Emerging Industrial Opportunities for Cold Spray

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Cold spray as a technology has now been around for a quarter of a century. In this time, the process understanding of cold spray has advanced remarkably and is well understood mechanistically for metal on metal coatings. And while equipment innovations are ongoing, there are now mature and robust commercial machines capable of performing a wide range of industrial coating applications. The equipment advancements and process understanding developments over the past two decades have been an important part of getting cold spray ready for the mainstream marketplace. There is however, another very important component of the technology maturation cycle that is required in order to achieve mainstream acceptance. It is the identification of large-scale applications where the technology is more cost effective and/or better performing than competing technologies. The first and most obvious application, which has been identified almost from the very beginning, is the surface repair of metallic components for wear and corrosion damage. This application alone represents enormous potential as cold spray transitions into the mainstream repair and overhaul market. There are also a number of emerging applications which also have the potential to be disruptive and transformative. They include dissimilar metal cladding and chrome plating replacement applications, anti-microbial copper and copper alloy coatings to combat the spread of infectious disease, and active leak repair for energized systems. These applications will be discussed, in addition to the broader environmental benefits of increasing use of cold spray technology globally. In fact, when the full environmental benefits of widely adopting cold spray are more broadly understood, in terms of total energy savings, reduction of CO2 emissions, and the elimination of toxic fumes and emissions from the work place for cold spray processes, then it is expected that cold spray will gain even greater support in terms of both public policy and investment.

Bio

Dr. Christian Widener is co-founder and Chief Technology Officer of VRC Metal Systems, which designs and manufactures cold spray equipment and develops and transitions cold spray processes for repair and new manufacturing applications. He has been actively investigating cold spray processes for repair and refurbishment since 2011 and has been working with solid-state metals processing and joining technologies for more than 15 years. He has over 85 publications and international conference proceedings on friction stir welding, cold spray, advanced manufacturing, and nanomaterials.