



AMLAPS

Advanced Metal Laser Additive Prototyping System



DEPARTAMENT OF MECHANICAL
AND METALLURGICAL
ENGINEERING



INDUSTRIAL SECTOR
METALWORKING
INDSUTRY



DEVELOPMENT LEVEL
TRL 4

PROBLEM



One of the most common problems faced by companies that use equipment or machinery is having either insufficient or excessive inventories of spare parts. Manufacturing parts through additive manufacturing or 3D printing can address this problem by reducing the costs of maintaining adequate inventory and the long lead times associated with importing parts. Various types of metal 3D printers can currently manufacture highly complex parts in a wide range of materials. However, printing speeds are slow, part dimensions are limited, and the resulting parts have low mechanical strength.

SOLUTION

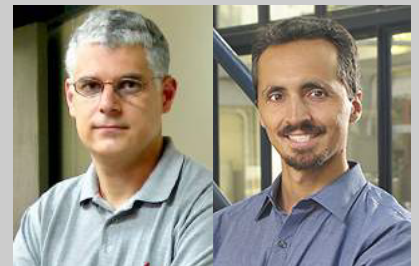


AMLAPS is a new metal 3D-printing technology. It uses the Selective Laser Melting (SLM) additive manufacturing technique, in which a laser melts layers of metal powder to form a three-dimensional part, together with a polar (circular) coordinate system instead of Cartesian coordinates (X, Y, Z). This enables continuous printing, reducing manufacturing times and improving the mechanical properties of the parts.

MARKET



There is strong interest in metal 3D printing across manufacturing, mining, energy, space and aerospace, healthcare, automotive, forestry, and other industries. AMLAPS can print various types of parts up to 14 cm in diameter and 1.5 cm in height.



Professor(s)
Jorge Ramos and Giancarlo
Troni

Intellectual property
Patent application in progress

Development status
A functional prototype has been used to print small parts. Its design, electrical system, and software are being improved to create a new prototype capable of printing larger parts (16 cm in diameter and 25 cm in height).

ADVANTAJES



Faster printing, reducing processing time by 40%-50% and increasing energy efficiency by 15%-20%.



Increases part strength and improves performance under real-world operating conditions.



Works with different metal alloys, including steel, cobalt-chromium, titanium, and aluminum, as well as non-metallic materials such as polymers.



Uses only the metal powder that becomes part of the finished component, optimizing raw-material use and reducing operating costs.