | 158 | M16×1,5 | 0.492 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD03-260-XP25-SP07-02 | * | ● | 26 | 25 | 32 | 83 | 56 | 161 | M16×1,5 | 0.497 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD03-270-XP25-SP07-02 | * | ● | 27 | 25 | 32 | 86 | 56 | 164 | M16×1,5 | 0.521 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD03-280-XP32-SP09-02 | * | ● | 28 | 32 | 37 | 89 | 60 | 174 | M22×2 | 0.75 | SPGT0904** | ZTD-XP32-Thin |
| ZTD03-290-XP32-SP09-02 | * | ● | 29 | 32 | 37 | 92 | 60 | 177 | M22×2 | 0.777 | SPGT0904** | ZTD-XP32-Thin |
| ZTD03-300-XP32-SP09-02 | * | ● | 30 | 32 | 37 | 95 | 60 | 180 | M22×2 | 0.81 | SPGT0904** | ZTD-XP32-Thin |
| ZTD03-310-XP32-SP09-02 | * | ● | 31 | 32 | 37 | 98 | 60 | 183 | M22×2 | 0.831 | SPGT0904** | ZTD-XP32-Thin |
| ZTD03-320-XP32-SP09-02 | * | ● | 32 | 32 | 37 | 101 | 60 | 186 | M22×2 | 0.867 | SPGT0904** | ZTD-XP32-Thin |
| ZTD03-330-XP32-SP09-02 | * | ● | 33 | 32 | 37 | 104 | 60 | 189 | M22×2 | 0.928 | SPGT0904** | ZTD-XP32-Thin |
| ZTD03-340-XP40-SP11-02 | * | ● | 34 | 40 | 47 | 107 | 70 | 207 | (BSPT)RC1/4 | 1.33 | SPGT1104** | |
| ZTD03-350-XP40-SP11-02 | * | ● | 35 | 40 | 47 | 110 | 70 | 210 | (BSPT)RC1/4 | 1.371 | SPGT1104** | |
| ZTD03-360-XP40-SP11-02 | * | ● | 36 | 40 | 47 | 113 | 70 | 213 | (BSPT)RC1/4 | 1.414 | SPGT1104** | |
| ZTD03-370-XP40-SP11-02 | * | ● | 37 | 40 | 47 | 116 | 70 | 216 | (BSPT)RC1/4 | 1.448 | SPGT1104** | |
| ZTD03-380-XP40-SP11-02 | * | ● | 38 | 40 | 47 | 119 | 70 | 219 | (BSPT)RC1/4 | 1.498 | SPGT1104** | |
| ZTD03-390-XP40-SP11-02 | * | ● | 39 | 40 | 47 | 122 | 70 | 222 | (BSPT)RC1/4 | 1.554 | SPGT1104** | |
| ZTD03-400-XP40-SP11-02 | * | ● | 40 | 40 | 47 | 125 | 70 | 225 | (BSPT)RC1/4 | 1.667 | SPGT1104** | |
| ZTD03-410-XP40-SP11-02 | * | ● | 41 | 40 | 47 | 128 | 70 | 228 | (BSPT)RC1/4 | 1.653 | SPGT1104** | |
| ZTD03-420-XP40-SP14-02 | * | ● | 42 | 40 | 52 | 131 | 70 | 241 | (BSPT)RC1/4 | 1.903 | SPGT1405** | |
| ZTD03-430-XP40-SP14-02 | * | ● | 43 | 40 | 52 | 134 | 70 | 244 | (BSPT)RC1/4 | 1.951 | SPGT1405** | |
| ZTD03-440-XP40-SP14-02 | * | ● | 44 | 40 | 52 | 137 | 70 | 247 | (BSPT)RC1/4 | 2.039 | SPGT1405** | |
| ZTD03-450-XP40-SP14-02 | * | ● | 45 | 40 | 52 | 140 | 70 | 250 | (BSPT)RC1/4 | 2.12 | SPGT1405** | |

● Ex stock ○ On demand

* Internal cooling

System code > C7

Grade selection > C5




Technical info > C165

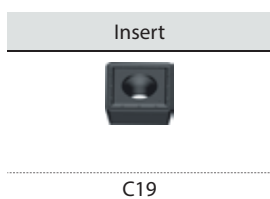
Cutting data > C22

| Article | * | Stock | Dimensions [mm] | | | | | | | kg | Inserts | Adapter |
|------------------------|---|-------|-----------------|-----|-----|-----|----|-----|-------------|-------|------------|---------|
| | | | ØD | ØD1 | ØD2 | L1 | L2 | L | d | | | |
| ZTD03-460-XP40-SP14-02 | * | ● | 46 | 40 | 52 | 143 | 70 | 253 | (BSPT)RC1/4 | 2.186 | SPGT1405** | |
| ZTD03-470-XP40-SP14-02 | * | ● | 47 | 40 | 52 | 146 | 70 | 256 | (BSPT)RC1/4 | 2.264 | SPGT1405** | |
| ZTD03-480-XP40-SP14-02 | * | ● | 48 | 40 | 52 | 149 | 70 | 259 | (BSPT)RC1/4 | 2.341 | SPGT1405** | |
| ZTD03-490-XP40-SP14-02 | * | ● | 49 | 40 | 52 | 152 | 70 | 262 | (BSPT)RC1/4 | 2.43 | SPGT1405** | |
| ZTD03-500-XP40-SP14-02 | * | ● | 50 | 40 | 52 | 155 | 70 | 265 | (BSPT)RC1/4 | 2.52 | SPGT1405** | |

● Ex stock ○ On demand

* Internal cooling

| Spare parts | | | | | | | |
|---|------------|------------|-------------|------------|------------|------------|------------|
| | Insert | SPGT0502** | SPGT0602** | SPGT07T3** | SPGT0904** | SPGT1104** | SPGT1405** |
|  | Grub screw | | | | | M6x6 | M8x8 |
|  | Screw | I60M2x4,3 | I60M2,2x5,5 | I60M3*10 | I60M3,5x8 | I60M4x10 | I60M5x13 |
|  | Wrench | WT06IP | WT07IP | WT07IP | WT15IP | WT15IP | WT20IP |



A
Turning
B
Milling
C
Drilling
D
Technical Information
E
Index

System code > C7

Grade selection > C5

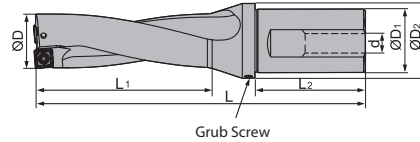
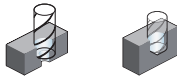
Technical info > C165

Cutting data > C22



Indexable drills series

ZTD04



| Article | * | Stock | Dimensions [mm] | | | | | | | kg | Inserts | Adapter |
|------------------------|---|-------|-----------------|-----|-----|-----|----|-----|-------------|--------|------------|---------------|
| | | | ØD | ØD1 | ØD2 | L1 | L2 | L | d | | | |
| ZTD04-130-XP20-SP05-02 | * | ● | 13 | 20 | 25 | 57 | 50 | 124 | M13×1 | 0.185 | SPGT0502** | ZTD-XP20-Thin |
| ZTD04-140-XP20-SP05-02 | * | ○ | 14 | 20 | 25 | 61 | 50 | 128 | M13×1 | 0.195 | SPGT0502** | ZTD-XP20-Thin |
| ZTD04-150-XP20-SP05-02 | * | ○ | 15 | 20 | 25 | 65 | 50 | 132 | M13×1 | 0.205 | SPGT0502** | ZTD-XP20-Thin |
| ZTD04-160-XP20-SP05-02 | * | ● | 16 | 20 | 25 | 69 | 50 | 136 | M13×1 | 0.216 | SPGT0502** | ZTD-XP20-Thin |
| ZTD04-170-XP25-SP06-02 | * | ● | 17 | 25 | 32 | 73 | 56 | 151 | M16×1,5 | 0.333 | SPGT0602** | ZTD-XP25-Thin |
| ZTD04-180-XP25-SP06-02 | * | ● | 18 | 25 | 32 | 77 | 56 | 155 | M16×1,5 | 0.347 | SPGT0602** | ZTD-XP25-Thin |
| ZTD04-190-XP25-SP06-02 | * | ● | 19 | 25 | 32 | 81 | 56 | 159 | M16×1,5 | 0.362 | SPGT0602** | ZTD-XP25-Thin |
| ZTD04-200-XP25-SP06-02 | * | ● | 20 | 25 | 32 | 85 | 56 | 163 | M16×1,5 | 0.381 | SPGT0602** | ZTD-XP25-Thin |
| ZTD04-210-XP25-SP06-02 | * | ● | 21 | 25 | 32 | 89 | 56 | 167 | M16×1,5 | 0.4 | SPGT0602** | ZTD-XP25-Thin |
| ZTD04-220-XP25-SP07-02 | * | ● | 22 | 25 | 32 | 93 | 56 | 171 | M16×1,5 | 0.391 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD04-230-XP25-SP07-02 | * | ● | 23 | 25 | 32 | 97 | 56 | 175 | M16×1,5 | 0.484 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD04-240-XP25-SP07-02 | * | ● | 24 | 25 | 32 | 101 | 56 | 179 | M16×1,5 | 0.513 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD04-250-XP25-SP07-02 | * | ● | 25 | 25 | 32 | 105 | 56 | 183 | M16×1,5 | 0.494 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD04-260-XP25-SP07-02 | * | ● | 26 | 25 | 32 | 109 | 56 | 187 | M16×1,5 | 0.535 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD04-270-XP25-SP07-02 | * | ● | 27 | 25 | 32 | 113 | 56 | 191 | M16×1,5 | 0.582 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD04-280-XP32-SP09-02 | * | ● | 28 | 32 | 37 | 117 | 60 | 202 | M22×2 | 0.6527 | SPGT0904** | ZTD-XP32-Thin |
| ZTD04-290-XP32-SP09-02 | * | ● | 29 | 32 | 37 | 121 | 60 | 206 | M22×2 | 0.846 | SPGT0904** | ZTD-XP32-Thin |
| ZTD04-300-XP32-SP09-02 | * | ● | 30 | 32 | 37 | 125 | 60 | 210 | M22×2 | 0.893 | SPGT0904** | ZTD-XP32-Thin |
| ZTD04-310-XP32-SP09-02 | * | ● | 31 | 32 | 37 | 129 | 60 | 214 | M22×2 | 0.914 | SPGT0904** | ZTD-XP32-Thin |
| ZTD04-320-XP32-SP09-02 | * | ● | 32 | 32 | 37 | 133 | 60 | 218 | M22×2 | 0.966 | SPGT0904** | ZTD-XP32-Thin |
| ZTD04-330-XP32-SP09-02 | * | ● | 33 | 32 | 37 | 137 | 60 | 222 | M22×2 | 1.016 | SPGT0904** | ZTD-XP32-Thin |
| ZTD04-340-XP40-SP11-02 | * | ● | 34 | 40 | 47 | 141 | 70 | 241 | (BSPT)RC1/4 | 1.46 | SPGT1104** | |
| ZTD04-350-XP40-SP11-02 | * | ● | 35 | 40 | 47 | 145 | 70 | 245 | (BSPT)RC1/4 | 1.52 | SPGT1104** | |
| ZTD04-360-XP40-SP11-02 | * | ● | 36 | 40 | 47 | 149 | 70 | 249 | (BSPT)RC1/4 | 1.579 | SPGT1104** | |
| ZTD04-370-XP40-SP11-02 | * | ● | 37 | 40 | 47 | 153 | 70 | 253 | (BSPT)RC1/4 | 1.592 | SPGT1104** | |
| ZTD04-380-XP40-SP11-02 | * | ● | 38 | 40 | 47 | 157 | 70 | 257 | (BSPT)RC1/4 | 1.801 | SPGT1104** | |
| ZTD04-390-XP40-SP11-02 | * | ● | 39 | 40 | 47 | 161 | 70 | 261 | (BSPT)RC1/4 | 1.801 | SPGT1104** | |
| ZTD04-400-XP40-SP11-02 | * | ● | 40 | 40 | 47 | 165 | 70 | 265 | (BSPT)RC1/4 | 1.874 | SPGT1104** | |
| ZTD04-410-XP40-SP11-02 | * | ● | 41 | 40 | 47 | 169 | 70 | 269 | (BSPT)RC1/4 | 1.861 | SPGT1104** | |
| ZTD04-420-XP40-SP14-02 | * | ● | 42 | 40 | 52 | 173 | 70 | 283 | (BSPT)RC1/4 | 2.168 | SPGT1405** | |
| ZTD04-430-XP40-SP14-02 | * | ● | 43 | 40 | 52 | 177 | 70 | 287 | (BSPT)RC1/4 | 2.17 | SPGT1405** | |
| ZTD04-440-XP40-SP14-02 | * | ● | 44 | 40 | 52 | 181 | 70 | 291 | (BSPT)RC1/4 | 2.31 | SPGT1405** | |
| ZTD04-450-XP40-SP14-02 | * | ● | 45 | 40 | 52 | 185 | 70 | 295 | (BSPT)RC1/4 | 2.421 | SPGT1405** | |

● Ex stock ○ On demand

* Internal cooling

System code > C7

Grade selection > C5




Technical info > C165

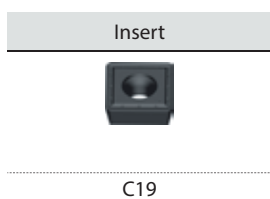
Cutting data > C22

| Article | * | Stock | Dimensions [mm] | | | | | | | kg | Inserts | Adapter |
|------------------------|---|-------|-----------------|-----|-----|-----|----|-----|-------------|-------|------------|---------|
| | | | ØD | ØD1 | ØD2 | L1 | L2 | L | d | | | |
| ZTD04-460-XP40-SP14-02 | * | ● | 46 | 40 | 52 | 189 | 70 | 299 | (BSPT)RC1/4 | 2.507 | SPGT1405** | |
| ZTD04-470-XP40-SP14-02 | * | ● | 47 | 40 | 52 | 193 | 70 | 303 | (BSPT)RC1/4 | 2.612 | SPGT1405** | |
| ZTD04-480-XP40-SP14-02 | * | ● | 48 | 40 | 52 | 197 | 70 | 307 | (BSPT)RC1/4 | 2.66 | SPGT1405** | |
| ZTD04-490-XP40-SP14-02 | * | ● | 49 | 40 | 52 | 201 | 70 | 311 | (BSPT)RC1/4 | 2.836 | SPGT1405** | |
| ZTD04-500-XP40-SP14-02 | * | ● | 50 | 40 | 52 | 205 | 70 | 315 | (BSPT)RC1/4 | 2.954 | SPGT1405** | |

● Ex stock ○ On demand

* Internal cooling

| Spare parts | | | | | | | |
|---|------------|------------|-------------|------------|------------|------------|------------|
| | Insert | SPGT0502** | SPGT0602** | SPGT07T3** | SPGT0904** | SPGT1104** | SPGT1405** |
|  | Grub screw | | | | | M6x6 | M8x8 |
|  | Screw | I60M2x4,3 | I60M2,2x5,5 | I60M3*10 | I60M3,5x8 | I60M4x10 | I60M5x13 |
|  | Wrench | WT06IP | WT07IP | WT07IP | WT15IP | WT15IP | WT20IP |



A
Turning
B
Milling
C
Drilling
D
Technical Information
E
Index

System code > C7

Grade selection > C5

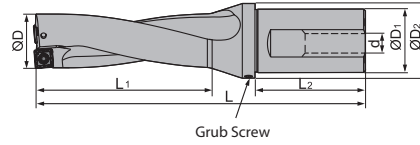
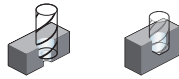
Technical info > C165

Cutting data > C22



Indexable drills series

ZTD05



| Article | * | Stock | Dimensions [mm] | | | | | | | kg | Inserts | Adapter |
|------------------------|---|-------|-----------------|-----|-----|-----|----|-----|-------------|-------|------------|---------------|
| | | | ØD | ØD1 | ØD2 | L1 | L2 | L | d | | | |
| ZTD05-170-XP25-SP06-02 | * | ● | 17 | 25 | 32 | 90 | 56 | 168 | M13×1 | 0.374 | SPGT0602** | ZTD-XP25-Thin |
| ZTD05-180-XP25-SP06-02 | * | ● | 18 | 25 | 32 | 95 | 56 | 173 | M13×1 | 0.394 | SPGT0602** | ZTD-XP25-Thin |
| ZTD05-190-XP25-SP06-02 | * | ● | 19 | 25 | 32 | 100 | 56 | 178 | M13×1 | 0.415 | SPGT0602** | ZTD-XP25-Thin |
| ZTD05-200-XP25-SP06-02 | * | ● | 20 | 25 | 32 | 105 | 56 | 183 | M13×1 | 0.44 | SPGT0602** | ZTD-XP25-Thin |
| ZTD05-210-XP25-SP06-02 | * | ● | 21 | 25 | 32 | 110 | 56 | 188 | M16×1,5 | 0.466 | SPGT0602** | ZTD-XP25-Thin |
| ZTD05-220-XP25-SP07-02 | * | ● | 22 | 25 | 32 | 115 | 56 | 193 | M16×1,5 | 0.476 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD05-230-XP25-SP07-02 | * | ○ | 23 | 25 | 32 | 120 | 56 | 198 | M16×1,5 | 0.507 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD05-240-XP25-SP07-02 | * | ● | 24 | 25 | 32 | 125 | 56 | 203 | M16×1,5 | 0.542 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD05-250-XP25-SP07-02 | * | ● | 25 | 25 | 32 | 130 | 56 | 208 | M16×1,5 | 0.561 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD05-260-XP25-SP07-02 | * | ● | 26 | 25 | 32 | 135 | 56 | 213 | M16×1,5 | 0.613 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD05-270-XP25-SP07-02 | * | ● | 27 | 25 | 32 | 140 | 56 | 218 | M16×1,5 | 0.665 | SPGT07T3** | ZTD-XP25-Thin |
| ZTD05-280-XP32-SP09-02 | * | ● | 28 | 32 | 37 | 145 | 60 | 230 | M16×1,5 | 0.891 | SPGT0904** | ZTD-XP32-Thin |
| ZTD05-290-XP32-SP09-02 | * | ● | 29 | 32 | 37 | 150 | 60 | 235 | M16×1,5 | 0.965 | SPGT0904** | ZTD-XP32-Thin |
| ZTD05-300-XP32-SP09-02 | * | ● | 30 | 32 | 37 | 155 | 60 | 240 | M16×1,5 | 0.959 | SPGT0904** | ZTD-XP32-Thin |
| ZTD05-310-XP32-SP09-02 | * | ● | 31 | 32 | 37 | 160 | 60 | 245 | M16×1,5 | 1.042 | SPGT0904** | ZTD-XP32-Thin |
| ZTD05-320-XP32-SP09-02 | * | ● | 32 | 32 | 37 | 165 | 60 | 250 | M22×2 | 1.11 | SPGT0904** | ZTD-XP32-Thin |
| ZTD05-330-XP32-SP09-02 | * | ● | 33 | 32 | 37 | 170 | 60 | 255 | M22×2 | 1.117 | SPGT0904** | ZTD-XP32-Thin |
| ZTD05-340-XP40-SP11-02 | * | ● | 34 | 40 | 47 | 175 | 70 | 275 | M22×2 | 1.57 | SPGT1104** | |
| ZTD05-350-XP40-SP11-02 | * | ● | 35 | 40 | 47 | 180 | 70 | 280 | M22×2 | 1.65 | SPGT1104** | |
| ZTD05-360-XP40-SP11-02 | * | ● | 36 | 40 | 47 | 185 | 70 | 285 | M22×2 | 1.712 | SPGT1104** | |
| ZTD05-370-XP40-SP11-02 | * | ● | 37 | 40 | 47 | 190 | 70 | 290 | M22×2 | 1.802 | SPGT1104** | |
| ZTD05-380-XP40-SP11-02 | * | ● | 38 | 40 | 47 | 195 | 70 | 295 | (BSPT)RC1/4 | 1.873 | SPGT1104** | |
| ZTD05-390-XP40-SP11-02 | * | ● | 39 | 40 | 47 | 200 | 70 | 300 | (BSPT)RC1/4 | 1.962 | SPGT1104** | |
| ZTD05-400-XP40-SP11-02 | * | ● | 40 | 40 | 47 | 205 | 70 | 305 | (BSPT)RC1/4 | 2.068 | SPGT1104** | |
| ZTD05-410-XP40-SP11-02 | * | ● | 41 | 40 | 47 | 210 | 70 | 310 | (BSPT)RC1/4 | 2.167 | SPGT1104** | |
| ZTD05-420-XP40-SP14-02 | * | ● | 42 | 40 | 52 | 215 | 70 | 325 | (BSPT)RC1/4 | 2.39 | SPGT1405** | |
| ZTD05-430-XP40-SP14-02 | * | ● | 43 | 40 | 52 | 220 | 70 | 330 | (BSPT)RC1/4 | 2.502 | SPGT1405** | |
| ZTD05-440-XP40-SP14-02 | * | ● | 44 | 40 | 52 | 225 | 70 | 335 | (BSPT)RC1/4 | 2.612 | SPGT1405** | |
| ZTD05-450-XP40-SP14-02 | * | ● | 45 | 40 | 52 | 230 | 70 | 340 | (BSPT)RC1/4 | 2.733 | SPGT1405** | |
| ZTD05-460-XP40-SP14-02 | * | ● | 46 | 40 | 52 | 235 | 70 | 345 | (BSPT)RC1/4 | 2.854 | SPGT1405** | |
| ZTD05-470-XP40-SP14-02 | * | ● | 47 | 40 | 52 | 240 | 70 | 350 | (BSPT)RC1/4 | 2.894 | SPGT1405** | |
| ZTD05-480-XP40-SP14-02 | * | ● | 48 | 40 | 52 | 245 | 70 | 355 | (BSPT)RC1/4 | 3.109 | SPGT1405** | |
| ZTD05-490-XP40-SP14-02 | * | ● | 49 | 40 | 52 | 250 | 70 | 360 | (BSPT)RC1/4 | 3.271 | SPGT1405** | |

● Ex stock ○ On demand

* Internal cooling

System code > C7

Grade selection > C5




Technical info > C165

Cutting data > C22


| Article | * Stock | Dimensions [mm] | | | | | | | kg | Inserts | Adapter |
|------------------------|---------|-----------------|-----|-----|-----|----|-----|-------------|-------|------------|---------|
| | | ØD | ØD1 | ØD2 | L1 | L2 | L | d | | | |
| ZTD05-500-XP40-SP14-02 | * ● | 50 | 40 | 52 | 255 | 70 | 365 | (BSPT)RC1/4 | 3,425 | SPGT1405** | |

● Ex stock ○ On demand

* Internal cooling

| Spare parts | | | | | | |
|---|------------|-------------|------------|------------|------------|------------|
| | Insert | SPGT0602** | SPGT07T3** | SPGT0904** | SPGT1104** | SPGT1405** |
|  | Grub screw | | | | M6x6 | M8x8 |
|  | Screw | I60M2,2x5,5 | I60M2x4,3 | I60M3,5x8 | I60M4x10 | I60M5x13 |
|  | Wrench | WT07IP | WT06IP | WT15IP | WT15IP | WT20IP |

Insert

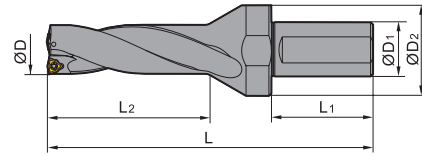
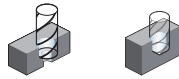


