

Cold Spray Nanostructured Aluminum for Corrosion Protection

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Perpetual technologies

The United States Navy and Marine Corps have numerous amphibious vehicles that are currently fabricated using Aluminum (e.g., 5083 alloy) structures. These large and costly structures are constantly being degraded by corrosion and wear. Bulk samples of nanostructured aluminum alloy have shown superior resistance to localized corrosion attack as compared to its microstructured counterpart. Recently, a newly developed non-cryogenic milling (NCM) process has demonstrated the ability to produce larger quantities of metal-base nanostructured powders in a faster and more economical way. Cold spray has been identified as the best means of depositing dense metal-base nanostructured coatings without changes to its composition and fine grain structure. Some of the preliminary results from the cold spray application of NCM nanostructured aluminum alloy will be presented.