

**SMEC
Research & Consultancy
Brochure**

2022

**SCHOOL OF MECHANICAL
ENGINEERING**



VIT[®]

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Introduction

The School of Mechanical Engineering (SMEC) was established in 2010, completing a decade of imparting knowledge. SMEC is supported by all its stakeholders who constantly aim at reaching new milestones year in and year out. The school has scaled up its reputation through its service and persistence in its attempt. The sustained effort to enhance its service led to the accreditation of the school as the best mechanical engineering college in Chennai. The school aims to creating and shaping the new generation of mechanical engineers through their innovative teaching methods and practical knowledge.

Course Specialization offered at VIT

The syllabus is re-designed year after year to accommodate various changes in the industry. The school has established itself as the best mechanical engineering college in Chennai through its interdisciplinary approach and innovative teaching methods. The school offers three undergraduate and two postgraduate programs:

- B. Tech. in Mechanical Engineering
- B. Tech. in Mechatronics and Automation
- B. Tech. Mechanical Engineering with specialization in Electric Vehicles
- M. Tech. in CAD/CAM, and
- M. Tech. in Mechatronics

CAD/CAE Solutions

Software Infrastructure

SOLID WORKS 2019_20

ANSYS 20.0 with research multicore licenses

DFMA 9.4

CATIA V6

HYPER WORKS 12.01

ABACUS 6.12-2

ADAMS 2012

CNC TRAIN SIMULATION

NX CAD CAM EXPRESS

MINITAB 16 ACADEMIC

MATLAB 2018

LMS VIRTUAL LAB

LS DYNA

Hardware Infrastructure

More than 100 high end workstations

Four multi-core high end computational facilities

Capabilities:

Comprehensive CAD / CAM / CAE / RPT solutions

CAD and 3D modelling services on the leading CAD software such as CATIA, SolidWorks

CAE Solutions include Finite Element Analysis, Kinematics and Multi Body Dynamics, Crash and Drop Test simulation, Fatigue Analysis, Durability Tests, renewable Analysis, Design Optimization, Computational Fluid Dynamics

Training for engineers in CAE theory & software tools

Few completed projects include...

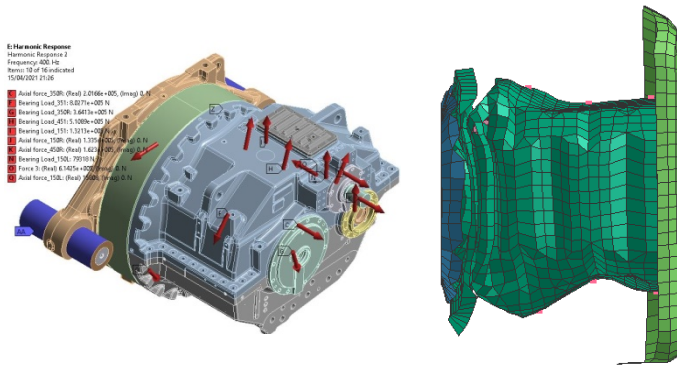
Design and development of SRM motor, IFB industries, Bangalore

Failure studies for air-conditioning component, Hanon, Chennai

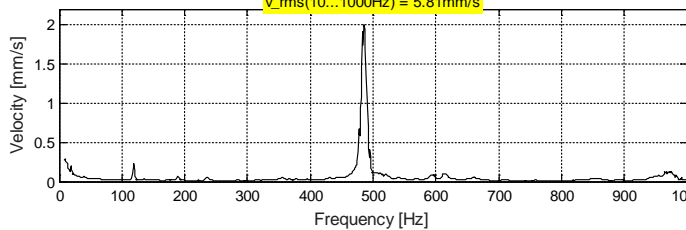
Design & development of tidal turbine, STAC, Chennai

01 Harmonic Response
Harmonic Response 2
Frequency: 400 Hz
Result: 102 of 102 indicated
15:58:02(2) 21:58

■ Axial Force_320R (Rev) 2.0766e+005 (New) 0 N
■ Bearing Load_351 (Rev) 8.8271e+003 N
■ Bearing Load_350R (Rev) 9.8481e+003 N
■ Bearing Load_401 (Rev) 5.5008e+003 N
■ Bearing Load_351 (Rev) 1.3213e+004 N
■ Axial Force_150R (Rev) 1.3316e+004 N
■ Axial Force_050R (Rev) 1.6221e+004 (New) 0 N
■ Bearing Load_150L (Rev) 7.9919e+003 N
■ Force 3_0 (Rev) 6.1465e+002 (New) 0 N
■ Axial Force_150L (Rev) 1.0226e+004 (New) 0 N



v_rms(10...1000Hz) = 5.81mm/s



Applications: Automotive, Aerospace, Light and heavy engineering, Customer goods, Power and energy sectors

