


*i-Dream Drills*

YA1A / YA2C

YB1A / YB2C

## i-DREAM DRILL INSERTS & HOLDERS

### i-DREAM DRILL EINSÄTZE UND HALTER

#### - Features of *i-Dream Drill Inserts*- Merkmale des i-Dream Drill Einsätze

- Secure and accurate seating resulting in accurate repeatability and concentricity.  
Der sichere und genaue Sitz der Platte garantiert genaue Wiederholbarkeit beim Einsatz und beim Rundlauf.

#### *i-Dream Drill General / i-Dream Drill allgemeinen*

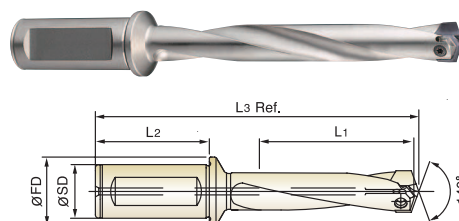
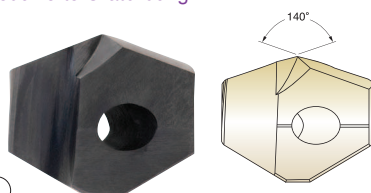
- For most steels materials / In den meisten Stahlsorten

#### *i-Dream Drill INOX / i-Dream Drill INOX*

- For tough, ductile materials and stainless steels  
Für zähe, verformbare Werkstoffe und rostfreie Stähle.
- Light, sharp cutting edge / Scharfe Schneidkante
- Soft cutting action / Weicher Schnitt
- Minimize cutting forces / Minimaler Schneidendruck
- Reduce built-up edge / Reduzierte Gratbildung

#### - Features of *i-Dream Drill Holders*- Merkmale des i-Dream Drill Halter-

- Special Alloy Steels maintain its hardness and toughness under high temperatures.  
Speziell legierter Stahl, der seine Härte und Zähigkeit auch bei hohen Temperaturen behält.
- Innovative surface treatment improves wear resistance and reduces corrosion.  
Innovative Oberflächenbehandlung, die die Verschleißfestigkeit erhöht und die Korrosion vermindert.
- High Performance flute design allows maximum chip evacuation and minimum interference.  
Optimierte Nutenform für maximale Spanabfuhr.



| Series Range<br>(mm)  | Insert EDP No.  |             | Insert O.D. |       |            | Holder EDP No. | Shank Dia. | Shank Length | Flange Dia. | Drilling Depth |         | Overall Length | Screw No. |       |
|-----------------------|-----------------|-------------|-------------|-------|------------|----------------|------------|--------------|-------------|----------------|---------|----------------|-----------|-------|
|                       | General (TiAlN) | INOX (TiCN) | h7          |       |            |                | SD         | L2           | FD          | L1             | L3 Ref. |                |           |       |
|                       |                 |             | dec.        | frac. | mm         |                |            |              |             |                |         |                |           |       |
| A<br>Ø12.00 to Ø13.99 | YA1A1200        | YA2C1200    | 0.4724      |       | 12.00      | ZH12003020     | 20         | 50           | 25          | 3D             | 36      | 112.4          | TX1213T08 |       |
|                       | YA1A1210        | YA2C1210    | 0.4764      |       | 12.10      | ZH12005020     |            |              |             | 5D             | 60      | 136.4          |           |       |
|                       | YA1A1220        | YA2C1220    | 0.4803      |       | 12.20      | ZH12007020     |            |              |             | 7D             | 84      | 160.4          |           |       |
|                       | YA1A1230        | YA2C1230    | 0.4844      | 31/64 | 12.30      |                |            |              |             |                |         |                |           |       |
|                       | YA1A1250        | YA2C1250    | 0.4921      |       | 12.50      | ZH12503020     | 20         | 50           | 25          | 3D             | 37.5    | 113.4          | TX1213T08 |       |
|                       | YA1A1260        | YA2C1260    | 0.4961      |       | 12.60      |                |            |              |             | ZH12505020     | 5D      | 62.5           |           | 138.4 |
|                       | YA1A1270        | YA2C1270    | 0.5000      | 1/2   | 12.70      |                |            |              |             | ZH12507020     | 7D      | 87.5           |           | 163.4 |
|                       | YA1A1280        | YA2C1280    | 0.5039      |       | 12.80      |                |            |              |             |                |         |                |           |       |
|                       | YA1A1290        | YA2C1290    | 0.5079      |       | 12.90      | ZH13003020     | 20         | 50           | 25          | 3D             | 39      | 115.4          | TX1314T08 |       |
|                       | YA1A1300        | YA2C1300    | 0.5118      |       | 13.00      |                |            |              |             | ZH13005020     | 5D      | 65             |           | 141.4 |
|                       | YA1A1310        | YA2C1310    | 0.5156      | 33/64 | 13.10      |                |            |              |             | ZH13007020     | 7D      | 91             |           | 167.4 |
|                       | YA1A1320        | YA2C1320    | 0.5197      |       | 13.20      |                |            |              |             |                |         |                |           |       |
|                       | YA1A1349        | YA2C1349    | 0.5312      | 17/32 | 13.49      | ZH13503020     | 20         | 50           | 25          | 3D             | 40.5    | 116.4          | TX1314T08 |       |
|                       | YA1A1350        | YA2C1350    | 0.5315      |       | 13.50      |                |            |              |             | ZH13505020     | 5D      | 67.5           |           | 143.4 |
|                       | YA1A1360        | YA2C1360    | 0.5354      |       | 13.60      |                |            |              |             | ZH13507020     | 7D      | 94.5           |           | 170.4 |
|                       | YA1A1370        | YA2C1370    | 0.5394      |       | 13.70      |                |            |              |             |                |         |                |           |       |
| YA1A1380              | YA2C1380        | 0.5433      |             | 13.80 | ZH13507020 | 20             | 50         | 25           | 3D          | 42             | 118.9   | TX1415T08      |           |       |
| YA1A1389              | YA2C1389        | 0.5469      | 35/64       | 13.89 |            |                |            |              |             |                |         |                |           |       |
| B<br>Ø14.00 to Ø15.99 | YB1A1400        | YB2C1400    | 0.5512      |       | 14.00      | ZH14003020     | 20         | 50           | 25          | 3D             | 42      | 118.9          | TX1415T08 |       |
|                       | YB1A1410        | YB2C1410    | 0.5551      |       | 14.10      | ZH14005020     |            |              |             | 5D             | 70      | 146.9          |           |       |
|                       | YB1A1420        | YB2C1420    | 0.5591      |       | 14.20      | ZH14007020     |            |              |             | 7D             | 98      | 174.9          |           |       |
|                       | YB1A1429        | YB2C1429    | 0.5625      | 9/16  | 14.29      |                |            |              |             |                |         |                |           |       |
|                       | YB1A1430        | YB2C1430    | 0.5630      |       | 14.30      |                |            |              |             |                |         |                |           |       |
|                       | YB1A1440        | YB2C1440    | 0.5669      |       | 14.40      |                |            |              |             |                |         |                |           |       |

