Detecting the transition from carbon to titanium

Derivative

1: Machining carbon
2: Stopping the feed
3: Changing the spindle speed
4: Machining titanium (step drilling)

Machining sandwiched materials

Gain in time – cost savings

<table>
<thead>
<tr>
<th>WattPilote</th>
<th>Without</th>
<th>With</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of the boring operation</td>
<td>76.42 s</td>
<td>47.28 s</td>
</tr>
<tr>
<td>Gain in time</td>
<td>38 %</td>
<td></td>
</tr>
</tbody>
</table>

Test conditions:
- Thickness of carbon panel: 12 mm
- Cutting conditions for carbon: F=300 S=3000
- Thickness of titanium panel: 14 mm
- Cutting conditions for titanium: F=40 S=1300

When used to monitor the machining of layered composite materials with unknown thicknesses, the WattPilote system detects each transition from one material to another and enables adjustment of the cutting conditions (feed and speed) to match the material.

Digital Way is the patentee for this method, which is based upon the power derivative. It is independent of no-load power, tool wear, and homogeneous variations in part hardness. It is also fast and reliable.

The WattPilote system is appropriate both for orbital boring/drilling and also for traditional boring operations. It optimizes the feed rates as well as the cycle times and therefore it becomes an important part of overall machining quality.

Boring 4.75-mm holes in a sandwiched panel made of carbon and titanium.