Low Speed Wind Tunnel Equipped with 30 HP Axial Fan



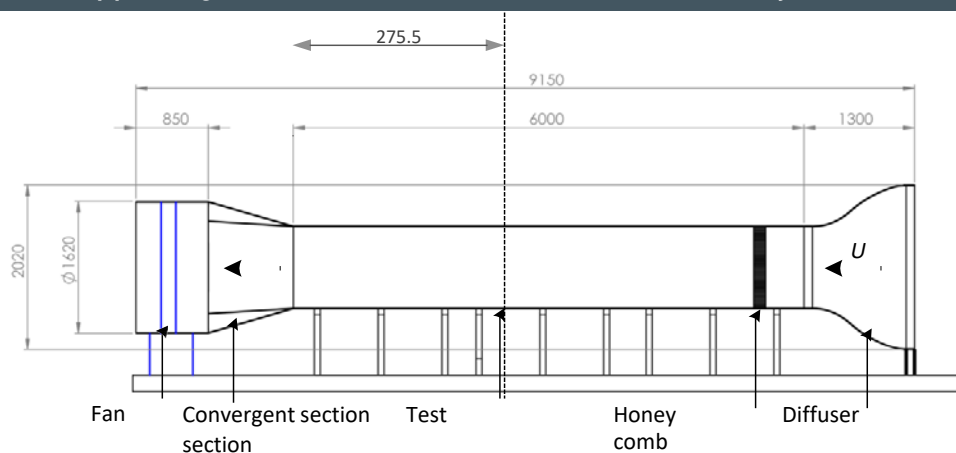
Figure Low speed wind tunnel equipped with 30 HP Axial fan (with a test section of 6 m x 1m x 1m and an overall length of 12 m)

Specifications of the wind tunnel

Test section size	6m (L) x 1m(B) x 1m(H)
Fan	Axial flow with variable pitch
Power rating	30 HP & 960 rpm
Max. velocity at the test section	25 m/s
Min Turbulence at the test section at 10 m/s	6 %
Test bed surface roughness	0.02
Wind tunnel type	Suction & Blower / Atmospheric Boundary Layer Conventional and Unconventional Buildings,
Application	Bridges, wind turbines, wind load on solar panels, Automotive Aerodynamics etc.,

32 Channel Pressure scanner

Pressure scanner system, 14-bit, including 1x 1 kPa transducer card (8 channels), supporting a maximum of 64 channels from Surrey Sensors Limited.



Wind Tunnel



Figure Low speed wind tunnel equipped with 6 HP fan (with a test section of 1m x 0.3m x 0.3m and an overall length of 14 m)

Specifications of the Wind Tunnel

Test section size	1m (L) x 0.3m(B) x 0.3m(H)
Power rating	6 HP
Max. velocity at the test section	25 m/s
Min Turbulence at the test section at 10 m/s	3 %
Test bed surface roughness	0.02
Wind tunnel type	Suction & Blower
Application	Small sized wind tunnel models, scaled down buildings.

Specifications of the wind tunnel:

- 32 Channel Pressure scanner
- Pressure scanner system, 14-bit, including 1x 1 kPa transducer card (8 channels), supporting a maximum of 64 channels from Surrey Sensors Limited.
- Flow visualization using Laser
- Computational Facility for CFD studies comprising ANSYS FLUENT.

Road Simulator Setup for Condition Monitoring Application

Make:

Model: Road Simulator Setup for Condition monitoring Application.

Specification /Features:

- Suitable for making condition monitoring study of LMV on the road simulator setup
- Suitable for making the vibration analysis of Suspension systems of LMV



Road Simulator Setup

Capabilities:

- The road simulator can produce different independent oscillation
- The simulator consists four Independent cylinders which is capable of producing various vertical oscillation using PLC
- Suitable for making the condition monitoring study, suspension study, etc.

