YE-ST13

YG-1 CO., LTD.

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Tool specifications are subject to change without notice.
Features of *i-Dream Drill*

**i-Dream Drill Insert:**
- By using advanced drill point technology, centering and reaming are eliminated, and accurate, consistent hole sizes are easily attainable.
- The newest coatings combined with tough long lasting carbide substrates, allow high penetration rates and long tool life.
- The strong and accurate insert locking system allows easy access and quick insert replacement while the drill is mounted in the machine.

**i-Dream Drill General**
- For most steel materials
- For tough, ductile materials and stainless steel
- Light, sharp cutting edge
- Soft cutting action
- Minimize cutting forces
- Reduce built-up edge

**i-Dream Drill Holder:**
- The holder, made of highly wear resistant steel alloy, is designed to allow maximum coolant flow and unrestricted chip removal during the drilling cycle.

**Speed and Feed:**
- The speeds and feeds recommended as shown are for ideal working conditions with adequate coolant pressure.
- It is recommended to consider on new jobs 10 ~ 20% lower speeds and feeds as a starting point.

**HIGH PERFORMANCE & OPTIMAL COST**

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Features of *i-Dream Drill*

Comparison with Split Point Drill, Spade Drill, Dream Drill

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**i-Dream Drill Portion in YG-1 Drill Products**

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Case Study

**WORKPIECE - Structural Steel**

- **ASTM:** A36
- **DIN:** St37-2
- **JIS:** S3550

**CONDITIONS**

- **Cutting Speed:** 80 m/min
- **Feed:** 0.24 mm/rev.
- **Feedrate:** 421 mm/min
- **RPM:** 1756 rev./min
- **Drilling:** 48.0 mm
- **Coolant:** Internal
- **Machine type:** Vertical Machining Center

**RESULT**

**COMPETITOR**

**TOOL**

- **HOLDER:** ZH14505020
- **INSERT:** YB1A1450 / Ø14.5

**COMPETITOR**

**TOOL**

- **HOLDER:** ZH24003032
- **INSERT:** YG1A2400 / Ø24.0

**WORKPIECE - Carbon Steel**

- **AISI:** 1045
- **DIN:** C45
- **JIS:** S45C

**CONDITIONS**

- **Cutting Speed:** 92 m/min
- **Feed:** 0.35 mm/rev.
- **Feedrate:** 527 mm/min
- **RPM:** 1950 rev./min
- **Drilling:** 70.0 mm
- **Coolant:** Internal
- **Machine type:** NC lathe

**RESULT**

**COMPETITOR**

**TOOL**

- **HOLDER:** ZH14005020
- **INSERT:** YB1A1400 / Ø14.0

**COMPETITOR**

**TOOL**

- **HOLDER:** ZH14005020
- **INSERT:** YB2C1400 / Ø14.0

**WORKPIECE - Alloy Steel (HB286)**

- **AISI:** 4140
- **DIN:** 45CrMo4
- **JIS:** SCM440

**CONDITIONS**

- **Cutting Speed:** 70 m/min
- **Feed:** 0.15 mm/rev.
- **Feedrate:** 290 mm/min
- **RPM:** 1250 rev./min
- **Drilling:** 50.0 mm
- **Coolant:** Internal
- **Machine type:** Vertical Machining Center

**RESULT**

**COMPETITOR**

**TOOL**

- **HOLDER:** ZH14005020
- **INSERT:** YB1A1450 / Ø14.0

**COMPETITOR**

**TOOL**

- **HOLDER:** ZH14005020
- **INSERT:** YB2C1400 / Ø14.0

**WORKPIECE - Stainless Steel**

- **AISI:** 304
- **DIN:** X5CrNi189
- **JIS:** SUS304

**CONDITIONS**

- **Cutting Speed:** 55 m/min
- **Feed:** 0.15 mm/rev.
- **Feedrate:** 188 mm/min
- **RPM:** 1250 rev./min
- **Drilling:** 50.0 mm
- **Coolant:** Internal
- **Machine type:** Vertical Machining Center

**RESULT**

**COMPETITOR**

**TOOL**

- **HOLDER:** ZH14005020
- **INSERT:** YB2C1400 / Ø14.0

**COMPETITOR**

**TOOL**

- **HOLDER:** ZH14005020
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- **HOLDER:** ZH14005020
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- Features of i-Dream Drill Inserts -
- Secure and accurate seating resulting in accurate repeatability and concentricity.
- i-Dream Drill General
- For most steels materials
- i-Dream Drill INOX
- For tough ductile materials and stainless steels
  - Light sharp cutting edge
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  - Reduce built-up edge

- Features of i-Dream Drill Holders -
- Special Alloy Steels that maintains its hardness and toughness under high temperatures.
- Innovative surface treatment that improves wear resistance and reduces corrosion.
- High Performance flute design allowing maximum chip evacuation and minimum interference.

