

ADVANCE MICROMANUFACTURING LAB

at



About PEC - The PEC University of Technology, Chandigarh was originally established as Mugalpura Engineering College at Lahore (now in Pakistan) on November 9, 1921. The name of the college was later changed to MacLagan Engineering College and its started functioning under the name on March 19, 1924. In the year 1931, the college got affiliated to Punjab University, Lahore. After partition in 1947, the college was shifted to Roorkee (India) and was renamed as East Punjab College of Engineering. In the year 1950 the word East was dropped and it came to know by its present name – Punjab Engineering College. Towards the end of December 1953, the college shifted to its present campus in Chandigarh to function under Govt. of Punjab. In 1966, with the formation of Union Territory of Chandigarh, the college came under control of Govt. of India through Chandigarh Administration. In October 2003, the Govt. of India notified the Punjab Engineering College as a Deemed to be University and thereafter it became known as Punjab Engineering College.

Department of Mechanical Engineering- The Department of Mechanical Engineering at PEC University is as old as the Institute itself. The Department is continuously striving to achieve excellence in education, academic and industry oriented research to prepare the manpower that are globally competitive and capable of leading in industry, academia and government organizations in both India and abroad. Besides the Bachelor degree,

Department offer Master and Ph.D. programme also. The major research areas include Advanced/non-traditional machining processes, Micro manufacturing, CAD/CAM, MEMS, Soft computing in Design and Manufacturing, Composites, Bio-materials, Modeling and Computation in heat transfer, Internal combustion engines, Nanofluids, Mechanical Vibration and so on

Introduction- When it comes to machining micro-sized parts and features, especially ones that are less than 100µm, there is a limited selection of feasible manufacturing processes. Micro-EDM is a process that allows you to machine micro-sized parts accurately and precisely. However, micro-EDM is not just about using smaller sized electrodes on machines used to fabricate larger parts. For a successful micro-EDM process, machines require the necessary accuracy and precision. The DT-110 Hybrid µEDM machine has been engineered from day one to excel at micro-machining. What is unique about the DT-110 machine is the ability to perform multiple micro-machining processes on the same machine, allowing the machine to excel at hybrid µEDM. Hybrid µEDM is the utilization of two or more processes including EDM on the same machine to achieve highest levels of accuracy, precision and throughput. For example, with its patented hybrid µEDM technology, micro-sized electrodes can be fabricated directly on the DT-110 machine accurately and precisely using the micro-turning process. Other micro-EDM machines utilize Electrical Discharge Grinding (EDG) to fabricate micro-sized electrodes directly on the machine, which usually takes more than an hour. In contrast, with micro-turning, it will only take about a minute.

Features- CNC Hybrid Micro EDM Machine Tool for Micro Machining. Machine is capable of carrying out the following types of micro machining process/operation. **Technical Specifications** - The technical specification can be downloaded from the link as <http://mikrotools.com/hybriduedm/hybrid-%CE%BCedm-technical-specification>

Capabilities of EDM processes:

- Micro-Die Sinking Electrical Discharge Machining
- Micro-Wire Electrical Discharge Machining
- Micro-EDM milling
- Micro-Wire Electrical Discharge Grinding
- Micro-Block Electrical Discharge Grinding

Other processes:

- Micro-Turning
- Micro-Milling
- Micro-Drilling

Other silent feature of Machine

- PC based CNC motion controller with 0.1 micrometer(100nm) programming resolution
- Touch screen based graphic user interface (GUI)
- Optical linear scale feedback system with 0.1 micrometer resolution.
- High precision linear guide way with more than 350N/µm stiffness
- Precision ball screw drive system with lead of 2mm
- Electrically isolated spindle system for multi process micro machining
- Travel capacity: 200 mm (X axis), 100 mm (Y axis) and 100 mm (Z axis)
- Compact foot print: (3 m X 2 m)

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Objectives - Currently micro manufacturing is emerged as an important technology in the areas where miniaturization yields economic and technical benefits in biomedical, automotive, aerospace, space mission, optical, and similar industries. These industries demand parts with dimensions in the range of micrometers leading to the miniaturization of the machines and devices.

