SOLID CARBIDE ENGRAVING TIP

**GRADES**

<table>
<thead>
<tr>
<th>Grades</th>
<th>P</th>
<th>M</th>
<th>K</th>
<th>N</th>
<th>S</th>
<th>H &lt;sub&gt;max&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN2005</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

When assembling, be sure carbide tip is seated firmly on shank with no gap. Recommended axial depth of cut is .005" per step down.

**HARDWARE**

<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Wrench</th>
<th>Optional Torque Wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>T05</td>
<td>WS-0043</td>
<td>DT-60-04</td>
</tr>
</tbody>
</table>

**OPERATING GUIDELINES**

<table>
<thead>
<tr>
<th>Workpiece Material</th>
<th>cutting speed</th>
<th>feed per tooth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V&lt;sub&gt;c&lt;/sub&gt; in/min</td>
<td>fz (in)</td>
</tr>
<tr>
<td><strong>P</strong> Steel</td>
<td>400-600</td>
<td>.001-.002</td>
</tr>
<tr>
<td><strong>P</strong> Tool steel</td>
<td>300-500</td>
<td>.001-.002</td>
</tr>
<tr>
<td><strong>M</strong> Stainless steel</td>
<td>250-400</td>
<td>.001-.002</td>
</tr>
<tr>
<td><strong>K</strong> Gray cast iron</td>
<td>400-700</td>
<td>.001-.002</td>
</tr>
<tr>
<td><strong>S</strong> Super alloys</td>
<td>100-200</td>
<td>.001-.002</td>
</tr>
<tr>
<td><strong>N</strong> Aluminum</td>
<td>1000-2500</td>
<td>.001-.002</td>
</tr>
<tr>
<td>Copper</td>
<td>250-450</td>
<td>.001-.002</td>
</tr>
</tbody>
</table>

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.
SOLID CARBIDE FINE ENGRAVING TIP

**Engraving Cutter Number**

- T1
- Thread Size: A
- Nominal Chamfer Angle: D1
- Nominal Diameter: D2
- Eff. Flutes: L1
- Length of Cut: L2
- Extension Length: L3
- Neck Diameter: L4
- L5 Length

**Specifications**

- **Grades**
  - Solid Carbide Engraving Tip Series 45Q, 46Q
  - WORKPIECE MATERIAL:
    - P Steel: 400-600, .001-.002
    - Tool steel: 300-500, .001-.002
    - M Stainless steel: 250-400, .001-.002
    - K Gray cast iron: 400-700, .001-.002
    - S Super alloys: 100-200, .001-.002
    - N Aluminum: 1000-2500, .001-.002
    - Copper: 250-450, .001-.002

**Note:** Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

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**IN2005**

- + Good
- 0 Bad

**Thread Size**

- T05

**Tool Hardware**

- Thread Size: T05
- Wrench: WS-0043
- Optional Torque Wrench: DF-60-06

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**OPERATING GUIDELINES**

When assembling, be sure carbide tip is seated firmly on shank with no gap. Recommended axial depth of cut is .002" per step down.

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**TOOL SPECIFICATIONS**

- **Cutter Number**: 46Q-1550TQR60 IN2005 T05 30 0.150 1 0.02 0.500 0.30 0.313

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**IN2005+ Good + + + +

**HARDWARE**

- **Thread Size**: T05
- Wrench: WS-0043
- Optional Torque Wrench: DF-60-06

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**OPERATING GUIDELINES**

- **Workpiece Material**
  - **Steel**: 400-600, .001-.002
  - **Tool steel**: 300-500, .001-.002
  - **Stainless steel**: 250-400, .001-.002
  - **Gray cast iron**: 400-700, .001-.002
  - **Super alloys**: 100-200, .001-.002
  - **Aluminum**: 1000-2500, .001-.002
  - **Copper**: 250-450, .001-.002

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.