

## 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*

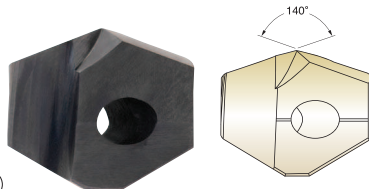
- For most steels materials / In den meisten Stahlsorten

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

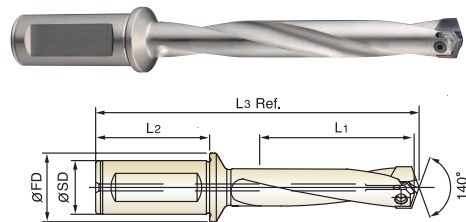
- For tough, ductile materials and stainless steels  
 Für zähe, verformbare Werkstoffe und rostfreie Stähle.
- Light, sharp cutting edge / Scharfe Schneidkante
- Soft cutting action / Weicher Schnitt
- Minimize cutting forces / Minimaler Schneidendruck
- Reduce built-up edge / Reduzierte Gratbildung

#### - 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. |                |           |
|                       |                 |             | dec.        | frac.   | mm         |                | SD         | L2           | FD          |                |         | L1             |           |
| I<br>Ø28.00 to Ø29.99 | YI1A2800        | YI2C2800    | 1.1024      |         | 28.00      | ZH28003032     | 32         | 60           | 37          | 3D             | 84      | 178.2          | TX2829T25 |
|                       | YI1A2818        | YI2C2818    | 1.1094      | 1*7/64  | 28.18      | ZH28005032     |            |              |             | 5D             | 140     | 234.2          |           |
|                       |                 |             |             |         |            | ZH28007032     |            |              |             | 7D             | 196     | 290.2          |           |
|                       | YI1A2850        | YI2C2850    | 1.1220      |         | 28.50      | ZH28503032     | 32         | 60           | 37          | 3D             | 85.5    | 179.2          |           |
|                       | YI1A2858        | YI2C2858    | 1.1250      | 1*1/8   | 28.58      | ZH28505032     |            |              |             | 5D             | 142.5   | 236.2          |           |
|                       |                 |             |             |         |            | ZH28507032     |            |              |             | 7D             | 199.5   | 293.2          |           |
|                       | YI1A2900        | YI2C2900    | 1.1417      |         | 29.00      | ZH29003032     | 32         | 60           | 37          | 3D             | 87      | 182.2          | TX2930T25 |
|                       | YI1A2937        | YI2C2937    | 1.1562      | 1*5/32  | 29.37      | ZH29005032     |            |              |             | 5D             | 145     | 240.2          |           |
|                       |                 |             |             |         | ZH29007032 | 7D             |            |              |             | 203            | 298.2   |                |           |
| YI1A2950              | YI2C2950        | 1.1614      |             | 29.50   | ZH29503032 | 32             | 60         | 37           | 3D          | 88.5           | 183.2   |                |           |
|                       |                 |             |             |         | ZH29505032 |                |            |              | 5D          | 147.5          | 242.2   |                |           |
| YI1A2977              | YI2C2977        | 1.1719      | 1*11/64     | 29.77   | ZH29507032 |                |            |              | 7D          | 206.5          | 301.2   |                |           |
| J<br>Ø30.00 to Ø31.99 | YJ1A3000        | YJ2C3000    | 1.1811      |         | 30.00      | ZH30003032     | 32         | 60           | 37          | 3D             | 90      | 186.0          | TX3031T25 |
|                       | YJ1A3016        | YJ2C3016    | 1.1875      | 1*3/16  | 30.16      | ZH30005032     |            |              |             | 5D             | 150     | 246.0          |           |
|                       |                 |             |             |         |            | ZH30007032     |            |              |             | 7D             | 210     | 306.0          |           |
|                       | YJ1A3050        | YJ2C3050    | 1.2008      |         | 30.50      | ZH30503032     | 32         | 60           | 37          | 3D             | 91.5    | 187.0          |           |
|                       | YJ1A3056        | YJ2C3056    | 1.2031      | 1*11/64 | 30.56      | ZH30505032     |            |              |             | 5D             | 152.5   | 248.0          |           |
|                       | YJ1A3096        | YJ2C3096    | 1.2188      | 1*7/32  | 30.96      | ZH30507032     |            |              |             | 7D             | 213.5   | 309.0          |           |
|                       | YJ1A3100        | YJ2C3100    | 1.2205      |         | 31.00      | ZH31003032     | 32         | 60           | 37          | 3D             | 93      | 188.0          | TX3132T25 |
|                       |                 |             |             |         |            | ZH31005032     |            |              |             | 5D             | 155     | 250.0          |           |
|                       |                 |             |             |         | ZH31007032 | 7D             |            |              |             | 217            | 312.0   |                |           |
| YJ1A3150              | YJ2C3150        | 1.2402      |             | 31.50   | ZH31503032 | 32             | 60         | 37           | 3D          | 94.5           | 191.0   |                |           |
|                       |                 |             |             |         | ZH31505032 |                |            |              | 5D          | 157.5          | 254.0   |                |           |
| YJ1A3175              | YJ2C3175        | 1.2500      | 1*1/4       | 31.75   | ZH31507032 |                |            |              | 7D          | 220.5          | 317.0   |                |           |

▶ 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.



*i-Dream Drills*

## RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDKONDITIONEN

CARBIDE

HSS

i-DREAM  
DRILLS

DREAM  
DRILLS  
-GENERAL

DREAM  
DRILLS  
-INOX

DREAM  
DRILLS  
-ALU

DREAM  
DRILLS  
-CFRP

DREAM  
DRILLS  
-MQL TYPE

DREAM  
DRILLS  
for HARDENED  
STEELS

GENERAL  
CARBIDE  
DRILLS

NC-SPOTTING  
DRILLS

CENTER  
DRILLS

MULTI-1  
DRILLS

HPD DRILLS

GOLD-P  
DRILLS

STRAIGHT  
SHANK  
DRILLS

TAPER  
SHANK  
DRILLS

NC-SPOTTING  
DRILLS

CENTER  
DRILLS

SPADE  
DRILLS

TECHNICAL  
DATA

## 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,<br>10SPb20 etc                                                | ~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        |
|                                                             |                                                                                 | 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        |
|                                                             |                                                                                 | 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        |
| Structural steels                                           | St33, St37-2, St44-2,<br>St52, St60 etc                                         | 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                                           | 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.