Applications:

1. The simulator can be used to produce various oscillation using PLC controller
2. The LMV can be allowed to rotate the wheel on the freewheel up to 276 rpm (30 kmph)
3. The setup is more suitable for making brake condition monitoring, suspension condition monitoring, Engine condition monitoring

Virtual Vehicle Testing & Environment Simulator

Make: Cockpit package standard

Model: Carmaker/officepro with Logitech G29 Driving force Racing wheel with customize mounting (Steering wheel, Pedals, Force Shifter)

Specification /Features:

- Cockpit Package Standard allows a wide range of USB compliant human interface devices (HID) to be interfaced with CarMaker.
- Generic USB devices that offer driving capabilities are commonly placed into the joystick device category



Capabilities:

- Operating a real vehicle in a virtual environment
- Virtual development and testing of passenger cars and light-duty vehicles
- Development and validation of advanced driver assistance systems and automated driving functions with virtual test driving
- Virtual test driving with CarMaker enables the seamless development, calibration, test and validation of entire systems in the whole vehicle within realistic scenarios
- Extensive sensor model portfolio for all widely used sensor technologies (radar, lidar, ultrasound and camera) for the validation of automated and autonomous driving functions

Applications:

Adopt the automotive systems engineering approach and test your virtual prototype as a whole vehicle with CarMaker. In closed loop tests, the systems can complete entire development, test and validation cycles up to the final approval of the respective function or component.

Industrial Automation using PLC, HMI and SCADA

Make: Siemens

Model: SIMATIC S7 1200, SIMATIC S7 1500, HMI TP700, TIA Portal 12

Specification /Features:

- Industrial grade Programmable controllers with Analog and Digital I/O Modules.
- Integrated Human Machine Interfaces
- TIA Portal Software modules for programming, interfacing and controlling automation solutions including SCADA features.



Capabilities:

- Compact controllers with integrated I/Os, technology and communication functions
- Networking options via various communication standards by means of integrated functions (PROFINET, Modbus, etc.) or add-on modules (IO-Link, AS-i, etc.)
- SIMATIC HMI TP700 Panel, touch operation, 7" widescreen TFT display, 16 million colors, PROFINET interface, MPI/PROFIBUS DP interface, 12 MB configuration memory, Windows CE 6.0, configurable from WinCC Comfort V11

Applications:

Development of Industry grade control systems for different processes using advanced PLCs, HMIs and Software.

Vibration/Sound Measurement using NI9234

Make:

Model: NI 9234 with C9191 CDAQ Wi-Fi Chassis (50k Samples / second).

Specification /Features:

- Can be used for capturing Sound and Vibration signals.
- Data transfer through wireless DAQ



CDAQ (C9191) Wireless Chassis

Capabilities:

- The vibration / sound signals can be measured through wireless transmission
- Used for making post processing the signals



NI 9234 Sound / Vibration Card

Capabilities:

- Both Sound and vibration / sound signals can be measured
- Capable of transferring signals up to 50 kilo-samples per second

Applications:

1. Useful for making NVH studies on various machine components and engineering elements
2. Useful for various condition monitoring application using machine learning.

CNC Lathe (IoT feature enabled)

Make: ACE DESIGNERS LTD

Model: SJ 500 XL

Specification /Features:

X x Z axis stroke	180 x 500 mm
Maximum turning diameter	350 mm
Maximum turning length	500 mm
Maximum spindle speed	3500 rpm
Number of stations	8
OD turning tool size	25 x 25 mm



Capabilities:

- IoT enabled predictive Alerts – for spindle load, spindle speed and temperature monitoring
- E-Shop X (provide access with drawings, CNC Program, process sheets, step by step guides for poka-yoke validation)
- 3 Jaw power operated hollow high speed chuck nominal $\varnothing 250\text{mm}$
- Spindle motor power 7.5 kW
- Maximum boring diameter 40 mm
- Achievable surface finish
 - Stainless Steel – $0.34\ \mu\text{m}$
 - Alloy steel – $0.58\ \mu\text{m}$

Applications:

High precision machining (turning, drilling, boring and tapping) of difficult to machine materials (like OHNS and D2 tool steel materials); Machining of lightweight materials and hybrid-composites. etc.

