

## Manufacturing of HEMRIN-EPDM based insulation system for Solid Rocket Motors

The Solid rocket propellant motor consists of about 80% by weight of energetic propellant, vital for rocket propulsion. The motor requires various other inert sub system for satisfactory performance. Insulation system is one of the most important subsystems for harnessing the predicted performance characteristics of a rocket motor. The major criteria of this system in case bonded rocket motors are low density, low thermal conductivity, low erosion rate, good mechanical properties and excellent bonding characteristics.

EPDM based insulation system is globally used in present day rocket motors and space shuttles because of its advantages like low specific gravity, superior thermal characteristics, improved low temp flexibility and wider range of compounding choices to reduce specific gravity. The most important property from defence application point of view is the long shelf life of the pure polymer.

Keeping the required characteristics in view, an insulation system for case bonded solid rocket motors based on Ethylene propylene diene rubber (EPDM) was developed at HEMRL under a Technology Demonstration project.

Low density (1.04-1.09 g/cc), very low erosion rate (0.06-0.09 mm/s) and excellent thermal, mechanical and interface properties were achieved with the developed insulation system. The insulation system is currently being used in most of the Indian defence rocket and missiles.