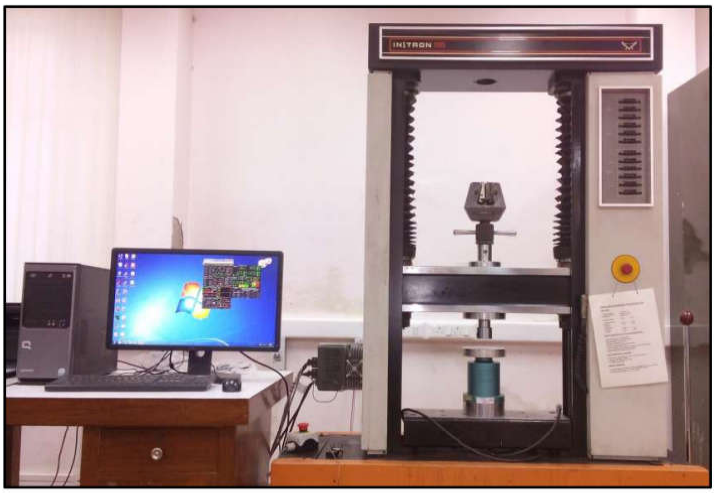
Mechanical Testing Lab

Advanced Center for Materials Science

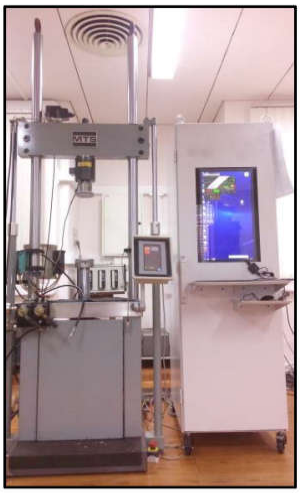
Testing Facilities In-House

IIT Kanpur

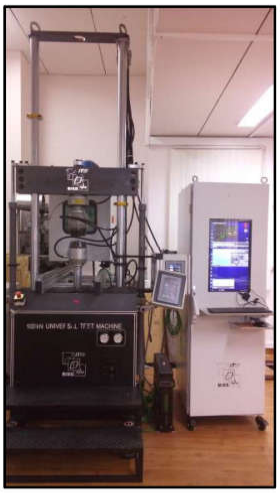
Photographs of Available Facilities
at Mechanical Testing Lab



