Brass tool - Measurements Report

07/11/2016

General
1. The following report describes the results obtained in measuring a Brass sample (see figure 1).
2. The objective was to measure the features on the brass with 0.01mm accuracy.
3. We measured the sample with CP10 and 50mm lens using our demo unite (see figure 2).
4. We used Optimet viewer for analysis.

Customer requirement
1. Measure the height and the profile of a tool for making metal washers with accuracy of 0.01mm.
2. To make a profile and show the tooth height.
Test Set Up
1. The sample was put on Demo unit.
2. The scans were performed using a CP-10 with 50mm lens.
3. The analysis was done in using Optimet’s viewer program.

Sensor parameters:
Type: ConoPoint-10
Lens: 50mm
Other elements: No

Main sensor specifications:

<table>
<thead>
<tr>
<th>Lens type</th>
<th>50mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range (mm)</td>
<td>8</td>
</tr>
<tr>
<td>Standoff (mm)</td>
<td>44</td>
</tr>
<tr>
<td>Accuracy (µm)</td>
<td>6</td>
</tr>
</tbody>
</table>

Scanning parameters:
Lateral resolution [X*Y]: 20µm X 100µm
Scanning axis: X axis
Measurement frequency: 9000Hz
Laser power: max (4000)
Auto exposure: on

Scanner system:
Demo unit
Measurement analysis

a. We have scanned the whole surface and not only one profile in order to see all types of features on the sample

b. When making a profile in the X direction:
c. When zooming in, we can see the small features that are in the center of the brass sample:

![Zoom into the middle of the sample](image)

d. Focusing onto the tooth heights we see the following:

<table>
<thead>
<tr>
<th>Left profile</th>
<th>Right profile</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Left profile" /></td>
<td><img src="image" alt="Right profile" /></td>
</tr>
</tbody>
</table>
Results

1. Requirements:
   a. Measure brass samples with accuracy of <10um – Accomplished.
      i. Tooth height 0.5mm – I double checked it all the tooth height is ~0.151mm with STD of 0.004mm.
   2. It seems that the CP10 with 50mm lens can easily fit into this application.

Tooth Heights Table:

<table>
<thead>
<tr>
<th>Position</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Average</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value (mm)</td>
<td>0.147</td>
<td>0.157</td>
<td>0.154</td>
<td>0.147</td>
<td>0.151</td>
<td>0.004</td>
</tr>
</tbody>
</table>