Department of Mechanical Engineering

National Institute of Technology

Tiruchirappalli

Welding Facilities

Advanced Welding Laboratory

Laboratory comprises of

1. Cold Metal Transfer Welding Machine.
2. Plasma and Micro Plasma Welding Machine.
3. TIG Welding Machine.
4. Resistance Spot welding Machine
5. Roto Weld H – Mini
6. Pulsed Wire Feeder
7. Numerical Controller for Torch Movement.

Cold Metal Transfer Welding Machine (CMT) 	• Dissimilar welding. • Joining aluminium with steel and other metals. • Spatter free operation. • Very low heat input. • High deposition rate. • Light-gauge welding (0.3 – 0.8 mm) of aluminum sheets is also perfectly feasible.
Plasma and Micro Plasma Power Source 	• Welding amp range 0.5 – 80A • Sheet thickness from 0.1mm • Manual and Mechanized Welding
TIG Power Source 	• 400 A output, Multivoltage • Welds low-alloy and high-alloy steels, aluminium and non-ferrous metals. • Welding current range – 3 to 400 A. • Working Voltage TIG – 10.1 to 26V. **Operating modes** • 2-step mode, 4-step mode, Special 4-step mode & Spot welding **Base materials** Aluminium, CrNi, Special metals, Steel • **Displays** • Final (i.e. "end") current • Start arc current • Welding current (actual value) • Welding voltage (actual value)
Resistance Spot Welding Machine	

	• Microprocessor controlled 50 kVA 3 phase DC pedestal type
ROTO WELD H-MINI 	• Rotary Welding Machine especially for Pipe Welding. • This is an all-weather product which can produce circular welded parts. • Fully programmable.
PULSED WIRE FEEDER 	• Cold wire feeders are primarily used for gas tungsten arc welding (TIG) and plasma arc welding (PAW). • They can also be used in other applications where a controlled feed of wire is required such as a brazing operation.

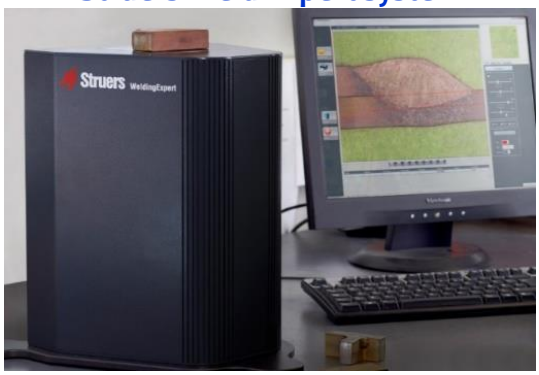
WIRE – EDM

(Specimen Preparation)

- Machining accuracy - 0.01mm.
- Best Surface Finish - Ra 1.25 to 1.75
- Inbuilt database for cutting different materials.
- Maximum Work Piece Thickness – 500 mm.
- Wire Diameter – 0.18mm.
- Kerf Width for Φ0.18 mm is 0.22 mm.

Specimens

Materials Testing Lab

Struers Weld Expert system 	Weld Expert is a full-featured imaging system engineered specifically for precise and rapid **weld bead measurement**. It is the most important new tool available for assuring welding quality.
Digital Rockwell Hardness Tester 	• Maximum Test Height – 225mm • 30 Rockwell Scales are present • 3 in 1 – Rockwell Scale + Brinell Scale + Superficial Scale. • Indenter – Diamond Cone 120°, Steel Ball of 1.58 and 3.17 mm.
Servo Controlled UTM	

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Suitable for tension, compression, flexure, shear and other tests to a maximum force of 50kN.
It has speed resolution of about 0.001 mm/min.
It has displacement resolution of about 0.0001 mm.

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<td>Universal Testing Machine – 1000kN
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100kN capacity universal testing machine with tensile test, compression test and bend test attachments.
Loading accuracy as high ± 1%
Printer & PC graphs enable to study the behavior of the material.
Clamping jaws for round specimens of Diameters 10-20mm and 20-30mm.
Clamping jaws for flat specimens of thickness 0-10mm and 10-20mm.

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<td>Direct Shear Apparatus, Hand Operated for Rocks
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<td>The equipment is used for Direct shear laboratory test in Rock Samples. The test measures peak & residual Direct Shear Strength as a function of stress normal to the sheared plane. The equipment can be used for testing Core, Lump specimens.</td>
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Direct Shear Apparatus for sand and gravel 	• Capacity – 50kN. • The equipment is used for determining the shear strength of Sands and Gravels. • Displacement Vs Load graph is obtained digitally.
Spring Deflection Tester 	• To determine stiffness of the spring and modulus of rigidity. • Capacity – 50kN. • Accuracy - ± 1% • Motorized loading operation.
Digital Impact Testing Machine 	• Izod and Charpy Digital Impact Testing Machine.