

# **Manufacturing Technology for Gravity Diecast Aluminium Alloy REAR SHELL Component for Underwater Application**

Presently rear shell components made by conventional sand casting methodology are used for underwater application. However, such sand cast components poses severe quality risk due to high level of casting defects like porosity, blow holes, inclusions etc. and unable to withstand critical hydrostatic pressure tightness requirements for underwater application. In such scenario, the cast component rejection rates are very high, causing serious concern during production schedule at critical juncture. To overcome such quality issues, NMRL has developed a gravity die cast production methodology to manufacture high integrity sound rear shell component for underwater application.

## **Property features:**

- MOC : LM25 Al-Alloy
- Harness : 120–130 VHN
- UTS : > 250 MPa
- Internal Pressure tightness : > 60 Bar
- X-ray radiography : L1 Severity Level
- Hard Anodising : > 10 micron
- Surface finish : > 1.6 – 3.2 micron

## **Technology know-how available:**

- *Die design for permanent mould gravity casting*
- *Casting Simulation: Runner / Riser /gating system to ensure defect free casting.*
- *Melting/casting/heat treatment process flow chart to produce large size shell components (weight >25 kg, OD >300 mm, thickness >12mm)*
- *Product testing methodology to produce high quality pressure tight shell component*



## **Industry requirements for ToT**

- *Melting facilities such as induction or pit furnace*
- *General foundry facilities for shell casting*
- *Quality control lab equipment set-up*

**Al-Alloy Shell Finished Component for Underwater Application**