► TiN, TiCN, TiAlN & Hardslick are available on your request.

► 10×D Holder is available on your request.

◎ : Excellent ○ : Good

|        | Non-alloy Steels, Free Machining Steels | Carbon Steels   |                 | Alloy Steels    |                 | High Alloyed steels |                 | Structural Steels |                 | Tool Steels     |                 | Stainless Steels | Cast Iron       |                 | Aluminum       | Copper Alloys |
|--------|-----------------------------------------|-----------------|-----------------|-----------------|-----------------|---------------------|-----------------|-------------------|-----------------|-----------------|-----------------|------------------|-----------------|-----------------|----------------|---------------|
|        | ~HRC24 (~HB250)                         | ~HRC28 (~HB275) | HRC28~ (HB275~) | ~HRC28 (~HB275) | HRC28~ (HB275~) | ~HRC37 (~HB350)     | HRC37~ (HB350~) | ~HRC24 (~HB250)   | HRC24~ (HB250~) | ~HRC13 (~HB200) | HRC13~ (HB200~) | ~HRC28 (~HB275)  | ~HRC19 (~HB220) | HRC19~ (HB220~) | ~HRC8 (~HB180) | ~HB110        |
| Y * 1A | ◎                                       | ◎               | ◎               | ◎               | ◎               | ◎                   | ◎               | ◎                 | ◎               | ◎               | ◎               |                  | ◎               | ◎               |                |               |
| Y * 2C | ○                                       | ○               |                 | ○               |                 |                     |                 | ○                 |                 | ○               |                 | ◎                |                 |                 | ○              | ○             |

## i-DREAM DRILL INSERTS & HOLDERS

### i-DREAM DRILL EINSÄTZE UND HALTER

#### - Features of i-Dream Drill Inserts- Merkmale des i-Dream Drill Einsätze

- Secure and accurate seating resulting in accurate repeatability and concentricity.  
Der sichere und genaue Sitz der Platte garantiert genaue Wiederholbarkeit beim Einsatz und beim Rundlauf.

