METALFOAM: GLOBALLY UNIQUE

The solution for lightweight constructions
AFS® is the only single-material aluminium sandwich system worldwide and offers completely new possibilities for applications and processing. The three-layer original material consists of a foamed aluminium core sandwiched between two aluminium cover layers. The cover layers are metallic, i.e. fused to the core layer without the need for adhesives.
AFS® - Aluminium Foam Sandwich

Globally unique

Aluminium foam
A metal bond fuses the pore-like aluminium core to the cover layers.

Fields of application

Transport
Transport, shipbuilding, aerospace industry etc.

Engineering
Machine tools etc.

Consumer goods
Consumer products, sports equipment etc.

Energy
Consumer products, sports equipment etc.

Building services engineering
General

Safety engineering
Armour plating etc.

Architecture
Design etc.

Fire protection
Safety/security doors etc.
**Basic data**

- **Sheet size**: max. 2000 x 1000 mm and 2500 x 1100 mm (see below)
- **Thickness**: 9 - 80 mm
- **Cover layer thickness**: 0.75 - 10 mm
- **Flatness of sheets**: 1 mm / 1000 mm
- **Thickness tolerance**: +/- 0.5 mm
- **Surface weight (Sample plate 25 mm / 1.2 mm)**: 10.5 kg/m²
- **E-module foam**: 5 GPa
- **E-module 1/10/1**: 21 GPa
- **E-module 2/28/2**: 18 GPa
- **Flexural strength**: approx. 8% lower than solid aluminium of the same thickness
- **Tensile strength**: 120 - 200 MPa
- **Compressive strength of foam**: 4 - 8 MPa
- **Thermal expansion**: 25 x 10⁻⁶ 1/K
- **Thermal conductivity**: 10 - 15 W/mK

---

<table>
<thead>
<tr>
<th>Type</th>
<th>Cover layer finish</th>
<th>Cover layer [mm]</th>
<th>Total sandwich height [mm]</th>
<th>Length [mm]</th>
<th>Width [mm]</th>
<th>Area [m²]</th>
<th>Weight per sheet [kg]</th>
<th>Weight per m² [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFS® J-8/0,75</td>
<td>EN AW 6082</td>
<td>0.75</td>
<td>8.00</td>
<td>2500</td>
<td>1100</td>
<td>2.75</td>
<td>18.56</td>
<td>6.75</td>
</tr>
<tr>
<td>AFS® J-10/0,75</td>
<td>EN AW 6082</td>
<td>0.75</td>
<td>10.00</td>
<td>2500</td>
<td>1100</td>
<td>2.75</td>
<td>18.56</td>
<td>6.75</td>
</tr>
<tr>
<td>AFS® J-10/1</td>
<td>EN AW 6082</td>
<td>1.00</td>
<td>10.00</td>
<td>2500</td>
<td>1100</td>
<td>2.75</td>
<td>26.73</td>
<td>9.72</td>
</tr>
<tr>
<td>AFS® J-12/1</td>
<td>EN AW 6082</td>
<td>1.00</td>
<td>12.00</td>
<td>2500</td>
<td>1100</td>
<td>2.75</td>
<td>26.73</td>
<td>9.72</td>
</tr>
<tr>
<td>AFS® J-13/1</td>
<td>EN AW 6082</td>
<td>1.00</td>
<td>13.00</td>
<td>2500</td>
<td>1100</td>
<td>2.75</td>
<td>26.73</td>
<td>9.72</td>
</tr>
<tr>
<td>AFS® J-15/1,5</td>
<td>EN AW 6082</td>
<td>1.50</td>
<td>15.00</td>
<td>2500</td>
<td>1100</td>
<td>2.75</td>
<td>40.54</td>
<td>14.74</td>
</tr>
<tr>
<td>AFS® J-20/1,5</td>
<td>EN AW 6082</td>
<td>1.50</td>
<td>20.00</td>
<td>2500</td>
<td>1100</td>
<td>2.75</td>
<td>40.54</td>
<td>14.74</td>
</tr>
<tr>
<td>AFS® J-25/1,5</td>
<td>EN AW 6082</td>
<td>1.50</td>
<td>25.00</td>
<td>2500</td>
<td>1100</td>
<td>2.75</td>
<td>40.54</td>
<td>14.74</td>
</tr>
<tr>
<td>AFS® J-30/2</td>
<td>EN AW 6082</td>
<td>2.00</td>
<td>30.00</td>
<td>2500</td>
<td>1100</td>
<td>2.75</td>
<td>66.33</td>
<td>24.12</td>
</tr>
<tr>
<td>AFS® J-30/5</td>
<td>EN AW 6082</td>
<td>6.00</td>
<td>30.00</td>
<td>2500</td>
<td>1000</td>
<td>2.50</td>
<td>101.25</td>
<td>40.50</td>
</tr>
<tr>
<td>AFS® J-40/5</td>
<td>EN AW 6082</td>
<td>6.00</td>
<td>40.00</td>
<td>2000</td>
<td>1000</td>
<td>2.00</td>
<td>89.10</td>
<td>44.55</td>
</tr>
<tr>
<td>AFS® J-50/5</td>
<td>EN AW 6082</td>
<td>6.00</td>
<td>50.00</td>
<td>2000</td>
<td>1000</td>
<td>2.00</td>
<td>97.20</td>
<td>48.60</td>
</tr>
<tr>
<td>AFS® J-60/5</td>
<td>EN AW 6082</td>
<td>6.00</td>
<td>60.00</td>
<td>2000</td>
<td>1000</td>
<td>2.00</td>
<td>108.00</td>
<td>54.00</td>
</tr>
<tr>
<td>AFS® K-30/5</td>
<td>EN AW 5754</td>
<td>6.00</td>
<td>30.00</td>
<td>2000</td>
<td>1000</td>
<td>2.50</td>
<td>101.25</td>
<td>40.50</td>
</tr>
<tr>
<td>AFS® K-40/5</td>
<td>EN AW 5754</td>
<td>6.00</td>
<td>40.00</td>
<td>2000</td>
<td>1000</td>
<td>2.00</td>
<td>89.10</td>
<td>44.55</td>
</tr>
<tr>
<td>AFS® K-50/5</td>
<td>EN AW 5754</td>
<td>6.00</td>
<td>50.00</td>
<td>2000</td>
<td>1000</td>
<td>2.00</td>
<td>97.20</td>
<td>48.60</td>
</tr>
<tr>
<td>AFS® K-60/5</td>
<td>EN AW 5754</td>
<td>6.00</td>
<td>60.00</td>
<td>2000</td>
<td>1000</td>
<td>2.00</td>
<td>108.00</td>
<td>54.00</td>
</tr>
</tbody>
</table>
Max. 60 % weight savings  
AFS® has a lower density than paper due to its pores and cavities.