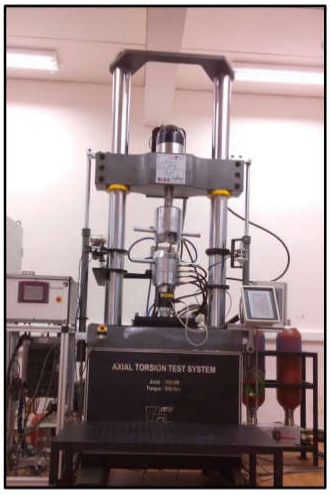
Instron-1195



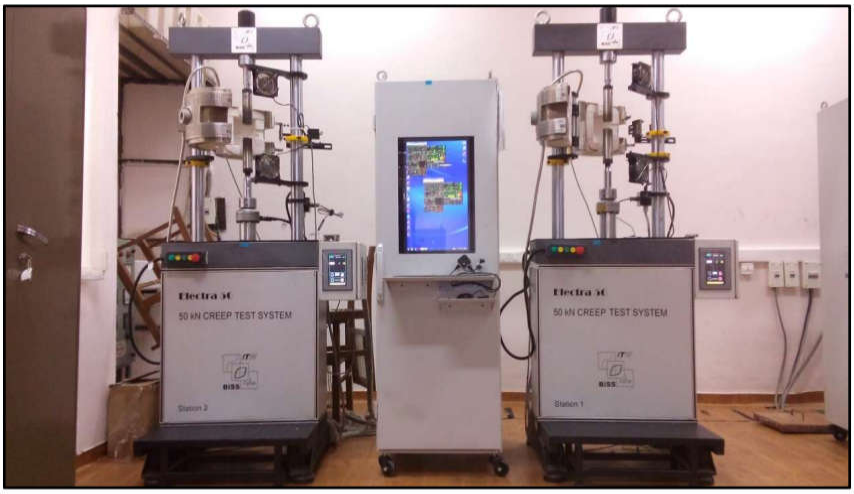
MTS-610



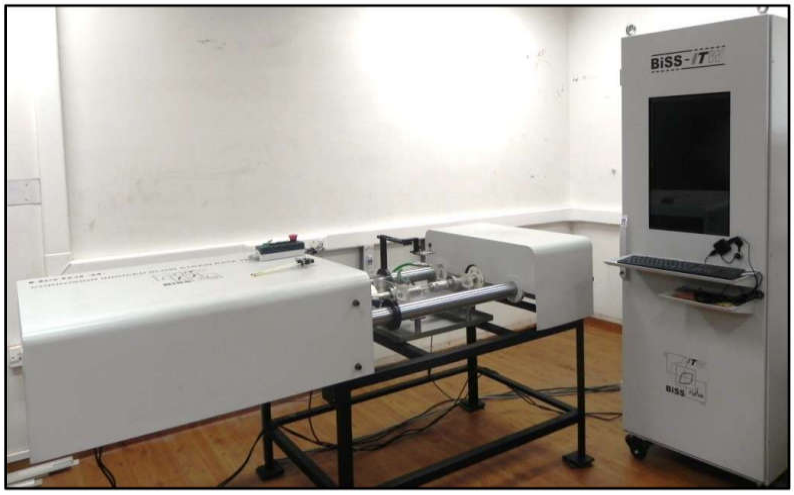
UTM-100kN



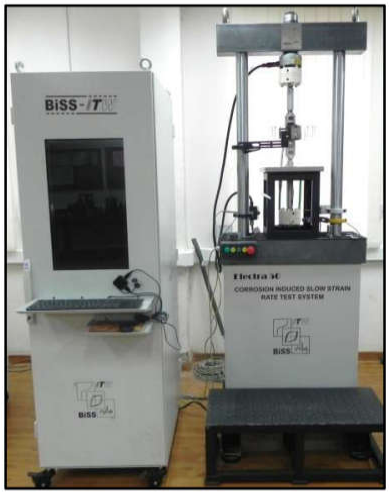
Axial Torsion



SSRT-Vertical



SSRT-Horizontal



SSRT-Vertical

Instron-1195

Machine Specifications:

Type of Machine	Screw-driven
Maximum Capacity	100 kN
Minimum Load can be Tested	1 gm
Type of Tests can be Performed	Tensile, Compression, 3-pt Bend, 4-pt Bend, Loading-Unloading and Oil dip tensile (upto 400 °C in silicon oil)
Types of Material can be Tested	Metallic, Plastic, Ceramic, Rubber and Fiber
Available Load Cells	Tensile 'or' Compression:- 200 N, 800 N, 2 kN, 100 kN Tensile only:- 50 gm Compression only:- 50 kg, 2 kg
Types of Sample can be Tested	Round, Flat, Sheet, Wire, Rod or Tubular
Crosshead Speed (Strain rate)	Max:- 40 mm/min Min:- 0.005 mm/min
Crosshead Displacement	Max:-700 mm
Type of Test Control	Stroke, Load and Strain
Type of Extensometers	GL 25 mm (travel 2.5 mm), GL 25 mm (travel 25 mm), COD- 10mm and Transverse- 12.5 mm

Sample Dimensions:

	Max	Min
Round Specimen		
(a) Length	350 mm	50 mm
(b) Diameter	12 mm	
Flat Specimen		
(c) Length	350 mm	20 mm
(d) Thickness	12 mm	> 0 mm
(e) Width	25 mm	No limit

MTS-810

Machine Specifications:

Type of Machine	Hydraulic
Maximum Capacity	100 kN
Minimum Load can be Tested	0.001 kN
Type of Tests can be Performed	Tensile, Compression, Fatigue, 3-pt Bend, 4-pt Bend, Loading-Unloading, FCP & J1C/K1C
Temperature Tests	High Temp:- upto 1000 ^{o}C (Tensile and Fatigue)
Types of Material can be Tested	Metallic, Plastic, Composite and Rubber
Available Load Cells	Tensile & Compression:- 10 kN & 100 kN
Types of Sample can be Tested	Round, Flat, Sheet, Wire and Compact-Tension (CT)
Crosshead Speed (Strain rate)	Max:- 70 mm/sec Min:- 0.001 mm/min
Crosshead Displacement	Max:- +/- 80 mm
Type of Test Control	Stroke, Load and Strain
Type of Extensometers	Room Temp:- GL 12.5 mm (travel 2.5 mm), GL 12.5 mm (travel 0.5 mm) High Temp:- GL 25 mm (travel 5 mm) & COD- 5 mm

Sample Dimensions:

	Max	Min
Round Specimen		
(a) Length	700 mm	65 mm
(b) Diameter	25 mm	4 mm
Flat Specimen		
(c) Length	700 mm	65 mm
(d) Thickness	25 mm	0.5 mm
(e) Width	50 mm	No limit

