

(54) Title of the invention : INNOVATIVE APPROACH TO LASER CLADDING OF AZ61 MAGNESIUM ALLOY WITH INCONEL 625 POWDER THROUGH GREY RELATION ANALYSIS

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(71)Name of Applicant :
1)Mr. G. B. Sathishkumar
 Address of Applicant :Research Scholar, Department of Manufacturing Engineering, Annamalai University, Chidambaram, Tamil Nadu, India, 608002 ----

2)Dr. B. Asaithambi
3)Dr. V. Srinivasan
4)Dr. S. Ramanathan
5)Dr. B. Karthikeyan
6)Dr. T. Balamurugan
7)Dr. S. Sundaraselvan
8)Mr. C. Kaviarasu
9)Mr. R. G. Padmanaban
10)Mr. A. Joseph Arockiam
 Name of Applicant : NA
 Address of Applicant : NA
 (72)Name of Inventor :
1)Mr. G. B. Sathishkumar
 Address of Applicant :Research Scholar, Department of Manufacturing Engineering, Annamalai University, Chidambaram, Tamil Nadu, India, 608002 ----

2)Dr. B. Asaithambi
 Address of Applicant :Assistant Professor, Department of Manufacturing Engineering, Annamalai University, Chidambaram, Tamil Nadu, India, 608002 ----

3)Dr. V. Srinivasan
 Address of Applicant :Associate Professor, Department of Manufacturing Engineering, Annamalai University, Chidambaram, Tamil Nadu, India, 608002 ----

4)Dr. S. Ramanathan
 Address of Applicant :Professor, Department of Manufacturing Engineering, Annamalai University, Chidambaram, Tamil Nadu, India, 608002 -----

5)Dr. B. Karthikeyan
 Address of Applicant :Associate Professor, Department of Chemistry, Annamalai University, Chidambaram, Tamil Nadu, India, 608002 -----

6)Dr. T. Balamurugan
 Address of Applicant :Professor, Department of Mechanical Engineering, Arasu Engineering College, Kumbakonam, Tamil Nadu, India, 612 501 -----

7)Dr. S. Sundaraselvan
 Address of Applicant :Associate Professor, Department of Mechanical Engineering, Arasu Engineering College, Kumbakonam, Tamil Nadu, India, 612 501 -----

8)Mr. C. Kaviarasu
 Address of Applicant :Professor, Department of Mechanical Engineering, Arasu Engineering College, Kumbakonam, Tamil Nadu, India, 612 501 -----

9)Mr. R. G. Padmanaban
 Address of Applicant :Assistant Professor, Department of Mechanical Engineering, Arasu Engineering College, Kumbakonam, Tamil Nadu, India, 612 501 -----

10)Mr. A. Joseph Arockiam
 Address of Applicant :Assistant Professor, Department of Mechanical Engineering, Arasu Engineering College, Kumbakonam, Tamil Nadu, India, 612 501 -----

(57) Abstract :
 The proposed invention focuses on optimizing laser cladding parameters to enhance the surface properties of AZ61 magnesium alloy using Inconel 625 powder. By varying laser power, scanning speed, and powder feed rate, the study aims to maximize microhardness and minimize wear volume. The method employs a Taguchi orthogonal array design and grey relational analysis for multi-objective optimization. Experimental validation confirms the effectiveness of the optimized parameters, resulting in a durable and high-performance composite material. This invention offers a robust, efficient, and environmentally friendly solution for improving the mechanical and tribological properties of magnesium alloys, making them suitable for demanding industrial applications.

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