Toolox® is a new steel made by Swedish special steel producer SSAB. Its is delivered with an unique of high mechanical strength and crack resistance. Therefore it is ideal for high performing tooling like U-drills and high speed mills. The high mechanical strength up to 45 HRC takes away the need for heat treatment. Thus shortening lead times and reducing quality problems.

Furthermore Toolox® reduces machining vibrations more than competing tooling materials. Creating possibilities to increase cutting speeds and depths without getting unstable machining conditions. In below test results, Tool A was made in H13 and Tool B in Toolox®.

![Machining test results](image)
TOOLOX® IN TOOLS FOR METAL CUTTING

The lower vibrations created using Toolox® 44 in the tooling also make it possible to increase a much higher life length on both the tool itself and the carbide inserts. Below a real example showing this effect.

**Application:** End milling - Aluminium Extrusion die production

<table>
<thead>
<tr>
<th>Max. ap</th>
<th>Dc</th>
<th>z</th>
<th>Dc1</th>
<th>Ds</th>
<th>L</th>
<th>Lf</th>
<th>Is</th>
<th>K (deg)</th>
<th>Kg</th>
<th>Air hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>16.00</td>
<td>2</td>
<td>9.5</td>
<td>16.0</td>
<td>150.0</td>
<td>50.0</td>
<td>100.0</td>
<td>15</td>
<td>0.20</td>
<td>with</td>
</tr>
</tbody>
</table>

**Insert Type:** Tungaloy LNMU 03
**Tool Holder:** Toolox® 44 Dia 21 mm
**Surface Treatment:** Electroless Nickel plating

**Cutting parameters**
- $V_c$: 150 m/min
- $f_z$: 0.75
- $a_p$: 0.5 mm

**General Advantages of Toolox® 44 vs AISI4340**
- Less wear on cutting tool surface
- Less vibration
- Less deformation in insert holes
- No heat treatment
- Much better end user (tool maker) satisfaction
- AISI 4340 is generally not delivered in heat treated condition. Cutting tool production of 4340 requires heat treatment in the manufacturing cycle. Toolox® 44 is delivered with its final heat treatment, which gives possibilities to shorten the cutting tool manufacturing time.

**Cutting tool material**
- **AISI 4340**: 42–44 HRc
- **Toolox® 44**: 45 HRC

<table>
<thead>
<tr>
<th></th>
<th>Typical hardness</th>
<th>Cutting tool life length</th>
<th>Failure on cutting tool</th>
<th>Insert life length</th>
</tr>
</thead>
<tbody>
<tr>
<td>AISI 4340</td>
<td>42–44 HRc</td>
<td>10 days</td>
<td>Deformation and wear</td>
<td>4 to 5 dies</td>
</tr>
<tr>
<td>Toolox® 44</td>
<td>45 HRC</td>
<td>5 months</td>
<td>Wear</td>
<td>9 to 10 dies</td>
</tr>
</tbody>
</table>

**Availability**
Plates from 6 – 165 mm. Bars between 15 and 353 mm with lengths up to 5000 mm. Toolox® is available from the local SSAB stock in Antwerp. Cut pieces of Toolox® can be obtained through the well-established global network of Approved Toolox® Distributors. Both SSAB and distributors can also provide you with good application support as well as technical guidelines.

**Contact and more information**
Contact your local sales representative to learn more, visit www.toolox.com or consult Tech Support at: help@ssab.com.