About the Institute

This Institute was established in 1961 as one of the RECs for imparting technical education in Civil, Mechanical and Electrical Engineering. In the year 1983-84 the Under Graduate programmes in Electronics Engineering was introduced and in the year 1988-89 the UG programmes in Computer Engineering and Production Engineering was started. In the year 1995-96, UG programme in Chemical Engineering was introduced. In exercise of the powers conferred by section 3 of the University Grants Commission (UGC) Act, 1956, the Central Government on the advice of the University Grants Commission, has declared the Sardar Vallabhbhai Regional College of Engineering & Technology (SVREC), Surat to Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat with status of “Deemed University” with effect from 4th December 2002. The Institute has been granted the status of ‘Institute of National Importance’ w.e.f. Aug. 15, 2007. At present, the Institute is offering Six UG Programmes, Eighteen PG Programmes and Three M.Sc. Five Years Integrated Programme including doctoral programme in all above branches.

About the Department

Department of Mechanical Engineering established in 1961, is the largest department of SVNIT, Surat. It is today one of the premier departments of not only this institute but in entire western zone of the country. It has earned a good reputation as a centre for academic, research and industrial consulting activities. It has built up a comprehensive research infrastructure with top-notch facilities for carrying cutting-edge teaching and research.

Academic programmes leading to B.Tech. Degree in Mechanical Engineering, M.Tech. Degree in Mechanical Engineering, Turbo Machines, Manufacturing Engineering, CAD/CAM and Thermal System Design; and Ph.D. degree are currently offered by the department. Laboratories with state of the art facilities, highly qualified and experienced faculty, and dedicated technical staff provide an ideal environment for academic and research pursuits. The department has also advanced sophisticated instrument center to cater the need of research scholars, and nearby industries.
## Equipment Catalogue

### Mechanical Engineering Department, SVNIT, Surat

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Solar Module Analyzer

It is used to measure the I-V Curve for Solar Panel / Module / Cell

Features:
- Max. Solar Cell/Module Power / Cell Power (Pmax) search by Auto-Scan,
- Efficiency (%) Calculation of Solar Panel,
- Real Time data logging.

Specifications
- Capability: 60V, 12A
- Resolution: 1mV, 1mA
- Memory Size: 100 Records
- Sampling Time: 0 ~ 99 min

Model: MECO 9009

Faculty In-charge:

Dr. P. V. Bhale / Dr. V. P. Rathod

Contact: pvbhale@med.svnit.ac.in

Lab Name: Renewable and Sustainable Energy Lab
This thermal imager testo 865 is used for studying temperature distribution of a given surface and is now a day extensively used for condition monitoring of rotating machines. This device is an ideal entry into the world of thermography. It serves the purpose of capturing best image and is handy in operation.

**Specifications**
- Infrared resolution: 160 x 120 pixels
- Thermal sensitivity: 120 mK
- Focus: Fixed focus
- Spectral range: 7.5 to 14 μm
- Model: Testo 865

**Faculty In-charge:**

Dr. P. V. Bhale / Dr. V. P. Rathod

Contact: pvbhale@med.svnit.ac.in

Lab Name: Renewable and Sustainable Energy Lab
Automatic Weather Monitoring Station

This is useful for efficiency measurement of Solar systems, Wind systems. The Automatic Weather Monitoring Station is useful for measurement of following Parameters:

- Wind Speed
- Wind Direction
- Temperature
- Relative Humidity
- Barometric Pressure
- Solar radiation

**Specifications**

| Internal Space: 2Gb MicroSD card
| Display: Digital
| Power Source: Electricity
| Frequency: 50Hz
| Voltage: 220v to 420v
| Phase: Single phase
| Current: AC
| Model: INSTRUMEX WMS-51

**Faculty In-charge:**

Dr. P. V. Bhale / Dr. V. P. Rathod

Contact: pybhale@med.svnit.ac.in  
Lab Name: Renewable and Sustainable Energy Lab
Gas Chromatographs (GC)

This is very useful for studying the gas composition of a given sample. This can be useful for determining the composition of Syngas, biogas, Producer Gas composition. The instrument is designed for online analysis of permanent gases. The sample is fed to Automated GC Model 606 through a filter, drier & via a gas sampling valve which has a number of loops and is injected through an injector at preset time intervals. This makes a complete automatic unit for gaseous application.

