Hindawi
Journal of Nanomaterials
Volume 2022, Article ID 2312076, 6 pages
https://doi.org/10.1155/2022/2312076

*Research Article*

# Experimental Analysis on Tribological Characteristics of AZ60A/Gr/BN Magnesium Composites

**C. R. Mahesha,[1] R. G. Deshmukh,[2] Prashant Sunagar,[3] M. Chandrasekaran,[4] B. S. Praveen Kumar,[5] Kumar Pratyush,[6] Anitha Gopalan,[7] and Asefa Sisay[8]**

[1]*Department of Industrial Engineering & Management, Dr. Ambedkar Institute of Technology, Mallathahalli, Bengaluru, Karnataka 560056, India*
[2]*Department of Physics, Shri Shivaji Science College, Amravati, Maharashtra 444603, India*
[3]*Department of Civil Engineering, Ramaiah Institute of Technology, Bengaluru, Karnataka 560054, India*
[4]*Department of Mechatronics Engineering, SRM Institute of Science and Technology, Kattankulathur, 603203 Tamil Nadu, India*
[5]*Department of Mechanical Engineering, Presidency University, Itgalpur, Rajanakunte, Bengaluru, Karnataka 560064, India*
[6]*Department of Pharmaceutical Chemistry, SVKM's Institute of Pharmacy, Dhule, Maharashtra 424001, India*
[7]*Department of Electronics and Communication Engineering, Saveetha School of Engineering, SIMATS Chennai, 602105 Tamil Nadu, India*
[8]*School of Electrical and Computer Engineering, Kombolcha Institute of Technology, Wollo University, Ethiopia*

Correspondence should be addressed to Asefa Sisay; asefasis@kiot.edu.et

Received 16 February 2022; Accepted 23 April 2022; Published 31 May 2022

Academic Editor: Palanivel Velmurugan

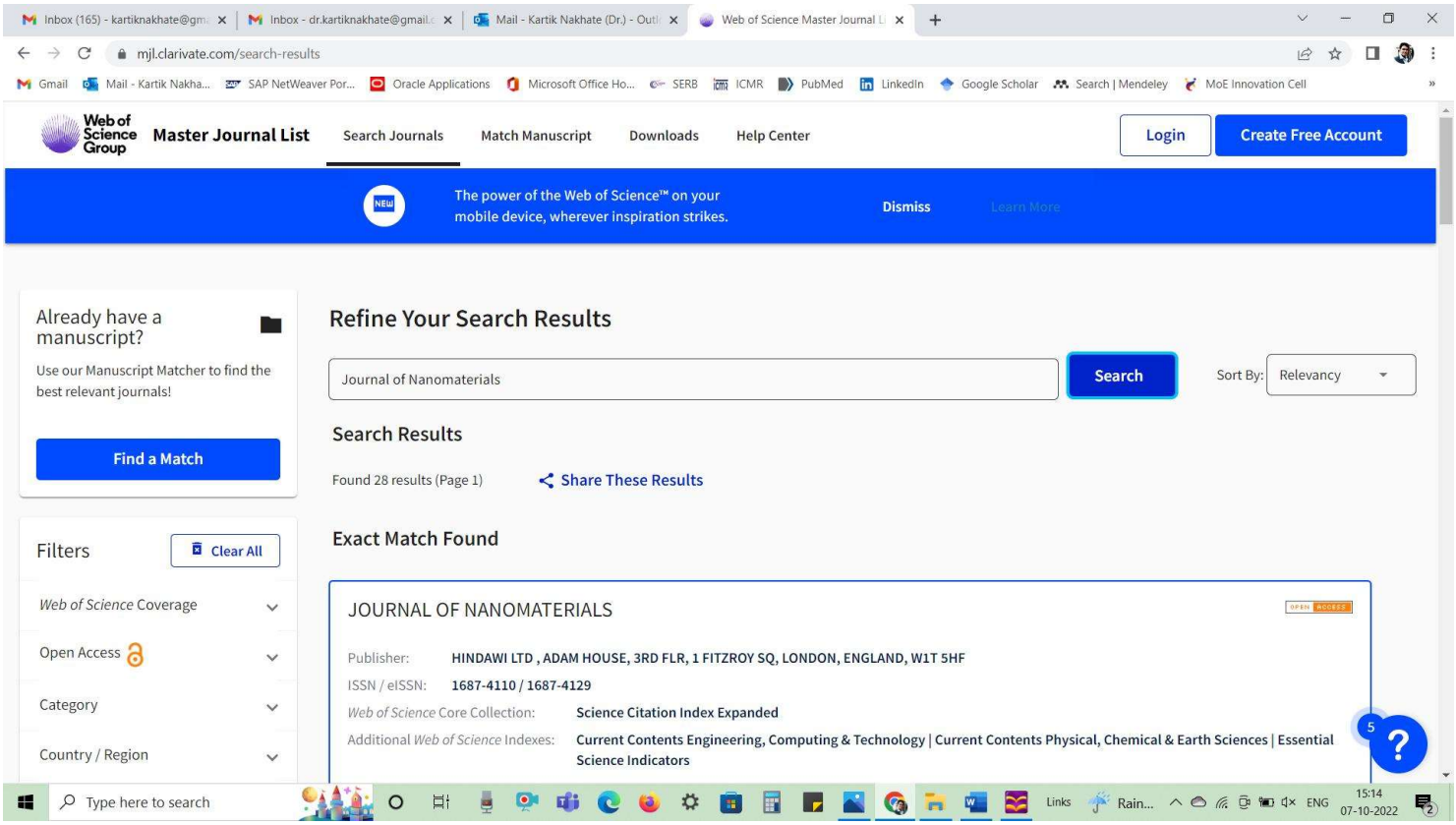
Copyright © 2022 C. R. Mahesha et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

