

TRACK 1: STRUCTURES AND MECHANICAL SYSTEMS
“QUALIFICATION OF ZINC-NICKEL AS ALTERNATIVE TO CADMIUM”

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ABSTRACT

The use of cadmium (Cd) in aerospace industry and Department of Defense (DoD) has been very successful for many years. The pros include excellent corrosion resistance, adhesion and lubricity characteristics. However, the cons are that it is toxic and carcinogenic. The United States (U.S.) and European Union (EU) therefore regulate the use of this metal. In U.S., Cd had been identified as occupational hazard in 1941 and regulations had increased steadily, with 7 Acts Control currently, to restrict Cd exposure to the environment. In EU, the use of Cd is banned in all plastics and some electronics. Its use is only allowed for aircraft and defence applications. Other countries are taking similar initiatives.

Zn-Ni alloy is today the most recognized alternative. The main benefits of electroplated Zinc-Nickel include: (1) wide range of thickness, (2) corrosion resistance similar to cadmium, (3) low impact on fatigue due to minimum hydrogen embrittlement, (4) meets most environmental restrictions, (5) applicable to components, consumables/fasteners, brush repair, connector. The paper will present the latest steps of evaluation by Air Force Research Laboratory of a selective application of Zinc-Nickel with a no drip equipment, for touch up applications well suited for MRO of military and civil aircrafts.

BIOGRAPHY OF SPEAKER


Mr Jean Pierre Chaix has 20 years of experience in the Aviation & Defence industry. His experience includes leading teams to study & offer new surface finishing applications for production to organizations like Airbus Aircraft, Defence and Helicopter Divisions, BAE Systems, Cobham, Dassault, HAL, SAFRAN, and for military MRO for various Air Forces in Europe, Gulf region, India and USA as well as for commercial MRO for LHT, Iberia, SAS, Emirates, Qatar Airways, UTC. He had also overseen projects to fulfil REACH requirements on aluminium and steel materials, projects involving aluminium and titanium anodizing, Zinc-Nickel coatings and the development of the dripless selective process with Dalistick product line and its automation.