Aluminum alloys and their welding in marine applications: overview and Sri Lankan exposure

R G N De S Munasinghe and W U S Mirihanage*

Department of Materials Engineering, University of Moratuwa, Moratuwa

Aluminum alloys offer an extremely wide range of applicability, with a unique combination of excellent properties. Aluminum alloys can be categorized into a number of groups based on the primary alloying elements added to the base material. Such groups show different types of characteristics. These characteristics are used in various Aluminum alloy applications and fabrication process.

In most marine applications Aluminum – Magnesium alloys are used due to their advantages over other materials in marine atmosphere. Al 5083 is one of the widely used Aluminum alloy for marine constructions. It has a unique chemical composition and microstructure, which provide the relevant properties to the material.

Gas Metallic Inert Welding is the dominating welding process for joining Aluminum alloys. The welding process creates a Heat Affected Zone [HAZ], which is having different microstructure to the parent material as well as filler material. Generally, Aluminum welding is more prone to defects and those can only be reduced by using optimized process parameters and proper design.

In Sri Lanka, there are very limited Aluminum alloy applications found in marine sector, but many potential avenues are available for their use with benefits of economy and performance.

*wajira@eudoramail.com Tel: 011 2650465