Flexural and torsional rigidity  
The three-layer sandwich system provides significantly higher flexural strength than solid sheets of the same weight.

Absorption of kinetic energy  
AFS® delivers an improved solution for vibration and safety due to its acoustic and thermal insulating properties.

Wide-ranging processing possibilities  
Conventional processes for sheet metal processing can be used when processing AFS because due to the metallic bond.

Fire resistance  
AFS® sheets meet stringent fire safety requirements due to the non-adhesive bond of the 3-layer material.

100 % recyclable  
The foam composite can be fed back into existing material cycles at the end of its life cycle without any problems.
Deep drawing, punching or pressing
For 3D structures before foaming.

Forming
The original sheets can be formed before foaming and then foamed in a forming tool.

Sawing, milling, laser and water jet cutting
AFS® is ideally suited for mechanical processing. Milling, sawing, drilling and modern joining techniques are not a problem.

Grouting edge areas
AFS® provides an alternative to sealing edges by milling off a cover layer and the core and subsequently flattening down the remaining cover layer. The structure is not damaged in the process.

Welding
Generally only the cover layers are welded while the core remains untouched and serves as a kind of welding fixture. As a result, deformation of the components is considerably reduced.

Screwing, riveting and bonding
The material can be easily bonded like conventional aluminium because of its metallic character, thus making it much more cost-effective.
We can draw on our long-term design experience to support you in integrating the new material into existing products and processes. We offer you a complete solution for your technical problems, from the identification of the problem through to the finished product.

**Definition of the requirements**

**Assessment of the problem**

**Development of a concept**

**Discussion of the concept**

**Revision according to the customer’s wishes**

**Design**

**Technical realisation**
Please visit our website for more information:
www.metalfoam.de

A Pohl Group company

Copyright © 11/2015 pohltec metalfoam GmbH. © Registered trademark. Subject to errors and changes in the interest of technical progress and all additional rights reserved. Version 11/2015.