C19



Indexable drills series

ZD03



| Article | * | Stock | Dimensions [mm] | | | | | | kg | Inserts |
|-----------------------|---|-------|-----------------|-----|-----|----|-----|-----|-------|------------|
| | | | ØD | ØD1 | ØD2 | L1 | L2 | L | | |
| ZD03-160-XP25-WC03-02 | * | ● | 16 | 25 | 32 | 56 | 52 | 129 | 0.33 | WCMX0302** |
| ZD03-170-XP25-WC03-02 | * | ● | 17 | 25 | 32 | 56 | 55 | 133 | 0.33 | WCMX0302** |
| ZD03-180-XP25-WC03-02 | * | ● | 18 | 25 | 32 | 56 | 58 | 137 | 0.35 | WCMX0302** |
| ZD03-190-XP25-WC03-02 | * | ● | 19 | 25 | 32 | 56 | 61 | 140 | 0.36 | WCMX0302** |
| ZD03-200-XP25-WC03-02 | * | ● | 20 | 25 | 32 | 56 | 64 | 143 | 0.37 | WCMX0302** |
| ZD03-210-XP25-WC04-02 | * | ● | 21 | 25 | 45 | 56 | 67 | 153 | 0.51 | WCMX0402** |
| ZD03-220-XP25-WC04-02 | * | ● | 22 | 25 | 45 | 56 | 70 | 156 | 0.54 | WCMX0402** |
| ZD03-230-XP25-WC04-02 | * | ● | 23 | 25 | 45 | 56 | 73 | 159 | 0.55 | WCMX0402** |
| ZD03-240-XP25-WC04-02 | * | ● | 24 | 25 | 45 | 56 | 76 | 162 | 0.57 | WCMX0402** |
| ZD03-250-XP25-WC04-02 | * | ● | 25 | 25 | 45 | 56 | 79 | 165 | 0.6 | WCMX0402** |
| ZD03-260-XP32-WC05-02 | * | ● | 26 | 32 | 55 | 60 | 83 | 176 | 0.93 | WCMX0503** |
| ZD03-270-XP32-WC05-02 | * | ● | 27 | 32 | 55 | 60 | 86 | 180 | 0.97 | WCMX0503** |
| ZD03-280-XP32-WC05-02 | * | ● | 28 | 32 | 55 | 60 | 89 | 184 | 1.01 | WCMX0503** |
| ZD03-290-XP32-WC05-02 | * | ● | 29 | 32 | 55 | 60 | 92 | 188 | 1.05 | WCMX0503** |
| ZD03-300-XP32-WC05-02 | * | ● | 30 | 32 | 55 | 60 | 95 | 192 | 1.08 | WCMX0503** |
| ZD03-310-XP40-WC06-02 | * | ● | 31 | 40 | 60 | 70 | 98 | 203 | 1.44 | WCMX06T3** |
| ZD03-320-XP40-WC06-02 | * | ● | 32 | 40 | 60 | 70 | 101 | 206 | 1.48 | WCMX06T3** |
| ZD03-330-XP40-WC06-02 | * | ● | 33 | 40 | 60 | 70 | 104 | 209 | 1.52 | WCMX06T3** |
| ZD03-340-XP40-WC06-02 | * | ● | 34 | 40 | 60 | 70 | 107 | 212 | 1.55 | WCMX06T3** |
| ZD03-350-XP40-WC06-02 | * | ● | 35 | 40 | 60 | 70 | 110 | 215 | 1.61 | WCMX06T3** |
| ZD03-360-XP40-WC06-02 | * | ● | 36 | 40 | 60 | 70 | 113 | 218 | 1.66 | WCMX06T3** |
| ZD03-370-XP40-WC06-02 | * | ● | 37 | 40 | 60 | 70 | 116 | 221 | 1.71 | WCMX06T3** |
| ZD03-380-XP40-WC06-02 | * | ● | 38 | 40 | 60 | 70 | 119 | 225 | 1.76 | WCMX06T3** |
| ZD03-390-XP40-WC06-02 | * | ● | 39 | 40 | 60 | 70 | 122 | 228 | 1.82 | WCMX06T3** |
| ZD03-400-XP40-WC06-02 | * | ● | 40 | 40 | 60 | 70 | 125 | 231 | 1.93 | WCMX06T3** |
| ZD03-410-XP40-WC06-02 | * | ● | 41 | 40 | 60 | 70 | 128 | 234 | 1.94 | WCMX06T3** |
| ZD03-420-XP40-WC08-02 | * | ● | 42 | 40 | 60 | 70 | 131 | 239 | 2.18 | WCMX0804** |
| ZD03-430-XP40-WC08-02 | * | ● | 43 | 40 | 60 | 70 | 134 | 242 | 2.245 | WCMX0804** |
| ZD03-440-XP40-WC08-02 | * | ● | 44 | 40 | 60 | 70 | 137 | 245 | 2.34 | WCMX0804** |
| ZD03-450-XP40-WC08-02 | * | ● | 45 | 40 | 60 | 70 | 140 | 248 | 2.34 | WCMX0804** |
| ZD03-460-XP40-WC08-02 | * | ● | 46 | 40 | 60 | 70 | 143 | 251 | 2.49 | WCMX0804** |
| ZD03-470-XP40-WC08-02 | * | ● | 47 | 40 | 60 | 70 | 146 | 253 | 2.88 | WCMX0804** |
| ZD03-480-XP40-WC08-02 | * | ● | 48 | 40 | 70 | 70 | 149 | 255 | 2.55 | WCMX0804** |

● Ex stock ○ On demand



* Internal cooling

System code > C7

Grade selection > C5



Technical info > C165

Cutting data > C22

| Article | * | Stock | Dimensions [mm] | | | | | |  | Inserts  |
|-----------------------|---|-------|-----------------|-----|-----|----|-----|-----|---|---|
| | | | ØD | ØD1 | ØD2 | L1 | L2 | L | | |
| ZD03-490-XP40-WC08-02 | * | □ | 49 | 40 | 70 | 70 | 152 | 257 | 2.619 | WCMX0804** |
| ZD03-500-XP40-WC08-02 | * | ● | 50 | 40 | 70 | 70 | 155 | 259 | 2.62 | WCMX0804** |
| ZD03-510-XP40-WC08-02 | * | □ | 51 | 40 | 70 | 70 | 158 | 261 | 2.62 | WCMX0804** |
| ZD03-520-XP40-WC08-02 | * | □ | 52 | 40 | 70 | 70 | 161 | 263 | 2.808 | WCMX0804** |
| ZD03-530-XP40-WC08-02 | * | □ | 53 | 40 | 70 | 70 | 164 | 265 | 2.906 | WCMX0804** |
| ZD03-540-XP40-WC08-02 | * | ● | 54 | 40 | 70 | 70 | 167 | 267 | 2.983 | WCMX0804** |
| ZD03-550-XP40-WC08-02 | * | □ | 55 | 40 | 70 | 70 | 170 | 269 | 3.126 | WCMX0804** |
| ZD03-560-XP40-WC08-02 | * | □ | 56 | 40 | 70 | 70 | 173 | 271 | 3.157 | WCMX0804** |
| ZD03-570-XP40-WC08-02 | * | □ | 57 | 40 | 70 | 70 | 176 | 273 | 3.275 | WCMX0804** |
| ZD03-580-XP40-WC08-02 | * | ● | 58 | 40 | 70 | 70 | 179 | 275 | 3.501 | WCMX0804** |

● Ex stock □ On demand

* Internal cooling

| Spare parts | | | | | | |
|---|--------|-------------|--------------|------------|------------|--------------|
| | Insert | WCMX0302** | WCMX0402** | WCMX0503** | WCMX06T3** | WCMX0804** |
|  | Screw | I60M2.5x6.5 | I60M2.5x6.5T | I60M3x7 | I60M3x7 | I60M3.5x10.4 |
|  | Wrench | WT06IP | WT07IP | WT15IP | WT15IP | WT20IP |

Insert



Medium Cut

C20

System code > C7

Grade selection > C5

Technical info > C165

Cutting data > C22



W C M X 08 04 12 R – PG

1

2

3

4

5

6

7

8

9

Insert shape



S



1

Clearance angle

C



P



2

Tolerance class

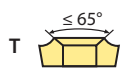


| Code | I.C [mm] | m [mm] | S [mm] |
|------|------------|------------|--------|
| G | ±0,025 | ±0,025 | ±0,130 |
| M | ±0,05–0,13 | ±0,08–0,18 | ±0,130 |

3

Fastening features (metric)

Insert shape



T

X Special

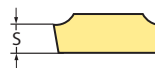
4

Cutting edge length l [mm]

| I.C [mm] | Insert shape | |
|----------|--------------|----|
| | S | W |
| 3.8 | | 03 |
| 4.3 | | 04 |
| 5.4 | | 05 |
| 6.35 | 06 | |
| 6.5 | | 06 |
| 8.0 | | 08 |
| 8.7 | 08 | |
| 9.252 | 09 | |
| 12.7 | 12 | |

5

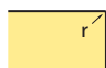
Insert thickness S [mm]



| 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

Nose radius r [mm]



| Code | r |
|------|-----|
| 04 | 0.4 |
| 08 | 0.8 |
| 12 | 1.2 |

7

Rotation direction

| Code | Description |
|------|-------------|
| R | Right |
| L | Left |

8

Chip breaker overview
(on page C3)

9

| SPGT | L | I.C | S | d |
|-------|------|------|------|------|
| 05 02 | 5 | 5 | 2.38 | 2.2 |
| 06 02 | 6 | 6 | 2.38 | 2.6 |
| 07 T3 | 7.94 | 7.94 | 3.97 | 2.8 |
| 09 04 | 9.8 | 9.8 | 4.76 | 4.2 |
| 11 04 | 11.5 | 11.5 | 4.76 | 4.4 |
| 14 05 | 14.3 | 14.3 | 5.2 | 5.75 |

- Ideal machining conditions
- Normal machining conditions
- Unfavorable machining conditions

Drilling inserts

| SP** drilling insert | | HC ¹ (CVD) | | | | HC ¹ (PVD) | | | | HW | | | |
|----------------------|---------------|-----------------------|--|--|--|----------------------------|--|--|--|----|-------|--|--|
| | P | | | | | | | | | | | | |
| | M | | | | | | | | | | | | |
| | K | | | | | | | | | | | | |
| | N | | | | | | | | | | | | |
| | S | | | | | | | | | | | | |
| | H | | | | | | | | | | | | |
| ISO | r | YB6338 YBD252 | | | | YBG202 YBG205 YBG212 | | | | | YD201 | | |
| | SPGT050204-PM | 0.4 | | | | | | | | | | | |
| | SPGT060204-PM | 0.4 | | | | | | | | | | | |
| | SPGT07T308-PM | 0.8 | | | | | | | | | | | |
| | SPGT090408-PM | 0.8 | | | | | | | | | | | |
| | SPGT110408-PM | 0.8 | | | | | | | | | | | |
| | SPGT140512-PM | 1.2 | | | | | | | | | | | |
| | SPGT050204-EM | 0.4 | | | | | | | | | | | |
| | SPGT060204-EM | 0.4 | | | | | | | | | | | |
| | SPGT07T308-EM | 0.8 | | | | | | | | | | | |
| | SPGT090408-EM | 0.8 | | | | | | | | | | | |
| | SPGT110408-EM | 0.8 | | | | | | | | | | | |
| | SPGT140512-EM | 1.2 | | | | | | | | | | | |

● Ex Stock ○ On demand

HC¹ Coated carbide
HW Uncoated carbide

| Tool holder | | | |
|-------------|-------|-------|-------|
| ZTD02 | ZTD03 | ZTD04 | ZTD05 |
| | | | |
| C10 | C12 | C14 | C16 |

System code > Grade selection > Technical Info > Cutting data >



Indexable drills Inserts

A

Turning

B

Milling

C

Drilling




D

Technical Information

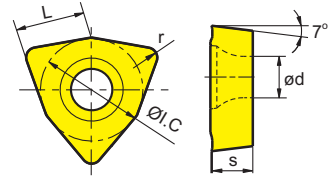



E

Index

| WCMX | L | I.C | S | d |
|-------|-----|-------|------|-----|
| 03 02 | 3.8 | 5.56 | 2.38 | 2.8 |
| 04 02 | 4.3 | 6.35 | 2.38 | 3.1 |
| 05 03 | 5.4 | 7.94 | 3.18 | 3.2 |
| 06 T3 | 6.5 | 9.525 | 3.97 | 3.7 |
| 08 04 | 8.7 | 12.7 | 4.76 | 4.3 |

-  Ideal machining conditions
-  Normal machining conditions
-  Unfavorable machining conditions

Drilling inserts

| WC** drilling insert | | HC ¹ (CVD) | | | | | | HC ¹ (PVD) | | | | | | HW | | |
|---|----------------|-----------------------|--------|---|---|---|---|-----------------------|--------|--------|--|--|--|----|-------|--|
|  | | P | M | K | N | S | H | | | | | | | | | |
| ISO | r | YB6338 | YBD252 | | | | | YBG202 | YBG205 | YBG212 | | | | | YD201 | |
| -53  | WCMX030208R-53 | 0.8 | ● | | | | | ● | | | | | | | | |
| | WCMX040208R-53 | 0.8 | ● | | | | | ● | | | | | | | | |
| | WCMX050308R-53 | 0.8 | ● | | | | | ● | | | | | | | | |
| | WCMX06T308R-53 | 0.8 | ● | | | | | ● | | | | | | ○ | | |
| | WCMX080412R-53 | 1.2 | ● | | | | | ● | | | | | | ● | | |
| -D  | WCMX030208R-D | 0.8 | ○ | | | | | | | | | | | | | |
| | WCMX040208R-D | 0.8 | ○ | | | | | | | | | | | | | |
| | WCMX050308R-D | 0.8 | ○ | | | | | | | | | | | | | |
| | WCMX06T308R-D | 0.8 | ○ | | | | | | | | | | | | | |
| | WCMX080412R-D | 1.2 | ● | | | | | | | | | | | | | |
| PG  | WCMX030208R-PG | 0.8 | | | | | | ● | | | | | | | | |
| | WCMX040208R-PG | 0.8 | | | | | | ● | | | | | | | | |
| | WCMX050308R-PG | 0.8 | | | | | | ● | ○ | | | | | | | |
| | WCMX06T308R-PG | 0.8 | | | | | | ● | | | | | | | | |
| | WCMX080412R-PG | 1.2 | | | | | | ● | | | | | | | | |

● Ex Stock ○ On demand

HC¹ Coated carbide
HW Uncoated carbide



Indexable drills

| Material group | Composition / structure / heat treatment | | HB | Machining group | ZTD* | | ZTD* | | | |
|--|--|------------------------------|---------------------|-----------------|------------------------|-----------|------------------------|-----------|-----------|--|
| | | | | | SPGT05/06 | | SPGT07/09 | | | |
| | | | | | v _c [m/min] | f [mm] | v _c [m/min] | f [mm] | | |
| P Unalloyed steel | ca. 0,15 % C | annealed | 125 | 1 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | | |
| | ca. 0,45 % C | annealed | 190 | 2 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | | |
| | ca. 0,45 % C | tempered | 250 | 3 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | | |
| | ca. 0,75 % C | annealed | 270 | 4 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | | |
| | ca. 0,75 % C | tempered | 300 | 5 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | | |
| | Low-alloyed steel | | annealed | 180 | 6 | 140-220 | 0,05-0,08 | 140-220 | 0,07-0,12 | |
| | | | tempered | 275 | 7 | 140-220 | 0,05-0,08 | 140-220 | 0,07-0,12 | |
| | | | tempered | 300 | 8 | 140-220 | 0,05-0,08 | 140-220 | 0,07-0,12 | |
| | | | tempered | 350 | 9 | 140-220 | 0,05-0,08 | 140-220 | 0,07-0,12 | |
| | High-alloyed steel and high-alloyed tool steel | | annealed | 200 | 10 | 120-180 | 0,05-0,08 | 120-180 | 0,07-0,12 | |
| | | hardened and tempered | 325 | 11 | 120-180 | 0,05-0,08 | 120-180 | 0,07-0,12 | | |
| M Stainless steel | ferritic/martensitic | annealed | 200 | 12 | 110-230 | 0,05-0,08 | 110-230 | 0,06-0,11 | | |
| | martensitic | tempered | 240 | 13 | 110-230 | 0,05-0,08 | 110-230 | 0,06-0,11 | | |
| | austenitic | quench hardened | 180 | 14 | 110-230 | 0,05-0,08 | 110-230 | 0,06-0,11 | | |
| | austenitic-ferritic | | 230 | 15 | 110-230 | 0,05-0,08 | 110-230 | 0,06-0,11 | | |
| K Grey cast iron Cast iron with spheroidal graphite Malleable cast iron | perlitic/ferritic | annealed | 180 | 16 | 170-240 | 0,05-0,08 | 170-240 | 0,08-0,14 | | |
| | | perlitic (martensitic) | 260 | 17 | 170-240 | 0,05-0,08 | 170-240 | 0,08-0,14 | | |
| | ferritic | annealed | 160 | 18 | 130-200 | 0,05-0,08 | 130-200 | 0,08-0,14 | | |
| | | perlitic | 250 | 19 | 130-200 | 0,05-0,08 | 130-200 | 0,08-0,14 | | |
| | ferritic | annealed | 130 | 20 | 120-220 | 0,05-0,08 | 120-220 | 0,08-0,14 | | |
| | | perlitic | 230 | 21 | 120-220 | 0,05-0,08 | 120-220 | 0,08-0,14 | | |
| N Aluminium wrought alloys Cast aluminium alloys Copper and copper alloys (bronze/brass) | cannot be hardened | | 60 | 22 | | | | | | |
| | hardenable | hardened | 100 | 23 | | | | | | |
| | ≤ 12% Si, cannot be hardened | | | 75 | 24 | | | | | |
| | | ≤ 12% Si, hardenable | hardened | 90 | 25 | | | | | |
| | | > 12% Si, cannot be hardened | | 130 | 26 | | | | | |
| | machining steel, PB> 1% | | | 110 | 27 | | | | | |
| | | CuZn, CuSnZn | | 90 | 28 | | | | | |
| CuSn, Pb-free copper, electrolytic copper | | | 100 | 29 | | | | | | |
| S Heat-resistant alloys Titanium alloys | Fe-based alloys | annealed | 200 | 30 | | | | | | |
| | | hardened | 280 | 31 | | | | | | |
| | Ni or Co bass | annealed | 250 | 32 | | | | | | |
| | | hardened | 350 | 33 | | | | | | |
| | | cast | 320 | 34 | | | | | | |
| pure titanium | | R _m 400 | 35 | | | | | | | |
| | α and β alloys | hardened | R _m 1050 | 36 | | | | | | |
| H Hardened steel Hard cast iron Hardened cast iron | | hardened and tempered | 55 HRC | 37 | | | | | | |
| | | hardened and tempered | 60 HRC | 38 | | | | | | |
| | | cast | 400 | 39 | | | | | | |
| X Non-metallic materials | | hardened and tempered | 55 HRC | 40 | | | | | | |
| | Thermoplasts | | | 41 | | | | | | |
| | Thermosetting plastics | | | 42 | | | | | | |
| | Plastic, glass-fibre reinforced GFRP | | | 43 | | | | | | |
| | Plastic, carbon fibre reinforced CFRP | | | 44 | | | | | | |
| Graphite | | | 45 | | | | | | | |
| Wood | | | 46 | | | | | | | |

Note: The given cutting values are guide values, which were determined under ideal conditions.
 The values have to be adapted in individual cases.
 With hole depths of 5xD adjust the cutting data accordingly to the application.
 For examples of material for cutting tool groups view page D22.

| | ZTD* | | ZD03 | | ZD03 | | |
|--|---------------|-----------|---------------|-----------|---------------|-----------|--|
| | SPGT11/14 | | WCMX03-05 | | WCMX06-08 | | |
| | v_c [m/min] | f [mm] | v_c [m/min] | f [mm] | v_c [m/min] | f [mm] | |
| | 200-300 | 0,08-0,14 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | |
| | 200-300 | 0,08-0,14 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | |
| | 200-300 | 0,08-0,14 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | |
| | 200-300 | 0,08-0,14 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | |
| | 200-300 | 0,08-0,14 | 200-300 | 0,05-0,08 | 200-300 | 0,06-0,11 | |
| | 140-220 | 0,09-0,16 | 140-220 | 0,05-0,08 | 140-220 | 0,07-0,12 | |
| | 140-220 | 0,09-0,16 | 140-220 | 0,05-0,08 | 140-220 | 0,07-0,12 | |
| | 140-220 | 0,09-0,16 | 140-220 | 0,05-0,08 | 140-220 | 0,07-0,12 | |
| | 140-220 | 0,09-0,16 | 140-220 | 0,05-0,08 | 140-220 | 0,07-0,12 | |
| | 120-180 | 0,09-0,16 | 120-180 | 0,05-0,08 | 120-180 | 0,07-0,12 | |
| | 120-180 | 0,09-0,16 | 120-180 | 0,05-0,08 | 120-180 | 0,07-0,12 | |
| | 110-230 | 0,08-0,14 | 110-230 | 0,05-0,08 | 110-230 | 0,06-0,11 | |
| | 110-230 | 0,08-0,14 | 110-230 | 0,05-0,08 | 110-230 | 0,06-0,11 | |
| | 110-230 | 0,08-0,14 | 110-230 | 0,05-0,08 | 110-230 | 0,06-0,11 | |
| | 110-230 | 0,08-0,14 | 110-230 | 0,05-0,08 | 110-230 | 0,06-0,11 | |
| | 170-240 | 0,12-0,21 | 170-240 | 0,05-0,08 | 170-240 | 0,08-0,14 | |
| | 170-240 | 0,12-0,21 | 170-240 | 0,05-0,08 | 170-240 | 0,08-0,14 | |
| | 130-200 | 0,12-0,21 | 130-200 | 0,05-0,08 | 130-200 | 0,08-0,14 | |
| | 130-200 | 0,12-0,21 | 130-200 | 0,05-0,08 | 130-200 | 0,08-0,14 | |
| | 120-220 | 0,12-0,21 | 120-220 | 0,05-0,08 | 120-220 | 0,08-0,14 | |
| | 120-220 | 0,12-0,21 | 120-220 | 0,05-0,08 | 120-220 | 0,08-0,14 | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

A
Turning

B
Milling

C
Drilling

D
Technical Information

E
Index



Notes

A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

Technical information

Trouble shooting – drilling

C166-C168

Technical information – drilling

C169-C176

Forms nonstandard order

C177-C182

C

A

Turning

B

Milling

C

Drilling

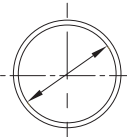
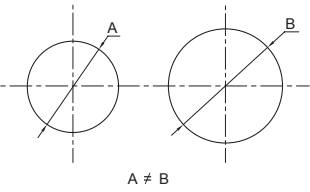
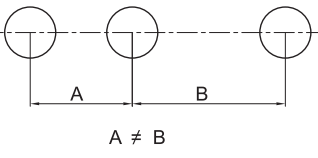
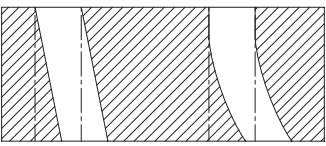
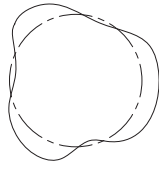
D

