**Technical datasheet - Extruded products**

**Alloy EN AW-6005A [AlSiMg(A)]**

Medium strength structural alloy. It has a good combination of strength, toughness, surface finish and is more suitable than 6082 for decorative anodising.

Widespread use in engineering, transportation, and leisure applications such as yacht masts, train carriages, running boards for SUVs and complex sections for railway, bus and truck structures.

### Typical Applications
- Structural elements
- Boat masts
- Railway applications

### Chemical Composition

<table>
<thead>
<tr>
<th>Element</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si</td>
<td>0.50</td>
<td>0.90</td>
</tr>
<tr>
<td>Fe</td>
<td>0.35</td>
<td>0.40</td>
</tr>
<tr>
<td>Cu</td>
<td>0.30</td>
<td>0.50</td>
</tr>
<tr>
<td>Mn</td>
<td>0.04</td>
<td>0.70</td>
</tr>
<tr>
<td>Mg</td>
<td>0.30</td>
<td>0.20</td>
</tr>
<tr>
<td>Cr</td>
<td>0.10</td>
<td>0.15</td>
</tr>
<tr>
<td>Zn</td>
<td>0.05</td>
<td>0.15</td>
</tr>
<tr>
<td>Ti</td>
<td>0.05</td>
<td>0.15</td>
</tr>
<tr>
<td>Pb</td>
<td>0.05</td>
<td>0.15</td>
</tr>
<tr>
<td>Bi</td>
<td>0.05</td>
<td>0.15</td>
</tr>
<tr>
<td>Sn</td>
<td>0.05</td>
<td>0.15</td>
</tr>
<tr>
<td>Others</td>
<td>0.05</td>
<td>0.15</td>
</tr>
</tbody>
</table>

1. Chemical composition in weight-% according to EN-573-3:2013

### Mechanical Properties

<table>
<thead>
<tr>
<th>Temper</th>
<th>Wall thickness t [mm]</th>
<th>Rp0,2 [MPa]</th>
<th>Rm [MPa]</th>
<th>A [%]</th>
<th>A50mm [%]</th>
<th>HBW c</th>
<th>Vickers c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Profile T4a</td>
<td>t ≤ 25</td>
<td>90</td>
<td>180</td>
<td>15</td>
<td>13</td>
<td>50</td>
<td>56</td>
</tr>
<tr>
<td>Open Profile T6a</td>
<td>t ≤ 5</td>
<td>225</td>
<td>270</td>
<td>8</td>
<td>6</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>Hollow Profile T4a</td>
<td>5 &lt; t ≤ 10</td>
<td>215</td>
<td>260</td>
<td>8</td>
<td>6</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td>Hollow Profile T6a</td>
<td>10 &lt; t ≤ 25</td>
<td>200</td>
<td>250</td>
<td>8</td>
<td>6</td>
<td>85</td>
<td>90</td>
</tr>
</tbody>
</table>

2. Properties according to EN 755-2:2016 for extruded profile, minimum values unless else specified
3. If a profile cross section comprises different thickness which fall in more than one set of specified mechanical property values, the lowest specified value shall be considered as valid for the whole profile section
4. Temper designations according to EN 515:1993

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Chemical composition in weight-% according to EN-573-3:2013

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</tr>
<tr>
<td>Sn</td>
<td>0.05</td>
<td>0.15</td>
</tr>
<tr>
<td>Others</td>
<td>0.05</td>
<td>0.15</td>
</tr>
</tbody>
</table>

1. Mn + Cr: 0.12 – 0.50

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Temper Designations

<table>
<thead>
<tr>
<th>Temper</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T4</td>
<td>Solution heat treated and naturally aged</td>
</tr>
<tr>
<td>T5</td>
<td>Cooled from an elevated temperature shaping process and then artificially aged</td>
</tr>
<tr>
<td>T6</td>
<td>Solution heat treated and then artificially aged</td>
</tr>
<tr>
<td>T64</td>
<td>Solution heat treated and then artificially aged in underaging conditions (between T6 and T61) to improve formability</td>
</tr>
<tr>
<td>T66</td>
<td>Solution heat treated and then artificially aged – mechanical property level higher than T6 achieved through special control of the process</td>
</tr>
</tbody>
</table>

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Temper designations according to EN 515:1993
Technical datasheet - Extruded products
Alloy EN AW-6005A [AlSiMg(A)]

Physical Properties

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>70</td>
<td>26</td>
<td>605 - 655</td>
<td>2.71</td>
<td>898</td>
<td>23.3</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

5 Reference: MNC Handbok nr 12, version 2, SIS, 1989. Typical properties at room temperature 20°C

Comparative Characteristics of Related Alloys

<table>
<thead>
<tr>
<th>Property</th>
<th>6060</th>
<th>6063</th>
<th>6005</th>
<th>6005A</th>
<th>6082</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Impact strength</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Surface finish</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Suitability for decorative anodizing</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Corrosion resistance</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Machinability</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Coldforming</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Weldability</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

6 Relative grading, 5 = top grade

Fatigue Properties

Example of fatigue properties for 6005A in temper T6.

Provided for informational purposes only, not to be considered as guaranteed properties. Results are valid for the investigated specimens taken from a specific sample.

Tests performed at 20 ± 2 °C on 7 mm diameter cylindrical specimens parallel to the extrusion direction by Hydro Innovation & Technology, Finspång, Sweden.

Axial testing, constant amplitude, sine wave loading at around 100 Hz test frequency.

Load ratio (min. stress / max. stress) R = 0.

Runouts after 10⁸ cycles are indicated by the arrows.
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Heat Treatment Response

Example of heat treatment response for alloy 6005A.

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7 Solid profile, 200 x 3 mm, water quenched after extrusion, 24 h natural ageing prior to artificial ageing, properties in extrusion direction