

IBAAS 2026 Technical Lecture Series: Lecture 5

Revolutionizing Safety in the Aluminium Industry: Advanced Patented Locking Nut Technology from HardLock Japan – The Japanese Engineering Edge

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ABSTRACT

The aluminium industry involves mechanically intensive processes across mining, refining, smelting, and downstream operations, where equipment is subjected to continuous vibration, cyclic loading, and thermal fluctuations. Maintaining joint integrity under such conditions is critical for ensuring operational safety and reliability.

Conventional fastening systems are prone to self-loosening under transverse vibration, as demonstrated by the Junker vibration test, leading to loss of preload and potential equipment failure. The patented locking nut technology developed by HardLock Industry utilizes a wedge-locking mechanism that ensures sustained preload and prevents rotational loosening, even under severe dynamic loading conditions.

This paper evaluates the performance of HardLock nuts in comparison with traditional fastening methods, focusing on vibration resistance, preload retention, and maintenance requirements. Applications in high-reliability sectors such as railway systems, along with industrial adoption by Maruti Suzuki, Tata Steel, and Jindal Steel, are referenced to demonstrate effectiveness.

The study highlights the potential of advanced wedge-locking technology to enhance safety, reduce downtime, and improve reliability in aluminium plant operations.

Speaker



Mr. Kiran N. Deshpande, Country Manager: India- (Technology Initiative) of Altek Europe Limited, UK

Mr. Kiran Deshpande is a Chemical Engineer from LIT Nagpur of 1986 Batch and MBA in Finance from NMIMS, Mumbai University.

He worked for many years with Petrochemicals, Complex Process Industries in reputed organizations as Godrej and Unilever. In Year 2010 He joined Pyrotek as MD and made his foray in Aluminium and Engineering. Later on, He worked for Morgan Advanced Materials UK as Global Head of Business in Aluminium and then with RIA Cast House Engineering GMBH as Country Manager for India.

He joined Altek Europe Limited as Country Manager: India for Technology Initiatives.

He is passionate in Aluminium Upstream Improvements such as Laser Cleaning of Anode Rods to save 10 milliVots savings and recently worked on EMS installation.

He is Problem solver and likes to work in team. He is a good teacher and had remained visiting Faculty to many Institutes. He is a member of Technical Committee of IBAAS as well as GDC TECH.