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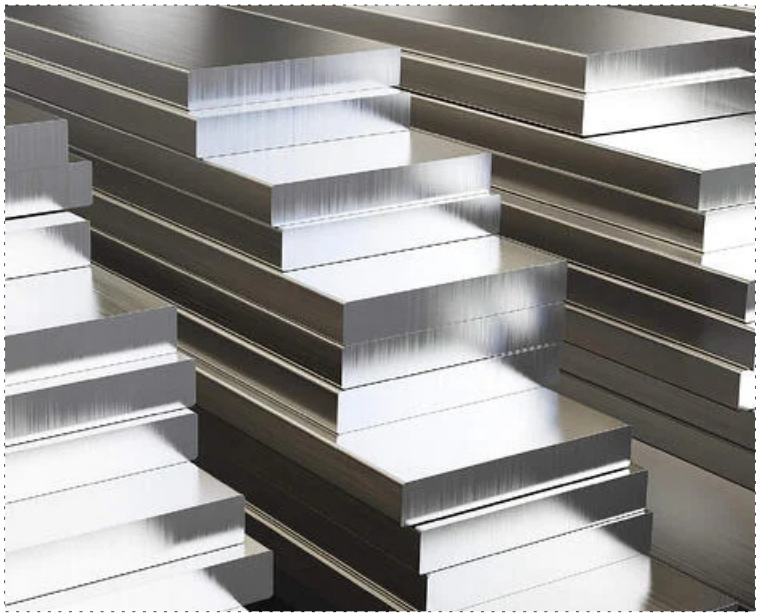
Technical data

CODE:	
PRODUCT:	EXTRUSION INGOT - AlMgSi alloy
NOTE:	TECHNICAL DATA
IMAGE:	
LAST UPDATE:	1/2023

EXTRUSION INGOT - AlMgSi alloy

AlMgSi alloy 606035

APPLICATION

Typical examples for use of this alloy are:
- Architectural members, i.e. glazing bars and window frames
- Windscreen sections
- Road transport

STRENGTH

Obtainable mechanical properties may vary with the production equipment, process parameters used in extrusion and consistency of the process parameters. We recommend that this is checked out for each production line.
However, the alloy is developed to satisfy the following mechanical properties:

TEMPER (AA)	Yield strength (MPa)	Tensile strength (MPa)	Enlogation (%)	Hardness Brinell
T4	70	150	23	43
T6*	190	215	10	67

* Aged for 5 hours at 185°C

ALLOY

Chemical composition **

										Other elements		
%	Si	Fe	Cu	Mn	Mg	Zn	Ti	Cr		Each	Total	Al
Min.	0,40	0,18	-	-	0,45	-	-	-		-	-	Balance
Max.	0,45	0,22	0,02	0,03	0,50	0,02	0,02	0,02		0,02	0,10	

** Analysis is performed on Hydro Aluminium's spectographs using Hydro Aluminium's selection of calibration standards. Analysis made on other instruments using other standards may show deviations.

PROPERTIES

STRENGTH

Strehgth depends upon the intermediate storing time before artificial ageing and ageing practice. For this alloy the strength will increase with increased intermediate storing time. Storing for 24 hours prior to artificial ageing will increase the strength with approx 5%.
Ageing at low temperatures (for longer time) generally gives higher strength than ageing at high temperatures (for shorter time). For details, see enclosed curves.

SPECIAL PROPERTIES

Formability	Good
Machinability	Moderate; best in T6 temper
Weldability	Suitable for all methods
Corrosion resistance	Good
Surface treatment	Well suiteble for all types of mechanicla surface treatment
Anodizing	Very good for anodizing

PHYSICAL PROPERTIES - TYPICAL VALUES

Density		2.70 - 2.71	kg/dm³
Modulus of elasticity		69	kN/mm²
Shear modulus		26	kN/mm²
Linear expansion coefficient	20-100°C	23	µ°C⁻¹
Thermal conductivity	20°C	200	W/(m•K)
Specific heat capacity	0-100°C	880-900	J/(m•K)
Resistivity	20°C	33	nΩ•m
Conductivity	20°C	52	% IACS
Melting range		600-655	°C

k = kilo
µ = micro (10^{-6})
n = nano (10^{-9})