In this particular instance, Taguchi methods are being used to look into how magnesium alloy (AZ60A) hybridized metal matrix composite wears. Using the stir casting method, they were made into the shape they were. Pin-on-disk tribometer instrument was used to figure out how much dry sliding wear happened on hybridized composites at different loads (30 N, 60 N, and 90 N), sliding speeds (1.045 m/s, 1.59 m/s, and 2.08 m/s), and compositions (1, 2, and 3 wt percent of each of boron nitride and graphite). We used the Taguchi strategy and the design of experiment method to look at how hybrid composites wear. The analysis of variance was used to look at the wear rate.

## 1. Introduction

Metal matrix composites have surpassed conventional alloys in areas including aerospace, automobiles, and mineral processing where high strength and stiffness are required [1]. To enhance the mechanical and tribological capabilities, hard ceramic particles or fibres that are evenly dispersed in the soft matrix phase can be added [2, 3]. Engineers may now customise the material properties to meet their specific requirements thanks to the emergence of composite materials as an important class of sophisticated materials. In terms of homogeneity, these materials differ from ordinary engineering materials [4–6]. Composites with metal particles in a matrix are most frequently made using the melt inclusion and stir casting methods [7]. With strong specific strength and modulus, these materials can be used in many technical applications everywhere sliding contact is anticipated [8].

As a result of its desirable characteristics, including less density and high specific strength, and excellent electrical and thermal conduction, magnesium alloys have emerged as prospective materials for industry, architecture, and transportation [9–11]. AZ60A is a common magnesium alloy with good mechanical and physical qualities that can used in many applications. This alloy is readily machinable and could be fused utilising fusion welding, and its application is commonly used on aerospace parts and other components. Depending on the expected service environment, degradation testing may be necessary after the material has been


Inbox (165) - kartiknakhate@gm
Inbox - dr.kartiknakhate@gmail.c
Mail - Kartik Nakhate (Dr.) - Outl
Web of Science Master Journal Li
mjl.clarivate.com/search-results
Gmail
Mail - Kartik Nakha...
SAP NetWeaver Por...
Oracle Applications
Microsoft Office Ho...
SERB
ICMR
PubMed
LinkedIn
Google Scholar
Search | Mendeley
MoE Innovation Cell
Web of Science Group
Master Journal List
Search Journals
Match Manuscript
Downloads
Help Center
Login
Create Free Account
NEW
The power of the Web of Science™ on your mobile device, wherever inspiration strikes.
Dismiss
Learn More
Already have a manuscript?
Use our Manuscript Matcher to find the best relevant journals!
Find a Match
Refine Your Search Results
Journal of Nanomaterials
Search
Sort By:
Relevancy
Search Results
Found 28 results (Page 1)
Share These Results
Exact Match Found
Filters
Clear All
Web of Science Coverage
Open Access
Category
Country / Region
JOURNAL OF NANOMATERIALS
OPEN ACCESS
Publisher:
HINDAWI LTD , ADAM HOUSE, 3RD FLR, 1 FITZROY SQ, LONDON, ENGLAND, W1T 5HF
ISSN / eISSN:
1687-4110 / 1687-4129
Web of Science Core Collection:
Science Citation Index Expanded
Additional Web of Science Indexes:
Current Contents Engineering, Computing & Technology | Current Contents Physical, Chemical & Earth Sciences | Essential Science Indicators
5
Type here to search
Links
Rain...
ENG
15:14
07-10-2022