#### i-Dream Drill **General** / i-Dream Drill **allgemeinen**

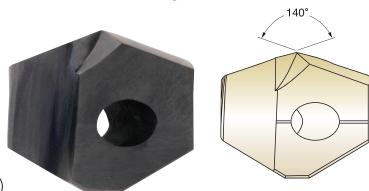
- For most steels materials / In den meisten Stahlsorten

#### i-Dream Drill **INOX** / i-Dream Drill **INOX**

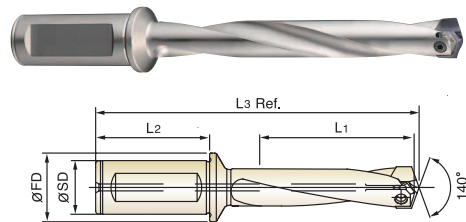
- For tough, ductile materials and stainless steels  
Für zähe, verformbare Werkstoffe und rostfreie Stähle.
- Light, sharp cutting edge / Scharfe Schneidkante
- Soft cutting action / Weicher Schnitt
- Minimize cutting forces / Minimaler Schneidendruck
- Reduce built-up edge / Reduzierte Gratbildung

#### - Features of i-Dream Drill Holders- Merkmale des i-Dream Drill Halter-

- Special Alloy Steels maintain its hardness and toughness under high temperatures.  
Speziell legierter Stahl, der seine Härte und Zähigkeit auch bei hohen Temperaturen behält.
- Innovative surface treatment improves wear resistance and reduces corrosion.  
Innovative Oberflächenbehandlung, die die Verschleißfestigkeit erhöht und die Korrosion vermindert.
- High Performance flute design allows maximum chip evacuation and minimum interference.  
Optimierte Nutenform für maximale Spanabfuhr.



cutting conditions : p.50~51



| Series Range          | Insert EDP No.  |             | Insert O.D. |       |            | Holder EDP No. | Shank Dia. | Shank Length | Flange Dia. | Drilling Depth |         | Overall Length | Screw No. |
|-----------------------|-----------------|-------------|-------------|-------|------------|----------------|------------|--------------|-------------|----------------|---------|----------------|-----------|
|                       | General (TiAlN) | INOX (TiCN) | h7          |       |            |                |            |              |             | L1             | L3 Ref. |                |           |
| (mm)                  |                 |             | dec.        | frac. | mm         |                | SD         | L2           | FD          | L1             |         |                |           |
| B<br>Ø14.00 to Ø15.99 | YB1A1450        | YB2C1450    | 0.5709      |       | 14.50      | ZH14503020     | 20         | 50           | 25          | 3D             | 43.5    | 120.9          | TX1415T08 |
|                       | YB1A1460        | YB2C1460    | 0.5748      |       | 14.60      | ZH14505020     |            |              |             | 5D             | 72.5    | 149.9          |           |
|                       | YB1A1468        | YB2C1468    | 0.5781      | 37/64 | 14.68      | ZH14507020     |            |              |             | 7D             | 101.5   | 178.9          |           |
|                       | YB1A1480        | YB2C1480    | 0.5827      |       | 14.80      |                |            |              |             |                |         |                |           |
|                       | YB1A1500        | YB2C1500    | 0.5906      |       | 15.00      |                |            |              |             |                |         |                |           |
|                       | YB1A1508        | YB2C1508    | 0.5938      | 19/32 | 15.08      | ZH15003020     | 20         | 50           | 25          | 3D             | 45      | 122.9          | TX1516T08 |
|                       | YB1A1510        | YB2C1510    | 0.5945      |       | 15.10      | ZH15005020     |            |              |             | 5D             | 75      | 152.9          |           |
|                       | YB1A1520        | YB2C1520    | 0.5984      |       | 15.20      | ZH15007020     |            |              |             | 7D             | 105     | 182.9          |           |
|                       | YB1A1530        | YB2C1530    | 0.6024      |       | 15.30      |                |            |              |             |                |         |                |           |
|                       | YB1A1548        | YB2C1548    | 0.6094      | 39/64 | 15.48      |                |            |              |             |                |         |                |           |
|                       | YB1A1550        | YB2C1550    | 0.6102      |       | 15.50      |                |            |              |             |                |         |                |           |
|                       | YB1A1560        | YB2C1560    | 0.6142      |       | 15.60      | ZH15503020     | 20         | 50           | 25          | 3D             | 46.5    | 123.9          |           |
| YB1A1570              | YB2C1570        | 0.6181      |             | 15.70 | ZH15505020 | 5D             |            |              |             | 77.5           | 154.9   |                |           |
| YB1A1580              | YB2C1580        | 0.6220      |             | 15.80 | ZH15507020 | 7D             |            |              |             | 108.5          | 185.9   |                |           |
| YB1A1587              | YB2C1587        | 0.6250      | 5/8         | 15.87 |            |                |            |              |             |                |         |                |           |
| C<br>Ø16.00 to Ø17.99 | YC1A1600        | YC2C1600    | 0.6299      |       | 16.00      |                | 20         | 50           | 25          |                |         |                | TX1617T08 |
|                       | YC1A1609        | YC2C1609    | 0.6335      |       | 16.09      | ZH16003020     |            |              |             | 3D             | 48      | 125.0          |           |
|                       | YC1A1620        | YC2C1620    | 0.6378      |       | 16.20      | ZH16005020     |            |              |             | 5D             | 80      | 157.0          |           |
|                       | YC1A1627        | YC2C1627    | 0.6406      | 41/64 | 16.27      | ZH16007020     |            |              |             | 7D             | 112     | 189.0          |           |
|                       | YC1A1630        | YC2C1630    | 0.6417      |       | 16.30      |                |            |              |             |                |         |                |           |
|                       | YC1A1650        | YC2C1650    | 0.6496      |       | 16.50      | ZH16503020     | 20         | 50           | 25          | 3D             | 49.5    | 127.0          |           |
|                       | YC1A1667        | YC2C1667    | 0.6562      | 21/32 | 16.67      | ZH16505020     |            |              |             | 5D             | 82.5    | 160.0          |           |
|                       | YC1A1680        | YC2C1680    | 0.6614      |       | 16.80      | ZH16507020     |            |              |             | 7D             | 115.5   | 193.0          |           |

