

Brief Description of Transfer of Technology

on

High Strength Aluminium Alloy Extrusions for the Manufacture of Hard Anodized Components for an Anti-tank Ammunition

1. Description of the technology

The technology involving thermal and extrusion processing of high strength, 7xxx series Al-Zn-Mg-Cu-Cr based DTD5124 alloy having suitable alloy composition, extrusion processing parameters and optimum aging heat treatments is disclosed. Optimization of the aforementioned process parameters enables the fully heat treated extrusions to have the acceptable width of the peripheral recrystallized layer, desired tensile properties and to develop the desired thickness of the hard anodic oxide coating on the machined components in an uninterrupted single step.

2. Application areas

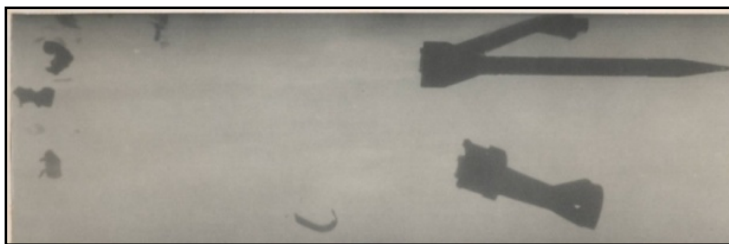
This technology has been developed and demonstrated at the industrial scale. This technology is currently in use for the manufacture of Tail unit and Sabot components of the fin stabilized armour piercing discarding sabot (FSAPDS) – an anti-tank ammunition for Indian Army. The components are machined from the heat treated extrusions and thereafter hard anodized for the targeted application.

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

- The *Table* below shows the tensile properties of the indigenized DTD5124-T651 extrusions.

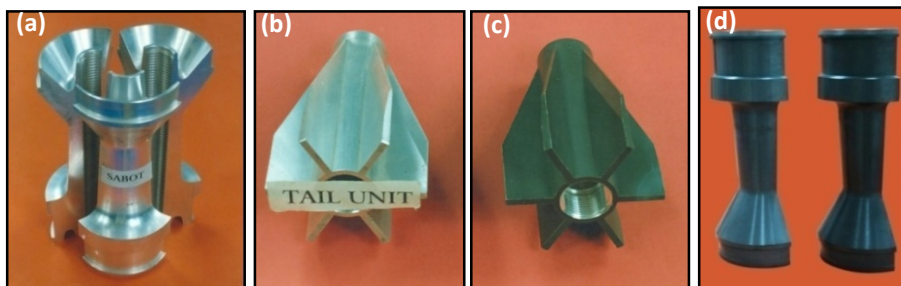
Extrusion diameter (mm)	0.2% PS (MPa)	UTS (MPa)	% Elongation (50 mm gauge length)
81 mm	(520 min.) 540-597	(580 min.) 590-621	(5 min.) 8-11n
116 mm	(490 min.) 524-572	(550 min.) 585-621	(5 min.) 7-11
135 mm	(490 min.) 510-520	(550 min.) 570-585	(5 min.) 7-9

- FSAPDS ammunitions fitted with tail fin and sabot made out of the indigenized DTD5124 materials were successfully test fired.



High speed photograph of a test fired Mk-I FSAPDS ammunition fitted with tail fin made out of the indigenized material.

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



Photographs of (a) Sabot and (b) Tail fin, machined out of indigenized alloy DTD5124 T651 extrusions, and (c) & (d) hard anodized tail fin and a couple of sabot petals, respectively.