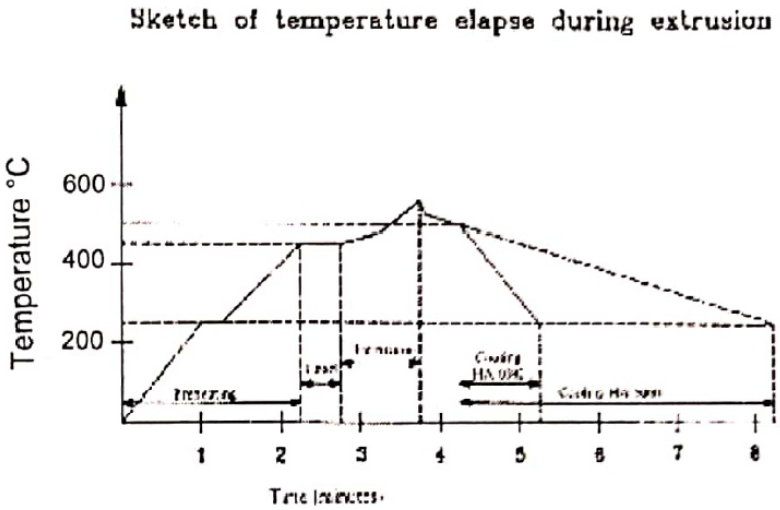
CORRESPONDING OR CLOSELY APPROXIMATING NORMS AND DESIGNATIONS

Norway NS	Sweden SIS	France NF	Germany DIN	UK BS	USA AA	ISO	Italy UNI
17310	4103	6060	AlMgSi0,5 F22	6063	6060	Al-MgSi	9006-1

EXTRUSION

PREHEATING

The preheating temperature should preferably be as low as possible to obtain the best possible speed in extrusion, but high enough to secure a good material flow and the necessary solution temperature. A too long stay at elevated temperature (e.g. in connection with a stop on the press) may destroy the optimized microstructure of the ingot and give reduced extrudability and mechanical properties.



FLOW

The material flow will depend upon:
- Friction against the container (container temperature)
- Deformation resistance (Mg and Si in solid solution)
- Surface of the container liner
- Lubrication of the dummy block
- Temperature difference between front and back end of the ingot (taper)

COOLING

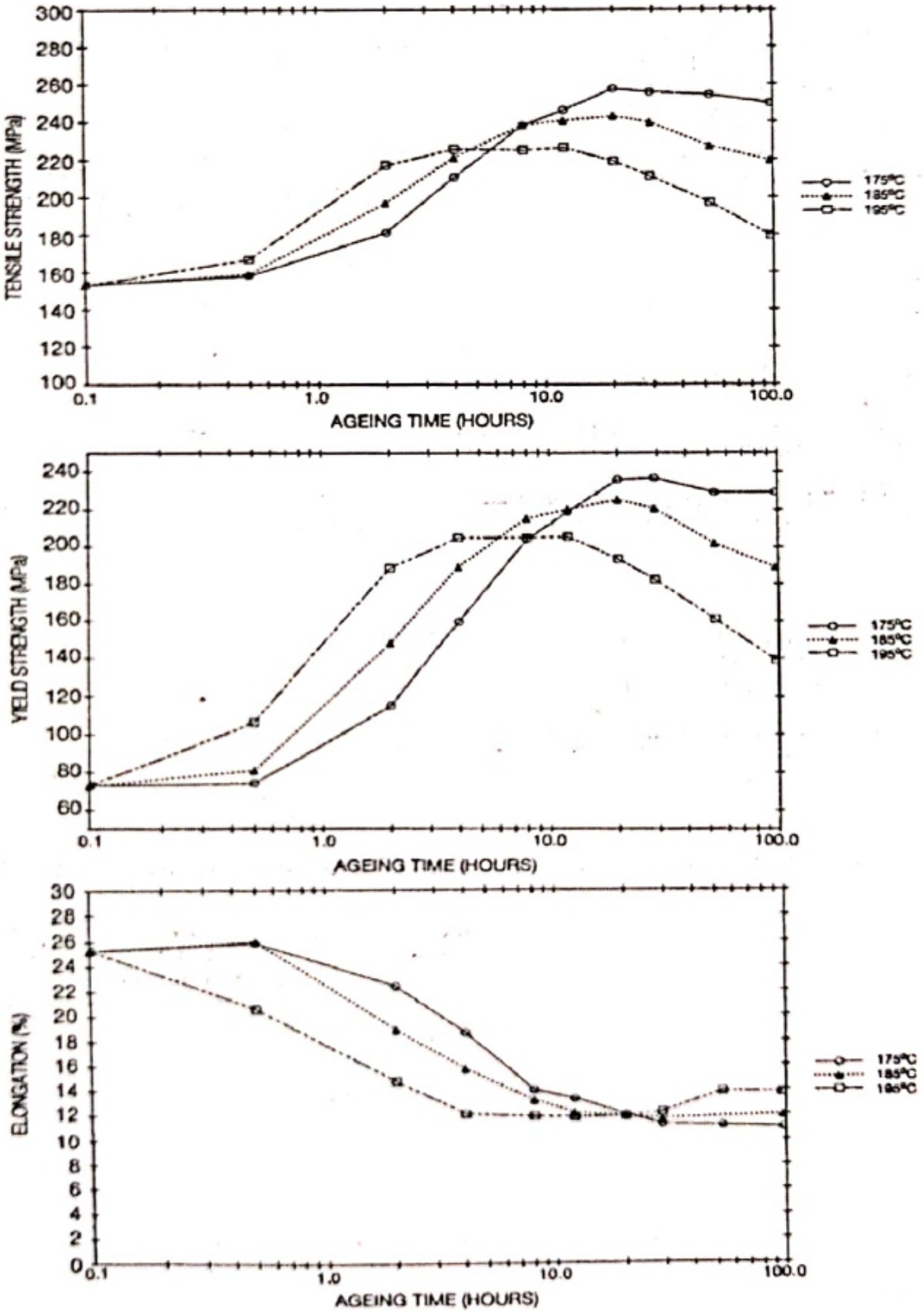
To obtain maximum strength the exit temperature must be above the solution temperature for Mg_2Si, and the cooling fast enough to depress precipitation.
For this alloy this means that cooling with forced air is usually satisfactory on open profiles with a thickness up to 10 mm.
Normally the rear end of the run out length obtains the slowest cooling (= lowest strength).