Die-sinking Electrical Discharge Machine (EDM)

Make: ELECTRONICA INDIA PVT LTD

Model: SMART- S 50 ZNC

Specification /Features:

Worktable Dimension: 550 x 350 mm

Traverse (X * Y *Z) : 300 x 200 x 250 mm

Maximum Job Weight : 300 Kg

Maximum Electrode Weight : 100 Kg

Maximum Job Height above Table : 250 mm



Capabilities:

- Manufacture dies and molds (from HcHcr, OHNS and D2 tool steel materials) used in automotive industry
- Machining of difficult to machine materials such as Ti6Al4V, WC, TiC, metal foam, etc.
- Machining of light weight material used in bio-medical industry
- Best surface roughness achievable
 - For Steel and hardened steel (R_a 0.29 μm and R_a 0.5 μm ; [R_{max} 5.5 μm] respectively)
 - For carbide (R_a 0.6 μm ; R_{max} 3.1 μm)
 - MRR achieved on Ti-Gr2 material – 66.3 mm^3/min

Friction Stir Welding (FSW) Machine

Make: Custom design (R V Machine Tools, Coimbatore)

Model: Customized

Specification /Features:

Maximum Load 30kN

Maximum Power 11kW

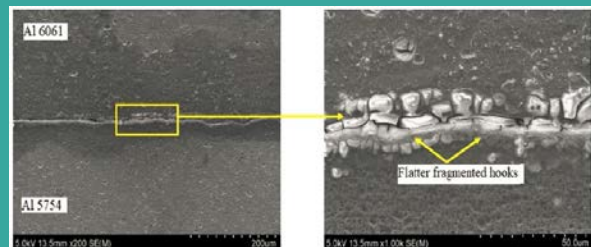
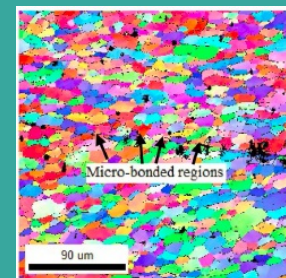
Tool Rotational Speed 1300rpm



Capabilities:

- Joining of dissimilar materials of varying thickness
- Joint composed of hooks at the weld interface. Hooks are mechanical and metallurgical bond formed at interface

FSW of Al 5754 with Al 6061



Applications:

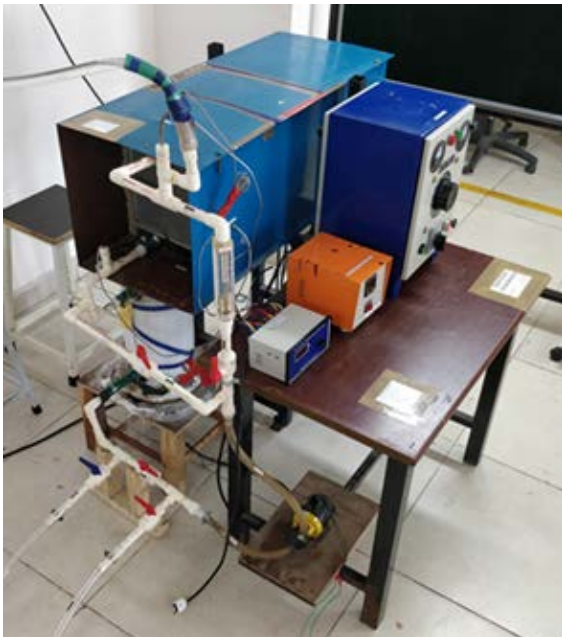
Pinless friction stir spot welding, Establish joint with superior mechanical and metallurgical characteristics and consume low power when compared RSW and self-piercing rivets.

Test Rig for Testing Engine Coolants

Make: VIT Chennai

Specification /Features:

- New coolants can be tested with varying air flow rate and coolant temperatures
- Temperature range : 40° to 80° C



Capabilities:

- Different types of coolants can be tested like combination of coolants, nano coolants and bio coolants etc.
- The range of coolant temperature can be maintained from 40° to 80°C
- The rate of air flow rate can be varied by varying the fan speed.
- The coolant flow rate could also be varied during testing.

Applications:

Useful for automotive, chemical and power production industries wherever cooling of liquid or surface is done.

Thermal Imaging Camera

Make: Testo

Model: Testo 875 -1i

Specification /Features:

- Non-contact Temperature distribution measurement
- Resolution: 160 × 120 pixels / 320 × 240 pixels



Capabilities:

Temperature distribution measurement in

- Laptops
- Electronic chips
- Solar panels
- Engine surface
- Human body and animals
- Any other heated surface
- Low temperature applications

Applications:

Useful for electronics, medical, automotive, chemical and renewable energy industries wherever heated and cooled surface temperature distribution is needed.

Digital Light Processing (DLP) 3D Printer

Make: FlashForge

Model: Hunter

Specification /Features:

- Build Volume: 12 cm x 6.7 cm x 15 cm (LxWxH)
- Light Engine Resolution: 1080p
- Compatible Materials: Castable Resins, Bio-compatible Resins etc.



