

Brief Description of Transfer of Technology

on

Aluminium-Magnesium Based Alloy Sheets and Plates for Superstructures in Naval Warship

1. Description of the technology

The technology involving optimization of aluminium-magnesium-manganese-chromium based DMR291A alloy composition, formulation of various thermal and deformation process parameters including homogenization treatment, hot rolling parameters to realize plates in M temper, cold rolling parameters and post cold rolling annealing cycle to realize sheets in H24 temper has been developed. The resultant materials are weldable and not susceptible to stress corrosion cracking and exfoliation corrosion. The materials meet the tensile and other mechanical property requirements for the targeted applications.

2. Application areas

This technology has been developed and demonstrated at the industrial scale. The resultant materials (having thicknesses ranging from 0.9 to 30 mm) met all the property requirements for use in the manufacture of superstructures of naval warship.

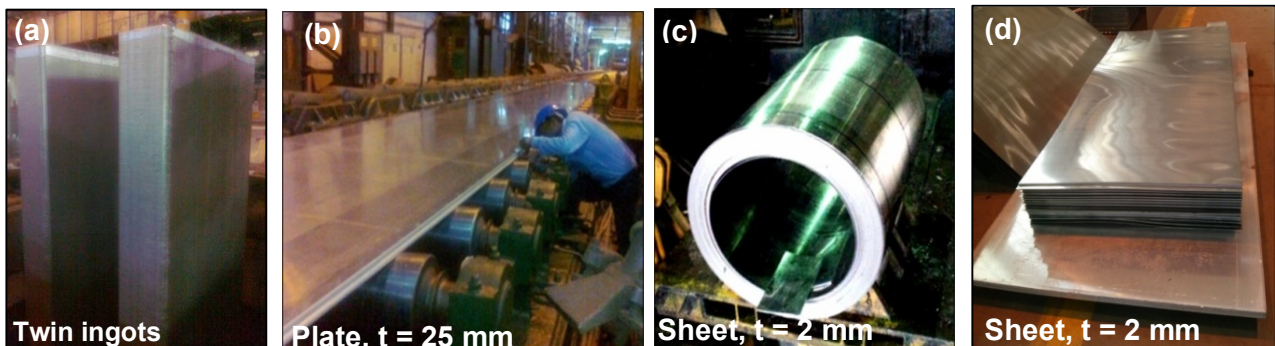
3. Its USP-such as certifications and test results etc.

- The *Table* below shows the tensile properties of the sheets in H24 temper and those of the plates in M temper.

Typical tensile properties of the indigenized Al alloy AA5086			
Alloy & temper	0.2% PS (MPa)	UTS (MPa)	% Elongation (GL = 50 mm)
DMR291A-H24 sheets (t = 2 mm)	(235 min.) 258-268 (L) 254-265 (LT)	(300 min.) (352 max.) 337-345 (L) 330-337 (LT)	(5 min.) 11-14 (L) 9-12 (LT)
DMR291A-M plates (t = 30 mm)	(105 min.) 127-130 (L) 123-127 (LT)	(240 min.) 275-280 (L) 265-267 (LT)	(9 min.) 22-27 (L) 25-27 (LT)

- These materials have been accepted by the competent authority of the Indian Navy, and a naval construction document: NCD 0291 Part I Issue 1, September, 2014 has been issued by Directorate of Naval Architecture (DNA), Integrated Headquarters (IHQ), MoD (Navy).

4. Photographs of semi-products / components / final products



Al-Mg alloy in the form of (a) as-cast ingots, (b) M plate (t = 25 mm), (c) sheet in coil form (t = 2 mm) & (d) H24 sheets cut to the desired size of 2500 (l) x 1350 (w) x 2 mm (t)