TECHNOLOGY
HOT RIVETING
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The active dynamic temperature regulated hot riveting technology is a clean, reliable and economical solution for your joining process.

A single head heats up a thermoplastic dome, forms a rivet and instantly cools down to achieve a maximum strong joint.

The bdtronic BHS hot riveting technology is cost-efficient and environmentally friendly. Consumables such as screws are no longer required.
### HOT RIVETING APPLICATIONS

<table>
<thead>
<tr>
<th>Riveting/Joining</th>
<th>Flanging</th>
<th>Closing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixing of PCB or lid, joining head or back lighting, joining modules</td>
<td>Centric enclosing of magnets or optics</td>
<td>Closing of holes from blow forming processes</td>
</tr>
</tbody>
</table>

- **Riveting/Joining of countersunk heads**
  - Riveting with flat surface

- **Flanging**
  - Centric enclosing of magnets or optics

- **Closing**
  - Closing of holes from blow forming processes

- **Embedding**
  - Embedding of metal nuts

- **Anchoring**
  - Joining of insulating or mesh material
HOT RIVETING
BASIC PRINCIPLE

The bdtronic BHS hot riveting systems with **active dynamic temperature regulation** ensures stable processes even in smallest process temperature windows

- Suitable for **semi-crystalline** thermoplastics
- Hysteresis from +/- 5°C
- Suitable for highly filled thermoplastics (GF50)
### Hot Riveting

**Basic Principle**

<table>
<thead>
<tr>
<th>Polymer type</th>
<th>Typical crystalline content</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA6, PA66</td>
<td>35…45%</td>
</tr>
<tr>
<td>POM</td>
<td>75…90%</td>
</tr>
<tr>
<td>PET</td>
<td>30…40%</td>
</tr>
<tr>
<td>PBT</td>
<td>40…50%</td>
</tr>
<tr>
<td>PTFE</td>
<td>60…80%</td>
</tr>
<tr>
<td>PE-HD</td>
<td>70…80%</td>
</tr>
<tr>
<td>PE-LD</td>
<td>45…55%</td>
</tr>
</tbody>
</table>

**Amorphous**

**Semi-crystalline**

**Crystalline**
The bdtronic hot riveting technology **BHS** is an alternative joining technology for a **form-closing** joint of thermoplastics to any other material.

- No consumables
- Dust-free
- Vibration-free
- Maximal joint strength
- No sticking
- Cost-effective
- Clean
- Environmentally friendly
- Single-Step technology
- Permante process control

**Benefits of the hot riveting technology BHS**

- Active dynamic temperature regulation
- Continuous process monitoring
- Single-Step technology with pneumatic stroke
- Minimized stress on part
- Quick-replace stamp system
- Position monitoring of stamp
- Time-distance measurement
HOT RIVETING PRINCIPLES

BHS Hot Stamp
- Contact riveting technology
- Electrical heating of stamp
- Internal air cooling
- Exact temperature measurement at stamp
- No thermal stress on part
- Suitable for electronics and PCBs
- Suitable for thermoplastic-to-thermoplastic joints

BHS Hot Jet
- Homogeneous plastifying of pins by hot air circulation
- Extremely strong joint
- Internal air cooling
- Temperature measurement in riveting head
- Minimized thermal stress by closed heating tool
- No axial or radial movement
- Zero gap
HOT RIVETING
PRINCIPLES

BHS Hot Stamp

BHS Hot Jet
BHS HOT STAMP
CONSTRUCTION DESIGN GUIDELINE

• Specially developed stamp geometry in corporation with BASF & TU Chemnitz!
• Based on DIN 660
HOT RIVETING
HIGH PERFORMANCE GENERATOR

- Protection class IP54
- Transformer (200A)
- Size 600x600x300 mm (1 transformer)
- Integrated panel PC
- Air filter unit
User interface
- Easy operation via touch panel
- Program management
- User management
- Error management with clear text messages and data logging
- Guided program configuration
- Continuous actual value display
- Maintenance function
- Analysis function
Process monitoring & regulation

- Continuous process monitoring of all relevant process data per riveting head
  - Display
  - Analysis
  - Provision for Traceability
HOT RIVETING
PROCESS CONTROL

Power
- Hot Stamp:
  - Current
  - Voltage
  - Power eff.
- Hot Jet:
  - Gas flow regulation

Distance measurement
- Stamp position monitoring

Temperature monitoring/temperature regulation
- Over temperature protection
- Regulated temperature profile
- Actual temperature measurement
- Temperature monitoring
**HOT RIVETING**

**STANDARD MACHINES**

**Tabletop**
Manual/integration hot riveting machine for individual part processing with manual load and unload

**Integration package**
Incl. cabinet, touch panel and digital handshake/profibus

**B2000-H**
Integration hot riveting machine for small batch production with program change and manual load and unload

**B5080-H/5090-H**
Space-saving fully automated hot riveting machine for high production rates

**B5100-H/5200-H**
Fully automated hot riveting machine for high production rates

**B5600-H**
Fully automated hot riveting machine with extended traversing range
<table>
<thead>
<tr>
<th><strong>Product description &amp; usage/function/information:</strong></th>
<th><strong>Electric control device</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Branch:</strong></td>
<td><strong>Automotive industry</strong></td>
</tr>
<tr>
<td><strong>Project description:</strong></td>
<td><strong>8-head machine BHS Hot Stamp with a rotary indexing table and manual loading and unloading</strong></td>
</tr>
<tr>
<td><strong>Process:</strong></td>
<td><strong>Fixing of PCBs with connectors</strong></td>
</tr>
<tr>
<td><strong>Material:</strong></td>
<td><strong>PBT-GF30</strong></td>
</tr>
<tr>
<td><strong>Required peel strenght:</strong></td>
<td><strong>&gt;300 N per rivet</strong></td>
</tr>
<tr>
<td><strong>Pin diameter:</strong></td>
<td><strong>3 mm</strong></td>
</tr>
</tbody>
</table>
THANK YOU
FOR YOUR ATTENTION