

Brief Description of Transfer of Technology
on

Aluminium Alloy Armour Plates for Infantry Combat Vehicle/Armoured Vehicle

1. Description of the technology

The technology involving optimization of alloy composition, casting parameters, homogenization schedule and aging heat treatment for the production of plates of aluminium-copper-magnesium-manganese-zirconium-titanium-vanadium alloy (AA2519) for armoured vehicle applications is disclosed. Optimization of the aforementioned processes enables the production of sound cast slabs and the resultant heat treated plates of desired dimensions and having reproducible tensile properties with reduced in-plane strength anisotropy.

2. Application areas

This technology has been developed and demonstrated at the industrial scale. The technology has been assessed in terms of ballistic tests against the prevailing threat level of the armoured vehicles. These alloy plates may be utilized in combination with other armour materials for similar applications.

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

- The *Table* below shows the tensile properties of the indigenized AA2519-T87 plates.

| Tensile properties of the indigenized AA2519-T87 plates | | | |
|--|----------------------------|----------------------------|---------------------------|
| Alloy & temper | 0.2% PS (MPa) | UTS (MPa) | % Elongation (GL = 50 mm) |
| (Specification) t = 15 mm | (407 min.) 432-440 (L) | (455 min.) 480-485 (L) | (10 min.) 13-16 (L) |
| | (400 min.) 417-435 (LT) | (455 min.) 470-476 (LT) | (7 min.) 12-14 (LT) |

- The 15 mm thick plates of the alloy were subjected to ballistic tests against 7.62 x 54 mm AP (I) ammunition. The test requirement is 7.62 X 54 mm AP(I) at average proof velocity of 509 m/s. The tests showed 6% superior results with reference to MIL-STD-46192C (MR).



Top and bottom sides of the 15 mm thick AA2519-T87 plate subjected to the ballistic test against 7.62 x 54 mm AP (I) ammunition

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



Indigenized AA2519-T87 plate (t = 15 mm)