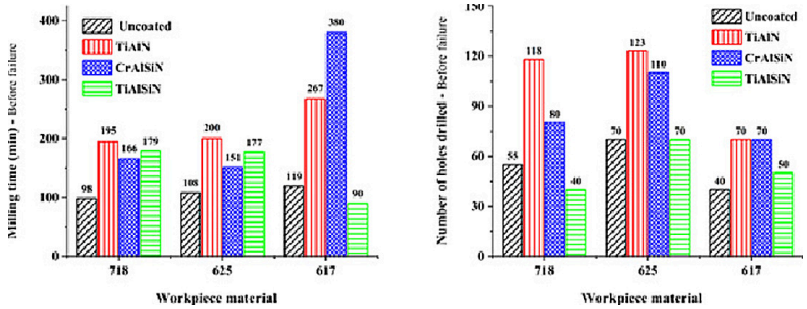
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VADAPALANI
8144337349

HELLO MADRAS
hellomadrasdaily@gmail.com
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Advanced protective coatings to improve machining of critical superalloys can help aerospace



CHENNAI – 5 Nov, 2026 Advanced protective coatings to improve machining of critical superalloys can help aerospace, energy & petrochemical sectors.

An advanced surface-engineering approach developed by scientists can help improve the durability of cutting tools used for machining super alloys.

This could help aerospace, energy and petrochemical sectors, where nickel-based superalloys are indispensable for components operating under extreme conditions.

Machining of super alloys for use in aircraft engines, power plants and petrochemical systems is a major manufacturing challenge. Nickel-based superalloys such as Inconel 718 (IN718), IN625 and IN617 possess exceptional strength and hardness which make them difficult to cut or shape. Rapid work hardening, poor thermal conductivity and strong chemical interaction with cutting tools accelerate tool wear, reduce productivity and increase manufacturing costs.

Scientists from the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad, an autonomous R&D Centre of the Department of Science and Technology (DST) have developed and evaluated two nanocomposite protective coatings—Titanium Aluminium Silicon Nitride (TiAlSiN) and Chromium Aluminium Silicon Nitride (CrAlSiN)—on widely used tungsten carbide cutting tools.