Technical
Information

E

Index

Trouble shooting – solid carbide drills

| Error | Reason | Countermeasure |
|--|---|---|
| <p>Oversized holes</p>  | <ul style="list-style-type: none"> – Insufficient clamping of workpiece and/or tool – Large radial run out – Point relief is off centre | <ul style="list-style-type: none"> – Use precision clamping – Reduce spindle play – Check and adjust clamped drill |
| <p>Irregular hole size</p>  | <ul style="list-style-type: none"> – Asymmetric point angle – Large radial run out – Point relief is off centre – High wear | <ul style="list-style-type: none"> – Use precision clamping – Reduce spindle play – Check and adjust clamped drill |
| <p>Low position accuracy</p>  | <ul style="list-style-type: none"> – Insufficient clamping and spindle positioning – Large radial run out of spindle | <ul style="list-style-type: none"> – Improve positioning of machine – Use precision clamping – Calibrate spindle – Check and adjust clamped drill |
| <p>Bad drill run out</p>  | <ul style="list-style-type: none"> – High tool wear – Poor drill accuracy – Asymmetric point angle – Large radial run out – Point relief is off centre | <ul style="list-style-type: none"> – Regrind drill – Improve positioning of drill – Regrind drill – Check quality of regrinding |
| <p>Inaccurate hole (roundness)</p>  | <ul style="list-style-type: none"> – Insufficient clamping of work piece and/or tool – Large radial run out of spindle – Clearance angle too large – Insufficient tool stability | <ul style="list-style-type: none"> – Adjust feed rate vertically to workpiece surface – Centre the tool – Regrind drill – Check quality of regrinding – Use precision clamping – Calibrate spindle – Check and adjust clamped drill – Regrind the drill – Improve tool stability |
| <p>Bad surface quality</p> | <ul style="list-style-type: none"> – Bad drill regrinding – Insufficient amount of coolant or coolant method – Insufficient clamping – Large radial run out of spindle – Feed rate too high – High wear of cutting edge – High welding – Bad chip removal | <ul style="list-style-type: none"> – Before boring align the workpiece horizontally to the drill or pre-machine the workpiece – Regrind drill – Check quality of regrinding – Use precision clamping – Calibrate spindle – Check and adjust clamped drill – Improve regrinding – Change coolant supply – Increase amount of coolant – Use precision clamping – Calibrate spindle – Reduce feed rate – Regrind drill – Use a coated drill – Chose a suitable drill (with an accordingly flute, helical angle etc.) – Adjust cutting speed (reduce feed rate, etc.) |

A

Turning

B

Milling

C

Drilling

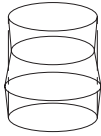
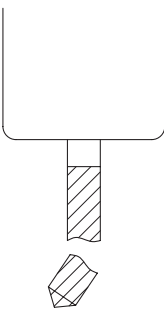

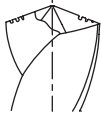

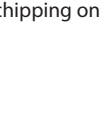





D

Technical Information

E

Index

Trouble shooting – solid carbide drills

| Problem | Reason | Countermeasure |
|--|--|---|
| Bad cylindricity  | <ul style="list-style-type: none"> - No symmetrical point angle - Large radial run out (drilling) - Centre insert is off centre - Large cutting edge wear - Feed rate too low | <ul style="list-style-type: none"> - Regrind drill - Check regrind - Increase feed rate |
| Breakage of drill  | <ul style="list-style-type: none"> - Insufficient clamping of tool and/or workpiece - Clearance angle too small - Feed rate too high - Excessive wear - Chip jamming - Drilling in uneven surfaces | <ul style="list-style-type: none"> - Improve stability of tool and clamping of workpiece - Use a drill with bigger clearance angle or regrind - Reduce feed rate - Regrind drill - Chose a suitable drill (considering flute geometry, helical angle, etc.) - Adjust cutting speed - Reduce feed rate - Increase rigidity of drill and clamping of machine and workpiece - Use drill with sharp centre insert - Pre-drill a centre hole - Create a straight surface (e.g. with solid carbide milling cutter) - Use a guide bush or bush plate |
| Chipping on the drill  | <ul style="list-style-type: none"> - Hard surface or blow holes - Feed rate too high - Insufficient coolant | <ul style="list-style-type: none"> - Check material and chose suitable grade - Change cutting conditions (cutting speed, feed rate or machining method) - Reduce feed rate - Improve/increase coolant supply |
| Chipping on the cutting edge  | <ul style="list-style-type: none"> - Poor clamping - Large radial run out - Cutting speed and feed rate too high - Clearance angle too large | <ul style="list-style-type: none"> - Use a more precise clamping device - Adjust the spindle - Reduce cutting speed and feed rate - Use a drill with smaller clearance angle or regrind |
| Excessive wear  | <ul style="list-style-type: none"> - Overdue regrinding - Drill tip not in centre position - Cutting speed too high - Cutting angle not suitable - Material not suitable - Insufficient cooling | <ul style="list-style-type: none"> - Regrind in time - Adjust drill with centre of spindle - Reduce cutting speed - Chose right cutting angle - Chose suitable material - Use suitable cooling |
| Wear and chipping on point relief  | <ul style="list-style-type: none"> - Feed rate too high - Cutting angle not suitable - Material not suitable - Clearance angle too small | <ul style="list-style-type: none"> - Reduce feed rate - Chose right cutting angle - Chose suitable material - Regrind drill |
| Breakage on margin  | <ul style="list-style-type: none"> - Guide bush too large | <ul style="list-style-type: none"> - Change guide bush |
| Built up edge on margin  | <ul style="list-style-type: none"> - High wear and heat - Insufficient cooling - Wrong coolant - Workpiece material is too soft | <ul style="list-style-type: none"> - Regrind drill - Change cooling method - Change coolant - Use drill with smaller clearance angle |
| High vibrations  | <ul style="list-style-type: none"> - Clearance angle too large - Drill stability too low | <ul style="list-style-type: none"> - Regrind drill - Improve stability |
| Swarf clogs the drill  | <ul style="list-style-type: none"> - Long chips - Chip removal not fluent | <ul style="list-style-type: none"> - Optimise cutting data - Change drill or adjust machine |
| One-side wear  | <ul style="list-style-type: none"> - Drill tip not centred - Poor clamping | <ul style="list-style-type: none"> - Adjust drill with centre of spindle - Improve drill clamping - Check concentricity |

A

Turning

B

Milling

C

Drilling

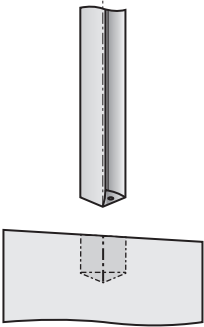
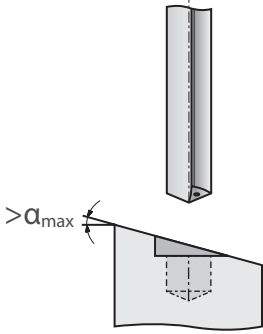
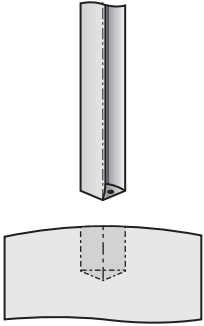
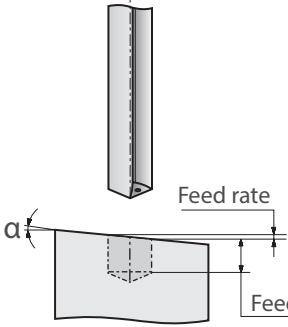
D

Technical Information

E

Index

Trouble shooting – PC series

| Machining | Recommendation | | | | | | | | |
|--|--|-------------------|----------------|----|-----|----|-----|----|-----|
| <p>Sloped surface</p>  | <p>Inclined surfaces should be pre-machined (chamfering).</p>  | | | | | | | | |
| <p>Inclined surface</p>  | <p>Reduce feed rate accordingly.</p>  <table border="1" data-bbox="1062 987 1385 1111"> <thead> <tr> <th>Inclination angle</th> <th>Max. feed rate</th> </tr> </thead> <tbody> <tr> <td>1°</td> <td>80%</td> </tr> <tr> <td>2°</td> <td>50%</td> </tr> <tr> <td>3°</td> <td>30%</td> </tr> </tbody> </table> | Inclination angle | Max. feed rate | 1° | 80% | 2° | 50% | 3° | 30% |
| Inclination angle | Max. feed rate | | | | | | | | |
| 1° | 80% | | | | | | | | |
| 2° | 50% | | | | | | | | |
| 3° | 30% | | | | | | | | |

A

Turning

B

Milling

C

Drilling

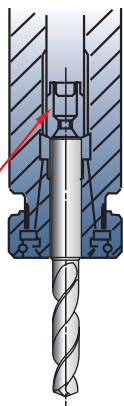
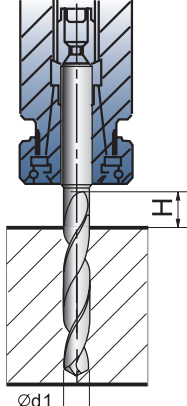
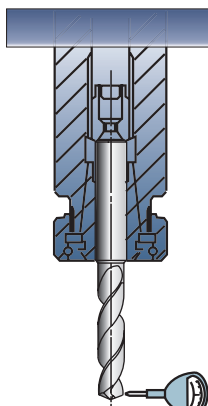
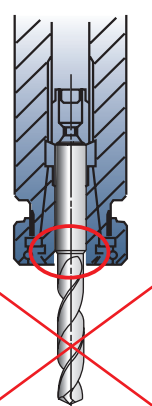
D

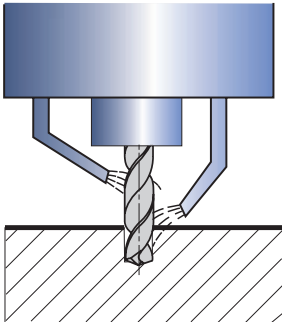
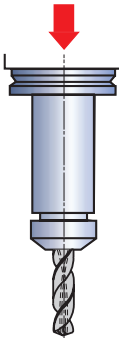
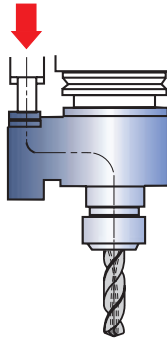
Technical Information

E

Index

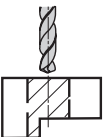
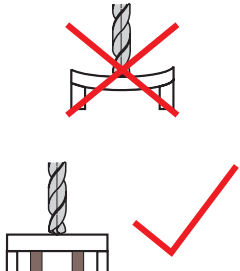
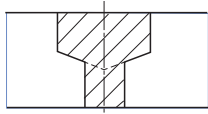
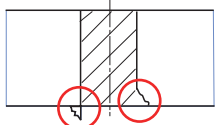
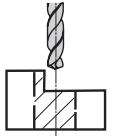
Operation notes

| Correct drill clamping | Max. drilling length | Radial run-out | Wrong drill clamping |
|--|---|--|---|
|  <p>Adjusting screw</p> |  <p>H $\varnothing d1$</p> |  |  |
| Use precision collets | $H = 1.5 \times d1$ | Radial run-out <math><0.02\text{ mm}</math> | Don't clamp on the drill flutes. |

| External coolant method | Internal coolant method | |
|--|--|--|
|  |  |  |
| The coolant liquid should shoot to the end and the centre of the drill as shown in the figure. | Coolant pressure is about 0.5–1 mpa (coolant pressure is 2–3 mpa when the diameter is less than 5 mm), coolant volume: 1.5–4 L/min | |

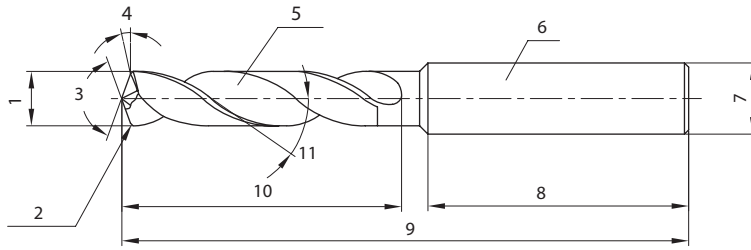
Handling of coolants:

- Small chip particles and dust can cause jamming in the oil hole. A fine mesh filter should be used.
- Dirt and dust particles will adhere to the oil hole and lead to unsmooth coolant flow. Regularly change the coolant. Please ensure proper coolant supply.

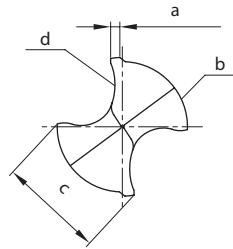
| Interrupted cutting | Thin work pieces | Stepped holes | Burrs and work piece chippings on exit |
|--|--|---|---|
|  <p>Reduce the feed rate when drilling interrupted cut.</p> |  <p>If bending occurs, add a supporter.</p> |  <ul style="list-style-type: none"> First drill the larger hole, then the smaller hole. We can offer multiple step and chamfer drills on request. |  <ul style="list-style-type: none"> Reduce the feed rate approx. by half when the drill exits. Use a drill with a different point angle. |
|  <p>Machine a countersink with an end mill prior to drilling.</p> | | | |

Solid carbide drills

Terminology



1. Drilling diameter
2. Chamfer
3. Point angle
4. Clearance angle
5. Chip pocket
6. Shank
7. Shank diameter
8. Shank length
9. Overall length
10. Flute length
11. Helical angle



- a. Margin width
- b. Body clearance
- c. Land width
- d. Primary cutting edge

Cutting edge type

| Shape | (Conical) | (Dual flats) | (Centring tip) |
|----------|---|--|---|
| Features | <ul style="list-style-type: none"> - The flank face is conical and the clearance angle increases toward the centre of drill. - Wide applications, commonly used both for soft and hard materials. | <ul style="list-style-type: none"> - The flank face is dual flats, to facilitate cutting and initial entering. - Often used for small diameter drills. | <ul style="list-style-type: none"> - This shape has two-stage point angles for perfect centring capabilities and reduces burrs. - It is the first choice for drilling thin plate. |

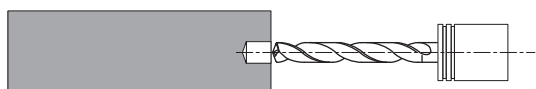
Solid carbide drills

Drill specification and cutting parameters

| | |
|---|---|
| Chip pocket | The chip pocket ensures that the chips are removed out of the hole during processing. |
| Helical angle | The helical angle describes the pitch of the flute. It's specified according to the to be machined material. hardened materials small ← helical angle → large tough materials |
| Cutting edge length or spiral length | The cutting edge length needs to be specified according to the drilling depth, guide bushing length and the whole regrinding length. The larger the helical angle, the lower the stability. Since it greatly influences the tool life, it should be as small as possible. The recommended min. spiral length is the drilling depth plus 1.5 times of the hole diameter. |
| Point angle | Generally the point angle is 140°, for special applications it should be set differently. tough materials, easy to machine small ← point angle → large hardened materials and high-performance drilling |
| Core diameter | The core diameter is an important factor and influences the stability and the chip flow. low axial cutting force low stability for easy to machine materials small ← core diameter → large high axial cutting force high stability for hardened materials or cross holes |
| Chamfer width | The chamfer width influences the guidance and friction of the drill during machining. low friction and bad drill guidance small ← chamfer width → large high friction and good drill guidance |
| Back taper | The drill diameter is slightly reduced from cutting edge to shank to reduce friction during machining. |
| Body clearance | The area behind the chamfer width. The body clearance is necessary to reduce friction during machining. |

Deep hole drilling

1 Preparation of the pilot hole with 1534SP03C*



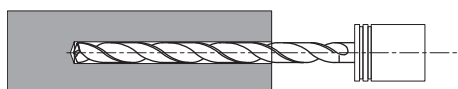
- Point angle of pilot drill must be bigger than SL drill.
- Diameter of pilot drill must be 0.01–0.04 mm bigger than SL drill.
- The pilot hole should be 1–3xD.

2 Entering the pilot hole with SL drill



- Entering the pilot hole with low cutting speed. (V_c : 20–30 m/min)
- Stop 1–3 mm before end of pilot hole. ($V_f = 0$)
- Increase cutting speed up to recommended parameter and then start drilling at feed rate.

3 Manufacturing the deep hole



- Drilling with suitable cutting speed and feed rate.
- In case of cross holes feed rate should be reduced to 0.05 mm/rev..

4 Pulling out the drill



- After reaching the required depth reduce the cutting speed (V_c : 20–30 m/min) and pull out the drill at high feed rate. (V_f : 2000 mm/min)

A

Turning

B

Milling

C

Drilling

D

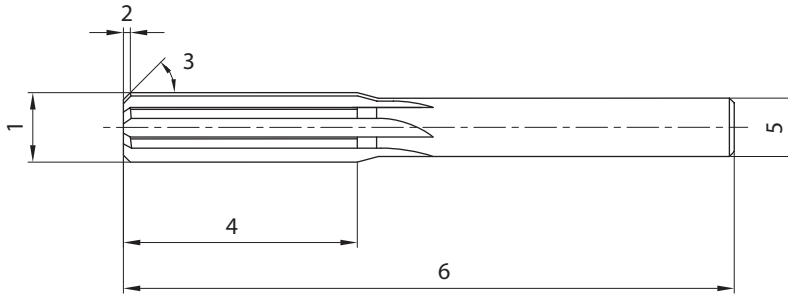
Technical Information

E

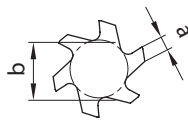
Index

Solid carbide reamers

Terminology

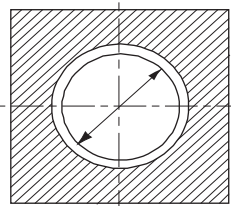


1. Nominal diameter
2. Chamfer length
3. Entry angle
4. Cutting edge length
5. Shank diameter
6. Total length

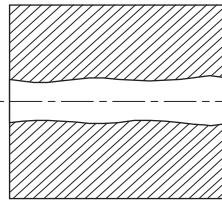


- a. Cutting edge thickness
- b. Core diameter

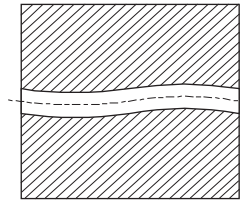
Reaming is semi-finishing and finishing of a previously formed hole within a narrow tolerance for higher surface quality, perfect roundness, cylindricity, etc.. To achieve a precisely reamed hole, the right choice of reamer and reamer diameter is important. In addition to that, the bore tolerance, the material and the machining conditions need to be taken into account. Furthermore the bore quality is strongly influenced by the radial run-out of the cutting tool.



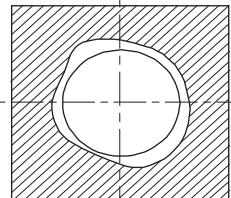
Diameter tolerance/Allowance



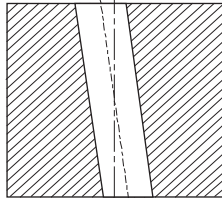
Cylindricity



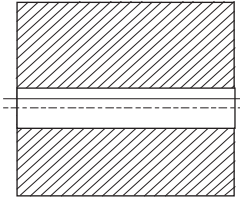
Straightness



Roundness



Vertical deviation



Off centre

Trouble shooting – solid carbide reamers

| Problem | Solution |
|---|---|
| Oversized hole | <ul style="list-style-type: none"> – Reduce the diameter of the reamer. – Check concentricity of the reamer and hole. – Check the radial run-out of the reamer. – Check the shank of the reamer for scratches. – Select a suitable coolant. – Adjust the cutting parameters. |
| Hole too small | <ul style="list-style-type: none"> – Increase the diameter of the reamer. – Reduce the cutting speed. – Reduce allowance. – Regrind or replace the reamer. – Ensure sufficient cooling. |
| Poor hole roundness and straightness | <ul style="list-style-type: none"> – Guarantee concentricity of the reamer chamfer. – Reduce overhang. – Check radial run-out after the reamer is clamped. – Adjust concentricity of the reamer and hole. – Check and ensure drill geometry. |
| Poor surface quality | <ul style="list-style-type: none"> – Reduce the cutting speed. – Ensure correct reaming allowance. – Check the cutting chamfer length of the reamer for wear and built-up edge. – Ensure stability of the machine, tool holder and reamer. – Chose the reamer according to the application. – Check the hole allowance. |
| Poor bore quality | <ul style="list-style-type: none"> – Pull out the reamer in cutting direction. – Reduce the cutting speed. – Use reamers with more teeth. – Check for concentricity and radial run-out. – Improve coolant supply. – Chose the optimal coolant lubrication. |
| Reamer breakage and thermal damage | <ul style="list-style-type: none"> – The guide chamfer is insufficient. Check the drill and drilling axis. – Adjust machining allowance. – Ensure sufficient coolant supply. – Adjust the cutting speed and feed rate. – Improve the stability of the machine, the tool holder and the cutting tool. – Change or regrind the cutting tool if the cutter wear is too high. |
| Damage on reamer shank | <ul style="list-style-type: none"> – Check clamping sleeve and tool holder for damage. |
| Short tool life | <ul style="list-style-type: none"> – Check coolant supply. – Change from straight fluted to helical fluted reamers. – Check all factors affecting machining precision. |
| Scratched hole surface | <ul style="list-style-type: none"> – Check the cutting edge for built-up edges and if necessary correct the cutting data. – Improve clamping of the workpiece. |
| Trumpet-shaped entry hole | <ul style="list-style-type: none"> – Improve clamping of the workpiece. – Check radial run-out of the clamped reamer. – The centre of the reamer may not be aligned with the centre of the hole. Adjust concentricity. |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

A

Solid carbide thread formers

What is thread forming?

The material fibres aren't severed but compressed at the base of the thread. This is why no material is lost unlike when thread cutting.

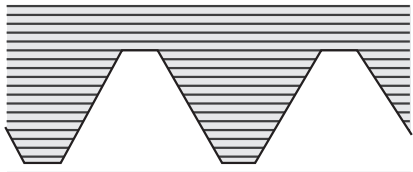
Advantages of thread forming:

- The thread is formed much more precisely.
- The thread is more resilient.
- The threads have a very smooth surface.
- Higher rotation speeds and feed rates possible than in thread cutting.
- Longer tool life increases the productivity.

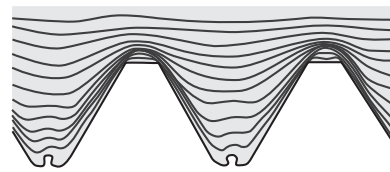
Disadvantages of thread forming:

- Higher requirements on the hole tolerance.
- Can't be used as hand tool.
- Greater heat build-up than in thread drilling.
- Limited material choice.
- Often the use of a release agent is necessary.

Thread formers should be used in materials with good cold formability. Next to steel, stainless steel and aluminium alloys, these include light metals and light metal alloys with a yield strength of 1200 N/mm². Basically, all long-chipping materials are suitable.



