

Improving Additive Manufactured Parts with Aluminum Ion Vapor Deposition.

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Additive manufacturing (AM) is gaining more prominence each year. The industry is witnessing the development of new 3D printing methods and an increase in the number of parts made from AM materials. Aerospace companies like Boeing also use 3D-printed titanium parts, which could save millions of dollars in cost.

However, despite AM becoming more widely adopted and trusted, the process still has some questions. The primary challenge is developing cost-effective heat treatment processes for AM parts. Heat treatment is necessary for AM parts to achieve the desired dimensions and physical properties. For those who want to manufacture AM parts on a large scale, the challenge is finding ways to do so cost-effectively. One solution emerging for surface improvement and corrosion enhancement of AM parts is aluminum ion vapor deposition (IVD). IVD is a physical vapor deposition process that applies pure aluminum coating to various parts. It eliminates surface imperfections and improves metal corrosion resistance.

This paper will discuss the advantages of the IVD process in mitigating surface imperfections and providing corrosion and dissimilar metal protection. While exploring ways to refine heat treatment processes for AM parts, we will examine the IVD method for improving the corrosion resistance of the AM parts.