Capabilities:

- Prototyping in high detail
- printing time is relatively less compared to FDM machines
- Excellent surface finish and quality
- Capable of producing dimensionally accurate prototypes
- Build volume: Capable of printing components of size up to 12 cm x 6.7 cm x 15 cm
- Users can have more flexibility to try different type of resin such as castable resin, tough resin, biocompatible resin etc.

Applications:

For making tough and highly detailed engineering prototypes, castable ring models, or even making medical models etc.

Fused Deposition Modelling(FDM) 3D Printer(Medium Size)

Make: FlashForge

Model: Guider II S

Specification /Features:

- Build Volume: 28 cm x 25 cm x 30 cm (L x W x H)
- Compatible Materials: PLA, ABS, PETG, NYLON, TPU, PC etc.
- Resume capability



Capabilities:

- Prototyping in high detail
- Capable of handling a range of industry-grade polymeric materials
- Build volume: Capable of printing components of size up to 28 cm x 25 cm x 30 cm
- Relatively cheaper material cost
- Materials are available in many colours
- The printer is capable of resuming the printing process in the case of power or any other interruptions.
- Online remote-monitoring is possible
- Capable of printing relatively bigger components up to a height of one feet.

Applications:

For making detailed engineering prototypes, proof-of-concept models, tooling for manufacturing and functional components for various applications using different engineering grade polymers

Fused Deposition Modelling (FDM) 3D Printer (Stratasys)

Make: Stratasys

Model: uPrint

Specification /Features:

- Build Volume: 20.3 cm x 20.3 cm x 15.2 cm (L x W x H)
- Compatible Material: ABS
- Dual extruders



Capabilities:

- Prototyping in high detail
- Capable of handling a range of industry-grade polymeric materials
- Build volume: Capable of printing components of size up to 20.3 cm x 20.3 cm x 15.2 cm
- Capable of printing highly accurate and durable components
- Dual extruders make it possible to print supports with solvable materials.

Applications:

For making detailed engineering prototypes, proof-of-concept models, tooling for manufacturing and functional components for various applications using different engineering grade polymers

Fused Deposition Modelling (FDM) 3D Printers (Small)

Make: FlashForge

Model: Dreamer (NX)

Specification /Features:

- Build Volume: 23 cm x 15 cm x 14 cm (L x W x H)
- Compatible Materials: PLA, ABS, PETG, NYLON, TPU, PC etc.
- Dual Nozzle (two machines)



Capabilities:

- Prototyping in high detail
- Capable of handling a range of industry-grade polymeric materials
- Build volume: Capable of printing components of size up to 23 cm x 15 cm x 14 cm
- Capable of printing two materials due to the presence of dual extruders
- Relatively cheaper material cost
- Materials are available in many colours

Applications:

For making detailed engineering prototypes, proof-of-concept models, tooling for manufacturing and functional components for various applications using different engineering grade polymers

Modal Shaker

Make: LABworks INC USA

Model: ET-126B-4

Specification /Features:

- The Labworks ET-126 Electrodynamic Transducer is a rugged, full featured, small permanent magnet shaker
- The shaker features a 2.125 inch diameter table with multiple attachment points, and an extraordinary 0.75 inch stroke
- Trunnion mounting base



Capabilities:

- Sine force 13 lbf pk, natural cooling
- Random force 8 lbf pk, natural cooling
- Maximum displacement 0.75" stroke
- Low stray magnetic field

Applications:

MODAL testing can be performed with modal shakers.

Free vibration characteristics such as natural frequency, damping and mode shape can be extracted

DATA Acquisition System

Make: M+P International Germany

Model: Vibplot

Specification /Features:

- 4 or 8 analog input channels
- 204.8 kHz simultaneous sampling
- 2 source output channels, 2 tacho inputs
- IEPE sensor conditioning user selectable on each channel
- TEDS support



Capabilities:

- Multiple VibPilot synchronization
- USB 2.0 host interface

Applications:

Noise and vibration measurement

Impact Hammer

Make: Dytran, USA

Model: 5800-B4

Specification /Features:

- 10.29 mV/lbf
- 500 lbf range
- Metal, Plastic and Soft Plastic tips
- Head weight 100 grams
- IEPE type



Capabilities:

TEDS capabilities

Applications:

Modal and structural analysis, useful for giving excitation on structural component such as machine parts, composite structures and panels.