- ▶ TiN, TiCN, TiAlN & Hardslick are available on your request.
- ▶ 10×D Holder is available on your request.

◎ : Excellent ○ : Good

|        | Non-alloyed Steels, Free Machining Steels | Carbon Steels   |                  | Alloy Steels    |                  | High Alloyed steels |                  | Structural Steels |                  | Tool Steels     |                  | Stainless Steels | Cast Iron       |                  | Aluminum       | Copper Alloys |
|--------|-------------------------------------------|-----------------|------------------|-----------------|------------------|---------------------|------------------|-------------------|------------------|-----------------|------------------|------------------|-----------------|------------------|----------------|---------------|
|        | ~HRc24 (~HB250)                           | ~HRc28 (~HB275) | HRc28~ (~HB275~) | ~HRc28 (~HB275) | HRc28~ (~HB275~) | ~HRc37 (~HB350)     | HRc37~ (~HB350~) | ~HRc24 (~HB250)   | HRc24~ (~HB250~) | ~HRc13 (~HB200) | HRc13~ (~HB200~) | ~HRc28 (~HB275)  | ~HRc19 (~HB220) | HRc19~ (~HB220~) | ~HRc8 (~HB180) | ~HB110        |
| Y * 1A | ◎                                         | ◎               | ◎                | ◎               | ◎                | ◎                   | ◎                | ◎                 | ◎                | ◎               | ◎                |                  | ◎               | ◎                |                |               |
| Y * 2C | ○                                         | ○               |                  | ○               |                  |                     |                  | ○                 |                  | ○               |                  | ◎                |                 |                  | ○              | ○             |



