



SEALIUM®

Sheets and plates

Description

This specification defines the properties and characteristics of Sealium® marine grade aluminium alloy, delivered by Alcan Marine as sheets or plates.

Created and registered by Alcan Marine, Sealium® optimises the overall productivity of shipbuilders and the performance of vessels in general as it makes them more robust, safer, and user-friendly.

In just a few years, Sealium® has become the international industry reference for fast ferries.

Chemical composition

%	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Zr	other (max.)
min.				0.7	4.0					each: 0.05
max.	0.25	0.25	0.20	1.0	5.2	0.25	0.40	0.15	0.20	total: 0.15

Remainder: Al.

(Limits are in percent maximum unless stated otherwise).

Applications

Sealium® may be used wherever a stronger welded aluminium structure is desired, from hulls to superstructures. Marine structures benefit from the excellent corrosion resistance offered by Sealium®.

Smaller boats (< 50 m) benefit from improved scantlings, which translate into structural weight savings on patrol craft, increased strength on workboats or added interior space in luxury yachts. Larger vessels (> 50 m) profit from the increased strength and improved fatigue behavior of Sealium®. Cruise ship superstructures can be lightened further while improving stability and not compromising strength or corrosion resistance.

Advantages

15 % higher welded yield strength than standard 5083 alloy:

- Increased margin of safety from same scantlings.
- Significant weight savings from optimized scantlings.

Proven improved corrosion resistance.

Increased fatigue strength.

Same usage properties as 5083 alloy:

- Formability: same cutting, bending and shaping.
- Welding: no change in welding procedure, consumables or heat induced deformation.

Greater recycling value for the entire Sealium® welded assembly.

Thickness

Thickness range			
standard		on request	
mm	in.	mm	in.
th ≤ 50	th ≤ 1.97	50 < th ≤ 80	1.97 < th ≤ 3.15

Corrosion resistance

Sheets or plates made of Sealium® marine grade aluminium alloy offer a guaranty of intergranular and exfoliation corrosion resistance for severe marine applications as described in ASTM B928 (marine hull construction or marine applications where frequent or constant direct contact with sea water is expected). Accelerated tests and marine exposure (air and immersion) as well as experience have proven the long term corrosion resistance of Sealium®. Sealium® offers a better mechanical resistance on welded components than standard alloy 5083 with a good or better corrosion resistance.



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Mechanical properties

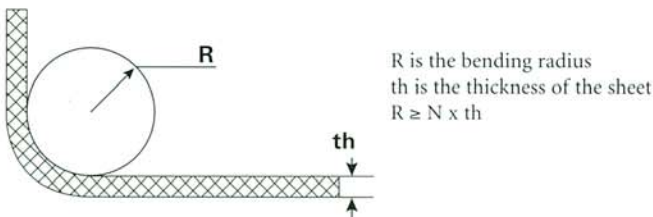
Thickness Range (mm)	R _{p0.2} (MPa)	R _m (MPa)	A %
3 ≤ th ≤ 50	220	305	10

Thickness Range (in.)	R _{p0.2} (ksi)	R _m (ksi)	A %
0.125 ≤ th ≤ 2	32	44	10

Minimal mechanical properties as per Alcan specification IS 5423. As information, welded Sealium® shows a R_{p0.2} minimal value of 145 MPa or 21 ksi to be compared to 125 MPa or 18 ksi for standard 5083 alloy. This value is considered by the main classification societies.

Bending properties

Sealium® sheets (th < 12.5 mm or 0.492 in.) are capable of being bent cold through an angle of 90 deg. around a pin having a radius equal to N times the thickness (th) of the sheet without cracking.



The certified minimum bending radius is given in the following table:

Thickness		Certified minimum bending radius
mm	in.	
2 < th ≤ 3	0.079 < th ≤ 0.118	$R \geq 2.0 \times th$
3 < th ≤ 6	0.118 < th ≤ 0.236	$R \geq 2.5 \times th$
6 < th ≤ 12.5	0.236 < th ≤ 0.492	$R \geq 4.0 \times th$

Type approval

Sealium® sheets/plates have been approved by the major classification societies :

- American Bureau of Shipping, USA (ABS)
- Bureau Veritas, France (BV)
- Det Norske Veritas, Norway (DNV)
- Germanischer Lloyd, Germany (GL)
- Lloyd's Register of Shipping, UK (LR)
- Nippon Kaiji Kyokai, Japan (Class NK)
- Registro Italiano Navale, Italy (RINA)

Standard manufacturing capabilities of Alcan Marine

Thickness		Max Width		Max Length	
mm	in.	mm	in.	mm	in.
4 ≤ th ≤ 4.5	0.157 ≤ th ≤ 0.177	2 260	89	15 000	590.55
4.5 < th ≤ 8	0.177 < th ≤ 0.315	2 400	94.5	15 000	590.55
8 < th ≤ 10	0.315 < th ≤ 0.394	2 400	94.5	12 500	492.13
10 < th ≤ 12.7	0.394 < th ≤ 0.5	2 400	94.5	10 350	407.48
12.7 < th ≤ 50	0.5 < th ≤ 1.97	3 050	120.1	*	*

* to be agreed on a case by case basis.

Contact us for non-standard dimensions. Specific tolerances and properties are available upon request.

Reference specification

Alcan Marine specification: IS 5423.



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The present document may under no circumstances be considered contractually binding. The information it contains is purely indicative and may under no circumstances be considered binding on Alcan or its subsidiaries, nor may it be used to contradict national or international regulations on the use, calculation or construction of aluminium alloy structures. It is the user's responsibility to check the accuracy of the information, refer to specialist works and contact experts of the Alcan group and those skilled in the field prior to use.



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