Accelerometers

Make: Dytran, USA

Model: 30562D2,3035BG,3273A2,1053V3

Specification /Features:

- Uniaxial
- Uniaxial miniature
- Tri-axial MEMS type
- IEPE type



Capabilities:

50 g range

Applications:

Modal and structural analysis, Automotive Test and NVH, Vibration measurement.

MONARCH Speed Sensor

Make: Monarch Instruments

Model: SPSR-115/230

Specification /Features:

- Self-powered sensor
- TTL pulse output



Capabilities:

- The TTL compatible output is switch selectable as either positive going 0-5V pulses or negative-going 5-0V pulses provided on a BNC connector
- Compatible one pulse per revolution output for triggering external equipment such as
 - Vibration analyzers
 - Spectrum analyzers
 - Stroboscopes
 - Data acquisition equipment
 - Tachometers
 - Balancers
 - Waveform analyzers
 - Magnetic tape recorders

Applications:

Speed measurement

Impedance Tube

Make: In-house developed

Model:

Measurements based on transfer-function method according to:

- ASTM E1050-12 for sound absorption coefficient
- ASTM E2611-09 for sound transmission loss

Specification /Features:

- Large, medium and small tubes
- Measures Acoustic Absorption and Impedance using classical Transfer Function (TF) method.



Capabilities:

It can measure sound absorption coefficient and sound transmission loss from 200 Hz to 6500 Hz

Applications:

Useful for measuring sound absorption and sound transmission loss of porous, foam, Helmholtz resonator, MPP and composite panels

Acoustic Transducers

Make: Microtech Gefell, Gras

Model: MK231E & MV210

Specification /Features:

- 1/4" Free-field Microphone (4 nos)
- 1/2" Random incidence Microphone (6 nos)
- Microphone calibrator
- IEPE type
- Sensitivity 50 mV/Pa



Capabilities:

- It consists of a microphone preamplifier and omnidirectional
- Random and free field

Applications:

Free field and random incidence Acoustic measurements, useful for measuring sound absorption and sound transmission loss of porous, foam, Helmholtz resonator, MPP and composite panels

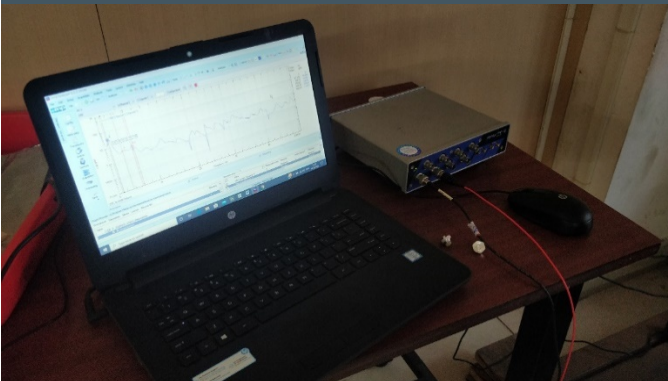
Vibration and Acoustic Software Modal Analysis, Vibration and acoustic, LMS Virtual Lab., ANSYS

Make: M+P Germany

Model: Modal Analysis (M+P Germany), LMS Virtual Lab (Siemens), ANSYS

Specification /Features:

- Modal Analysis software with ODS capabilities
- LMS virtual lab
- ANSYS with research capabilities
- Inbuilt MATLAB code for sound absorption and sound transmission loss calculation
- M+P International (Perpetual License)& SO-2011, SO-2201



Capabilities:

M+P SO Analyzer for MODAL Testing, ODS, acoustics and FRF analyzing software

Applications:

Modal analysis, FRF measurement, damping estimation, ODS analysis, Acoustic measurement, sound absorption and sound transmission loss Measurements, structural analysis, NVH simulations

Compression Ignition Engine with Electronic Control Unit

Make: Kirloskar engine and Nira Electronic Control Unit

Model: Kirloskar AV1, Nira i7R.

