



## Maharaja Agrasen Institute of Technology, Delhi Department of Mechanical and Automation Engineering

Department of Mechanical & Automation Engineering and Department of Mechanical Engineering, Maharaja Agrasen Institute of Technology organized an online webinar on the topic '**Experimental investigations on mechanical behaviour of friction stir welded aluminum based composites**' on 29<sup>th</sup> January 2022. The event was started with the welcome address of Prof. Neelam Sharma, Director, MAIT who enlightened us with her inspirational and encouraging words. She emphasized the significance of research for the benefit of the students and the faculty.

The main theme of the event was based on the research work carried out by Dr. Narinder kaushik during his PhD. Dr. Narinder kaushik is working as an Assistant Professor in the Department of Mechanical and Automation Engineering (MAE) and Mechanical Engineering (ME) at Maharaja Agrasen Institute of Technology, New Delhi. Dr Narinder kaushik is awarded with the Ph.D. degree from NIT Kurukshetra in the year 2019. He has done his M.Tech in Mechanical Engineering in the year 2009 from NIT Kurukshetra. Dr. Narinder kaushik has been involved in research on the composite materials characterization, wear analysis and FSW of AMC's. He has authored many research papers in International Journals and Conferences of repute.

Dr. Narinder kaushik presented a very informative talk on '**Experimental investigations on mechanical behaviour of friction stir welded aluminum based composites**'. The lecture focuses on the adoption of Friction Stir Welding (FSW), a green welding technology, for the welding of aluminum matrix composites. The talk started with the introduction of composite materials and introduction of FSW process. Further, the principle of FSW was very well explained along with the supporting literature. Dr. Narinder kaushik listed the various types of equipment utilized for achieving the research objectives. The speaker briefly explained the influence of microstructural features obtained after FSW on the mechanical and tribological properties of the FS welded joints. The lecture concluded with the future scope of the research work.


Finally, the webinar was ended with a Q & A session. More than 100 participants attended for the same and the event was a grand success.

## GUEST SPEAKER



**Dr. Narinder Kaushik**  
Department of Mechanical and Automation Engineering

Dr. Narinder Kaushik is presently working as an Assistant Professor in the Department of Mechanical and Automation Engineering at Maharaja Agrasen Institute of Technology, Delhi. He has been awarded the Ph.D. degree from National Institute of Technology, Kurukshetra (NITKRR). Prior to working in MAIT, he had worked at Vaish College of Engineering, Rohtak for 9 years summing his total teaching experience to 14 years. His research interests includes experimental and numerical aspects of fabrication of composite materials, wear analysis and tribological behavior of composite materials, and some novel approach in friction stir welding (FSW) etc. He has authored many research papers in International Journals and Conferences of repute. He is also in the reviewer board of some reputed international journals.



**MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY**  
AGRASEN CHOWK, SECTOR 22, ROHINI, NEW DELHI-110086

**DEPARTMENT OF MECHANICAL & AUTOMATION ENGINEERING & DEPARTMENT OF MECHANICAL ENGINEERING**

**PRESENTS**

**WEBINAR SERIES**


**DR. NARINDER KAUSHIK, SPEAKER**

**EXPERIMENTAL INVESTIGATIONS ON MECHANICAL BEHAVIOUR OF FRICTION STIR WELDED ALUMINUM BASED COMPOSITES**




### PRODUCTION OF AA6063/SiC AMC


(0%, 3.5%, 7%, 10.5% wt. % of SiC) using stir casting



Stirrer  
Electric resistance furnace



Permanent mold



Fabricated casting

### PIN-ON-DISC APPARATUS

DUCOM (TR-20LE)




Pin    Counter face disc    Load lever    LVDT    Pin specimen    Counter face rotating disc

### PIN-ON-DISC DRY SLIDING WEAR ANALYSIS

- The manufactured composite ought to have a decent wear protection performance, when it is suited in any application. Consequently, the impact of applied load, sliding distance and wt. % of SiC particles on the output response characteristics such as wear rate, specific wear rate and frictional force are researched.

$$\text{Volumetric loss} = \text{Height loss} \times \text{cross sectional area of pin}$$

$$\text{Wear rate (WR)} = \frac{\text{Volumetric loss } \text{mm}^3}{\text{Sliding distance } \text{m}}$$

### DEVELOPMENT OF FSW TOOLS

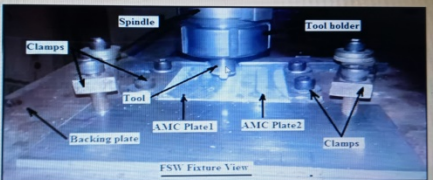




(a)    (b)    (c)

- The trials welds were carried out using tools of different profiles viz., square, cylindrical threaded and conical

### SPECIALLY DESIGNED FIXTURE TO PERFORM FSW



FSW Fixture View