## METRIC

| Material<br>Werkstück                                       |                                                                                                          | Tensile<br>Strength | Hardness |       | Cutting<br>Speed | Feed [mm/rev]   |                 |                 |                 |                 |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------|----------|-------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                                                             |                                                                                                          | [N/mm²]             | HB       | HRC   | Vc<br>[M/min]    | Ø12.0<br>~Ø14.9 | Ø15.0<br>~Ø17.9 | Ø18.0<br>~Ø21.9 | Ø22.0<br>~Ø26.9 | Ø27.0<br>~Ø31.9 |
| Non-alloyed steels,<br>Cast steels<br>Free-machining steels | 9SMn28, 9SMnPb28,                                                                                        | ~500                | 100~150  |       | 95~120           | 0.16~0.28       | 0.21~0.35       | 0.27~0.40       | 0.34~0.52       | 0.37~0.55       |
|                                                             | 10SPb20 etc                                                                                              | 500~850             | 150~250  | ~24   | 80~105           | 0.14~0.24       | 0.21~0.35       | 0.27~0.40       | 0.34~0.52       | 0.37~0.55       |
| Low-alloyed steels,<br>Cast steels(<5% )<br>Carbon steels   | C15, C22, 20Mn5,<br>Ck45, C45 etc                                                                        | ~450                | 85~125   |       | 90~115           | 0.14~0.25       | 0.20~0.33       | 0.25~0.39       | 0.31~0.47       | 0.34~0.50       |
|                                                             |                                                                                                          | 450~755             | 125~225  | ~19   | 70~90            | 0.12~0.20       | 0.17~0.28       | 0.22~0.32       | 0.30~0.46       | 0.33~0.49       |
|                                                             |                                                                                                          | 755~900             | 225~265  | 19~27 | 60~80            | 0.12~0.20       | 0.17~0.28       | 0.22~0.32       | 0.30~0.46       | 0.33~0.49       |
|                                                             |                                                                                                          | 900~1200            | 265~350  | 27~37 | 55~70            | 0.10~0.16       | 0.15~0.25       | 0.21~0.30       | 0.25~0.38       | 0.29~0.43       |
| Alloyed steels                                              | 45CrMo4, 42CrMo4,<br>16MnCr5,<br>Ck75, 35CrMo4,<br>16MnCr5 etc                                           | ~600                | 125~175  | ~7    | 80~100           | 0.14~0.24       | 0.17~0.28       | 0.22~0.32       | 0.30~0.46       | 0.34~0.50       |
|                                                             |                                                                                                          | 600~800             | 175~235  | 7~22  | 70~90            | 0.12~0.20       | 0.17~0.28       | 0.22~0.32       | 0.30~0.46       | 0.34~0.50       |
|                                                             |                                                                                                          | 800~950             | 235~280  | 22~29 | 60~80            | 0.12~0.20       | 0.15~0.25       | 0.22~0.32       | 0.30~0.46       | 0.34~0.50       |
|                                                             |                                                                                                          | 950~1110            | 280~330  | 29~35 | 55~70            | 0.10~0.16       | 0.13~0.21       | 0.21~0.30       | 0.25~0.38       | 0.29~0.43       |
|                                                             |                                                                                                          | 1110~1230           | 330~360  | 35~39 | 45~60            | 0.08~0.12       | 0.13~0.21       | 0.21~0.30       | 0.25~0.38       | 0.29~0.43       |
| High-alloyed steels                                         | 36CrNiMo4,<br>41CrAlMo7 etc                                                                              | 600~1020            | 225~300  | 19~32 | 45~60            | 0.12~0.20       | 0.15~0.25       | 0.21~0.30       | 0.20~0.31       | 0.24~0.35       |
|                                                             |                                                                                                          | 1020~1200           | 300~355  | 32~38 | 40~55            | 0.10~0.16       | 0.11~0.18       | 0.21~0.30       | 0.20~0.31       | 0.24~0.35       |
|                                                             |                                                                                                          | 1200~1330           | 355~390  | 38~42 | 40~50            | 0.08~0.12       | 0.09~0.14       | 0.18~0.26       | 0.19~0.29       | 0.23~0.34       |
| Structural steels                                           | St33, St37-2, St44-2,<br>St52, St60 etc                                                                  | 350~500             | 100~150  |       | 75~95            | 0.14~0.24       | 0.21~0.35       | 0.27~0.39       | 0.29~0.44       | 0.32~0.47       |
|                                                             |                                                                                                          | 500~850             | 150~250  | ~24   | 60~75            | 0.12~0.20       | 0.20~0.33       | 0.22~0.32       | 0.25~0.38       | 0.29~0.43       |
| Tool steels                                                 | 102Cr6, 105WCr6,<br>C75W etc                                                                             | 850~1200            | 250~355  | 24~38 | 50~65            | 0.10~0.16       | 0.17~0.28       | 0.21~0.30       | 0.21~0.32       | 0.26~0.38       |