Specification /Features:

- Single cylinder diesel engine, 3.7 kW, 1500 rpm (const. speed), 500 cc (displacement)
- Fuel injection control - pressure (500 bar Max.) and timing (main, pilot and post)
- Load control by Powermag (PM05) air cooled eddy current dynamometer
- NI USB 6210 - Combustion pressure (Kistler 6613CA) and crank angle (1 deg accuracy)



Capabilities:

- Peak cylinder pressure till 250 bar with gaseous (Hydrogen) and biodiesel fuel
- Combustion parameters derived from data acquisition, export to MS-excel (NI MAX & Mlcromech Instruments)
- Input engine parameter mapping for fuel injection pressure and timing
- Engine load control facility upto 20 Nm torque at 1200-1500 rpm engine speed
- Fuel and air flow measurement (Bronkhorst-EL Flow select 100 LPM)
- Intake air temperature can be regulated using vortex tube (280 K - 320 K)
- Intake air pressure boost upto 5 bar (gage) from Elgi TS10LB-12TM500L air compressor
- Starter motor facility for an easy engine start with 100 AH battery
- EGR, steam/water induction modes included

Applications:

Power generation from renewable energy using biodiesel, hydrogen and other gaseous fuels at constant engine speed condition for stationary genset and agriculture application

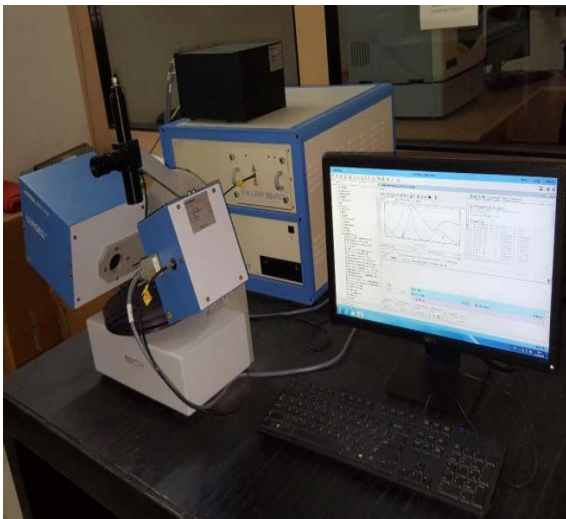
Ellipsometry Horiba UVISEL (SE)

Make:

Model: Horiba UVISEL Spectroscopic Ellipsometer.

Specification /Features:

- Spectral Range: 400 nm to 1000 nm
- Resolution: 3 nm.
- Sample Size: up to 200 mm
- Angle of Incidence 45° to 90° by step of 5°



Capabilities:

- Spectroscopic Ellipsometer for fast and accurate thin film measurements. It characterizes thin film thickness from a few Angstroms to 20 μ m, optical constants (n,k), and thin film structure properties (such as roughness, optical graded and anisotropic layers, etc).
- Application areas including microelectronic, photovoltaic, display, optical coatings, surface treatments and organic compounds.
- Measurement of thin film coating thickness, refractive index on glass and semiconductors

Applications:

Useful for Application areas including microelectronic, photovoltaic, display, optical coatings, surface treatments and organic compounds. It could be used in multiple disciplines of research such as physics, chemistry, material science, metallurgy, biology, nanotechnology and nano-science.

NI-PXIe1092-DAQ-Workstation (NI-DAQ)

Make:

Model: NI-PXIe1092-DAQ-Workstation.

Specification /Features:

- 80 Channels Analog Inputs at 1.2 MS/s
- 24 Channels Digital I/O.
- 32 Channels Temperature measurements
- 2 Analog Outputs



Capabilities:

- Measurement of Voltages from multiple sensors simultaneously
- Measurement of Currents from multiple sensors simultaneously
- Measurement of Temperature from multiple thermal sensors simultaneously.
- Characterization and optimization of sensors.
- Design and development of flow sensors, inertial sensor, chemical and bioactive sensors could be done.

Applications:

Useful for design and development of sensors used in multiple disciplines of research such as physics, chemistry, material science, metallurgy, biology, nanotechnology and nano-science.

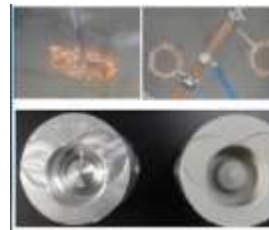
Plasma Electrolytic Oxidation Unit

Make: MILMAN

Model: MICRO ARC OXIDATION POWER SUPPLY

Specification /Features:

Peak Voltage	800V – higher range
Power Rating	30Hz – 2KHz
Pulse Frequency	10KHz



Capabilities:

To provide hard, wear resistant and corrosion resistant ceramic coating on light metals such as Al, Mg, Ti and Ta for automotive, aerospace and biomedical applications

Applications:

Useful for multiple disciplines of research such as Mechanical engineering, Metallurgical Engineering, Chemistry, Automotive Engineering, Aerospace Engineering, Material science and Biomedical Engineering etc.