Job Work - The department invites the nearby industries and institution to make the use of the exceptional facility that has been created in the Adv. Manufacturing Tech. lab at PEC University of Technology Chandigarh. The Industries can get work done on their dies/moulds/products for producing microholes/micro features using any of the mentioned machining capabilities on the payment basis. Details in this regard can be discussed mutually.

Training Programmes: Further the nearby institutes can also be offered short term training programs to their Technical staff on the machine for their skill development and exposure to advanced machining technologies .Small batch of 10-15 trainees shall be run for imparting such training programs. The charges for training program shall be Rs.5000 for three days training program. Another objective of the course is to acquaint the participants, concerned with teaching, research, and industrial applications of micromachining, micro to nanofinishing, micro-fabrication with the principles, basic machine tools, developments, and research trends in the area of micro manufacturing processes. Arrangements will also be made for the hands-on experience of different software and Laboratory visit to demonstrate the state-of-the-art techniques, equipments and assisting tools commonly involved with modern day micro manufacturing practices.

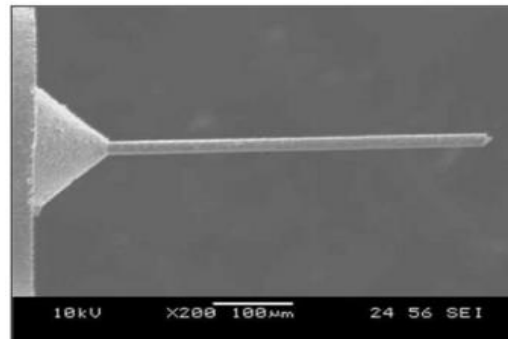
Speakers - The course lectures will be delivered by the faculty members of PEC University and other eminent speakers invited from premier institutions.

Mode of payment the registration fee should be sent by bank draft payable at the “State Bank of India, PEC Chandigarh” branch and drawn in favor of ‘Director PEC’ payable at Chandigarh.

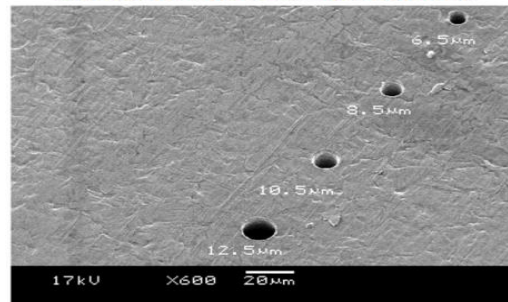
All queries in this regard may be addressed to

1. Prof. P.S Satsangi (9814798963)
2. Prof. D.R Prajapati (9876166331)

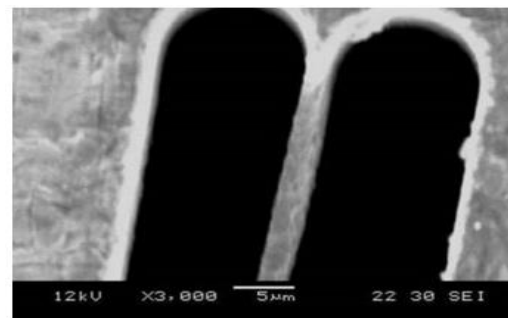
Sample part image



A 19µm graphite shaft made by Micro turning



Holes machined using the micro EDM process on 50 µm thick stainless steel plate.



Micro EDM Milling - A 10 µm slots on 50 µm SUS plate.

Application Form

1. Name
2. Position
3. Department
4. Institution / organization
5. Address
6. Email Address
7. Mobile num.
8. Telephone number
9. Educational back round
 - a. B.E b. M.E c. Ph.d
 - d. Other(Specify)
10. Field of specialization
11. Experience
 - a. Teaching
 - b. Industrial
 - c. Research
12. Gender
 - a. Male b. Female

(a) **For applicants from institutions**

Prof./Dr./Mr./Ms. _____
 _____ is an employee of our institute and his/her application is hereby sponsored. The applicant will be permitted to attend the Training course on “Micro manufacturing” at PEC University, if selected.

Date: _____ Designation _____

Signature of sponsoring authority Official Seal:

(b) **For applicants from industries and Government departments** The amount for the jobwork/Training Program is submitted as

DD No. _____ Date: _____

Bank: _____

Amount: _____ Signature of the Applicant

(Details of Industry/Deptt)