|                                                             |                                                                                                          | 500~705             | 150~210  | ~16   | 50~65            | 0.10~0.16       | 0.13~0.21       | 0.18~0.26       | 0.20~0.31       | 0.24~0.35       |
| Grey cast iron                                              | Pearlitic, Ferritic<br>Pearlitic                                                                         | 705~950             | 210~280  | 16~29 | 40~50            | 0.10~0.16       | 0.13~0.21       | 0.18~0.26       | 0.20~0.31       | 0.24~0.35       |
|                                                             |                                                                                                          | 500~700             | 150~210  | ~16   | 100~125          | 0.15~0.26       | 0.20~0.37       | 0.27~0.42       | 0.36~0.51       | 0.40~0.55       |
| Cast iron nodular                                           | Ferritic<br>Pearlitic                                                                                    | 700~850             | 210~250  | 16~24 | 75~95            | 0.11~0.20       | 0.16~0.29       | 0.20~0.30       | 0.25~0.35       | 0.29~0.40       |
|                                                             |                                                                                                          | 540                 | 165      | 4     | 95~120           | 0.13~0.22       | 0.17~0.31       | 0.21~0.32       | 0.28~0.40       | 0.32~0.44       |
| Malleable cast iron                                         | Ferritic<br>Pearlitic                                                                                    | 850                 | 250      | 24    | 75~95            | 0.11~0.20       | 0.14~0.26       | 0.19~0.29       | 0.25~0.35       | 0.29~0.40       |
|                                                             |                                                                                                          | 450                 | 125      |       | 100~125          | 0.13~0.22       | 0.17~0.31       | 0.21~0.32       | 0.28~0.40       | 0.32~0.44       |
| Aluminum alloys<br>(Wrought)                                | not heat treatable<br>hardened                                                                           | 780                 | 230      | 21    | 75~95            | 0.11~0.18       | 0.14~0.26       | 0.19~0.29       | 0.25~0.35       | 0.29~0.40       |
|                                                             |                                                                                                          |                     | 65       |       | 250~330          | 0.30~0.40       | 0.35~0.45       | 0.40~0.50       | 0.45~0.55       | 0.50~0.60       |
| Aluminum alloys<br>(Cast)                                   | ≤12% Si, not heat treatable<br>≤12% Si, hardened<br>>12% Si, not heat treatable<br>Free machining(Pb>1%) |                     | 150      |       | 200~250          | 0.30~0.40       | 0.35~0.45       | 0.40~0.50       | 0.45~0.55       | 0.50~0.60       |
|                                                             |                                                                                                          |                     | 75       |       | 200~50           | 0.25~0.35       | 0.30~0.40       | 0.35~0.45       | 0.40~0.50       | 0.45~0.55       |
|                                                             |                                                                                                          |                     | 90       |       | 150~220          | 0.25~0.35       | 0.30~0.40       | 0.35~0.45       | 0.40~0.50       | 0.45~0.55       |
|                                                             |                                                                                                          |                     | 130      |       | 100~200          | 0.20~0.30       | 0.25~0.35       | 0.30~0.40       | 0.35~0.45       | 0.40~0.50       |
| Copper alloys                                               | Brass<br>Electrolitic copper                                                                             |                     | 110      |       | 115~145          | 0.16~0.28       | 0.23~0.36       | 0.29~0.36       | 0.37~0.45       | 0.41~0.48       |
|                                                             |                                                                                                          |                     | 90       |       | 145~185          | 0.17~0.29       | 0.24~0.37       | 0.30~0.38       | 0.38~0.46       | 0.42~0.49       |
| Non ferrous<br>material                                     | Duroplastics<br>Fiber plastics<br>Hard rubber                                                            |                     | 100      |       | 95~120           | 0.06~0.09       | 0.09~0.13       | 0.11~0.13       | 0.15~0.18       | 0.19~0.22       |
|                                                             |                                                                                                          |                     |          |       |                  |                 |                 |                 |                 |                 |
|                                                             |                                                                                                          |                     |          |       |                  |                 |                 |                 |                 |                 |
| Stainless steels                                            | Austenitic and<br>Austenitic/ferritic                                                                    | 450~610             | 135~185  | ~9    | 45~60            | 0.10~0.16       | 0.12~0.18       | 0.14~0.20       | 0.15~0.26       | 0.18~0.28       |
|                                                             |                                                                                                          | 610~930             | 185~275  | 9~28  | 30~45            | 0.08~0.14       | 0.09~0.15       | 0.10~0.16       | 0.12~0.20       | 0.14~0.22       |

