Investigation on the characterization of hot extruded AA7075 based metal matrix composites developed by powder metallurgy

Babu B1, Meinathan S2, Manikandan P3, Lingeswaran P4, Nanthakumar S5, Yasminebegum A5, Girimurugan R6\*

1Associate Professor, Department of Mechanical Engineering, Amrita College of Engineering and Technology, Nagarcoil 629 901, Tamilnadu, India.

2Assistant Professor, Department of Mechanical Engineering, Shree Venkateshwara Hi-Tech Engineering College, Erode 638 455, Tamilnadu, India

3Assistant Professor, Department of Mechanical Engineering, K S R Institute for Engineering and Technology, Tiruchengode 637 215, Tamilnadu, India

4Assistant Professor, Department of Mechanical Engineering, Shree Venkateshwara Hi-Tech Engineering College, Erode 638 455, Tamilnadu, India

5Assistant Professor (Senior Grade), Department of Mechanical Engineering, PSG Institute of Technology and Applied Research, Coimbatore 641 062, Tamilnadu, India

6Associate Professor, Department of Electronics and Instrumentation Engineering, Sree Vidyanikethan Engineering College, Tirupati 517102, Andhra Pradesh, India

7Assistant Professor, Department of Mechanical Engineering, Nandha College of Technology, Perundurai 638 052, Tamilnadu, India.

\*Corresponding Author: rgirimuruganmech@gmail.com

**Abstract**. Higher compressive stress and greater density after extrusion contribute to stronger bonds, which in turn improves mechanical and tribological properties were analyzed. In order to minimize manufacturing defects, a cosine-profiled die with mathematically precise contours was used in the thermo mechanical process. It was requested that more mechanical characterization tests, such as a compression testing and a three-point bending test, be directed to better define the material's density, hardness, and ductility. Before and after extrusion, the prepared AMCs were put through pin-on-disc (POD) wear testing, during which the RPM of the counter disc, load (N) and track diameter (mm) were varied to simulate different two-body dry sliding wear behaviors. Hot extrusion of AA7075 aluminium matrix composites (AMCs) was investigated for its effect on the materials' mechanical and tribological properties. These AMCs were manufactured by controlled atmospheric sintering, powder metallurgy and double axial cold compaction. The finely dispersed graphite (Gr) particles shear off at the tribo-surface, creating a solid lubricant that slows the rate of wear. The wear mechanism was found to be more complex when the loading and sliding velocities were increased.

References:

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