Gear tooth profile grinding

**Objective**

The particular challenge of gear tooth profile grinding is the extremely high sensibility to thermal damage caused by a relatively high contact between the workpiece and the grinding wheel. To avoid thermal damage of the workpiece ALTANTIC recommends using very porous, vitrified bonded aluminium oxide grinding wheels. ATLANTIC grinding wheels master the special challenge of combining a cool grinding process with simultaneous high wear-resistance. Benefit from the great deal of experience and manufacturing expertise that ATLANTIC company offers to you and reach an increase of your material removal rate (V′w) and stock removal volume (Q′w).

**Grinding wheel**

ATLANTIC specification of grinding wheels for gear tooth profile grinding

**EX3 80 - D11 VY 40N**

EX3 - grain type
80 - grit size
D - hardness (very soft)
11 - structure (open)
VY - ATLANTIC bonding for gear tooth profile grinding (V = vitrified)
40N - porosity of the grinding wheel

**Results of the machine tool laboratory (WZL) Aachen**

The machine tool laboratory (WZL) of the University of Aachen is one of the leading institutions in the field of gearing technology. The WZL and ATLANTIC concluded a cooperation agreement on the development of a specification for gear tooth profile grinding.

The aim of this cooperation was the evaluation of the performance of grinding wheel specifications for roughing during gear tooth profile grinding.

The tests were made on a Kapp machine. During the test set-up a gear wheel of material 20MnCr5 (60 HRc) got used. The module [mn] was 4.5 mm at a number of teeth of 47.

The curve illustrated shows the grinding power [P′c] in comparison to the stock removal rate [Q′w]. Because of the decreasing power at a Q′w of approx. 17, the risk of grinding burn on the workpiece is minimized by a reduction of the grinding wheel.
The chart shows the grinding power a constant stock removal volume. Grind burn could be proven as of tooth gap 57 by the usual test procedures like Barkhausen Noise Analyses and nital etching. ATLANTIC could increase the grinding performance by about 15 % compared to the specification known on the market so far.

**Stock list**

<table>
<thead>
<tr>
<th>Stock Number</th>
<th>Specification</th>
<th>Grinding Wheel Dimensions (OD x W x ID*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>05999 3001  SLS</td>
<td>EX3 80 -D11 VY 40N</td>
<td>350 x 40 x 127.0 [mm]</td>
</tr>
<tr>
<td>05999 3002  SLS</td>
<td>EX3 80 -D11 VY 40N</td>
<td>400 x 30 x 127.0 [mm]</td>
</tr>
<tr>
<td>05999 3003  SLS</td>
<td>EX3 80 -D11 VY 40N</td>
<td>400 x 45 x 127.0 [mm]</td>
</tr>
<tr>
<td>05999 3004  SLS</td>
<td>EX3 80 -D11 VY 40N</td>
<td>400 x 70 x 127.0 [mm]</td>
</tr>
</tbody>
</table>

*OD = outer diameter  
W = grinding wheel width  
ID = inner diameter

The grinding wheel dimensions given are to be considered as semi-finished product program. The dimensions given can be reworked in accordance with your individual requirements. That means the external diameter (ED) and the wheel width (W) can be reduced and the inner diameter (ID) can be increased.

**Our service**

Our application engineering department provides comprehensive support and thus additional optimization possibilities for the solution of customer-specific tasks.