

Brief Description of Transfer of Technology
on
Aluminium-Zinc-Magnesium Based Alloy Sheets and Plates Having Desired Strength and High Stress Corrosion Cracking (SCC) Resistance for Military Bridging System

1. Description of the technology

The technology involving optimization of copper-free aluminium-zinc-magnesium-manganese-zirconium alloy composition and formulation of a novel aging heat treatment for the production of sheets and plates of the alloy having thicknesses in the range of 4 mm to 20 mm has been developed. These materials possess a combination of desired strength [0.2% PS = 300 MPa (minimum)] and high stress corrosion cracking resistance [%IACS \geq 40 minimum].

2. Application areas

This technology has been developed and demonstrated at the industrial scale. The technology has been assessed in terms of structural tests of Sarvatra Bridging system wherein the sheets and plates were utilized to make structural parts of the bridge.

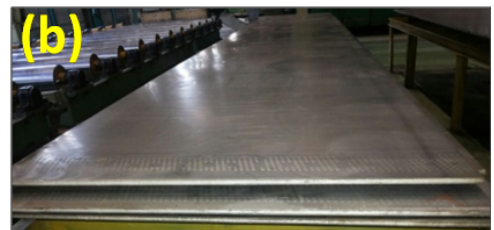
3. Its USP-such as certifications and test results etc.

Tables 1 & 2 show the tensile properties of the indigenized copper-free 7xxx-T7x51 sheets and plates without and with the novel aging treatment.

Table 1: Typical tensile properties of the indigenized copper-free 7xxx-T7x51 alloy sheets & plates <i>without the novel aging treatment</i>				
Alloy & temper	Electrical conductivity (% IACS)	0.2% PS (MPa)	UTS (MPa)	% Elongation (GL = 50 mm)
7xxx-Tx51 t = 6 mm	39.20	(300 min.) 344-350 (LT)	(360 min.) 384-389 (LT)	(8 min.) 10-11 (LT)
7xxx-Tx51 t = 20 mm	39.40	(300 min.) 322-323 (LT)	(360 min.) 368-369 (LT)	(8 min.) 16-18 (LT)

Table 2: Typical tensile properties of the indigenized copper-free 7xxx-T7x51 alloy sheets & plates <i>with the novel aging treatment</i>				
Alloy & temper	Electrical conductivity (% IACS)	0.2% PS (MPa)	UTS (MPa)	% Elongation (GL = 50 mm)
7xxx-Tx51 t = 6 mm	40.6	(300 min.) 321-341 (LT)	(360 min.) 375-388 (LT)	(8 min.) 10-13 (LT)
7xxx-Tx51 t = 20 mm	40.2	(300 min.) 315-330 (LT)	(360 min.) 361-375 (LT)	(8 min.) 14-16 (LT)

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



Aluminium alloy sheets of thickness (a) 6 mm and plates of thickness (b) 20 mm in T7x51 temper



Photographs of selected parts of the bridge fabricated using the sheets and plates of the indigenized alloy in T7x51 temper.



Manufacture of Sarvatra bridges



Load testing of Sarvatra Bridge