Fibre orientation after thread cutting



Fibre orientation after thread forming

Drehen

B

Fräsen

C

Bohren

D

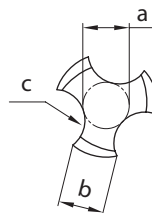
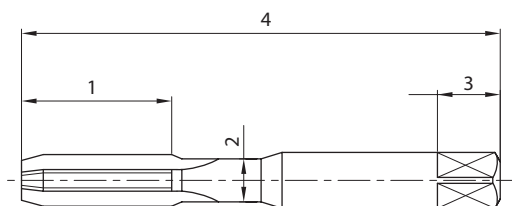
Technische
Information

E

Index

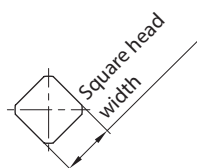
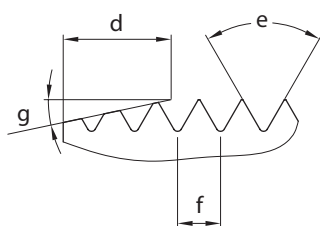
Solid carbide taps

Terminology



1. Thread length
2. Neck diameter
3. Square head length
4. Total length



- a. Core diameter
- b. Cutting edge thickness
- c. Chip pocket



- d. Chamfer length
- e. Thread profile angle
- f. Pitch
- g. Chamfer angle

Chamfer and thread profile

Chip space and application

| Chip space type | Features | Application |
|---|---|--|
|  Helical flute tap | <ul style="list-style-type: none"> - Helical flute - No chips inside the hole - Good entering performance - Simple centring | <ul style="list-style-type: none"> - For long-chipping materials - Suitable for blind holes - Usage in holes with groove |
|  Straight flute tap | <ul style="list-style-type: none"> - Straight flute - Stable cutting edge - Easy regrinding | <ul style="list-style-type: none"> - For hard machining - For short-chipping materials - For through holes and blind holes - For wear material |

A

Drehen

B

Fräsen

C

Bohren

D

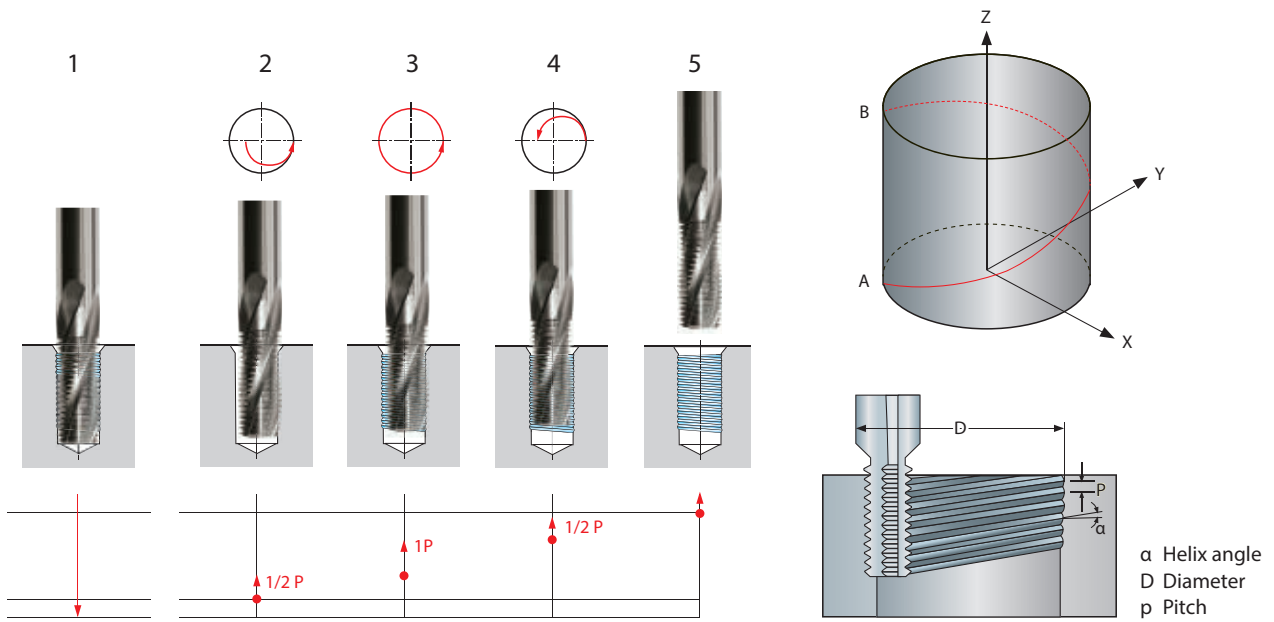
Technische
Information

E

Index

Solid carbide thread milling cutters

Solid carbide thread milling cutters with cylindrical shank – example



A

Drehen

B

Fräsen

C

Bohren

D

Technische Information

E

Index

Technical information

| | |
|---|---------|
| Comparison table materials | D2-D8 |
| Comparison table hardness and tensile strength | D9-D10 |
| Conversion table chip breaker – turning | D11-D12 |
| Conversion table chip breaker – milling/turning | D13-D21 |
| Example of materials for machining groups | D22 |
| Form test protocol | D23 |
| Torque for screw | D24 |



A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

Comparison table materials

| ISO | Country and standard | | | | | | | | | | | |
|----------|----------------------|----------|---------|--------------|---------------|------|--------|---------|------------|-----------|-----------|-----------|
| | China | USA | Germany | | Great Britain | | Sweden | France | Italy | Spain | Japan | Russia |
| | GB | AISI/SAE | W.-nr | DIN | BS | EN | SS | AFNOR | UNI | UNE | JIS | GOST |
| P | Alloy steel | | | | | | | | | | | |
| | 15 | 1015 | 1.0401 | C15 | 080M15 | - | 1350 | CC12 | C15C16 | F.111 | - | - |
| | 20 | 1020 | 1.0402 | C22 | 050A20 | 2C | 1450 | CC20 | C20C21 | F.112 | - | 20 |
| | 35 | 1035 | 1.0501 | C35 | 060A35 | - | 1550 | CC35 | C35 | F.113 | - | 35 |
| | 45 | 1045 | 1.0503 | C45 | 080M40 | - | 1650 | CC45 | C45 | F.114 | - | 45 |
| | 55 | 1055 | 1.0535 | C55 | 070M55 | - | 1655 | - | C55 | - | - | 55 |
| | 60 | 1060 | 1.0601 | C60 | 080A62 | 43D | - | CC55 | C60 | - | - | 60 |
| | Y15 | 1213 | 1.7015 | 9SMn28 | 230M07 | - | 1912 | S250 | CF9SMn28 | 11SMn28 | SUM22 | 15Ch |
| | - | 12L13 | 1.0718 | 9SMnPb28 | - | - | 1914 | S250Pb | CF9MnPb28 | 11SMnPb28 | SUM22L | - |
| | - | - | 1.0722 | 10SPb20 | - | - | - | 10PbF2 | CF10Pb20 | 10SPb20 | - | - |
| | - | 1140 | 1.0726 | 35S20 | 212M36 | 8M | 1957 | 35MF4 | - | F210G | - | - |
| | Y13 | 1215 | 1.0736 | 9SMn36 | 240M07 | 1B | - | S300 | CF9SMn36 | 12SMn35 | - | - |
| | - | 12L14 | 1.0737 | 9SMnPb36 | - | - | 1926 | S300Pb | CF9SMnPb36 | 12SMnP35 | - | - |
| | 55Si2Mn | 9255 | 1.0904 | 55Si9 | 250A53 | 45 | 2085 | 55S7 | 55Si8 | 56Si7 | - | - |
| | - | 9262 | 1.0961 | 60SiCr7 | - | - | - | 60SC7 | 60SiCr8 | 60SiCr8 | - | - |
| | 15 | 1015 | 1.1141 | Ck15 | 080M15 | 32C | 1370 | XC12 | C16 | C15K | S15C | 15 |
| | 40Mn | 1039 | 1.1157 | 40Mn4 | 150M36 | 15 | - | 35M5 | - | - | - | 40G |
| | 25 | 1025 | 1.1158 | Ck25 | - | - | - | - | - | - | S25C | 25 |
| | 35Mn2 | 1335 | 1.1167 | 36Mn5 | - | - | 2120 | 40Mn5 | - | 36Mn5 | SMn438(H) | 35G2,35GL |
| | 30Mn | 1330 | 1.1170 | 28Mn6 | 150M28 | 14A | - | 20M5 | C28Mn | - | SCMn1 | 30G |
| | 35Mn | 1035 | 1.1183 | Cf35 | 060A35 | - | 1572 | XS38TS | C36 | - | S35C | - |
| | Ck45 | 1045 | 1.1191 | 45 | 080M46 | - | 1672 | XC42 | C45 | C45K | S45C | - |
| | 55 | 1055 | 1.1203 | Ck55 | 070M55 | - | - | XC45 | C50 | C55K | S55C | 55 |
| | 50 | 1050 | 1.1213 | Cf53 | 060A52 | - | 1674 | XC48TS | C53 | - | S50C | - |
| | 60Mn | 1060 | 1.1221 | Ck60 | 080A62 | 43D | 1678 | XC60 | C60 | - | S58C | 60,60G |
| | - | 1095 | 1.1274 | Ck101 | 060A96 | - | 1870 | - | - | - | SUP4 | - |
| | - | - | 1.3401 | X120Mn12 | Z120M12 | - | - | X120M12 | XG120Mn12 | X120Mn12 | SCMnH/1 | 110G13L |
| | Gr15;45Gr | 52100 | 1.3505 | 100Cr6 | 534A99 | 31 | 2258 | 100C6 | 100Cr6 | F.131 | SUJ2 | SchCh 15 |
| - | ASTM A204Gr.A | 1.5415 | 15Mo3 | 1501-240 | - | 2912 | 15D3 | 16Mo3KW | 16Mo3 | - | - | |
| - | 4520 | 1.5426 | 16Mo5 | 1503-245-420 | - | - | - | 16Mo5 | 16Mo5 | - | - | |
| - | ASTM A350LF5 | 1.5622 | 14Ni6 | - | - | - | 16N6 | 14Ni6 | 15Ni6 | - | - | |
| - | ASTM A353 | 1.5662 | X8Ni9 | 1501-509;510 | - | - | - | X10Ni9 | XBNI09 | - | - | |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Comparison table materials

| ISO | Country and standard | | | | | | | | | | | |
|----------|----------------------|----------------------|------------|----------------------|-------------------|------|-----------|---------------------|---------------|------------|-------------------|-----------------|
| | China | USA | Germany | | Great Britain | | Sweden | France | Italy | Spain | Japan | Russia |
| | GB | AISI/SAE | W.-nr | DIN | BS | EN | SS | AFNOR | UNI | UNE | JIS | GOST |
| P | Alloy steel | | | | | | | | | | | |
| | - | 2515 | 1.5680 | 12Ni19 | - | - | - | Z18N5 | - | - | - | - |
| | - | 3135 | 1.5710 | 36NiCr6 | 640A35 | 111A | - | 35NC6 | - | - | SNC236 | - |
| | - | 3415 | 1.5732 | 14NiCr10 | - | - | - | 14NC11 | 16NiCr11 | 15NiCr11 | SNC415(H) | - |
| | - | 3415 3310 | 1.5752 | 14NiCr14 | 655M13 655A12 | 36A | - | 12NC15 | - | - | SNC815(H) | - |
| | - | 9840 | 1.6511 | 36CrNiMo4 | 816M40 | 110 | - | 40NCD3 | 38CrNiMo4(KB) | 35CrNiMo4 | - | 40 ChN2MA |
| | - | 8620 | 1.6523 | 21NiCrMo2 | 850M20 | 362 | 2503 | 20NCD2 | 20NiCrMo2 | 20NiCrMo2 | SNCCM220(H) | - |
| | - | 8740 | 1.6546 | 40NiCrMo2 | 311-Type7 | - | - | - | 40NiCrMo2(KB) | 40NiCrMo2 | SNC240 | 38ChGNM |
| | 40CrNiMoA | 4340 | 1.6582 | 34CrNiMo6 | 817M40 | 24 | 2541 | 35NCD6 | 35CrNiMo6(KB) | - | - | 38Ch2N2MA |
| | - | - | 1.6587 | 17CrNiMo6 | 820A16 | - | - | 18NCD6 | - | 14CrNiMo13 | - | - |
| | 15Cr | 5015 | 1.7015 | 15Cr3 | 523M15 | - | - | 12C3 | - | - | SCr415(H) | 15Ch |
| | 35Cr | 5132 | 1.7033 | 34Cr4 | 530A32 | 18B | - | 32C4 | 34Cr4(KB) | 35Cr4 | SCr430(H) | 35Ch |
| | 40Cr | 5140 | 1.7035 | 41Cr4 | 530M40 | 18 | - | 42C4 | 41Cr4 | 42Cr4 | SCr440(H) | 40Ch |
| | 40Cr | 5140 | 1.7045 | 42Cr4 | - | - | 2245 | - | - | 42Cr4 | SCr440 | 40Ch |
| | 18CrMn | 5115 | 1.7131 | 16MnCr15 | (527M20) | - | 2511 | 16MC5 | 16MnCr15 | 16MnCr15 | - | 18ChG |
| | 20CrMn | 5155 | 1.7176 | 55Cr3 | 527A60 | 48 | - | 55C3 | - | - | SUP9(A) | 50ChGA |
| | 30CrMn | 4130 | 1.7218 | 25CrMo4 | 1717CDS110 | - | 2225 | 25CD4 | 25CrMo4(KB) | 55Cr3 | SCM420; SCM430 | 30ChM |
| | 35CrMo | 4137;4135 | 1.7220 | 34CrMo4 | 708A37 | 19B | 2234 | 35CD4 | 35CrMo4 | 34CrMo4 | SCM432; SCRMM3 | AS38ChGM |
| | 40CrMoA | 4140;4142 | 1.7223 | 41CrMo4 | 708M40 | 19A | 2244 | 42CD4TS | 41CrMo4 | 41CrMo4 | SCM440 | 40 ChFA |
| | 42CrMo 42CrMnMo | 4140 | 1.7225 | 42CrMo4 | 708M40 | 19A | 2244 | 42CD4 | 42CrMo4 | 42CrMo4 | SCM440(H) | - |
| | - | - | 1.7262 | 15CrMo5 | - | - | 2216 | 12CD4 | - | 12CrMo4 | SCM415(H) | - |
| | - | ASTM A182 F11;F12 | 1.7335 | 13CrMo44 | 1501- 620Gr.27 | - | - | 15CD3.5; 15CD4.5 | 14CrMo44 | 14CrMo45 | - | 12ChM, 15ChM |
| | - | - | 1.7361 | 32CrMo12 | 722M24 | 40B | 2240 | 30CD12 | 32CrMo12 | F.124.A | - | - |
| - | ASTM A182 F22 | 1.7380 | 10CrMo910 | 1501- 622Gr.31;45 | - | 2218 | 12CD9;10 | 12CrMo9,10 | TU.H | - | - | |
| - | - | 1.7715 | 14MoV63 | 1503-660-440 | - | - | - | - | 13MoCrV6 | - | - | |
| 50CrVA | 6150 | 1.8159 | 50CrV4 | 735A50 | 47 | 2230 | 50CV4 | 50CrV4 | 51CrV4 | SUP10 | 50ChGFA | |
| - | - | 1.8509 | 41CrAlMo7 | 905M39 | 41B | 2940 | 40CAD6,12 | 41CrAlMo7 | 41CrAlMo7 | - | 38ChMJuA | |
| - | - | 1.8523 | 39CrMoV139 | 897M39 | 40C | - | - | 36CrMoV12 | - | - | - | |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Comparison table materials

| ISO | Country and standard | | | | | | | | | | | |
|----------|----------------------|----------|---------|---------------------------|---------------|-----|--------|-------------------------|------------------------------|----------------|-----------------------|----------|
| | China | USA | Germany | | Great Britain | | Sweden | France | Italy | Spain | Japan | Russia |
| | GB | AISI/SAE | W.-nr | DIN | BS | EN | SS | AFNOR | UNI | UNE | JIS | GOST |
| P | Alloy steel | | | | | | | | | | | |
| | T10 | W.110 | 1.1545 | C105W1 | - | - | 1880 | Y1105 | C98KU C100KU | F.515 F.516 | - | U10A |
| | T12A | W.112 | 1.1663 | C125W | - | - | - | Y2120 | C120KU | (C120) | SK2 | U13 |
| | CrV;9SiCr | L3 | 1.2067 | 100Cr6 | BL3 | - | - | Y100C6 | - | 100Cr6 | - | - |
| | Cr12 | D3 | 1.2080 | X210Cr12 | BD3 | - | - | Z200Cr12 | X210Cr13KU X250Cr12KU | X210Cr12 | SKD1 | Ch12 |
| | 4Cr5MoVSi | H13 | 1.2344 | X40CrMoV5 1 | BH13 | - | 2242 | Z40CDV5 | X35CrMoV05KU X40CrMoV51KU | X40CrMoV5 | SKD61 | 4Ch5MF1S |
| | Cr6WV | A2 | 1.2363 | X100CrMoV5 1 | BA2 | - | 2260 | Z100CDV5 | X100CrMoV51KU | X100CrMoV5 | SKD12 | - |
| | CrWMo | - | 1.2419 | 105WCr6 | - | - | 2140 | 105WC13 | 10WCr6 107WCr5KU | 105WCr5 | SKS31 SKS2 SKS3 | ChWG |
| | Cr12W | - | 1.2436 | X210CrW12 | - | - | 2312 | - | X215CrW12 1KU | X210CrW12 | SKD2 | - |
| | 5CrNiMo | S1 | 1.2542 | 45WCrV7 | BS1 | - | 2710 | - | 45WCrV8KU | 45WCrS8 | - | - |
| | 3Cr2W8V | H21 | 1.2581 | X30WCrV9 3 X30WCrV93KU | BH21 | - | - | Z30WCV9 | X28W09KU X30WCrV9 3KU | X30WCrV9 | SKD5 | 3Ch2W8F |
| | Cr12MoV | - | 1.2601 | X165CrMoV 12 | - | - | 2310 | - | X165CrMoW12KU | X160CrMoV12 | SKD11 | - |
| | 5CrNiMo | L6 | 1.2713 | 55NiCrMoV6 | - | - | - | 55NCDV7 | - | F.250.S | SKT4 | 5ChNM |
| | V | W210 | 1.2833 | 100V1 | BW2 | - | - | Y1105V | - | - | SKS43 | - |
| | W6Mo5Cr4V2Co5 | - | 1.3243 | S6-5-2-5 | - | - | 2723 | Z85WDKCV | HS6-5-2-5 | HS6-5-2-5 | SKH55 | R6M5K5 |
| | W18Cr4VCo5 | T4 | 1.3255 | S18-1-2-5 | BT4 | - | - | Z80WKC 10-05-04-01 | X78WCo1805KU | HS18-1-1-5 | SKH3 | - |
| | W6Mo5Cr4V2 | M2 | 1.3343 | S6-5-2 | BM2 | - | 2722 | Z85WDCV 06-05-04-02 | X82WMo0605KU | HS6-5-2 | SKH9 | R6M5 |
| | - | M7 | 1.3348 | S2-9-2 | - | -Z- | 2782 | Z100WCWV 09-02-04-02 | HS2-9-2 | HS2-9-2 | - | - |
| | W18Cr4V | T1 | 1.3355 | S18-0-1 | BT1 | - | - | Z80WCV 18-04-01 | X75W18KU | HS18-0-1 | SKH2 | - |
| | W6Mo5Cr4V3 | M3 | - | S6-5-3 | - | - | - | - | - | - | SKH52 | - |
| - | M42 | - | - | BM42 | - | - | - | - | - | SKH59 | - | |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Comparison table materials

| ISO | Country and standard | | | | | | Main application |
|----------|-------------------------------|----------|-------------|---------------|------------------------------|--------|---|
| | China | USA | Germany | Japan | Daido Steel Co., Ltd (Japan) | Russia | |
| | GB | AISI/SAE | DIN | JIS | DAIDO | GOST | |
| P | Plastic die steel | | | | | | |
| | - | P20 mod. | | - | PX5N | | For mass production of large mirror dies. Automobile tail light, front fender of car, video camera, household electrical appliances etc |
| | - | - | | - | NAK55 | | High precision mirror die. Video camera, music disc, Cosmetic Containers, transparent covers, transparent films etc |
| | - | - | | - | NAK80 | | High precision mirror die. Video camera, music disc, Cosmetic Containers, transparent covers, transparent films etc |
| | 3Cr13 | 420 mod. | | SUS420J2 mod. | S-STAR | | For ultra-mirror corrosion resistant precise dies. Accessories of camera, CD, lens, watch case. |
| | Cold-working die steel | | | | | | |
| | - | 02 | - | SKS93 | YK30 | | Stamping die, gauge calipers, paper cutter, auxiliary tools |
| | 9CrWMn | 01 mod. | - | SKS3 mod. | GOA | | Blanking die, gauge calipers, drawing die, taps, Perforated punch. |
| | Cr12MoV | D2 | X165CrMoV12 | SKD11 | DC11 | | Blanking die, cold forming die, cold drawing die, forming roller, punch |
| | - | D2 mod. | - | SKD11 mod. | DC53 | | Blanking die, cold forming die, cold drawing die, forming roll, punch |
| | Hot-working die steel | | | | | | |
| | 4Cr5MoSiV1 | H13 | X40CrMoV51 | SKD61 | DHA1 | | Aluminum-compression die, connecting parts of compression die, hot stamping die, hot extrusion die, thermal shear cutting blade |
| | - | - | - | - | DH21 | | Long life Aluminum compression die |
| | - | - | - | - | DH31-S | | Compression die |
| | - | - | - | - | DH2F | | Compression die, plastic die |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Comparison table materials

