

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Advancements in Materials Applications and Rapid Prototyping (9)

Author: Mr. Francois Prinsloo
CSIR National Laser Centre, South Africa, fprinsloo@csir.co.za

HIGH SPEED LASER BASED ADDITIVE MANUFACTURING AND REFURBISHMENT

Abstract

Modern additive manufacturing (AM) traces back to the mid 1980s with the advent of stereolithography. In the late 1980s and early 1990s a plethora of AMs appeared. Over the ensuing twenty years, the research community has applied these processes and process variations in novel ways to attack a wide variety of research and manufacturing problems in a diverse number of technical areas.

Laser Additive Manufacturing (LAM) is an emerging manufacturing technology that lends itself to the development of processes and components for unique ceramic, alloy, and light metal materials like Titanium. This innovative technology is being used successfully for research and development as well as the refurbishment and production of finished goods for the aerospace and medical industries.

In South Africa, research in this area commenced in 2002, and following the establishment of the necessary expertise and infrastructure, participation in large R&D programmes like FANTASIA (Flexible And near Net-shape generative manufacturing chainS and repair techniques for complex-shaped Aero-engine parts) followed. This has led to the development of industry directed manufacturing and refurbishment facilities.

This presentation will deal with the above as well as the work currently being done at the CSIR National Laser Centre(NLC) on new concepts and systems that can significantly increase the speed at which Titanium components can be manufactured for industry.