

## Overview

This sheet summarises three aluminium grades available through Shapeways CNC machining services. Data is compiled by Shapeways on the basis of EN 485-2 and EN 573-3 standard values for the specified alloy and temper. For full grade data, refer to the individual Material Properties Sheets.

## Grade Comparison

Property	5083	6082	7075
EN Designation	EN AW-5083	EN AW-6082	EN AW-7075
Chemical Composition	AlMg4,5Mn	AlMgSi1	AlZnMgCu1,5
Werkstoffnummer	3.3547	3.2315	3.4365
Tensile Strength (Rm)	270–350 MPa	310 MPa min	503 MPa min
Yield Strength (Rp0.2)	125 MPa min	260 MPa min	435 MPa min
Elongation (A50)	12% min	8% min	7% min
Hardness (Brinell)	~75 HB	~95 HB	~150 HB
Density	2.66 g/cm <sup>3</sup>	2.71 g/cm <sup>3</sup>	2.81 g/cm <sup>3</sup>
Elastic Modulus	~70 GPa	~70 GPa	~72 GPa
Thermal Conductivity	~117 W/m·K	~170 W/m·K	~130 W/m·K
Coeff. Thermal Expansion	23.7 × 10 <sup>-6</sup> /K	23.4 × 10 <sup>-6</sup> /K	23.6 × 10 <sup>-6</sup> /K
Corrosion Resistance	Excellent	Good	Low — anodise recommended
Machinability	Good	Very good	Very good
Weldability	Excellent	Good	Not recommended
Primary Use	Marine, offshore, cryogenics	Structural, transport, aerospace	Aerospace, defence, high-performance

CTE values measured over 20–100 °C range. Corrosion resistance ratings are relative within this grade set. All mechanical values are EN 485-2 minimums for the relevant alloy.

## Grade Selection Guide

Application	Recommended Grade	Rationale
Marine / offshore / seawater	5083	Best corrosion resistance; weldable
General structural / mechanical	6082	Best all-round balance; most versatile
Aerospace / high-load / defence	7075	Highest strength; anodise for corrosion protection
Cryogenic service	5083	Retains toughness at -196 °C

Welded assemblies	5083 or 6082	7075 not suitable for fusion welding
Hard anodising required	6082 or 7075	Both anodise well; 7075 may show colour variation