

In-Process Monitoring for Laser Metal Deposition

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Introduction

As metal additive manufacturing adoption continues to expand from prototyping and demonstrator components to production components, quality parts and part-to-part replication become necessity. With the aerospace sector being one of the most predominant users of producing components with additive manufacturing and the need to scale to very large parts that are often several feet or more in size, technologies that can offer higher deposition rates are required. Laser metal deposition (LMD) or offers deposition rates and scalability required but lack the analytics, data and installation base as the powder bed systems provide. In order to provide insight into quality of the build during processing, in-process monitoring can be utilized throughout the build.

Laser Metal Deposition Overview

Laser Metal Deposition (LMD) is a technology being adopted to augment, and in some cases replace, traditional manufacturing methods for the remanufacturing, laser cladding, and 3D printing of metallic parts.

The Laser Metal Deposition (LMD), also known as Directed Energy Deposition (DED) or Direct Metal Deposition (DMD), process utilizes a system in which metallic powder(s) contained in one or more hoppers are blown through a deposition head and heated with a laser to produce a metallic bead. Employing a motion system, the metallic bead is laid down and then layered up to build a part or add material to an existing part.

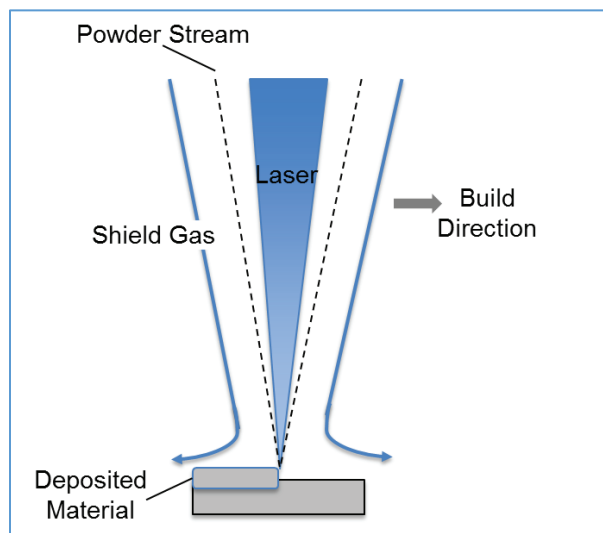


Image: A coaxial deposition head deposits material onto a substrate or existing part