\*Formulas :

RPM = revolution per minute (rev/min)  
M/min = surface meter per minute(M/min)  
DIA. = diameter of drill (mm)  
mm/rev = feed rate(mm/rev)

$$\begin{aligned} \text{M/min} &= \frac{(\text{RPM}) \cdot \pi \cdot (\text{DIA.})}{1000} \\ \text{mm/min} &= (\text{RPM}) \cdot (\text{mm/rev}) \\ \text{RPM} &= \frac{(\text{M/min}) \cdot 1000}{(\pi) \cdot (\text{DIA.})} \end{aligned}$$

- The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.  
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.
- Recommend you to reduce the feed rate to 85%,70% when you use 5xD,7xD holders.
- For use of 7xD holder, we recommend to drill a centering pre-hole with equal to or larger than 140 ° point angle to min. 2/3 cutting diameter.  
The use of the centering pre-hole improves hole location , roundness and surface finish.



## INCH

| Material<br>Werkstück                                       |                                                                                 | Tensile<br>Strength | Hardness  |         | Cutting<br>Speed | Feed [IPR] |               |                   |                   |                   |                  |                    |
|-------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------|-----------|---------|------------------|------------|---------------|-------------------|-------------------|-------------------|------------------|--------------------|
|                                                             |                                                                                 |                     | MPa       | HB      |                  | HRc        | Vc<br>[SFM]   | Ø31/64<br>~Ø37/64 | Ø19/32<br>~Ø45/64 | Ø23/32<br>~Ø55/64 | Ø7/8<br>~Ø1-1/16 | Ø1-3/32<br>~Ø1-1/4 |
| Non-alloyed steels,<br>Cast steels<br>Free-machining steels | 9SMn28, 9SMnPb28,                                                               | Y□1A / Y□2C         | ~500      | 100~150 |                  | 312~394    | 0.006~0.011   | 0.008~0.014       | 0.011~0.016       | 0.013~0.020       | 0.015~0.022      |                    |
|                                                             | 10SPb20 etc                                                                     |                     | 500~850   | 150~250 | ~24              | 262~344    | 0.006~0.009   | 0.008~0.014       | 0.011~0.016       | 0.013~0.020       | 0.015~0.022      |                    |
| Low-alloyed steels,<br>Cast steels(<5% )<br>Carbon steels   | C15, C22, 20Mn5,<br>Ck45, C45 etc                                               |                     | ~450      | 85~125  |                  | 295~377    | 0.006~0.010   | 0.008~0.013       | 0.010~0.015       | 0.012~0.019       | 0.013~0.020      |                    |
|                                                             |                                                                                 |                     | 450~755   | 125~225 | ~19              | 230~295    | 0.005~0.008   | 0.007~0.011       | 0.009~0.013       | 0.012~0.018       | 0.013~0.019      |                    |
|                                                             |                                                                                 |                     | 755~900   | 225~265 | 19~27            | 197~262    | 0.005~0.008   | 0.007~0.011       | 0.009~0.013       | 0.012~0.018       | 0.013~0.019      |                    |
|                                                             |                                                                                 |                     | 900~1200  | 265~350 | 27~37            | 180~230    | 0.004~0.006   | 0.006~0.010       | 0.008~0.012       | 0.010~0.015       | 0.011~0.017      |                    |
| Alloyed steels                                              | 45CrMo4, 42CrMo4,<br>16MnCr5,<br>Ck75, 35CrMo4,<br>16MnCr5 etc                  |                     | ~600      | 125~175 | ~7               | 262~328    | 0.006~0.009   | 0.007~0.011       | 0.009~0.013       | 0.012~0.018       | 0.013~0.020      |                    |
|                                                             |                                                                                 |                     | 600~800   | 175~235 | 7~22             | 230~295    | 0.005~0.008   | 0.007~0.011       | 0.009~0.013       | 0.012~0.018       | 0.013~0.020      |                    |
|                                                             |                                                                                 |                     | 800~950   | 235~280 | 22~29            | 197~262    | 0.005~0.008   | 0.006~0.010       | 0.009~0.013       | 0.012~0.018       | 0.013~0.020      |                    |
|                                                             |                                                                                 |                     | 950~1110  | 280~330 | 29~35            | 180~230    | 0.004~0.006   | 0.005~0.008       | 0.008~0.012       | 0.010~0.015       | 0.011~0.017      |                    |
|                                                             |                                                                                 |                     | 1110~1230 | 330~360 | 35~39            | 148~197    | 0.003~0.005   | 0.005~0.008       | 0.008~0.012       | 0.010~0.015       | 0.011~0.017      |                    |
| High-alloyed steels                                         | 36CrNiMo4,<br>41CrAlMo7 etc                                                     |                     | 600~1020  | 225~300 | 19~32            | 148~197    | 0.005~0.008   | 0.006~0.010       | 0.008~0.012       | 0.008~0.012       | 0.009~0.014      |                    |
|                                                             |                                                                                 |                     | 1020~1200 | 300~355 | 32~38            | 131~180    | 0.004~0.006   | 0.004~0.007       | 0.008~0.012       | 0.008~0.012       | 0.009~0.014      |                    |
|                                                             |                                                                                 |                     | 1200~1330 | 355~390 | 38~42            | 131~164    | 0.003~0.005   | 0.004~0.006       | 0.007~0.010       | 0.007~0.011       | 0.009~0.013      |                    |
| Structural steels                                           | St33, St37-2, St44-2,<br>St52, St60 etc                                         |                     | 350~500   | 100~150 |                  | 246~312    | 0.006~0.009   | 0.008~0.014       | 0.011~0.015       | 0.011~0.017       | 0.013~0.019      |                    |
|                                                             |                                                                                 |                     | 500~850   | 150~250 | ~24              | 197~246    | 0.005~0.008   | 0.008~0.013       | 0.009~0.013       | 0.010~0.015       | 0.011~0.017      |                    |
|                                                             |                                                                                 |                     | 850~1200  | 250~355 | 24~38            | 164~213    | 0.004~0.006   | 0.007~0.011       | 0.008~0.012       | 0.008~0.013       | 0.010~0.015      |                    |
| Tool steels                                                 | 102Cr6, 105WCr6,<br>C75W etc                                                    |                     | 500~705   | 150~210 | ~16              | 164~213    | 0.004~0.006   | 0.005~0.008       | 0.007~0.010       | 0.008~0.012       | 0.009~0.014      |                    |