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<th>Series Range</th>
<th>Insert EDP No.</th>
<th>Insert O.D.</th>
<th>Drilling Depth</th>
<th>Holder EDP No.</th>
<th>Shank Dia.</th>
<th>Shank Length</th>
<th>Flute Dia.</th>
<th>Flute Length</th>
<th>Overall Length</th>
<th>Screw No.</th>
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Features of i-Dream Drill Holders-
- Special Alloy Steels that maintains its hardness and toughness under high temperatures.
- Innovative surface treatment that improves wear resistance and reduces corrosion.
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Features of i-Dream Drill INSERTS & HOLDERS
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### RECOMMENDED CUTTING CONDITIONS

#### METRIC

<table>
<thead>
<tr>
<th>Material</th>
<th>Tensile Strength</th>
<th>Hardness</th>
<th>Cutting Speed</th>
<th>Feed [mm/rev]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-alloyed steel, Cast steel Pre-hardening</td>
<td>580-628</td>
<td>HB 120-150</td>
<td>30-120</td>
<td>0.16-0.28</td>
</tr>
<tr>
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<td>500-650</td>
<td>HB 150-200</td>
<td>24-90</td>
<td>0.21-0.35</td>
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<tr>
<td>Low-alloyed steel, Cast steel (5%)</td>
<td>450-520</td>
<td>HB 120-150</td>
<td>18-70</td>
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<td>900-1000</td>
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<td>25-70</td>
<td>0.10-0.15</td>
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<td>1200-1400</td>
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<td>30-70</td>
<td>0.08-0.12</td>
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<td>1600-1900</td>
<td>HB 300-350</td>
<td>35-70</td>
<td>0.06-0.10</td>
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<td></td>
<td>3000-3500</td>
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<td>50-70</td>
<td>0.03-0.05</td>
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<tr>
<td></td>
<td>5000-6000</td>
<td>HB 800-1000</td>
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<td>0.02-0.03</td>
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<tr>
<th>Material</th>
<th>Tensile Strength</th>
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<th>Cutting Speed</th>
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**Formulas:**

\[ \text{RPM} = \frac{\text{(RPM)} \times (\text{DIA})}{1000} \]

\[ \text{mm/min} = \frac{(\text{RPM}) \times \left(\frac{\text{DIA}}{2}\right)}{1000} \]

\[ \text{RPM} = \frac{1000}{(\sigma) \times (\text{DIA})} \]

---

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

**RPM** = revolution per minute (rev/min)

**mm/min** = surface feed per minute (mm/min)

**DIA.** = diameter of drill (mm)

**mm/min** = feed rate (mm/min)

---

**Formulas:**

\[ \text{RPM} = \frac{(\text{RPM}) \times (\text{DIA})}{12} \]

\[ \text{SFm} = \frac{(\text{RPM}) \times (\text{IPR})}{(\sigma) \times (\text{DIA})} \]

\[ \text{RPM} = \frac{1000}{(\sigma) \times (\text{DIA})} \]

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**RPM** = revolution per minute (rev/min)

**mm/min** = surface feed per minute (mm/min)

**DIA.** = diameter of drill (mm)

**SFm** = feed rate (inch/min)

**IPM** = inch per minute penetration rate

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

**Formulas:**

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**Note:**

- 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.
Assembly of Dream Drill

Make sure to clean the insert and insert seat.

Slide the drill insert into the slot of the holder and press down the insert to touch the bottom of the slot.

After confirming the insert is pressed down to the bottom of the slot, tighten the screw using anti-seize compound.

<table>
<thead>
<tr>
<th>WRENCH TYPE</th>
<th>PRODUCT No.</th>
<th>T-HANDLE No.</th>
<th>SERIES (SIZE)</th>
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<td>A (Ø12.00~Ø13.99)</td>
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<td>B (Ø14.00~Ø15.99)</td>
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<td></td>
<td>C (Ø16.00~Ø17.99)</td>
</tr>
<tr>
<td>TORX BIT TYPE</td>
<td>TWBT15</td>
<td>TWH600</td>
<td>D (Ø18.00~Ø19.99)</td>
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<td>TWBT20</td>
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<td>E, F, G (Ø20.00~Ø25.99)</td>
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<td></td>
<td>TWBT25</td>
<td></td>
<td>H, I, J (Ø26.00~Ø31.99)</td>
</tr>
</tbody>
</table>

Use the wing type or T-type wrench.

- Need to use appropriate wrenches and screws as indicated.
- It's important to tighten the screw properly.

Caution and Non-Recommendable Applications

Intersecting cross hole is bigger than the drill insert’s Margin Length.

Material with slanting entrance and exit over 7 degree. (If drilling 7 degree or under slanting surface, reduce the feed about 30-50%)

For drilling stacked plates, minimize the space between the plates. The space stacked plates can cause insert breakage or poor chip control.

The material needs to be fixtured securely before drilling.
Recommended Coolant Pressure and Flow Rate on Vertical Drilling

- Recommended emulsion mix is 6% - 8%.
- For Drilling in Stainless and High Strength steels, a mix of 10% is recommended.
- For horizontal drilling, 30% reduction on the coolant pressure and flow rate is possible.
- Dry drilling is possible for 1-2xD drilling. But not recommended.

Trouble Shooting

1) Heavy flank wear / Fast flank wear
   - Reduce cutting speed
   - Increase feed

2) Chipping on cutting edge
   - Reduce feed
   - Check the rigidity of spindle and chuck
   - Rigid clamping of workpiece

3) Build up on cutting edge
   - Increase cutting speed
   - Use a coated insert

4) Chipping or break down on outer corner
   - Reduce feed
   - Rigid clamping of workpiece

5) Wear of land margin
   - Rigid clamping of workpiece
   - Reduce cutting speed
   - Increase coolant flow

6) Unsatisfactory positioning of the hole
   - Rigid clamping of workpiece
   - Reduce feed during entrance or exit

7) Scratching on holder
   - Rigid clamping of workpiece
   - Reduce feed
   - Increase coolant flow

8) Unsatisfactory surface finish
   - Rigid clamping of workpiece
   - Increase coolant flow and pressure