| ISO | Country and standard | | | | | | | | | | | |
|---------------|-----------------------------------|--------------|-----------------|----------------|---------------|-------------|------------|------------------|---------------|------------------------------|--------------|------------------|
| | China | USA | Germany | | Great Britain | | Sweden | France | Italy | Spain | Japan | Russia |
| | GB | AISI/ SAE | W.-nr | DIN | BS | EN | SS | AFNOR | UNI | UNE | JIS | GOST |
| M | Stainless steel | | | | | | | | | | | |
| | 0Cr13; 1Cr12 | 403 | 1.4000 | X6Cr13 | 403S17 | - | 2301 | Z6C13 | X6Cr13 | F.3110 | SUS403 | 08Ch13 |
| | - | - | 1.4001 | X7Cr14 | - | - | - | - | - | F.8401 | - | - |
| | 1Cr13 | 410 | 1.4006 | X10Cr13 | 410S21 | 56A | 2302 | Z10C14 | X12Cr13 | F.3401 | SUS410 | 12Ch13 |
| | 1Cr17 | 430 | 1.4016 | X6Cr17 | 430S15 | 60 | 220 | Z8C17 | X8Cr17 | F.3113 | SUS430 | 12Ch17 |
| | 2Cr13 | 410 | 1.4021 | X20Cr13 | 562 | 56B; 56C | - | Z20C13 | X20C13 | F.3401 | SUS410 | 20Ch13 |
| | - | - | 1.4027 | G-X20Cr14 | 420C29 | 56B | - | Z20C13M | - | - | SCS2 | 20Ch13L |
| | 4Cr13 | - | 1.4034 | X46Cr13 | 420S45 | 56D | 2304 | Z40CM Z38C13M | X40Cr14 | F.3405 | SUS420J2 | 40Ch13 |
| | 1Cr17Ni2 | 431 | 1.4057 | X20CrNi172 | 431S29 | 57 | 2321 | Z15CNi6.02 | X16CNi16 | F.3427 | SUS431 | 20Ch17N2 |
| | Y1Cr17 | 430F | 1.4104 | X12CrMoS17 | - | - | 2383 | Z10CF17 | X10CrS17 | F.3117 | SUS430F | - |
| | 1Cr17Mo | 434 | 1.4113 | X6CrMo171 | 434S17 | - | 2325 | Z8CD17.01 | X8CrMo17 | - | SUS434 | - |
| | - | - | 1.4313 | X5CrNi134 | 425C11 | - | - | Z4CND13.4M | - | - | SCS5 | - |
| | - | - | 1.4408 | G-X6CrNiMo1810 | 316C16 | - | - | - | - | F.8414 | SCS14 | 07Ch18N10G2S2M2L |
| | 4Cr9Si2 | HW3 | 1.4718 | X45CrSi93 | 401S45 | 52 | - | Z45CS9 | X45CrSi8 | F.322 | SUH1 | 40Ch9S2 |
| | 0Cr13Al | 405 | 1.4724 | X10CrAl13 | 403S17 | - | - | Z10C13 | X10CrAl12 | F.311 | SUS405 | 10Ch13SJu |
| | Cr17 | 430 | 1.4742 | X10CrAl18 | 430S15 | 60 | - | Z10CAS18 | X8Cr17 | F.3113 | SUS430 | 15Ch18SJu |
| | 8Cr20Si2Ni | HNV6 | 1.4757 | X80CrNiSi20 | 443S65 | 59 | - | Z80CSN20.02 | X80CrSiNi20 | F.320V | SUH4 | - |
| | 2Cr25N | 446 | 1.4762 | X10CrAl24 | - | - | 2322 | Z10CAS24 | X16Cr26 | - | SUH446 | - |
| | Austenitic stainless steel | | | | | | | | | | | |
| | 0Cr18Ni9 | 304 | 1.4301 | X5CrNi1810 | 304S15 | 58E | 2332 | Z6CN18.09 | X5CrNi1810 | F.3551; F.3541; F.3504 | SUS304 | 08Ch18N10 |
| | 1Cr18Ni9MoZr | 303 | 1.4305 | X10CrNiS189 | 303S21 | 58M | 2346 | Z10CNF18.09 | X10CrNiS18.09 | F.3508 | SUS303 | - |
| | 0Cr19Ni10 | 304L | 1.4306 | X2CrNi1911 | 304S12 | - | 2352 | Z2CN18.10 | X2CrNi18.11 | F.3503 | SCS19 | 03Ch18N11 |
| | - | - | 1.4308 | G-X6CrNi189 | 304C15 | - | - | Z6CN18.10M | - | - | SCS13 | 07Ch18N9L |
| | Cr17Ni7 | 301 | 1.4310 | X12CrNi177 | - | - | 2331 | Z12CN17.07 | X12CrNi1707 | F.3517 | SUS301 | - |
| | - | 304LN | 1.4311 | X2CrNi1810 | 304S62 | - | 2371 | Z2CN18.10 | - | - | SUS304LN | - |
| | 0Cr19Ni9 | 304 | 1.4350 | X5CrNi189 | 304S31 | 58E | - | Z6CN18.09 | X5CrNi1810 | - | SUS304 | - |
| | 0Cr17Ni11Mo2 | 316 | 1.4401 | X5CrNiMo1712 | 316S16 | Z6CND17.11 | 2347 | 1.4401 | X5CrNiMo1712 | F.3543 | SUS316 | - |
| | 00Cr17Ni13Mo2 | 316LN | 1.4429 | X2CrNiMo17133 | - | - | 2375 | Z2CND17.13 | - | - | SUS316LN | - |
| | 0Cr27Ni12Mo3 | 316L | 1.4435 | X2CrNiMo18143 | 316S12 | - | 2353 | Z2CDN17.13 | X2CrNiMo1713 | - | SCS16, | 03Ch17N14M2 |
| | 00Cr19Ni13Mo3 | 317L | 1.4438 | X2CrNiMo17133 | 317S12 | - | 2367 | Z2CND19.15 | X2CrNiMo18.16 | - | SUS317L | - |
| - | 329L | 1.4460 | X8CrNiMo275 | - | - | 2324 | - | - | - | SUS329L; SCH11; SCS11 | - | |
| 1Cr18Ni9Ti | 321 | 1.4541 | X6CrNiTi1810 | 2337 | 321S12 | 58B | Z6CNT18.10 | X6CrNiTi1811 | F.3553 | SUS321 | 12Ch18N10T | |
| 1Cr18Ni11Nb | 347 | 1.4550 | X6CrNiNb1810 | 347S17 | 58F | 2338 | Z6CNNb18.1 | X6CrNiTi1811 | F.3552 | SUS347 | 08Ch18N12B | |
| Cr18Ni12Mo2Ti | 316Ti | 1.4571 | X6CrNiMoTi17122 | 320S17 | 58J | 2350 | Z6NDT17.12 | X6CrNiMoTi17 | F.3535 | - | 10Ch17N13M2T | |

Comparison table materials

| ISO | Country and standard | | | | | | | | | | | Russia |
|------------|----------------------------|----------|--------------|------------------|-------------------|----|------------|--------------|----------------|---------------|------------|-------------|
| | China | USA | Germany | | Great Britain | | Sweden | France | Italy | Spain | Japan | |
| | GB | AISI/SAE | W.-nr | DIN | BS | EN | SS | AFNOR | UNI | UNE | JIS | |
| M | Austenitic stainless steel | | | | | | | | | | | |
| | - | - | 1.4581 | G-X5CrNiMoNb1810 | 318C7 | - | - | Z4CNDNb1812M | XG8CrNiMo18 | - | SCS22 | - |
| | Cr17Ni12Mo3Nb | 318 | 1.4583 | X10CrNiMoNb1812 | - | - | - | Z6CNDNb1713B | X6CrNiMoTiNb17 | - | - | - |
| | 1Cr23Ni13 | 309 | 1.4828 | X15CrNiSi2012 | 309S24 | - | - | Z15CNS20.1 | - | - | SUH309 | 20Ch20N14S2 |
| | 0Cr25Ni20 | 310S | 1.4845 | X12CrNi2521 | 310S24 | - | 2361 | Z12CN2520 | X6CrNi2520 | F.331 | SUH310 | 20Ch23N18 |
| | Cr15Ni36W3Ti | 330 | 1.4864 | X12NiCrSi3616 | - | - | - | Z12CNS35.1 | - | - | SUH330 | - |
| | - | - | 1.4865 | G-X40NiCrSi3818 | 330C11 | - | - | - | XG50NiCr3919 | - | SCH15 | - |
| | 5Cr2Mn9Ni4N | EV8 | 1.4871 | X53CrMnNiN219 | 349S54; 321S12 | - | 58B | - | Z52CMN21.0 | X53CrMnNiN219 | - | SUH35 |
| 1Cr18Ni9Ti | 321 | 1.4878 | X12CrNiTi189 | 321S320 | 58C | - | Z6CNT18.12 | X6CrNiTi1811 | F.3523 | SU321 | 09Ch18N10T | |

| ISO | Country and standard | | | | | | | | | | Russia |
|----------|----------------------|-----------|---------|---------------|---------|-----------|----------|----------|--------|----------|--------|
| | China | USA | Germany | Great Britain | Sweden | France | Italy | Spain | Japan | | |
| K | Nodular cast iron | | | | | | | | | | |
| | QT400-18 | 60-40-18 | GGG40 | 400/17 | 0717-02 | FGS370-17 | GS370-17 | FGE38-17 | FCD400 | VC 42-12 | |
| | QT450-10 | 65-45-12 | -- | 420/12 | -- | FGS400-12 | GS400-12 | FGE42-12 | FCD450 | - | |
| | QT500-7 | 70-50-05 | GGG50 | 500/7 | 0727-02 | FGS500-7 | GS500-7 | FGE50-7 | FCD500 | VC 50-2 | |
| | QT600-3 | 80-60-03 | GGG60 | 600/7 | 0732-03 | FGS600-2 | GS600-2 | FGE60-2 | FCD600 | VC 60-2 | |
| | QT700-2 | 100-70-03 | GGG70 | 700/2 | 0737-01 | FGS700-2 | GS700-2 | FGE70-2 | FCD700 | VC 70-2 | |
| | QT800-2 | 120-90-02 | GGG80 | 800/2 | 0864-03 | FGS800-2 | GS800-2 | FGE80-2 | FCD800 | VC 80-2 | |
| | QT900-2 | -- | -- | 900/2 | -- | -- | -- | -- | -- | - | |
| | Grey cast iron | | | | | | | | | | |
| | -- | NO.60 | GG40 | -- | 0140 | FGL400 | -- | -- | -- | Sc 40 | |
| | HT350 | NO.50 | GG35 | 350 | 0135 | FGL350 | G35 | FG35 | FC350 | Sc 35 | |
| | HT300 | NO.45 | GG30 | 300 | 0130 | FGL300 | G30 | FG30 | FC300 | Sc 30 | |
| | HT250 | NO.35 | GG25 | 250 | 0125 | FGL250 | G25 | FG25 | FC250 | Sc 25 | |
| | HT200 | NO.30 | GG20 | 200 | 0120 | FGL200 | G20 | FG20 | FC200 | Sc 20 | |
| HT150 | NO.20 | GG15 | 150 | 0115 | FGL150 | G15 | FG15 | FC150 | Sc 15 | | |
| HT100 | -- | -- | 100 | 0110 | -- | G10 | -- | FC100 | - | | |

| ISO | Country and standard | | | | | | | | | | | Russia |
|----------|----------------------|----------|---------|-------------|---------------|----|---------|--------|-------|-------|-------|--------|
| | China | USA | Germany | | Great Britain | | Sweden | France | Italy | Spain | Japan | |
| | GB | AISI/SAE | W.-nr | DIN | BS | EN | SS | AFNOR | UNI | UNE | JIS | |
| H | Hardened materials | | | | | | | | | | | |
| | - | 440A | 1.4108 | X100CrMo03 | - | - | 2258 08 | - | - | - | C4B5 | - |
| | - | 610 | 1.4111 | X100CrMoV15 | - | - | 2534 05 | - | - | - | AC4A | - |
| | - | 0-2 | - | X65CrMo14 | - | - | 2541 06 | - | - | - | AC4A | - |

Comparison table materials

| ISO | Country and standard | | | | | | | | | | | |
|----------|-------------------------------|-----------|----------------|--------------|---------------|------|--------|--------|-------|-------|-------|--------|
| | China | USA | Germany | | Great Britain | | Sweden | France | Italy | Spain | Japan | Russia |
| | GB | AISI/SAE | W.-nr | DIN | BS | EN | SS | AFNOR | UNI | UNE | JIS | GOST |
| N | Aluminium-based alloys | | | | | | | | | | | |
| | - | SC64D | 3.2373 | G-AISI9MGWA | | | 4251 | A-57G | | | C4BS | - |
| | - | DG-AISI12 | | G-ALMG5 | LM5 | | 4252 | A-SU12 | | | AC4A | |
| | - | 356.1 | | | LM25 | | 4244 | | | | A5052 | |
| | - | A413.0 | | GD-AISI12 | | | 4247 | | | | A6061 | |
| | - | A380.1 | | GD-AISI8Cu3 | LM24 | | 4250 | | | | A7075 | |
| | - | A413.1 | | G-AISI12(Cu) | LM20 | | 4260 | | | | ADC12 | |
| | - | A413.2 | | G-AISI12 | LM6 | | 4261 | | | | | |
| - | A360.2 | | G-AISI10Mg(Cu) | LM9 | | 4253 | | | | | | |

| ISO | Country and standard | | | | | | | | | | | |
|----------|----------------------------|--------------|------------------|------------------|------------------|----|--------|------------|-------|-------|-------|--------|
| | China | USA | Germany | | Great Britain | | Sweden | France | Italy | Spain | Japan | Russia |
| | GB | AISI/SAE | W.-nr | DIN | BS | EN | SS | AFNOR | UNI | UNE | JIS | GOST |
| S | Nickel based alloys | | | | | | | | | | | |
| | - | 5391 | LW2 4670 | S-NiCr13A16MoNb | mar-46 | - | - | NC12AD | - | - | | |
| | - | AMS 5397 | LW2 4674 | NiCo15Cr10MoAlTi | - | - | - | - | - | - | | |
| | - | 5660 | LW2.4662 | NiFe35Cr14MoTi | - | - | - | ZSNCDT42 | - | - | | |
| | - | 5383 | LW2.4668 | NiCr19Fe19NbMo | HR8 | - | - | NC19eNB | - | - | | |
| | - | - | 2.4631 | NiCr20TiAk | Hr401.601 | - | - | NC20TA | - | - | | - |
| | - | AMS 5399 | 2.4973 | NiCr19Co11MoTi | - | - | - | NC19KDT | - | - | | - |
| | - | AMS 5544 | LW2.4668 | NiCr19Fe19NbMo | - | - | - | NC20K14 | - | - | | |
| | - | 5390A | 2.4603 | - | - | - | - | NC22FeD | - | - | | - |
| | - | 5666 | 2.4856 | NiCr22Mo9Nb | - | - | - | NC22FeDNB | - | - | | - |
| | - | - | 2.4630 | NiCr20Ti | HR5.2034 | - | - | NC20T | - | - | | - |
| | - | 4676 | 2.4375 | NiCu30AL3Ti | 3072-76 | - | - | - | - | - | | - |
| | Cobalt based alloys | | | | | | | | | | | |
| | - | 5537C AMS | | CoCr20W15Ni | - | - | - | KC20WN | - | - | | |
| | - | 5772 | LW2.4964 | CoCr20W14Ni | | | | KC22WN | | | | |
| | Titanium alloys | | | | | | | | | | | |
| | - | UNS R54520 | 3.7115.1 | TiAl5Sn2.5 | TA14/17 | - | - | T-A5E | - | - | | |
| | - | | | | | | | UNS R56400 | | | | |
| | - | - | 3.7165.1 | TiAl6V4 | TA10-13/ TA28 | | - | UNS R56401 | T-A6V | - | - | |
| | - | | | TiAl5V5Mo5Cr3 | | | | | | | | |
| - | - | 3.7185 | TiAl4Mo4Sn4Si0.5 | - | - | - | - | - | - | | | |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Comparison table hardness and tensile strength

| Hardness | | | | Tensile strength N/mm ² | Hardness | | | | Tensile strength N/mm ² |
|-------------------|------|------------------|------------------|---------------------------------------|-------------------|------|------------------|------------------|---------------------------------------|
| Rockwell Hardness | | Vickers Hardness | Brinell Hardness | | Rockwell Hardness | | Vickers Hardness | Brinell Hardness | |
| HRC | HRA | HV | HB | | HRC | HRA | HV | HB | |
| 70.0 | 86.6 | 1037 | — | — | 51.0 | 76.3 | 525 | 501 | 1780 |
| 69.5 | 86.3 | 1017 | — | — | 50.5 | 76.1 | 517 | 494 | 1750 |
| 69.0 | 86.1 | 997 | — | — | 50.0 | 75.8 | 509 | 488 | 1720 |
| 68.5 | 85.8 | 978 | — | — | 49.5 | 75.5 | 501 | 481 | 1690 |
| 68.0 | 85.5 | 959 | — | — | 49.0 | 75.3 | 493 | 474 | 1660 |
| 67.5 | 85.2 | 941 | — | — | 48.5 | 75.0 | 485 | 468 | 1630 |
| 67.0 | 85.0 | 923 | — | — | 48.0 | 74.7 | 478 | 461 | 1605 |
| 66.5 | 84.7 | 906 | — | — | 47.5 | 74.5 | 470 | 455 | 1575 |
| 66.0 | 84.4 | 889 | — | — | 47.0 | 74.2 | 463 | 449 | 1550 |
| 65.5 | 84.1 | 872 | — | — | 46.5 | 73.9 | 456 | 442 | 1525 |
| 65.0 | 83.9 | 856 | — | — | 46.0 | 73.7 | 449 | 436 | 1500 |
| 64.5 | 83.6 | 840 | — | — | 45.5 | 73.4 | 443 | 430 | 1475 |
| 64.0 | 83.3 | 825 | — | — | 45.0 | 73.2 | 436 | 424 | 1450 |
| 63.5 | 83.1 | 810 | — | — | 44.5 | 72.9 | 429 | 418 | 1430 |
| 63.0 | 82.8 | 795 | — | — | 44.0 | 72.6 | 423 | 413 | 1405 |
| 62.5 | 82.5 | 780 | — | — | 43.5 | 72.4 | 417 | 407 | 1385 |
| 62.0 | 82.2 | 766 | — | — | 43.0 | 72.1 | 411 | 401 | 1360 |
| 61.5 | 82.0 | 752 | — | — | 42.5 | 71.8 | 405 | 396 | 1340 |
| 61.0 | 81.7 | 739 | — | — | 42.0 | 71.6 | 399 | 391 | 1320 |
| 60.5 | 81.4 | 726 | — | — | 41.5 | 71.3 | 393 | 385 | 1300 |
| 60.0 | 81.2 | 713 | — | 2555 | 41.0 | 71.1 | 388 | 380 | 1280 |
| 59.5 | 80.9 | 700 | — | 2500 | 40.0 | 70.8 | 382 | 375 | 1260 |
| 59.0 | 80.6 | 688 | — | 2450 | 40.0 | 70.5 | 377 | 370 | 1245 |
| 58.5 | 80.3 | 676 | — | 2395 | 39.5 | 70.3 | 372 | 365 | 1225 |
| 58.0 | 80.1 | 664 | — | 2345 | 39.0 | 70.0 | 367 | 360 | 1210 |
| 57.5 | 79.8 | 653 | — | 2295 | 38.5 | — | 362 | 355 | 1190 |
| 57.0 | 79.5 | 642 | — | 2250 | 38.0 | — | 357 | 350 | 1175 |
| 56.5 | 79.3 | 631 | — | 2205 | 37.5 | — | 352 | 345 | 1160 |
| 56.0 | 79.0 | 620 | — | 2160 | 37.0 | — | 347 | 341 | 1140 |
| 55.5 | 78.7 | 609 | — | 2115 | 36.5 | — | 342 | 336 | 1125 |
| 55.0 | 78.5 | 599 | — | 2075 | 36.0 | — | 338 | 332 | 1110 |
| 54.5 | 78.2 | 589 | — | 2035 | 35.5 | — | 333 | 327 | 1095 |
| 54.0 | 77.9 | 579 | — | 1995 | 35.0 | — | 329 | 323 | 1080 |
| 53.5 | 77.7 | 570 | — | 1955 | 34.5 | — | 324 | 318 | 1065 |
| 53.0 | 77.4 | 561 | — | 1920 | 34.0 | — | 320 | 314 | 1050 |
| 52.5 | 77.1 | 551 | — | 1885 | 33.5 | — | 316 | 310 | 1035 |
| 52.0 | 76.9 | 543 | — | 1850 | 33.0 | — | 312 | 306 | 1020 |
| 51.5 | 76.6 | 534 | — | 1815 | 32.5 | — | 308 | 302 | 1010 |

A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

Comparison table hardness and tensile strength

| Hardness | | | | | Tensile strength N/mm ² | Hardness | | | | | Tensile strength N/mm ² |
|-------------------|-----|------------------|------------------|--|---------------------------------------|-------------------|-----|------------------|------------------|--|---------------------------------------|
| Rockwell Hardness | | Vickers Hardness | Brinell Hardness | | | Rockwell Hardness | | Vickers Hardness | Brinell Hardness | | |
| HRC | HRA | HV | HB | | | HRC | HRA | HV | HB | | |
| 32.0 | — | 304 | 298 | | 995 | 24.0 | — | 249 | 245 | | 820 |
| 31.5 | — | 300 | 294 | | 980 | 23.5 | — | 246 | 242 | | 810 |
| 31.0 | — | 296 | 291 | | 970 | 23.0 | — | 243 | 240 | | 800 |
| 30.5 | — | 292 | 287 | | 960 | 22.5 | — | 240 | 237 | | 790 |
| 30.0 | — | 289 | 283 | | 950 | 22.0 | — | 237 | 234 | | 785 |
| 29.5 | — | 285 | 280 | | 935 | 21.5 | — | 234 | 232 | | 775 |
| 29.0 | — | 281 | 276 | | 920 | 21.0 | — | 231 | 229 | | 765 |
| 28.5 | — | 278 | 273 | | 910 | 20.5 | — | 229 | 227 | | 760 |
| 28.0 | — | 274 | 269 | | 900 | 20.0 | — | 226 | 225 | | 750 |
| 27.5 | — | 271 | 266 | | 890 | 19.5 | — | 223 | 222 | | 745 |
| 27.0 | — | 268 | 263 | | 880 | 19.0 | — | 221 | 220 | | 735 |
| 26.5 | — | 264 | 260 | | 870 | 18.5 | — | 218 | 218 | | 730 |
| 26.0 | — | 261 | 257 | | 860 | 18.0 | — | 216 | 216 | | 725 |
| 25.5 | — | 258 | 254 | | 850 | 17.5 | — | 214 | 214 | | 715 |
| 25.0 | — | 255 | 251 | | 835 | 17.0 | — | 211 | 211 | | 710 |
| 24.5 | — | 252 | 248 | | 830 | | | | | | |

Note: The conversion values for steel in the table are commonly applicable for the steels with carbon from low to high.

