Wire Arc Additive Manufacturing (WAAM)

Technology & benefits of the process

WAAM uses the well-established wire arc welding to build near net shape cnc parts.

Benefits

- Big variety of materials
- Material efficiency
- Very good mechanical properties
- High build rate
- Easy change of material
- Economical production starting from lot size 1
- Up to 60% lower production costs when compared directly to conventional CNC manufacture (depending on material and geometry)

Production process

1. Programming of CAM data based on CAD model
2. Manufacture of the raw part
3. CNC finishing to create the final part

Added value by flexibility, lead time, and range of materials

Size

- 3-axis: 1.2 m x 1.5 m x 1.6 m ➔ 3.0 m³
- 5-axis: Ø 0.9 m x 1.1 m ➔ 0.8 m³

Maximum productivity

- Fast build rate of up to 600 cm³/h
- Less material consumption by use of wire material
- Wide variety of materials

Broad range of materials

- Steel
- Aluminum
- Ni basis
- NE metals
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Areas of application

Size samples

- Ø 420 mm
- Ø 250 mm
- 600 mm
- 180 mm

Manufacturing data "FIT Propeller"

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Data preparation time</td>
<td>4 h</td>
</tr>
<tr>
<td>Total volume</td>
<td>230 cm³</td>
</tr>
<tr>
<td>Production time</td>
<td>1h welding time</td>
</tr>
<tr>
<td>Build rate</td>
<td>230 cm³/h</td>
</tr>
<tr>
<td>Layer thickness &amp; number</td>
<td>2.3 mm/40 layers</td>
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<tr>
<td>Material</td>
<td>G3Si1 1.5125</td>
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<tr>
<td>Tensile strength</td>
<td>540 MPa (500-560 MPa*)</td>
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<tr>
<td>0.2%-Yield strength</td>
<td>420 MPa (420-470 MPa*)</td>
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<tr>
<td>Elongation</td>
<td>28 % (22-26 %*)</td>
</tr>
</tbody>
</table>

* Values according to manufacturer of wire material

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