Pin on Disc wear and Tribo-Corrosion Test

Make: DUCOM

Model: TESTER TR-20LE

Specification /Features:

Pin Size 3, 6 and 10 mm

Disc Size 100 mm diameter and 8 mm thick

Load 5 - 200 N



Capabilities:

To test wear rate and tribo-corrosion test on metallic / non-metallic samples

Applications:

Useful for multiple disciplines of research such as Mechanical engineering, Metallurgical Engineering, Chemistry, Automotive Engineering, Aerospace Engineering, Material science and Biomedical Engineering etc.

Gamry - Potentiostat

Make: GAMRY

Model: INTERFACE 1010T.

Specification /Features:

Maximum Current - ± 100 mA

Maximum Applied Potential - ± 5 V

EIS- 10 μ Hz - 20 KHz



Capabilities:

- Corrosion testing,
- Evaluation of protective coatings and Paints
- Research in electrochemical storage and conversion
- Battery and electrochemical capacitor evaluation
- Bio-electrochemical testing
- Electrochemical sensor development.

Applications:

Useful for multiple disciplines of research such as Mechanical engineering, Metallurgical Engineering, Chemistry, Material science and Biomedical Engineering etc.

Anodization

Make: SAIRUSH

Model: DC REGULATOR SVL 050005

Specification /Features:

Output Voltage	0-50 V DC
Line Voltage	20 V AC \pm 10% - \pm 5 V
Power Supply	230 V/50HZ
Temperature	0 - 50 deg.C



Capabilities:

To provide hard, wear resistant and corrosion resistant ceramic coating on light metals such as Al, Mg, Ti and Ta for automotive, aerospace and biomedical applications

Applications:

Useful for multiple disciplines of research such as Mechanical engineering, Metallurgical Engineering, Chemistry, Material science and Biomedical Engineering etc.

Universal Testing Machine

Make:

Model: AUTOGRAPH-SHIMADZU AG -x plus -50kN

Specification /Features:

- Accuracy Within $\pm 1\%$ indicated test force (at 1/500 to 1/1 load cell rating).
- Cyclic loading and Thermostatic chamber attachments available
- High-speed sampling of 1msec ensures no missed strength changes



Capabilities:

- Tensile, Compression and Flexural testing can be done.
- All types of metals, alloys and composites can be tested as per standards.
- Automatic reading of load cell characteristic values.
- Test force display, stress display, stroke display and position display.
- Conforms to EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS 1610 Class 1, ASTM E4, and JIS B7721 Class 1.

Applications:

Useful for multiple disciplines of research such as physics, material science, metallurgy and nanotechnology.

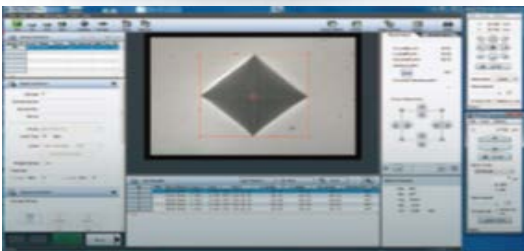
Micro Vickers Hardness Tester

Make:

Model: SHIMADZU AG –HMV-G20 Series

Specification /Features:

- Manual reading with an optical microscope with direct USB transfer function
- Automatic Sample Shape Recognition and improved Indentation Reading Accuracy
- Measurement of Depth of Hardening



Capabilities:

- Standardized automatic length measurement function
- Capable of automatically recognizing the total image of the sample and the sample edges.
- low test force function can be added to enable tests from 9.8 mN.
- Soft samples and thin samples can be evaluated.
- Equipped with an automatic lens switching function that switches the lens to suit the size of the indentation.

Application:

Useful for measure hardness distribution of gears and other parts with complicated shapes, such as those used in automobiles, aircraft, and hydraulic equipment.

Useful for multiple disciplines of research such as physics, material science, metallurgy and nano technology.

Variable Speed Centrifugal Pump Test Rig

Make:

Model: 1.5 kW AC motor, 0-3000 RPM variable frequency drive

Specification /Features:

- Suction and discharge pressure measurement with Bourdon pressure gauges
- Manual flow rate measurement



Capabilities:

- Determine main and operating characteristics of a centrifugal pump
- Determine constant efficiency characteristics of a centrifugal pump

Applications:

Useful for pump manufacturing industry.



VIT[®]

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

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