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Conversion table chip breakers – turning

| ISO | Application | ZCC-CT | | Sandvik | | Seco | | Kennametal | | ISCAR | | Walter | | Mitsubishi | | Sumitomo | | Tungaloy | | Kyocera | | Korloy | | Ingersoll Tague Tec | | |
|------------------------------------|------------------------------------|-----------------------|-------------|--------------|----------|------------------------------|--------|-------------|----------|--------|-------------|----------------|------------|----------------------|------------------------|------------------------|---------|----------------|----------------------|---------|--------------|--------|-------------|----------------------|-------------------------|-----|
| | | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | |
| P | Wiper-finishing | WG | | WF WL | WF WK | W-MF2 | W-F1 | FW MW | FW MW | WF | | NF | PF | SW | FW | NLU-W | NLU-W | ASW | | WP | | VW LW | | WS | | |
| | Finishing | DF EF | SF HF | PF QF | PF UF 23 | FF1 MF1 | FF1 F1 | FF FN | 11 UF LF | SF | | FF FS | FH FS | EJ FV | NSE NSU NLU NFA NLF | NLU NFP NFK | PF 01 | DP GP VF | CF | | VG VF VL | VF | | FG FC VF | FA SA FG | |
| | Semi-finishing | DM EM | HM | PM QM | PM UM | MF2 | F2 | FN | MF | | NF TF SM | 14 16 17 19 | N56 | P55 | SH SA MV | NSX | TSTMA S | HQ CQ CJ | CK DP GP VF XP | | VQ VC VB | HMP | | WT ML | WT | |
| | Medium machining to light roughing | DM PM | HR | PM QM | PR UR | M3 MF3 | F2 | MN | MF | | GN PP NR | 17 19 | NM4 NM6 | PM5 | MV MZ MA | NMU NSF | PM | GS GS HS PS | HQ XQ GK G | | VM | | | PC MC MT MG MF | PC MT PMR | |
| | Wiper-medium | | | WR WM | WM | W-M3 W-R4 W-R7 | W-F2 | MW RW | MW | | WG | | NM | PM | MW | | NGU-W | | WQ | | | | | | | |
| | Roughing | DR | | PR QR 31 | | M5 MR5 MR7 | | RP UN RN | | | TNM GN | 19 | NM9 | GH MAT MT | | NMU NMX | | TH TR TU | PT GT HT | | G St-form | HR | | | RT | |
| | Single side roughing | HDR 31HPR DR LR | | HR QR | | R8 RR9 -56 -57 -LUX | | RH RM RP | | | NM | | NR6 NR8 | HA HZ HH HV HX | | NMP NHG NHP NHU NHW | | | | | HX | | GH VH VT | | HT HD HY HZ RX RH | CMX |
| | Wiper-finishing | WG | | WF WL WMX | WF WK | W-MF2 | | FW MW | FW MW | | WF | | PF | SW | FW | NLU-W | | | | | | | | | | |
| | Finishing | EF DF | EF HF | MF | MF UF | FF1 F2 MF1 | F1 | FF FP | 11 UF LF | | NF VL | PF SM | NF4 | PF4 PF5 | F5 | EJ FV | NSU NLU | SS | SS | SS | GU | | VF | | EA SF | FG |
| | Semi-finishing | EF EM | EF HM | MF MM | MF UM | MF3 | F2 | FP | MF | | PP TF | 14 16 17 19 | NM4 | P55 | SH MS MV | NEX NUP | PS | SS SM | MS | | MS | | VP2 | | | |
| Medium machining to light roughing | EM DM | EM HM | MM | MM UM | R6 S6 | F2 | MP | HP | | PP TF | 17 19 | NM4 NR4 | PM5 | MS ES MH | NGU | PM | SA S | | MS | | H5 VP3 | | EM SU MT | MT PMR WT | | |
| Wiper medium | | | WR WM | WM | W-M3 | | MW RW | MW | | WG | | | PM | MW | NGU -W | | | | | | | | | | | |
| Roughing | ER DR | HR | MR QR PR | MR | R7 R8 | | MP-P | | | HTW NR | 19 | NR4 | GH HZ | | NMU NMX NHG | | | | | | VM | | ET | CMX | | |
| Single side roughing | ER DR HDR LR | | HR QR | | -56 | | RP | | | NM | | | | | NMP NHG NHP NHU NHW | | | | | | | | | | | |

Conversion table chip breakers – turning

| ISO | Application | ZCC-CT | | Sandvik | | Seco | | Kennametal | | ISCAR | | Walter | | Mitsubishi | | Sumitomo | | Tungaloy | | Kyocera | | Korloy | | Ingersoll Tague Tec | |
|------------------------------------|------------------------------------|----------|----------------|---------|----------|-------|-----------|------------|-------|-------|-----|--------|-----|------------|-------------|----------|-------|----------|-----|---------|-------|--------|-------|---------------------|-------|
| | | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Wiper-Finishing | WG | | W-MF2 | W-F1 | FW-MW | FW-MW | WF | | | | | | | | NLU-W | NLU-W | | | | | | | | |
| | Finishing | DF | HF | F1 | F1 | FF FN | 11 UF LF | NF SM | 14 19 | | | PS5 | | | NSU | NSU | C | | | | VM | | | | |
| | Semi-finishing | PM | HM | M3 | F2 | FN | MF | GN | 14 19 | | | NM5 | PM5 | GH | NUX NGU | NSU | | | CM | | B25 | HMP | | | |
| | Medium machining to light roughing | DR | HM HR | M3 | F2 | UN | HP | GN NR | | | | NM6 | PM5 | | NUZ NGU NLU | NMU | | | CM | | VK GR | C25 | MT MG | MT PMR WT | |
| Wiper-medium | | | W-M3 W-R4 W-R7 | | MW | MW | WG | | | | NM | PM | | NGU-W | | | | | | | | | | | |
| Roughing | DR +NMA | HR | KR UR | M5 | | | | NR | | | NR6 | | GH | NMU | NMU | | | | | | MA | RT | | CMX | |
| Finishing | | LC | AL | | | | LF | NF | | | | PM2 | | | | | | | | | | | | | |
| Semi-finishing | | LC | AL | AL | GP | | | NF PP | AS | | | | | | | | | | | | AH | HA | AK | | FL SA |
| Medium machining to light roughing | | LH | AL | AL | GG-FS MS | HP | NMS | | | | | | | | | | | | | | | AR | | | |
| Finishing | | NF EF | NF | MF1 | FS | GT-HP | SF PF | PF SM | | | | PF4 | FJ | NSU | NSU | | | | | | | | VP1 | | |
| Semi-finishing | | NF NM EM | NF | MF1 M1 | FS MS | GT-MF | SF PF | PF SM | | | | PF5 | MJ | NEX NUP | NSU NSK | | | | | | | | VP2 | AK | |
| Medium machining to light roughing | | NM EM | MM LUM | M1 | MS | MT-LF | PP TF | | | | | PS5 | MS | NMU | NSK | | | | | | | | VP3 | HMP | SU |
| Roughing | | ER | | MR3 MR4 | RP | | TF HTW NR | | | | | | GJ | | | | | | | | | | VM | | |
| S | | | | | | | | | | | | | | | | | | | | | | | | | |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Conversion table grades – turning

Coated cemented carbide CVD

| ISO | ZCC-CT | Sandvik | Kennametal | Sumitomo | Mitsubishi | Toshiba Tungaloy | Kyocera | Walter | Iscar | SECO | Korloy | Ingersoll Tague Tec | Widia | |
|--------|----------------------|--------------|----------------------|-----------------------------|------------------------------|----------------------|-------------------|---------------------------|----------------------|---|----------------------|----------------------|---------------------|--------|
| P | Steel | P01-05 | GC4205 GC4305 | KCP05 KC9105 | AC805P | UE6005 UE6105 | T9005 T9105 | CA5505 | WPP01 WPP05 | IC8150 IC9150 IC428 | TP0500 TP0501 | | | |
| | | P10-15 | GC4315 GC4215 | KCP10 KC9110 | AC810P AC700G | UC6110 MY5015 | T9015 T9115 | CA510 CA5515 CA510 | WPP10 WPP10S | IC8150 IC8250 IC9150 IC9250 IC9015 | TP1500 TP1501 | NC3010 | TT8115 TT8125 | WP15CT |
| | | P20-25 | GC4325 GC4225 GC4025 | KCP25 KC9125 | AC820P AC8020P AC900G AC2000 | UE6020 MC6025 | T9025 T9125 | CA5525 CA525 CR9025 | WPP20 WPP20S | IC8150 IC8250 IC9250 IC9025 | TP2501 TP2500 TP200 | NC3220 NC3120 | TT8125 TT3500 | WP25CT |
| P30-35 | GC4335 GC4235 GC4035 | KCP30 KC8050 | AC830P AC3000 | UE6035 UE6400 | T903 T9135 | CA530 CA5535 CA535 | WPP30 WPP30S | IC8250 IC8350 IC9350 | TP3500 | NC3030 NC5330 NC500H | TT5100 TT8135 | WP35CT | | |
| M | Stainless steel | M10 | GC2015 GC1515 | KCM15 | AC610M | MC7015 | T9115 | | IC8250 IC9250 IC6015 | | | TT9215 | WM15CT | |
| | | M20 | GC2015 GC2025 | KCM25 KC9225 | AC610M AC650M | US7020 MC7015 MC7025 | T6020 T6120 T9125 | CA6515 | WAM20 | IC8250 IC9350 IC9025 IC6025 | TM 2000 TP200 TP2500 | TT5100 TT9225 | WM25CT | |
| | | M30 | GC2025 GC2035 | KCM25 KCM35 KC9225 | AC630M AC6030M AC830P AC3000 | US735 US7025 | T6030 T6130 | CA6525 | WAM30 | IC8350 IC9350 IC9025 | TP3500 TM 4000 | TT5100 TT7100 TT9235 | WM35CT | |
| K | Cast iron | M40 | GC2035 | KCM35 KC9240 KC9245 | AC630M AC6030M AC830P AC3000 | US735 | CA6525 | | IC6025 IC9350 | TP 40 | | TT5100 TT7100 TT9235 | WK05CT | |
| | | K01-05 | GC3005 GC3205 | KCK05 | AC405K AC410K | UC5005 UC5105 | T5105 | CA4505 | IC5005 IC9007 | | NC6205 | TT1300 TT7005 | WK05CT | |
| | | K10-15 | GC3215 | KCK15 KC9315 | AC410K AC415K AC420K AC700G | MC5015 UC5115 MY5015 | T5105 T5115 | CA4010 CA4515 CA4115 | WAK10 WAK10S | IC9015 IC9007 IC8150 IC5010 IC428 IC4028 IC9150 | TK1001 TK1000 | NC6210 | TT1300 TT7310 T7015 | WK20CT |
| K20-25 | GC3225 | KCK20 KC9320 | AC420K AC900G | MC5015 UC5115 UE6110 MY5015 | T5125 T9125 | CA4125 | WAK20 WKK20S | IC5010 IC428 IC4028 C9150 | TK2000 TK2001 | NC5330 | | WK20CT | | |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index



Conversion table grades – turning

Coated cemented carbide PVD

| ISO | ZCC-CT | Sandvik | Kennametal | Sumitomo | Mitsubishi | Toshiba Tungaloy | Kyocera | Walter | Iscar | SECO | Korloy | Ingersoll Tague Tec | Widia |
|--------|-------------------------|--|---|------------------------|--------------------------------------|--|-----------------------------------|---|--|------------------------------------|------------------|----------------------------|--------|
| P | P01-05 | GC1105 | | | | | PR1005 | | | | | | |
| | P10-15 | GC1515 GC1115 GC1025 | KC5010 KC5510 KC7215 KC7315 | AC510U | VP10MF VP15TF | AH710 | PR930 PR1005 PR930 PR115 | WSM10 WXN10 | IC520N IC507 IC570 IC807 IC907 IC908 | | | | |
| | P20-25 | GC1515 GC1125 GC1025 | KC5025 KC5525 KU25T | AC520U | VP20RT VP20MF | AH725 AH120 | PR930 PR1025 PR1225 | WSM20 WMP205 WSM21 | IC228 IC250 IC308 IC828 IC350 IC354 IC507 IC807 IC808 IC907 IC908 IC928 IC1008 IC1028 IC3028 | CP200 CP250 TP2000 TS2500 | | TT8020 TT9020 | |
| P30-35 | GC1125 GC2035 | KC7335 | AC530U | | SH730 J740 GH130 AH740 | PR660 | WSM30 | IC228 IC250 IC328 IC330 IC354 IC528 IC1008 IC1028 IC3028 | CP500 | PC5300 | | | |
| M | M10 | GC1105 GC1115 GC1025 GC1125 GC1515 | KCU10 KC5010 KC5510 KC6005 KC6015 | EH10Z AC510U AC530U | VP10MF | AH710 | PR915 PR1005 | WSM10 | IC330 IC354 IC507 IC520 IC570 IC807 IC1028 IC3028 | CP500 TS2000 | PC8110 | TT5080 | WS10PT |
| | M20 | GC1025 GC1125 | KC501 KCU25 | AC520U AC530U | VP10RT VP20RT VP20MF | AH120 AH725 SH730 AH710 AH630 GH330 | PR1025 PR1125 PR1225 | WSM10 WMP205 WSM20 WSM21 | IC228 IC250 IC354 IC808 IC908 IC1008 IC1028 IC3028 | TS2000 TS2500 CP200 CP250 | | TT8020 TT9020 TT9080 | WS25PT |
| M30 | YBG302 | GC2035 | KC5025 KCU25 | | VP10RT VP20RT VP20MF MP7035 | AH12 AH725 SH730 AH710 AH630 GH330 J740 | PR1025 PR1125 PR1225 | WSM20 WSM21 WSM30 | IC228 IC250 IC328 IC330 IC1008 IC1028 IC3028 | CP500 TS2500 | PC5300 PC9030 | | |
| S05 | | S05F | | | MP9005 | AH905 | | | IC507 IC907 | | | | |
| S | S10 | GC1105 GC1115 | KC5010 KCU10 KC5510 KC510 | AC510U EH510Z | MP9015 VP10RT | AH905 SH730 AH110 AH120 | | WSM10 | IC507 IC807 IC808 IC907 | CP200 CP250 TS2000 TS2500 | PC8110 | TT5080 | WS10PT |
| | S20 | GC1025 GC1125 GC1515 | KC5010 KCU10 KC5025 KCU25 KC5525 | AC520U EH520Z | MP9015 MT9015 VP20RT | AH120 AH725 | PR1125 | WSM20 WSM21 WSM30 | IC507 IC807 IC907 | CP250 TS2500 CP500 | PC5300 | TT5080 TT8020 TT9080 | WS25PT |
| S30 | YBG302 | | | AC520U | VP15TF | AH725 | PR1125 | WSM30 | IC3028 IC808 IC830 | | PC5400 | TT8020 | |
| N | YBG101 YBG102 YBG105 | GC1515 | KC5410 | | | | | WXN10 | IC520 | | | | |

Conversion table grades – turning

Cermet

| ISO | ZCC-CT | Sandvik | Kennametal | Sumitomo | Mitsubishi | Toshiba Tunggaloy | Kyocera | Walter | Iscar | SECO | Korloy | Ingersoll Tague Tec | Widia | |
|----------|--------|-----------------|---------------------------|--------------------------------------|--|---|--|--------|---|-------------------------------|-----------------------------------|---------------------|-------|-------|
| P | P01-05 | CT5005 | | T110A T1000A | AP25N VP25N | NS520 AT520 GT520 GT720 | TN30 TN6010 PV30 PV7010 | | IC20N IC520N | | CN1000 CC105 | CT3000 PV3010 | | |
| | P10-15 | CT5015 CT530 | KT315 KT125 | T1200A T2000Z T1500A T1500Z | NX2525 AP25N VP25N | NS520 NS730 GT730 PV60 NS9530 GT9530 | TN60 TN6010 PV60 PV6010 | | IC20N IC520N IC530N | CM TP1020 TP1030 CMP | CN1000 CT10 CN2000 CC115 | CT3000 PV3010 | TT115 | |
| | P20-25 | GC1525 | KT325 KT1120 KT5020 | T1200A T2000Z T1500A T1500Z | NX2525 NX3035 AP25N VP25N MP3025 | NS530 NS730 GT730 NS9530 GT9530 | TN60 IC30N PV60 PV7020 PV7025 | | IC20N IC30N IC75T IC520N IC530N | CM TP1020 TP1030 CMP | CN20 CN2000 CC115 | | | TT115 |
| | P30-35 | | | T3000Z | MP3025 VP45N | | PV7025 PV90 | | IC75T | | | | | |
| M | M10 | GC1525 | KT125 | T110A T1000A T1500Z T2000Z | NX2525 AP25N VP25N | NS520 AT530 GT530 GT720 | TN60 TN6020 PV60 PV7020 | | | CM TP1020 TP1030 CMP | | CT3000 PV3010 | TT115 | |
| | M20 | CT5015 CT530 | HT2 | T110A T1000A T1500Z T2000Z | NX2525 AP25N VP25N | NS530 GT730 NS730 | TN90 TN6020 PV90 PV7020 PV7025 | | | | | CT3000 PV3010 | TT115 | |
| | M30 | | | T3000Z | | | | | | | | | | |
| | M40 | | | | | | | | | | | | | |
| K | K01-05 | | | T110A T1000A T2000Z T1500Z | NX2525 AP25N | NS520 GT730 NS730 | TN30 TN6010 PV30 PV7005 PV7010 | | | | CN1000 | CT3000 PV3010 | | |
| | K10-15 | CT5015 | KT325 KT125 | T1200A T1500A T2000Z T1500Z | NX2525 AP25N | NS520 GT730 NS730 | TN60 TN6020 PV60 PV7020 PV7025 | | | | CN1000 | CT3000 PV3010 | | |
| | K20-25 | CT5015 | | T3000Z | NX2525 AP25N | | | | | | | | | |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Conversion table grades – turning

Uncoated carbide

| ISO | ZCC-CT | Sandvik | Kennametal | Sumitomo | Mitsubishi | Toshiba Tungaloy | Kyocera | Walter | Iscar | SECO | Korloy | Ingersoll Tague Tec | Widia |
|--------------------------------|--------|-------------|----------------------|----------|------------|------------------|---------|--------------|-------|-----------------|--------|---------------------|-------|
| N Non-ferrous metals | N01 | H10 H13A | KF1 | H1 | | KS05F | | | | 883 890 | | | |
| | N10 | H10 H13A | K313 KF1 THM-F | H1 | HT110 | KS15F | KW10 | WK01 WK10 | IC20 | 890 KX HX | H01 | K10 | THM |
| | N20 | H10 H13A | K313 KF1 THM-F | | | KS15F | KW15 | | IC20 | KX HX | | | |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Conversion table grades – milling

CVD milling grades

| Material / Class | ZCC-CT | Sandvik | Kennametal | Sumitomo | Mitsubishi | Toshiba Tunggaloy | Kyocera | Walter | Iscar | SECO | Korloy | Ingersoll Tague Tec |
|------------------|----------|------------------------------------|------------------|----------|-----------------|-------------------|---------|--------------------------|--------------------------------------|--|------------------|----------------------------|
| P | P05 | K20W GC4220 | | F7010 | | | | | | | | |
| | P10 | K20W GC3040 GC4220 GC4230 | | ACP100 | F7010 | | | | IC4100 IC5100 | MP1500 | NC5330 NCM325 | IN6505 IN6520 |
| | P20 | GC3040 GC4230 | | CS3000 | FH7020 | T3130 | | WKP25 WKP255 | IC4050 IC4100 IC5100 IC5400 | MP1500 MP2500 MS2500 T25M | NC5330 NCM325 | IN6505 IN6520 IN7035 |
| | P30 | GC2040 GC4240 | KC930M KC935M | CS3000 | F7030 | T3130 | | WKP35 WKP355 WTP35 | IC4050 IC5400 | MK3000 T25M T350M | NCM325 | IN7035 IN6530 |
| | P40 | GC2040 GC4240 | | | | | | | | T350M | | IN6530 |
| | M10 | GC4230 | | F7010 | | | | | | MP1500 | NCM325 NC5330 | IN6520 |
| | M20 | GC4230 | | F7020 | F7020 | T3130 | | | IC4050 | MP1500 MP2500 MS2500 T25M | NCM325 NCM335 | IN7035 IN6520 IN6505 |
| | M30 | GC2040 GC4240 | KC930M KC935M | F7030 | F7030 | T3130 | | WTP35 | | MP2500 MS2500 T25M T350M | NCM335 | IN6530 IN7035 IN6505 |
| | M40 | GC2040 GC4240 | | | | | | | | T350M | | IN6530 |
| | K | K05 | | KCK15 | | F7010 MC5020 | | | | DT7150 IC4100 | | |
| K10 | | K20W | KCK15 | ACK200 | F7010 MC5020 | T1115 | | WAK15 | DT7150 IC4100 IC4010 | MP1500 MK1500 | NC5330 | IN6520 |
| K20 | | K20W | | ACK200 | | T1115 | | WKP25 WKP255 | DT7150 IC4100 | MP1500 MP2500 MS2500 T25M MK1500 | NC5330 | IN6530 IN6515 IN6520 |
| K30 | | | KC930M KC935M | | | | | WKP35 WKP355 | IC4050 | MK3000 MP2500 MS2500 | | IN6530 IN6515 |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Conversion table grades – milling

CVD milling grades

| Material / Class | S05 | S10 | S20 | S30 | N05 | N10 | N20 | H05 | H10 | H20 |
|------------------------|-----------------------|-----|--------------------------|-----------------|----------|-----|---------------|----------|------|----------------|
| S | Heat-resistant alloys | | | | N | | | H | | |
| ZCC-CT | | | | | | | | | | |
| Sandvik | | | | GC2040 | | | | | K20W | K20W GC3040 |
| Kennametal | | | | | | | | | | |
| Sumitomo | | | | | | | | | | |
| Mitsubishi | | | | | | | | | | |
| Toshiba Tungaloy | | | | | | | | | | |
| Kyocera | | | | | | | | | | |
| Walter | | | | WTP35 | | | | | | |
| Iscar | | | | | | | | | | |
| SECO | MK3000 | | MP2500 MS2500 T25M | MM4500 T350M | | | MP2500 25M | | | |
| Korloy | | | | | | | | | | |
| Ingersoll Tague Tec | | | IN7035 IN6520 | | | | | | | |

A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

Conversion table grades – milling

PVD milling grades

| Material / Class | ZCC-CT | Sandvik | Kennametal | Sumitomo | Mitsubishi | Toshiba Tunggaloy | Kyocera | Walter | Iscar | SECO | Korloy | Ingersoll Tague Tec |
|-------------------|--------|--------------------------------------|--|---|---------------------------|--|---|---|---|-------------------|---|--|
| P Steel | P05 | | | ACZ120 | VP05HT | GH130 | | | IC903 | | | IN2004 IN2006 |
| | P10 | GC1010 GC1025 GC1020 | KC522M KC525M KC610M KC643M KC715M | ACZ10M ACZ20W | VP10H | AH120 GH130 | PR730 PR1225 PR1525 | WXH15 WHH15 WXM15 | IC903 IC950 IC1008 | F15M | | |
| | P20 | GC1020 GC1025 GC1010 GC2030 | KC522M KC525M KC643M KC715M KC725M | ACP200 ACZ330 ACX70 ACW30 AC350 ACZ50M | VP15TF VP20M VP20RT | AH725 AH120 AH130 AH330 AH725 AH730 GH330 | PR630 PR830 PR730 PR1225 PR1230 PR1525 | WXM15 | IC810 IC380 IC830 IC900 IC908 IC910 IC950 IC1008 | F25M MP3000 | PC3500 PC3600 | IN2006 IN1030 IN2004 IN2005 IN2015 IN2030 IN2505 IN2540 |
| | P30 | GC1030 GC2030 | KC530M KC725M KC735M | ACP200 ACP300 ACZ50M ACZ330 ACZ350 ACX70 ACW30 AC350 | VP30RT | AH740 AH130 AH140 | PR630 PR660 PR830 PR1230 | WXM35 | IC300 IC328 IC830 IC900 IC928 IC350 IC808 IC908 | F30M MP3000 | PC3500 PC3600 PC3300 PC3545 PC9570T | IN1030 IN2005 IN2015 IN2030 IN2035 IN2040 IN2505 IN2530 IN4035 |
| | P40 | GC1030 | KC735M | ACP300 ACZ350 | | AH140 AH750 | | WXP45 WSP45 WSP46 | IC300 IC328 IC928 | F40M | PC5300 PC3545 | IN2035 IN2040 |
| | M10 | GC1020 | KC522M KC610M KC643M KC715M | ACZ20W ACZ350 EH20Z | AH330 GH110 GH130 | PR730 PR1225 PR660 PR1525 | | | PR730 PR660 PR1025 PR1225 PR1525 | F15M | PC8110 | IN2505 |
| | M20 | GC1020 GC1025 GC1030 GC203 | KC522M KC525M KC610M KC715M KC725M | ACP200 ACZ50M ACZ20M ACZ350 EH20Z AC350 | VP15TF VP20RT | AH725 AH730 GH110 | PR730 PR1025 PR660 PR1225 PR1525 | WXM15 | | F25M MP3000 | PC5300 PC8110 PC9530 | IN2005 IN2015 IN2505 |
| | M30 | GC1040 GC203 | KC525M KC530M KC725M KC735M | ACP300 ACZ50M ACX80 AC350 | VP30RT | AH740 AH120 AH130 GH330 GH340 | | | | F30M MP3000 | PC9530 PC3545 PC9570T | IN1030 IN2015 IN2030 IN2035 IN2530 IN4035 |
| | M40 | GC1040 | KC530M KC735M | ACP300 ACX80 | | AH140 AH750 GH330 GH340 | | W5M35 W5M36 WXM35 | | F40M | PC3545 | IN1030 IN2030 IN2035 IN2530 IN4035 |
| | K05 | GC1010 | KC510M | ACZ10M ACZ120 ACZ310 | | AH330 | PR905 PR1210 PR1510 | | | MH1000 | PC8110 | IN2510 |
| K10 | GC1010 | KC510M KC520M KC620M KC643M | EH20Z ACZ310 | | AH120 AH330 AH725 | PR905 PR1210 PR1510 | WXH15 WHH15 WXM15 | IC810 IC950 IC1008 | F15M MK2000 | PC6510 | IN2004 IN2010 IN2510 | |
| K20 | GC1020 | KC520M KC620M KC725M | ACK300 EH20Z ACX80 ACW30 | VP15TF | GH130 | | WKK25 | IC328 IC830 IC950 IC350 IC808 IC908 IC1008 | F25M MK2000 MO3000 | PC6510 PC5300 | IN1030 IN2004 IN2010 IN2015 IN2030 IN2505 | |
| K30 | GC1020 | KC620M KC725M | ACK300 ACZ50M | | | | | IC328 IC830 IC900 IC908 IC350 IC808 IC908 | F30M F40M MP3000 | PC5300 PC9570T | IN2005 IN2015 IN2030 IN2505 | |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index