Universal Test Machine

Machine Specifications:

Type of Machine	Hydraulic
Maximum Capacity	100 kN
Minimum Load can be Tested	0.01 kN
Type of Tests can be Performed	Tensile, Compression, 3-pt Bend, 4-pt Bend, Loading-Unloading, Fatigue, FCP, J1C/K1C & DIC
Temperature Tests	Low Temp:- -20 °C to 180 °C (Tensile, Compression and Fatigue) High Temp:- upto 1000 °C (Tensile and Fatigue)
Types of Material can be Tested	Metallic, Plastic and Composite
Available Load Cells	Tensile & Compression:- 5 kN, 10 kN & 100 kN
Types of Sample can be Tested	Round, Round-Threaded (M8,M10 & M12), CT, Flat and Sheet
Crosshead Speed (Strain rate)	Max:- 60 mm/sec Min:- 0.001 mm/min
Crosshead Displacement	Max:- +/- 80 mm
Type of Test Control	Stroke, Load and Strain
Type of Extensometers	Room Temp:- GL 12.5 mm (travel 2.5 mm), GL 12.5 mm (travel 0.5 mm) High Temp:- GL 25 mm (travel 5 mm) & COD- 5 mm

Sample Dimensions:

	Max	Min
Round Specimen		
(a) Length	700 mm	65 mm
(b) Diameter	20 mm	2 mm
Flat Specimen		
(c) Length	700 mm	65 mm
(d) Thickness	18 mm	0.5 mm
(e) Width	50 mm	No limit

Axial Torsion Test Systems

Machine Specifications:

Type of Machine	Hydraulic
Maximum Capacity	Axial:- 100 kN & Torque:- 500 Nm
Minimum Load can be Tested	0.001 kN
Type of Tests can be Performed	Tensile, Tension-Torsion, Torsion-360^{o} (Low cycle), Low-cycle Fatigue
Temperature Tests	High Temp:- upto 1000 ^{o}C induction heater
Types of Material can be Tested	Metallic, Plastic, Composite and Rubber
Available Load Cells	100 kN Bi-axial
Types of Sample can be Tested	Round and Flat
Crosshead Speed (Strain rate)	Max:- 70 mm/sec Min:- 0.001 mm/min
Crosshead Displacement	Max:- +/- 75 mm
Type of Test Control	Stroke and Load

Sample Dimensions:

	Max	Min
Round Specimen		
(a) Length	300 mm	92 mm
(b) Diameter	25 mm	3 mm
Flat Specimen		
(c) Length	300 mm	92 mm
(d) Thickness	18 mm	0.5 mm
(e) Width	70 mm	No limit

Creep Test Systems

Machine Specifications:

Type of Machine	Electrically Actuated
Maximum Capacity	50 kN
Minimum Load can be Tested	0.01 kN
Type of Tests can be Performed	Creep, Tensile and Compression
Temperature Tests	High Temp:- upto 1000 °C (Creep and Tensile)
Types of Material can be Tested	Metallic
Available Load Cells	Tensile & Compression:- 50 kN
Types of Sample can be Tested	Round-Threaded (M12 & M16)
Crosshead Speed (Strain rate)	Max:- 375 mm/min Min:- 0.005 mm/min
Crosshead Displacement	Max:- +/- 80 mm
Type of Test Control	Stroke, Load and Strain
Type of Extensometers	High Temp:- GL 25 mm (travel 5 mm)

Sample Dimensions:

	Max	Min
Round-Threaded Specimen		
(a) Length	120 mm	92 mm
(b) Diameter	16 mm	12 mm

Slow Strain Rate Test Systems

Machine Specifications:

Type of Machine	Electrically Actuated
Maximum Capacity	50 kN
Minimum Load can be Tested	0.01 kN
Type of Tests can be Performed	Tensile with Corrosion (solution)
Types of Material can be Tested	Metallic
Available Load Cells	50 kN
Types of Sample can be Tested	Round-Threaded (M6, M10, & M12) Pin-Loaded Flat sample
Strain rate	Max:- 10^{2} /sec Min:- 10^{-7} /sec
Crosshead Displacement	Max:- +/- 80 mm
Type of Test Control	Stroke, Load and Strain
Type of Extensometers	GL 25 mm (travel 5 mm)

Sample Dimensions:

	Max	Min
Round-Threaded Specimen		
(a) Length	120 mm	60 mm
(b) Diameter	12 mm	6 mm
Pin-Loaded Flat Specimen		
(a) Length	120 mm	60 mm
(b) Width	40 mm	20 mm
(c) Thickness	8 mm	>0 mm