|                                                             |                                                                                 |                     | 705~950   | 210~280 | 16~29            | 131~164    | 0.004~0.006   | 0.005~0.008       | 0.007~0.010       | 0.008~0.012       | 0.009~0.014      |                    |
| Grey cast iron                                              | Pearlitic, Ferritic<br>Pearlitic                                                |                     | 500~700   | 150~210 | ~16              | 328~410    | 0.006~0.010   | 0.008~0.015       | 0.011~0.017       | 0.014~0.020       | 0.016~0.022      |                    |
|                                                             |                                                                                 |                     | 700~850   | 210~250 | 16~24            | 246~312    | 0.004~0.008   | 0.006~0.011       | 0.008~0.012       | 0.010~0.014       | 0.011~0.016      |                    |
| Cast iron nodular                                           | Ferritic<br>Pearlitic                                                           |                     | 540       | 165     | 4                | 312~394    | 0.005~0.009   | 0.007~0.012       | 0.008~0.013       | 0.011~0.016       | 0.013~0.017      |                    |
|                                                             |                                                                                 |                     | 850       | 250     | 24               | 246~312    | 0.004~0.008   | 0.006~0.010       | 0.007~0.011       | 0.010~0.014       | 0.011~0.016      |                    |
| Malleable cast iron                                         | Ferritic<br>Pearlitic                                                           |                     | 450       | 125     |                  | 328~410    | 0.005~0.009   | 0.007~0.012       | 0.008~0.013       | 0.011~0.016       | 0.013~0.017      |                    |
|                                                             |                                                                                 |                     | 780       | 230     | 21               | 246~312    | 0.004~0.007   | 0.006~0.010       | 0.007~0.011       | 0.010~0.014       | 0.011~0.016      |                    |
| Aluminum alloys<br>(Wrought)                                | not heat treatable<br>hardened                                                  |                     |           | 65      |                  | 820~1083   | 0.0118~0.0157 | 0.0138~0.0177     | 0.0157~0.0197     | 0.0177~0.0217     | 0.0197~0.0236    |                    |
|                                                             |                                                                                 |                     |           | 150     |                  | 656~820    | 0.0118~0.0157 | 0.0138~0.0177     | 0.0157~0.0197     | 0.0177~0.0217     | 0.0197~0.0236    |                    |
| Aluminum alloys<br>(Cast)                                   | ≤12% Si, not heat treatable<br>≤12% Si, hardened<br>>12% Si, not heat treatable |                     |           | 75      |                  | 656~820    | 0.0098~0.0138 | 0.0118~0.0157     | 0.0138~0.0177     | 0.0157~0.0197     | 0.0177~0.0217    |                    |
|                                                             |                                                                                 |                     |           | 90      |                  | 492~722    | 0.0098~0.0138 | 0.0118~0.0157     | 0.0138~0.0177     | 0.0157~0.0197     | 0.0177~0.0217    |                    |
|                                                             |                                                                                 |                     |           | 130     |                  | 328~656    | 0.0079~0.0118 | 0.0098~0.0138     | 0.0118~0.0157     | 0.0138~0.0177     | 0.0157~0.0197    |                    |
| Copper alloys                                               | Free machining(Pb>1%)<br>Brass<br>Electrolitic copper                           |                     |           | 110     |                  | 377~476    | 0.006~0.011   | 0.009~0.014       | 0.011~0.014       | 0.015~0.018       | 0.016~0.019      |                    |
|                                                             |                                                                                 |                     |           | 90      |                  | 476~607    | 0.007~0.011   | 0.009~0.015       | 0.012~0.015       | 0.015~0.018       | 0.017~0.019      |                    |
|                                                             |                                                                                 |                     |           | 100     |                  | 312~394    | 0.002~0.004   | 0.004~0.005       | 0.004~0.005       | 0.006~0.007       | 0.007~0.009      |                    |
| Non ferrous<br>material                                     | Duroplastics<br>Fiber plastics<br>Hard rubber                                   |                     |           |         |                  |            |               |                   |                   |                   |                  |                    |
|                                                             |                                                                                 |                     |           |         |                  |            |               |                   |                   |                   |                  |                    |
|                                                             |                                                                                 |                     |           |         |                  |            |               |                   |                   |                   |                  |                    |
| Stainless steels                                            | Austenitic and<br>Austenitic/ferritic                                           | Y□2C                | 450~610   | 135~185 | ~9               | 145~197    | 0.004~0.006   | 0.005~0.007       | 0.006~0.008       | 0.006~0.011       | 0.007~0.011      |                    |
|                                                             |                                                                                 |                     | 610~930   | 185~275 | 9~28             | 89~145     | 0.003~0.005   | 0.004~0.006       | 0.004~0.006       | 0.005~0.008       | 0.006~0.009      |                    |

\*Formulas :

RPM = revolution per minute (rev/min)  
SFM = surface feet per minute (ft/min)  
DIA. = diameter of drill (inch)  
IPR = feed rate (inch/rev)  
IPM = inch per minute penetration rate

$$\begin{aligned} \text{SFM} &= \frac{(\text{RPM}) \cdot \pi \cdot (\text{DIA.})}{12} \\ \text{IPM} &= (\text{RPM}) \cdot (\text{IPR}) \\ \text{RPM} &= \frac{(\text{SFM}) \cdot 12}{(\pi) \cdot (\text{DIA.})} \end{aligned}$$

► The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.

Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.

► Recommend you to reduce the feed rate to 85%,70% when you use 5xD,7xD holders.

► For use of 7xD holder, we recommend to drill a centering pre-hole with equal to or larger than 140 ° point angle to min. 2/3 cutting diameter.

The use of the centering pre-hole improves hole location , roundness and surface finish.