Conversion table grades – milling

PVD milling grades

| Material / Class | ZCC-CT | Sandvik | Kennametal | Sumitomo | Mitsubishi | Toshiba Tungaloy | Kyocera | Walter | Iscar | SECO | Korloy | Ingersoll Tague Tec |
|-----------------------------------|--------|----------------------------|--------------------------------------|----------|------------|------------------|----------------------------|---|--|-------------------------------|------------------|--|
| S Heat-resistant alloys | S05 | YBG102 | | | | | | | | MH1000 F15M | PC8110 | |
| | S10 | YBG102 YBG202 YBG205 | KC525M KC643M | ACZ20W | VP15TF | | PR905 PRI210 PRI1510 | | IC808 | NH1000 F15M F25M | PC5300 | |
| | S20 | YBG202 YBG205 | KC525M KC643M | ACZ20W | | | PR905 PRI210 PRI1510 | | IC908 IC380 IC900 IC903 IC908 IC928 IC830 IC808 | F25M F30M | PC5300 PC3545 | IN2005 IN2505 |
| | S30 | | KC725M KC735M | ACZ50M | | | | WSM35 WSM36 WSP45 WSP46 WXM35 WXP45 | IC328 IC928 IC830 | F40M | PC3545 | IN1030 IN2030 IN2035 IN2530 IN4035 |
| N Non-ferrous metals | N05 | | KC510M | | | | | | | MH1000 F15M | | |
| | N10 | YBG202 | KC510M KC620M KC522M | EH20Z | | | | WXN15 | | MH1000 F15M | | |
| | N20 | | KC620M KC522M KC525M KC651M | | | | | | | F25M F30M F40M MP3000 | | |
| H Hardened materials | H05 | | | | VP05HT | | | | IC903 | MH1000 F15M | PC210F | IN2004 IN2006 |
| | H10 | YBG102 | KC643M | | VP10MF | | | WXH15 WHH15 | IC900 IC808 | MK2000 F30M MP3000 | PC210F | IN2004 IN2005 IN2006 |
| | H20 | YBG202 | GC1010 GC1025 GC1030 | | VP15TF | | | | IC810 IC908 | F30M F40M MK2000 MP3000 | | |

Conversion table grades – milling

Uncoated milling grades

| ISO | ZCC-CT | Sandvik | Kennametal | Sumitomo | Mitsubishi | Toshiba Tungaloy | Walter | Kyocera | Iscar | SECO | Korloy | Ingersoll Tague Tec |
|---------------------------|--------|--------------|----------------|----------|------------|---------------------|--------|---------|-------|------|--------|------------------------|
| N | N01 | H10 | K115M K110M | | | | WK10 | | IC20N | | H01 | IN04S |
| | N10 | | K313 | EH520 | HT10 | | WKM | GW25 | IC08 | H15 | G10 | IN10K IN05S |
| | N20 | H13A H10F | KMF | EH520 | TF15 | | KMG40 | | IC28 | H25 | | IN15K |
| Non-ferrous metals | | | | | | | | | | | | |

A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

Examples of materials for machining groups

| Material No. | Material | Machining group |
|--------------|----------|-----------------|
| 1.0722 | 10SPb20 | 1 |
| 1.0715 | 9SMn28 | 1 |
| 1.0736 | 9SMn36 | 1 |
| 1.0718 | 9SMnPb28 | 1 |
| 1.0737 | 9SMnPb36 | 1 |
| 1.0401 | C15 | 1 |
| 1.0402 | C22 | 1 |
| 1.1141 | Ck15 | 1 |
| 1.1170 | 28Mn6 | 2 |
| 1.0726 | 35S20 | 2 / 3 |
| 1.1167 | 36Mn5 | 2 / 3 |
| 1.1157 | 40Mn4 | 2 / 3 |
| 1.0501 | C35 | 2 / 3 |
| 1.0503 | C45 | 2 / 3 |
| 1.1191 | Ck45 | 2 / 3 |
| 1.1183 | Cf35 | 2 / 3 |
| 1.1213 | Cf53 | 2 / 3 |
| 1.1545 | C 105 W1 | 4 / 5 |
| 1.1663 | C 125 W | 4 / 5 |
| 1.0535 | C55 | 4 / 5 |
| 1.0601 | C60 | 4 / 5 |
| 1.1274 | Ck101 | 4 / 5 |
| 1.1203 | Ck55 | 4 / 5 |
| 1.1221 | Ck60 | 4 / 5 |
| 1.5710 | 36NiCr6 | 5 / 9 |
| 1.5120 | 38MnSi 4 | 5 / 9 |
| 1.1545 | C 105 W2 | 4 / 5 |
| 1.1663 | C 125 W | 4 / 5 |
| 1.0535 | C65 | 4 / 5 |
| 1.0601 | C70 | 4 / 5 |
| 1.1274 | Ck101 | 4 / 5 |
| 1.1203 | Ck55 | 4 / 5 |
| 1.1221 | Ck60 | 4 / 5 |
| 1.5710 | 36NiCr7 | 5 / 9 |
| 1.5120 | 38MnSi 5 | 5 / 9 |
| 1.1545 | C 105 W3 | 4 / 5 |
| 1.1663 | C 125 W | 4 / 5 |
| 1.0535 | C75 | 4 / 5 |
| 1.0601 | C80 | 4 / 5 |
| 1.1274 | Ck101 | 4 / 5 |
| 1.1203 | Ck55 | 4 / 5 |
| 1.1221 | Ck60 | 4 / 5 |
| 1.5710 | 36NiCr8 | 5 / 9 |
| 1.5120 | 38MnSi 6 | 5 / 9 |
| 1.1545 | C 105 W4 | 4 / 5 |
| 1.1663 | C 125 W | 4 / 5 |
| 1.0535 | C85 | 4 / 5 |
| 1.0601 | C90 | 4 / 5 |
| 1.1274 | Ck101 | 4 / 5 |

| Material No. | Material | Machining group |
|--------------|--------------------|-----------------|
| 1.1203 | Ck55 | 4 / 5 |
| 1.1221 | Ck60 | 4 / 5 |
| 1.5710 | 36NiCr9 | 5 / 9 |
| 1.5120 | 38MnSi 7 | 5 / 9 |
| 1.1545 | C 105 W5 | 4 / 5 |
| 1.1663 | C 125 W | 4 / 5 |
| 1.0535 | C95 | 4 / 5 |
| 1.0601 | C100 | 4 / 5 |
| 1.1274 | Ck101 | 4 / 5 |
| 1.1203 | Ck55 | 4 / 5 |
| 1.1221 | Ck60 | 4 / 5 |
| 1.5710 | 36NiCr10 | 5 / 9 |
| 1.5120 | 38MnSi 8 | 5 / 9 |
| 1.5680 | 12Ni19 | 10 / 11 |
| 1.3255 | S 18-1-2-5 | 10 / 11 |
| 1.3348 | S 2-9-2 | 10 / 11 |
| 1.3343 | S 6-5-2 | 10 / 11 |
| 1.3243 | S 6-5-2-5 | 10 / 11 |
| 1.2363 | X 100 CrMoV 5-1 | 10 / 11 |
| 1.2601 | X165CrMoV12 | 10 / 11 |
| 1.2080 | X210 Cr 12 | 10 / 11 |
| 1.2581 | X30WCrV 9-3 | 10 / 11 |
| 1.2344 | X40CrMoV 5-1 | 10 / 11 |
| 1.4718 | X45CrSi9-3 | 10 / 11 |
| 1.3355 | S 18-0-1 | 10 / 11 |
| 1.4027 | G-X20Cr14 | 12 / 13 |
| 1.4006 | X12 Cr 13 | 12 / 13 |
| 1.4104 | X12CrMoS 17 | 12 / 13 |
| 1.4057 | X19CrNi 17-2 | 12 / 13 |
| 1.4034 | X46Cr 13 | 12 / 13 |
| 1.4871 | X53 CrMnNiN 21-9 | 12 / 13 |
| 1.4113 | X6CrMo 17 | 12 / 13 |
| 1.4000 | X6CR 13 | 12 / 13 |
| 1.4001 | X7Cr14 | 12 / 13 |
| 1.4016 | X6Cr17 | 12 / 13 |
| 1.4581 | G-X5CrNiMoNb 18 | 14 |
| 1.4308 | G-X6CrNi 18-9 | 14 |
| 1.4408 | G-X6CrNiMo 18-10 | 14 |
| 1.4583 | X6CrNiMoNb 18-12 | 14 |
| 1.4571 | X6CrNiMoTi 17-12-2 | 14 |
| 1.4550 | X6CrNiNb 18-10 | 14 |
| 1.4541 | X14CrNiTi 18-10 | 14 |
| 1.4845 | X12CrNi 25-21 | 14 |
| 1.4310 | X10CrNi 18-8 | 14 |
| 1.4305 | X10CrNiS 18-10 | 14 |
| 1.4878 | X12CrNiTi 18-9 | 14 |
| 1.4317 | X2CrNi 18-8 | 14 |
| 1.4436 | X3CrNiMo 17-13-3 | 14 |
| 1.4440 | X2CrNiMo 18-16 | 14 |

| Material No. | Material | Machining group |
|--------------|-------------------|-----------------|
| 1.4429 | X2CrNiMoN 17-13-3 | 14 |
| 1.4311 | X2CrNiN 18 10 | 14 |
| 1.4301 | X5CrNi 18-10 | 14 |
| 1.4401 | X5CrNiMo 17-12-2 | 14 |
| 0.6010 | GG10 | 16 |
| 0.6015 | GG15 | 16 |
| 0.6020 | GG20 | 16 |
| 0.6025 | GG25 | 16 / 17 |
| 0.6030 | GG30 | 17 |
| 0.6035 | GG35 | 17 |
| 0.6040 | GG40 | 17 |
| 1.4829 | X12NiCrSi 22-12 | 17 |
| 1.4828 | X15CrNiSi20-12 | 17 |
| 0.7033 | GGG35.3 | 18 |
| 0.7040 | GGG40 | 18 |
| 0.7043 | GGG40.3 | 18 |
| 0.8135 | GTS-35 | 18 |
| 0.7050 | GGG50 | 19 |
| 0.7060 | GGG60 | 19 |
| 0.7070 | GGG70 | 19 |
| 0.7660 | GGGNiCr 20-2 | 19 |
| 0.7652 | GGGNiMn 13-7 | 19 |
| 0.8155 | GTS-55 | 21 |
| 0.8165 | GTS-65 | 21 |
| 0.8170 | GTS-70 | 21 |
| 0.8145 | GTS-45 | 21 |
| 3.0205 | Al99 | 22 |
| 3.3315 | AlMg 1 | 22 |
| 3.1325 | AlCuMg 1 | 23 |
| 3.2315 | AlMgSi 1 | 23 |
| 3.2581 | G-AlSi12 | 24 |
| 3.2163 | G-AlSi9Cu3 | 24 |
| 3.2381 | G-AlSi10Mg | 25 |
| 2.0375 | CuZn36Pb 3 | 27 |
| 2.1096 | G-CuSn5ZnPb | 27 |
| 2.0590 | G-CuZn40Fe | 27 |
| 2.0240 | CuZn15 | 28 |
| 2.0060 | E-Cu 57 | 29 |
| 1.4865 | G-X40NiCrSi 38-18 | 30 |
| 1.4864 | X12NiCrSi 36-16 | 30 |
| 2.4631 | NiCr20TiAl | 32 |
| 2.4856 | NiCr22Mo9Nb | 32 |
| 2.4375 | NiCu30Al | 33 |
| 2.4955 | NiFe25Cr20NbTi | 33 |
| 2.4764 | CoCr20W15Ni | 34 |
| 1.3401 | G-X120Mn12 | 34 |
| 3.7165 | TiAl6V4 | 36 |

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

Test protocol

ZCC Cutting Tools Europe GmbH

Date:

General

End User

Distributor

Company

Contact person

Machine

Type

Producer

Power [kW]

Tooling system

Work piece

Material

Hardness/Tensile strength [N/mm²]

Heat treatment/Surface

Interrupt cutting

Cutting tools

Producer (holder)

Toolholder (name)

Teeth Z

Producer/Supplier

Insert type/Tool number

Grade

Solid carbide tools number

Cooling

Cutting Data

RPM n [U/min]

Cutting speed Vc [m/min]

Feed rate f [mm/rpm]

Feed rate Vf [mm/min]

Depth of cut a_p [mm]

Width of cut a_e [mm]

Machining length [mm]

Cutting time T [min]

Results

Machined pieces/Edges

Surface quality

Flankwear VB

Criteria

Notch wear

Crater wear

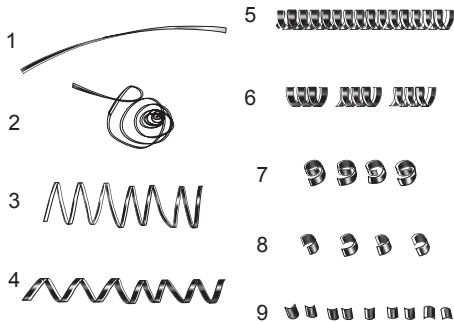
Plastic deformation

Built-up edge

Insert breakage

Cutting edge breakage

Chip forms



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

Conclusion:

Fax: +49-(0)211-989240-111
E-mail: technik@zccct-europe.com

Signature:

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

A

Torque for screw

| | | | | | | | | | | | | | | | |
|-------------|------|------|-----|------|------|-----|------|-----|------|-----|------|------|------|------|-----|
| Thread | M1,6 | M1,8 | M2 | M2,2 | M2,5 | M3 | M3,5 | M4 | M4,5 | M5 | M6 | M7 | M8 | M10 | M12 |
| Torque [Nm] | 0,2 | 0,3 | 0,4 | 0,7 | 0,8 | 1,5 | 2,3 | 3,4 | 5,0 | 6,7 | 11,4 | 19,2 | 27,0 | 55,8 | 85 |

Turning

B

Milling

C

Drilling

DTechnical
Information**E**

Index

Index

Inserts

E2-E5

Tools

E6-E8

E

A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

1

| | |
|-----------|-----|
| 175.32-22 | A99 |
| 175.32-24 | A99 |
| 175.32-25 | A99 |
| 175.32-28 | A99 |
| 175.32-31 | A99 |

A

| | |
|-------------|------|
| ANGX*PNR-GM | B117 |
| | B119 |
| | B121 |
| | B123 |
| | B125 |
| ANGX*PNR-LH | B117 |
| | B119 |
| | B121 |
| | B123 |
| | B125 |
| APKT-ALH | B95 |
| | B98 |
| | B101 |
| | B104 |
| | B106 |
| | B195 |
| APKT-APF | B95 |
| | B98 |
| | B101 |
| | B104 |
| | B106 |
| | B195 |
| APKT-APM | B95 |
| | B98 |
| | B101 |
| | B104 |
| | B106 |
| | B195 |
| APKT-KM | B169 |
| | B171 |
| | B173 |
| APKT-LH | B95 |
| | B98 |
| | B101 |
| | B104 |
| | B106 |
| | B195 |

| | |
|---------|------|
| APKT-PF | B95 |
| | B98 |
| | B101 |
| | B104 |
| | B106 |
| | B195 |
| APKT-PM | B95 |
| | B98 |
| | B101 |
| | B104 |
| | B106 |
| | B195 |
| APKT-PR | B95 |
| | B98 |
| | B101 |
| | B104 |
| | B106 |
| | B195 |
| APMT | B108 |

C

| | |
|----------------|------|
| CCGT (PCD) | A162 |
| CCGT-SF | A102 |
| CCGT-USF | A102 |
| CCGW (PCBN) | A152 |
| CCGX-LC | A108 |
| CCGX-LH | A108 |
| CCMT-AHF | A103 |
| CCMT-EF | A105 |
| CCMT-EM | A105 |
| CCMT-HF | A103 |
| CCMT-HM | A106 |
| CCMT-HR | A107 |
| CCMT-TC | A107 |
| CCMW | A107 |
| CNE-A/B | B165 |
| CNEG-NF | A44 |
| CNGA (PCBN) | A146 |
| CNGN (PCBN) | A157 |
| CNGX (Ceramic) | A178 |
| CNMA | A52 |
| CNMG | A52 |
| CNMG-ADF | A43 |
| CNMG-DF | A43 |
| CNMG-DM | A45 |
| CNMG-DR | A47 |
| CNMG-EF | A43 |
| CNMG-EG | A45 |
| CNMG-EM | A45 |
| CNMG-ER | A49 |

| | |
|----------|------|
| CNMG-NM | A47 |
| CNMG-PM | A44 |
| CNMG-SF | A43 |
| CNMG-SNR | A48 |
| CNMG-TC | A47 |
| CNMG-WG | A43 |
| CNMG-ZM | A46 |
| CNMM | A51 |
| CNMM-DR | A49 |
| CNMM-ER | A49 |
| CNMM-HDR | A51 |
| CNMM-HPR | A51 |
| CNMM-LR | A50 |
| CPGT | A104 |
| CPGT-SF | A109 |
| CPGW | A109 |
| CPMT-HF | A109 |
| CPMT-HM | A109 |

D

| | |
|----------------|------|
| DCGT (PCD) | A164 |
| DCGT-SF | A110 |
| DCGT-USF | A111 |
| DCGW (PCBN) | A153 |
| DCGX-LC | A114 |
| DCGX-LH | A115 |
| DCMT-AHF | A110 |
| DCMT-EF | A112 |
| DCMT-EM | A112 |
| DCMT-HF | A112 |
| DCMT-HM | A113 |
| DCMT-HR | A114 |
| DCMW | A114 |
| DNEG-NF | A56 |
| DNEG-NGF | A56 |
| DNGA (PCBN) | A147 |
| DNGN (PCBN) | A158 |
| DNGX (Ceramic) | A181 |
| DNMA | A59 |
| DNMG | A61 |
| DNMG-ADF | A53 |
| DNMG-DF | A53 |
| DNMG-DM | A54 |
| DNMG-DR | A58 |
| DNMG-EF | A56 |
| DNMG-EG | A57 |
| DNMG-EM | A57 |
| DNMG-ER | A59 |
| DNMG-FM | A56 |
| DNMG-NM | A57 |

DNMG-PM A54
 DNMG-SF A53
 DNMG-SNR A58
 DNMG-TC A57
 DNMG-ZM A55
 DNMM-DR A60
 DNMM-ER A60
 DNMM-HDR A60
 DNMM-LR A60
 DPGT-SF A116
 DPGT-USF A116
 DPMW A116

H

HNEX-DF B63
 HNEX-DM B63
 HNEX-DR B63
 HNGX-HDR B203
 HNGX-MR B203

K

KNUX A98

L

LNCX B206
 LNE32.302 B204
 LNE32.534 B205
 LNKT-GM B111
 LNKT-ZR B113
 B65
 B73
 B80

M

MPHT-DM B148
 B150
 B167

O

OFKR-DF B39
 OFKR-DM B39
 OFKR-LH B39
 OFKT-DF B37
 OFKT-DM B37

OFKT-LH B37
 ONHU-GM B53
 ONHU-PF B43
 B45
 ONHU-PM B43
 B45
 ONHU-W B43
 B46

P

PNEG-CF B57
 B60
 PNEG-CM B57
 B60
 PNEG-CR B57
 B60
 PNEG-PF B58
 B60
 PNEG-PM B58
 B60
 PNEG-PR B58
 B60

Q

QC**R/L A367
 QC**R/L***R A370

R

R/LT****N-A(G) A413
 R/LT****N-A(G)B A430
 R/LT****N-AC A424
 R/LT****N-AP A426
 R/LT****N-BPTB A435
 R/LT****N-BSPT A417
 R/LT****N-BSPTB A434
 R/LT****N-BUT A428
 R/LT****N-GM A411
 R/LT****N-GMB A429
 R/LT****N-NPT A418
 R/LT****N-NPTF A419
 R/LT****N-R A420
 R/LT****N-RT A427
 R/LT****N-STAC A425
 R/LT****N-TR A423
 R/LT****N-UN A416
 R/LT****N-UNB A433
 R/LT****N-W A415

R/LT****N-WB A432
 R/LT****W-A(G) A413
 R/LT****W-A(G)B A430
 R/LT****W-AC A424
 R/LT****W-AP A426
 R/LT****W-BPTB A435
 R/LT****W-BSPT A417
 R/LT****W-BSPTB A434
 R/LT****W-BUT A428
 R/LT****W-GM A411
 R/LT****W-GMB A429
 R/LT****W-MJ A421
 R/LT****W-NPT A418
 R/LT****W-NPTF A419
 R/LT****W-R A420
 R/LT****W-RT A427
 R/LT****W-STAC A425
 R/LT****W-TR A423
 R/LT****W-UN A416
 R/LT****W-UNB A433
 R/LT****W-UNJ A422
 R/LT****W-W A415
 R/LT****W-WB A432
 RCGT A117
 RCGX-LH A117
 B82

RCKT-DM B84
 B82
 B85
 RCKT-DR B82
 B85
 B82
 B85
 RCKT-NM B82
 B85
 RCMT A117
 RCMW (PCBN) B85
 RCMX A118
 RDKW B89
 B93
 B198
 B200
 RNGN (PCBN) A161
 RNMG A97
 ROHX B130

S

SCGX-LC A121
 SCGX-LH A122
 SCMT A121
 SCMT-AHF A119

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index



A

Turning

| | |
|---------|------|
| SCMT-EF | A119 |
| SCMT-EM | A119 |
| SCMT-HF | A120 |
| SCMT-HM | A120 |
| SCMT-HR | A121 |
| SDMT | B128 |
| SDMT-DM | B157 |

B

Milling

| | |
|---------|------|
| SDMT-PM | B157 |
| | B159 |
| | B191 |
| SEEN | B34 |
| SEET-CF | B28 |
| | B31 |
| SEET-CM | B28 |
| | B31 |
| SEET-CR | B28 |
| | B31 |
| SEET-DF | B28 |
| | B31 |

C

Drilling

| | |
|---------|-----|
| SEET-DM | B28 |
| | B31 |
| SEET-DR | B28 |
| | B31 |
| SEET-EF | B28 |
| | B31 |
| SEET-EM | B28 |
| | B31 |
| SEET-LH | B28 |
| | B31 |
| SEET-PF | B78 |

D

Technical Information

| | |
|---------|-----|
| SEET-PM | B78 |
| SEET-PR | B78 |
| SEET-W | B29 |
| | B32 |
| SEKN | B35 |
| SEKR | B35 |
| SNEG-E | B49 |
| SNEG-GM | B49 |
| SNEG-GR | B49 |
| SNEG-W | B50 |

