



Pure Copper processed by Electron Beam Melting (EBM) technology for industrial applications

DESCRIPTION OF THE TECHNOLOGY

AIDIMME has developed the parameters setup for processing pure-Copper by means of an Additive Manufacturing (AM): Electron Beam Melting (EBM). This AM technology enables to melt metal powders for building parts with near full density from a 3d file. The powder of Copper is processed in a vacuum chamber reaching values of temperature close to 50% of the melting point of the metal alloy.

A research program in cooperation with GH Induction with expertise on Induction Heating aims to develop the process of pure Copper for producing induction coils by EBM in an industrial manner. The method for producing Copper coils for induction heating was patented by GH. AIDIMME has the rights to keep the

knowledge as trade secret and to expand this result to other industrial applications.

Despite the results achieved with this method for producing parts made of pure Copper are satisfactory for this industrial application, continuous enhancement of the process in progress not only will ensure an improvement of the method efficiency if not also the access to new industrial applications with similar or even more restrictive requirements. This opens a new horizon for processing pure Copper industrially.

MARKET APPLICATION SECTORS

-) Additive Manufacturing manufacturers
-) Aeronautical
-) Space
-) Tool makers - EDM electrodes
-) RF waveguides
-) Products which requires high electrical conductivity

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

The technology offers the following advantages and benefits:

-) The Electron Beam Melting process of the pure Copper exhibits properties close to commercial annealed ETP Copper in terms of chemical composition and physical properties
-) Creating novel geometries for thermal management systems
-) Increasing the durability of parts in comparison with casting, cutting and welding.
-) Ensuring dimensional repeatability and total adaptation to the workpiece.

CURRENT STATE OF DEVELOPMENT

TRL9



Pure Copper processed by Electron Beam Melting (EBM) technology for industrial applications

INTELLECTUAL PROPERTY RIGHTS

As per results obtained, GH Induction patented the method for producing induction coils by EBM¹. Meanwhile, AIDIMME has the rights to keep the knowledge as trade secret and to expand this result to other industrial applications.

COLABORATION SOUGHT

We look for companies interested in the following cooperation:

-) License agreement for the exploitation of this knowledge to other industrial application through know-how transfer, hardware upgrade and production of Copper parts.

RELATED IMAGES



Figure 1 Induction coils produced per build job by EBM.



Figure 1. Modified system Arcam A2 at AIDIMME

CONTACT DETAILS

NAME Luis Portolés Griñán
IT AIDIMME
ADDRESS: Avda. Leonardo Da Vinci 38. Parque Tecnológico de Valencia
POSTE CODE: 46980 / CITY: Paterna. (Valencia). España
Telephone: +34 96 131 85 59
E-Mail: lportoles@aimme.es
Web: www.aidimme.es

¹ WO/2016/079360. Magnetic inductor and production method