

Tribology Laboratory

Faculty Coordinator: Dr. Suresh Kumar Reddy Narala (nskreddy@hyderabad.bits-pilani.ac.in)

Laboratory Technical Assistant: Mr. B. Laxman

Location: E -220



Welcome to the Tribology Laboratory at BITS Pilani Hyderabad Campus. The Tribology laboratory is equipped with number of sophisticated equipment & experimental setups to cater the needs of UG/PG students of diverse disciplines (Mechanical, Civil, Chemical, Biology, etc.) to study tribological behavior of various materials. It is now a mainstream field of science with key implications in biomedical, nanotechnology, alternative energies, and “green” methodologies. Tribology is a multidisciplinary field by nature because the interaction between surfaces can only be completely understood when considering the physics, chemistry, mechanics and materials of the interaction. The research focus of the laboratory is on the interfacial interactions of materials and energy dissipation of interacting materials. An extensive focus is placed on sustainable manufacturing techniques while improving overall machining process performance. The Tribology lab’s research efforts are enhanced through sponsored projects by national bodies like DST and CSIR. The Tool maker’s microscope, Pin-on-disc Tribometer, Four ball tester and Scratch tester are used to quantify various parameters during wear and tear. Thermal infrared camera and Oscilloscope are among other equipment being used in the lab. The Tribology lab has always witnessed a tremendous talent and interest from undergraduate, higher degree and graduate students.

The goals of the Tribology Lab are:

- Research on tribo-corrosion: sliding- and erosion-corrosion.
- Research on tribological problems related with dry and lubricated systems.
- Research on in-situ tribology.
- Research on new surface coatings and treatments for improved tribological performance.
- To support the industry in finding solutions related to wear, lubrication, friction, and maintenance.
- To educate engineers and scientists in tribological aspects.

PhD Students:

Completed:

(1) Dr. Uma Maheshwera Reddy, on “Studies on Development of Micro-Solid Lubricant Coating on Cutting Tools”.

In Progress:

(1) Mr. Sravan Kumar J, on “Machinability studies of metal matrix composites”.

(3) Mr. Rakesh Kumar G, on “Novel minimal SLM application method for performance improvement in turning”.

Higher Degree Dissertation Students:

Mr. Annup Darshan (Completed), Mr. Guru charan E (Completed), Mr. Marri Bhasker (Completed), Mr. S Karthikeyan (Completed), Mr. Avula Bhaskar (Completed).

First Degree Thesis Students:

(1) Mr. C. Vinod Reddy (Completed), (2) Mr. Pranay Raj (in progress), (3) Mr. Dinesh (Completed).

LIST OF EQUIPMENTS:

S. No.	Equipment/Make/ Specification	Utility
1	Pin-on-disc Tribometer	ME C342, ME F313, ME F243 DE G513 courses; PhD research; funded research; friction analysis support to many departments in the campus
2.	Four ball tester	
3.	Tool maker's microscope (Olympus STM6)	ME F313, ME F243 courses, PhD research support; Support to other departments.
4	Scratch Tester	Teaching support and PhD research support; Support to other departments.
5.	DEFORM-3D finite element modeling machining module	PhD research, HDD research and FDTS support
6.	ABAQUS finite element modeling software	PhD research, HDD research and FDTS support
7.	Xenon processor, DELL workstation with large display	PhD research, HDD research and FDTS support
8.	Thermal Imaging camera	Teaching support and PhD research support; Support to other departments, HDD research and FDTS support
9.	Oscilloscope (Digital phosphor, 500MHz, 2.5 Gs/S, 5m record length, 4-Ch, Color display)	PhD research, HDD research and FDTS support
10	Solid lubricant coating experimental setup	PhD research, HDD research and FDTS support
11	Syringe Pump	PhD research, HDD research

		and FDTS support
12	Load Cell	PhD research, HDD research and FDTS support
13	Weighing balance	PhD research, HDD research and FDTS support
14	Curing oven (up to 400°C)	PhD research support; Support to other departments, HDD research and FDTS support

Research Projects:

S. No.	Project		Principal Investigator	Status	Total Funding
1.	Development of novel coated tools for green machining	ABG (Aditya Birla Group)	Prof. Suresh Kumar Reddy Narala	Completed	Rs. 11,80,000 (2011-2013)
2.	Development of ES nano-solid lubricant coated tools for sustainable machining	CSIR (Council of Scientific & Industrial Research)	Prof. Suresh Kumar Reddy Narala	Completed	Rs. 18,52,000 (2012-2015)
3	Novel minimal SLM application method for performance improvement in turning	DST (Department of Science and Technology)	Prof. Suresh Kumar Reddy Narala	In progress	Rs. 34,85,768 (2013-2016)