Recommended production parameters for an open section:

Preheating temp. (°C)	Taper (°C)	Container (°C)	Min. exit. temp (°C)	Typical extrusion speed (m/min)	Max. recommended cooling time from 500 to 250°C
430 - 470	50-90	400	480	40	4 min

HEAT TREATMENT

The mechanical properties of the alloy after artificial ageing at different temperatures are given in the curves below. The data are recorded on extruded sections, which have been solution treated at 540°C (20 minutes), water quenched and stored 4 hours bef.



For products:

230295	DENCOP hanging profile 9010 (6m)
237027	DENCOP Upper clamping profile 20mm anodized 5253 (6m)
237042	DENCOP Upper clamping profile 32mm anodized 5318 (6m)
237052	DENCOP Upper clamping profile 32mm anodized 5319 (6m)
237115	DENCOP Base profile 20/25mm raw 5248 (6m)
2371154	DENCOP Base profile 18/20 raw 5248 (4m)
237117	DENCOP Base profile 18/20 anodized 5248 (6m)
237122	DENCOP Base profile 32/45 anodized (6m)
237132	DENCOP LED snap basic profile 32/45 anodized (6m)
237233	DENCOP upper profile poster clamp anodized 7233 (6m)
237234	DENCOP basic profil poster clamp anodized 7234 (6m)
237905	DENCOP Framing profile for decorate 5mm anodized 6527 (6m)
65100	DENCOP Flexface profile one-sided 20cm 7136 (6m)
65101	DENCOP Flexface profile one-sided 25cm 6649 (6m)
65112	DENCOP Reinforcing profile 6523 (6m)
65113	DENCOP Cover strip 6528 (6m)
65114	DENCOP Fluted corner 6648 (6m)
65115	DENCOP Flexface foil reinforcing profile raw 7144 (6m)
67011	DENCOP CTS Flexface profile bar foil secure wedge (6m)
67102	DENCOP CTS Flexface profile clamp. buckle - clip (6m)
722016513	DENCOP Aluminum "L" profile 20x16,5x1,3mm (6m)
73010	DENCOP Aluminium profile for furniture anodized (6m)
75011	DENCOP Aluminium profile one-sided formed 130mm anodized 5124 (6m)
75016	DENCOP Aluminium profile one-sided removable 130mm anodized 5125 (6m)
75021	DENCOP Aluminium profile double-sided formed 156mm anodized 5128 (6m)
75051	DENCOP Removable frame 16,5mm anodized 5123 (6m)
75056	DENCOP Removable frame 21mm anodized 5126 (6m)
75058	DENCOP Removable frame for clamping profile anodized 6274 (6m)
75101	DENCOP One-sided fix. straight profile 72mm anodized 6177 (6m)
75106	DENCOP One-sided removable straight profile 72mm anodized 6178 (6m)
75111	DENCOP One-sided formed straight profile 110mm anodized 5611 (6m)
75116	DENCOP One-sided removable straight profile 110mm anodized 5612 (6m)
75121	DENCOP double-sided formed straight profile 140mm anodized 5427 (6m)
75126	DENCOP double-sided removable straight profile 140mm anodized 5428 (6m)
75401	DENCOP Aluminium profile universal formed 80mm anodized 9195 (6m)
75401b	DENCOP Aluminium profile universal formed 80mm white RAL9010 9195 (6m)
75406	DENCOP Aluminium profile one-sided removable 80mm anodized 9194 (6m)
75408	DENCOP Aluminium profile double-sided removable 80mm anodized 9193 (6m)
75411	DENCOP Aluminium profile universal formed 120mm anodized 8759 (6m)
75416	DENCOP Aluminium profile one-sided removable 120mm anodized 8758 (6m)
75418	DENCOP Aluminium profile double-sided removable 120mm anodized 9306 (6m)
75421	DENCOP Aluminum profile double-sided formed 150mm anodized 8757 (6m)
75426	DENCOP Aluminum profile double-sided removable 150mm 8756 (6m)
75451	DENCOP Removable straight 20x20mm frame anodized (6m)
76000	DENCOP Reinforcing profile raw 35x35mm 6490 (6m)