E

Index

| | |
|----------------|------|
| SNGA (PCBN) | A148 |
| SNGN (PCBN) | A159 |
| SNGX (Ceramic) | A183 |
| SNKN | B207 |
| SNMA | A74 |
| SNMG | A73 |
| SNMG-ADF | A62 |
| SNMG-DF | A62 |
| SNMG-DM | A65 |
| SNMG-DR | A67 |

| | |
|----------|------|
| SNMG-EF | A63 |
| SNMG-EG | A65 |
| SNMG-EM | A66 |
| SNMG-ER | A68 |
| SNMG-NM | A67 |
| SNMG-PM | A64 |
| SNMG-SF | A62 |
| SNMG-TC | A66 |
| SNMM | A73 |
| SNMM-DR | A69 |
| SNMM-HDR | A71 |
| SNMM-HPR | A72 |
| SNMM-LR | A70 |
| SNUN | A76 |
| SPAN | B208 |
| SPCN | B208 |
| SPEX-1 | B71 |
| SPGN | B211 |
| SPGT-EM | C19 |
| SPGT-PM | C19 |
| SPKN | B58 |

| | |
|---------|------|
| | B70 |
| SPKR | B71 |
| SPKR-GM | B71 |
| SPKT | B67 |
| SPKW | B67 |
| SPMR | B209 |
| SPMT | B128 |
| | B175 |
| | B177 |
| | B179 |
| | B181 |
| | B183 |
| | B185 |

| | |
|---------|------|
| SPMT-HT | B210 |
| SPMT-KM | B169 |
| | B171 |
| | B173 |
| SPMT-KT | B210 |
| SPMT-PM | B169 |
| | B171 |
| | B173 |
| SPMW | A123 |
| SPUN | B211 |

T

| | |
|------------|------|
| TBGH | A124 |
| TCGT (PCD) | A166 |
| TCGT-SF | A125 |
| TCGT-USF | A125 |

| | |
|----------------|------|
| TCGW (PCBN) | A154 |
| TCGX-LC | A130 |
| TCGX-LH | A130 |
| TCMT | A129 |
| TCMT-AHF | A126 |
| TCMT-EF | A127 |
| TCMT-EM | A127 |
| TCMT-HF | A126 |
| TCMT-HM | A128 |
| TCMT-HR | A128 |
| TCMW | A128 |
| TNGA (PCBN) | A149 |
| TNGN (Ceramic) | A186 |
| TNMA | A87 |
| TNMG | A86 |
| TNMG-ADF | A77 |
| TNMG-DF | A77 |
| TNMG-DM | A80 |
| TNMG-DR | A83 |
| TNMG-EF | A79 |
| TNMG-EG | A82 |
| TNMG-EM | A82 |
| TNMG-ER | A84 |
| TNMG-FM | A79 |
| TNMG-PM | A80 |
| TNMG-SF | A78 |
| TNMG-TC | A82 |
| TNMG-ZM | A81 |
| TNMM | A87 |
| TNMM-DR | A84 |
| TNMM-HDR | A85 |
| TNMM-LR | A84 |
| TNMX | A100 |
| TNMX-WG | A77 |
| TPAN | B212 |
| TPCN | B212 |
| TPGH | A131 |
| TPGT-SF | A131 |
| TPKN | B75 |
| | B213 |
| TPMR | B214 |
| TPUN | B214 |

V

| | |
|-------------|------|
| VBET-NF | A138 |
| VBET-NGF | A140 |
| VBGT (PCD) | A168 |
| VBGT-HR | A140 |
| VBGT-SF | A139 |
| VBGW (PCBN) | A155 |

| | |
|--------------|------|
| VBMT-AHF | A138 |
| VBMT-EF | A138 |
| VBMT-EM | A140 |
| VBMT-HF | A138 |
| VBMT-HM | A140 |
| VBMT-HR | A141 |
| VBMT-SNR | A141 |
| VBMW | A141 |
| VC GT | A133 |
| VC GT-HF | A132 |
| VC GT-NF | A132 |
| VC GT-SF | A132 |
| VC GT-USF | A133 |
| VC GW (PCBN) | A156 |
| VC GX-LC | A134 |
| VC GX-LH | A135 |
| VC MT-EF | A136 |
| VC MT-EM | A136 |
| VNEG-NF | A88 |
| VNEG-NGF | A89 |
| VNGA (PCBN) | A150 |
| VNMG | A90 |
| VNMG-ADF | A88 |
| VNMG-DF | A88 |
| VNMG-DM | A90 |
| VNMG-EF | A88 |
| VNMG-EM | A90 |
| VNMG-NM | A90 |
| VNMG-SF | A89 |
| VNMG-TC | A91 |
| VNMG-ZM | A91 |
| VP GT-USF | A137 |

W

| | |
|-------------|------|
| WCMX-53 | A142 |
| | C20 |
| WCMX-D | C20 |
| WCMX-PG | C20 |
| WNEG-NF | A93 |
| WNGA (PCBN) | A151 |
| WNGN (PCBN) | A160 |
| WNMA | A96 |
| WNMG-ADF | A92 |
| WNMG-DF | A92 |
| WNMG-DM | A94 |
| WNMG-DR | A96 |
| WNMG-EF | A93 |
| WNMG-EG | A94 |
| WNMG-EM | A94 |
| WNMG-NF | A93 |

| | |
|---------|------|
| WNMG-NM | A96 |
| WNMG-PM | A95 |
| WNMG-SF | A92 |
| WNMG-TC | A96 |
| WNMG-WG | A93 |
| WNMG-ZM | A95 |
| WPGT | B161 |
| | B163 |
| | B193 |
| WPGT-PM | B161 |
| | B163 |
| | B193 |

X

| | |
|---------|------|
| XPHT-GM | B132 |
| | B134 |
| | B136 |
| | B138 |
| | B189 |
| XSEQ | B144 |
| | B146 |

Y

| | |
|------|------|
| YNMX | A101 |
| YNUX | A101 |

Z

| | |
|-------------|------|
| ZDET | B127 |
| ZDET-PM | B127 |
| ZIGQ-NM | A363 |
| ZILD-LC | A365 |
| ZIMF-NM | A362 |
| ZOHX-GF | B140 |
| | B142 |
| | B202 |
| ZOHX-GM | B140 |
| | B142 |
| | B202 |
| ZP*D-MG-R/L | A354 |
| ZP*S-MG | A353 |
| ZPD-MG | A352 |
| ZPNT | B127 |
| ZR*D-EG | A361 |
| ZR*D-LH | A364 |
| ZR*D-MG | A360 |
| ZT*D-EG | A357 |
| ZT*D-MG | A355 |

| | |
|---------|------|
| ZT*D-MM | A351 |
| ZT*S-MG | A356 |

A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

1

| | |
|-----------|------|
| 1101SC05 | C110 |
| 1105SC03 | C107 |
| 1143SC120 | C120 |
| 1143SC90 | C119 |
| 1165PA03 | C112 |
| 1534SH03 | C106 |
| 1534SP03C | C87 |
| 1534ST03C | C92 |
| 1534SU03 | C30 |
| 1534SU03C | C30 |
| 1536ST05C | C96 |
| 1536SU05 | C41 |
| 1536SU05C | C41 |
| 1538SU08C | C51 |
| 1557SU03 | C70 |
| 1576PC05 | C116 |
| 1576PC05C | C116 |
| 1579PC15C | C118 |
| 1588SL10C | C72 |
| 1588SL12C | C75 |
| 1588SL15C | C79 |
| 1588SL20C | C82 |
| 1588SL30C | C85 |
| 1634SU03C | C54 |
| 1636ST05C | C100 |
| 1636SU05C | C58 |
| 1734SU03C | C62 |
| 1736SU05C | C66 |

3

| | |
|--------|------|
| 3101H7 | C131 |
| 3102H7 | C132 |
| 3103H7 | C134 |
| 3112H7 | C133 |

4

| | |
|-------|------|
| 4111 | C159 |
| 4122A | C145 |
| 4122M | C148 |
| 4201A | C155 |
| 4201C | C151 |
| 4202A | C157 |
| 4202C | C153 |
| 4222A | C146 |
| 4222M | C149 |

5

| | |
|----------------|------|
| 5501/5601 | B418 |
| 5501R302GM | B262 |
| 5501R303GM | B278 |
| 5501R304GF | B292 |
| 5501R38414GM | B394 |
| 5502R302GM | B264 |
| 5502R303GM | B280 |
| 5502R304GF | B294 |
| 5502R38414GM | B395 |
| 5502R38414GM-R | B398 |
| 5502R402NM | B368 |
| 5502R453GM | B282 |
| 5502R55MHH | B352 |
| 5508R454GM | B296 |
| 5565R302GF | B301 |
| 5565R302NH | B385 |
| 5566R302GF | B303 |
| 5566R302NH | B386 |
| 5589R45MGFR02 | B298 |
| 5601 | B420 |
| 5601R302GM | B263 |
| 5601R303GM | B279 |
| 5601R304GF | B293 |
| 5601R38414GM | B396 |
| 5602R302GM | B266 |
| 5602R303GM | B281 |
| 5602R303GR | B315 |
| 5602R304GF | B295 |
| 5602R304GR | B316 |
| 5602R305GR | B317 |
| 5602R38414GM | B397 |
| 5602R38414GM-R | B399 |
| 5602R453GM | B283 |
| 5602R454GM | B297 |
| 5665R202GM | B302 |

A

| | |
|--------------|------|
| A***-PCLNR/L | A284 |
| A***-PDSNR/L | A286 |
| A***-PDUNR/L | A287 |
| A***-PSKNR/L | A289 |
| A***-PTFNR/L | A290 |
| A***-SCLCR/L | A293 |
| A***-SDQCR/L | A295 |
| A***-SDUCR/L | A296 |
| A***-SDZCR/L | A297 |
| A***-SSKCR/L | A298 |
| A***-STFCR/L | A300 |

| | |
|--------------|------|
| A***-SVQBR/L | A304 |
| A***-SVUBR/L | A305 |
| AL-2B | B387 |
| AL-2E | B376 |
| AL-2EL | B377 |
| AL-2R-AIR | B388 |
| AL-2RL-AIR | B389 |
| AL-3E | B379 |
| AL-3EL | B380 |
| AL-3R-AIR | B391 |
| AL-3RL-AIR | B392 |
| AL-3W | B384 |
| ALG-2E | B378 |
| ALG-2R | B390 |
| ALG-3E | B381 |
| ALP-3E | B382 |
| ALP-4E | B383 |

B

| | |
|-------|------|
| BMR01 | B126 |
| BMR02 | B129 |
| BMR03 | B131 |
| BMR04 | B139 |

C

| | |
|--------------|------|
| C***-SCLPR/L | A312 |
| C***-SDQPR/L | A314 |
| C***-SDUPR/L | A316 |
| C***-STUPR/L | A318 |
| C***-SVQCR/L | A321 |
| C***-SVUCR/L | A322 |
| C40X-Q*DR/L | A394 |
| CCLNR/L | A258 |
| CDJNR/L | A260 |
| CKJNR/L | A256 |
| CKNNR/L | A257 |
| CMA01 | B178 |
| CMD01 | B182 |
| CMZ01 | B174 |
| CRDNN | A264 |
| CSDNN | A265 |
| CSKNR/L | A262 |
| CSRNR/L | A263 |
| CTJNR/L | A259 |
| CTUNR/L | A261 |

D

| | |
|---------|------|
| DCLNR/L | A197 |
| DDJNR/L | A198 |
| DSBNR/L | A199 |
| DTGNR/L | A200 |
| DVJNR/L | A202 |
| DVVNN | A201 |
| DWLNR/L | A203 |

E

| | |
|--------------|------|
| E***-SCLCR/L | A313 |
| E***-SCLPR/L | A312 |
| E***-SDQCR/L | A315 |
| E***-SDUCR/L | A317 |
| E***-STFCR/L | A319 |
| E***-STFPR/L | A320 |
| E***-SVUCR/L | A322 |
| EMP01 | B94 |
| EMP02 | B100 |
| EMP03 | B103 |
| EMP04 | B105 |
| EMP05 | B107 |
| EMP09 | B110 |
| EMP13 | B116 |

F

| | |
|-------|-----|
| FMA01 | B27 |
| FMA02 | B30 |
| FMA03 | B33 |
| FMA04 | B36 |
| FMA07 | B44 |
| FMA11 | B48 |
| FMA12 | B52 |
| FMD02 | B56 |
| FMD03 | B64 |
| FME02 | B66 |
| FME03 | B68 |
| FME04 | B72 |
| FMP01 | B74 |
| FMP02 | B76 |
| FMP03 | B79 |
| FMR01 | B81 |
| FMR02 | B83 |
| FMR03 | B86 |
| FMR04 | B90 |

G

| | |
|----------|------|
| GM-2B | B304 |
| GM-2BFP | B306 |
| GM-2BL | B305 |
| GM-2BP | B308 |
| GM-2BS | B307 |
| GM-2E | B267 |
| GM-2EFP | B270 |
| GM-2EL | B268 |
| GM-2EP | B273 |
| GM-2ES | B275 |
| GM-2EX | B269 |
| GM-2F | B271 |
| GM-2FL | B272 |
| GM-2R | B312 |
| GM-3E | B276 |
| GM-3EL | B277 |
| GM-4B | B310 |
| GM-4BL | B311 |
| GM-4E | B288 |
| GM-4E-G | B289 |
| GM-4EFP | B291 |
| GM-4EL | B290 |
| GM-4EL-G | B285 |
| GM-4EX-G | B287 |
| GM-4F-G | B284 |
| GM-4FL-G | B286 |
| GM-4R | B313 |
| GM-4RL | B314 |
| GM-4W | B318 |
| GM-6E | B299 |
| GM-6EL | B300 |
| GQC**R/L | A397 |

H

| | |
|---------|------|
| HM-2B | B355 |
| HM-2BFP | B357 |
| HM-2BL | B356 |
| HM-2BP | B359 |
| HM-2BS | B358 |
| HM-2E | B344 |
| HM-2EFP | B345 |
| HM-2EP | B346 |
| HM-2ES | B348 |
| HM-4B | B361 |
| HM-4BL | B362 |
| HM-4E | B349 |
| HM-4EFP | B351 |
| HM-4EL | B350 |

| | |
|----------|------|
| HM-4R | B363 |
| HM-4RF | B364 |
| HM-4RP | B365 |
| HM-6E | B353 |
| HM-6EL | B354 |
| HMP01 | B168 |
| HMP01-EC | B172 |

J

| | |
|---------|------|
| JCLNR/L | A266 |
| JDJNR/L | A267 |
| JSDNN | A268 |

M

| | |
|---------|------|
| MCBNR/L | A218 |
| MCLNR/L | A219 |
| MDJNR/L | A220 |
| MDPNN | A221 |
| MRDNN | A233 |
| MRGNR/L | A234 |
| MSBNR/L | A222 |
| MSDNN | A225 |
| MSKNR/L | A224 |
| MSRNR/L | A223 |
| MTFNR/L | A229 |
| MTGNR/L | A226 |
| MTJNR/L | A227 |
| MVJNR/L | A231 |
| MVVNN | A230 |
| MWLNR/L | A232 |

N

| | |
|--------|------|
| NM-2B | B372 |
| NM-2BP | B373 |
| NM-2E | B369 |
| NM-2EP | B370 |
| NM-4E | B371 |

P

| | |
|---------|------|
| PCBNR/L | A204 |
| PCLNR/L | A205 |
| PDJNR/L | A206 |
| PDNNR/L | A207 |
| PM-2B | B329 |
| PM-2BC | B332 |
| PM-2BFP | B331 |

A

Turning

B

Milling

C

Drilling

DTechnical
Information**E**

Index

A

Turning

| | |
|----------|------|
| PM-2BL | B330 |
| PM-2E | B320 |
| PM-2EL | B321 |
| PM-2R | B337 |
| PM-4B | B335 |
| PM-4BL | B336 |
| PM-4E | B325 |
| PM-4E-G | B322 |
| PM-4EL | B326 |
| PM-4EL-G | B323 |
| PM-4EX-G | B324 |
| PM-4H | B338 |
| PM-4HL | B339 |
| PM-4R | B340 |
| PM-4RL | B341 |
| PM-6E | B327 |
| PM-6EL | B328 |
| PSBNR/L | A208 |
| PSDNN | A210 |
| PSKNR/L | A211 |
| PSSNR/L | A212 |
| PTFNR/L | A213 |
| PTGNR/L | A215 |
| PTTNR/L | A214 |
| PWLNR/L | A217 |

B

Milling

C

Drilling

Q

| | |
|-----------|------|
| Q*DR/L | A395 |
| QCH-APKT | B194 |
| QCH-RD | B197 |
| QCH-RDKW | B199 |
| QCH-SDMT | B190 |
| QCH-WPGT | B192 |
| QCH-XPHT | B188 |
| QCH-ZOHX | B201 |
| QE**R/L | A376 |
| QE*S**N | A382 |
| QE*SN30 | A378 |
| QE*SR/L | A381 |
| QEBDR/L | A376 |
| QECDR/L | A379 |
| QF**R/L | A384 |
| QF**RR/LL | A386 |
| QF*DRR/LL | A390 |
| QX**R/L | A380 |
| QZS* | A383 |

D

Technical Information

E

Index

S

| | |
|--------------|------|
| S***-PCLNR/L | A284 |
| S***-PDSNR/L | A286 |
| S***-PDUNR/L | A287 |
| S***-PSKNR/L | A289 |
| S***-PTFNR/L | A290 |
| S***-PWLNR/L | A291 |
| S***-SCFCR/L | A310 |
| S***-SCLCR | A311 |
| S***-SCLCR/L | A293 |
| S***-SCLPR/L | A306 |
| S***-SDQCR/L | A295 |
| S***-SDQPR/L | A307 |
| S***-SDUCR/L | A296 |
| S***-SDUPR/L | A308 |
| S***-SDZCR/L | A297 |
| S***-SSKCR/L | A298 |
| S***-STFCR/L | A300 |
| S***-STUPR/L | A309 |
| S***-SVQBR/L | A304 |
| S***-SVQCR/L | A302 |
| S***-SVUBR/L | A305 |
| S***-SVUCR/L | A303 |
| S*K-QC**R/L | A398 |
| SCACR/L | A235 |
| SCACR/L-SC | A272 |
| SCLCR/L | A236 |
| SCLCR/L-SC | A273 |
| SDACR/L | A237 |
| SDACR/L-SC | A274 |
| SDHCR/L-SC | A275 |
| SDJCR/L | A238 |
| SDJCR/L-SC | A276 |
| SDNCN | A239 |
| SDNCN-SC | A277 |
| SMP01 | B143 |
| SMP03 | B147 |
| SMP05 | B151 |
| SNL | A440 |
| SNR | A439 |
| SRDCN | A254 |
| SRGCR/L | A255 |
| SSBCR/L | A245 |
| SSDCN | A246 |
| SSKCR/L | A247 |
| SSSCR/L | A248 |
| STACR/L | A249 |
| STFCR/L | A250 |
| STGCR/L | A251 |
| STTCR/L | A252 |

| | |
|------------|------|
| SVABR/L | A241 |
| SVACR/L-SC | A278 |
| SVJBR/L | A240 |
| SVJCR/L | A244 |
| SVJCR/L-SC | A279 |
| SVVBN | A242 |
| SVVCN | A243 |
| SWACR/L | A253 |
| SWL | A438 |
| SWR | A437 |

T

| | |
|-------|------|
| TMP01 | B166 |
|-------|------|

U

| | |
|-----------|------|
| UM-4E | B402 |
| UM-4E-W | B403 |
| UM-4EFP | B407 |
| UM-4EL | B404 |
| UM-4EL-W | B405 |
| UM-4ELP-W | B406 |
| UM-4R | B408 |
| UM-4RFP | B410 |
| UM-4RL | B409 |

V

| | |
|----------|------|
| VSM-4E | B412 |
| VSM-4E-C | B413 |
| VSM-4R | B414 |

X

| | |
|-------|------|
| XMP01 | B164 |
| XMR01 | B158 |

Z

| | |
|-------|-----|
| ZD03 | C16 |
| ZTD02 | C8 |
| ZTD03 | C10 |
| ZTD04 | C12 |
| ZTD05 | C14 |







The Company

Zhuzhou Cemented Carbide Cutting Tools Co., Ltd. (ZCC-CT) is located in Zhuzhou, Hunan province, China and is the largest supplier of carbide tools into the Chinese market. The ZCC-CT cutting tool company is part of the "Zhuzhou cemented carbide Group" who manufacture carbide materials and powders. Both of these companies are part of the "Minmetals Corporation" who mine and produce raw tungsten carbide materials.

Since its foundation in 1953 ZCC-CT has developed rapidly by progressively using highly advanced modern production technology as well as having a highly qualified and committed workforce. With over 2,000 employees the company is now the largest producer of carbide cutting tools in China and one of the leading carbide manufacturers worldwide.

Using this advanced production technology, ZCC-CT products are manufactured to the highest quality standards to maintain a constant quality and high performance. The wide range of products contains indexable carbide inserts (coated and uncoated), inserts of Cermets, CBN, PCD and ceramics, solid carbide cutting tools as well as tool holders and milling bodies. The products are produced to various international standards such as ISO DIN, ANSI, JIS and BSI. Furthermore customised and special carbide product are also offered.

Research and development plays a major and significant role at ZCC-CT. The production facilities use the most sophisticated and advanced equipment available and this is supplied by the leading machine and equipment manufacturers in Germany and Switzerland. A highly qualified and skilled team of engineers in the R&D departments are constantly developing new and improved cutting tools. There is a constant desire to continually enhance the quality, to fulfill the ever increasing market requirements for new and initiative products and to achieve the best possible result for the customers.

The production and administration facilities in China are certified to ISO 9001:2000 and they maintain strict environmental management to ISO 14001:2004 standards.

Since 2003 ZCC Cutting Tools has operated a sales organisation in Europe. This sales and warehousing subsidiary of ZCC-CT is based in Düsseldorf (Germany) and has been progressively build up and expanded by Mr. Quanliang Zhao the European Managing Director.

Sales to all European countries, as well as Russia and Turkey, are controlled and managed from this European central warehouse in Düsseldorf, with the majority of the products being dispatched on the same day of ordering. The business operates under the quality management system for "Distribution and Logistics of Metal Cutting Tools" and is certified with DIN EN ISO 9001:2008.

ZCC Cutting Tools Europe has a constantly growing number of employees covering sales, marketing, warehouse and distribution, technical support, IT, HR and accounting. Our external sales team and our partners from around Europe are there to support you on-site in your production facilities or distribution operations. Our internal, highly qualified, technical application engineering staff are always available to give the customer technical advice and support via telephone, by email or in person. The internal sales team takes care of your enquiries and orders and together with dedicated warehouse staff they ensure that products are dispatched to you as quickly as possible.

The complete team at ZCC Cutting Tools Europe are there to support you and be your competent and efficient partner in the global Cutting Tool Industry.



Sales center in Europe

ZCC Cutting Tools Europe GmbH

www.zccct-europe.com

Wanheimer Straße 57 40472 Düsseldorf, Germany

Tel.: +49(0)211-989240-0

Fax: +49(0)211-989240-111

E-mail: info@zccct-europe.com

Sales center in France

ZCC Cutting Tools France S.A.S.

www.zccct-europe.com

14, Allée Charles Pathé, 18000 Bourges, France

Tel.: +33 (0)2-454101-40

Fax: +33 (0)2-486619-46

E-mail: ventes@zccct-europe.com



© Copyright by ZCC Cutting Tools Europe GmbH
All rights reserved.