Specifications
Option of Detectors- TCD, FID, ECD, NPD, FPD, etc. Operation option of packed / capillary column. Standard features include auto cooling, remote ignition, 15 temperature ramps to tackle any complex sample, storage of 15 methods for instant recall temperature accuracy of + 0.1 Deg C for Oven, Injector, Detector. Operation from ambient to 4000 C for Oven, Injector & Detector with control accuracy of + 0.1 Deg C Option of auto gas / liquid sampling valves.
Model: Sigma GC Model 606

Faculty In-charge:
Dr. P. V. Bhale / Dr. V. P. Rathod

Contact: pvbhale@med.svnit.ac.in
Lab Name: Renewable and Sustainable Energy Lab
Solar PV Training & Research System

This is useful for studying the Solar PV Characteristics using an artificial light source. This unit enables to understand in-depth concepts about stand-alone PV systems. This also provides research orientation on several concepts such as MPPT, inverter control etc. The conception of the system allows indoor and outdoor experiments. Additional options are the change of slope angle of the module to see the effect of tilt.

**Specifications**

- **Power Generating Unit:** Solar PV Module (Polycrystalline)
- **Artificial Source Of Radiation:** Halogen - with regulator
- **Power Conditioning Unit:** DC-DC Converter-Auto/Manual Mode, Inverter-Auto/Manual Mode
- **Control And Measuring Unit:** Measuring Meters, Battery Bank, Load AC/DC

Model: Ecosense

**Faculty In-charge:**

**Dr. P. V. Bhale / Dr. V. P. Rathod**

Contact: pybhale@med.svnit.ac.in  
Lab Name: Renewable and Sustainable Energy Lab
Redwood Viscometer

This is useful for measurement of viscosity of fuels and lubricants and any fluid.

**Specifications**

- Min flow seconds: 2000 s
- Average head: 7.67 cm

**Faculty In-charge:**

Dr. P. V. Bhole / Dr. V. P. Rathod

Contact: pvbhale@med.svnit.ac.in  
Lab Name: Renewable and Sustainable Energy Lab
Cleveland Open Cup Flash Point & Fire Point Apparatus

Fire point and Flash point are important for fuel storage safety. This Cleveland open-cup method is useful for determining the flash point and fire point of a petroleum product.

Specifications
Power: 230 V, 50 Hz

Faculty In-charge:
Dr. P. V. Bhale / Dr. V. P. Rathod

Contact: pvbhale@med.svnit.ac.in
Lab Name: Renewable and Sustainable Energy Lab
Auto Digital pH meter

This is useful for measurement of pH value of biogas digester slurry and its changes. It is useful for pH measurement of any fluid.

**Specifications**
- **Dimension:** $76 \times 275 \times 175 \text{ mm}^3$
- **pH Range:** 0-14 pH
- **Model:** LT-11

**Faculty In-charge:**
Dr. P. V. Bhale / Dr. V. P. Rathod

Contact: pvhale@med.svnit.ac.in

Lab Name: Renewable and Sustainable Energy Lab
Auto Digital Conductivity meter

This is useful for thermal conductivity measurement. To measure the ability of a water-based solution to carry an electric current. These meters help to measure frequency and have adjustment facility in cell constant.

<table>
<thead>
<tr>
<th>Specifications</th>
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<tbody>
<tr>
<td>Dimension: 76 × 275 × 175 mm³</td>
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<tr>
<td>Range: 0 – 1 mhos/cm</td>
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Model: LT-16

Faculty In-charge:

Dr. P. V. Bhale / Dr. V. P. Rathod

Contact: pvbhale@med.svnit.ac.in

Lab Name: Renewable and Sustainable Energy Lab
Engine Test Setup (Computerised)

The setup consists of single cylinder four stroke diesel engine connected to eddy current type dynamometer for loading.

This set up is useful for Engine Performance, Combustion and Emission Characteristics.

**Specifications**

**Engine Details:** Power 5.2 kW at 1500 rpm, stroke 110 mm, bore 87.5 mm, 661 cc, CR 17.5

Model: Code 224

**Faculty In-charge:**

Dr. Bade Mukund / Dr. P. V. Bhale

Contact: pvbhale@med.svnit.ac.in

Lab Name: Internal combustion & Automobile Engineering.
Engine Test Setup Petrol Engine

This is useful for measurement of engine performance, combustion and emission characteristics. This is also useful for measurement of engine friction power. The setup consists of three cylinder, four stroke, petrol (MPFI) engine connected to Eddy current/hydraulic dynamometer for engine loading.

Specifications

Engine Details: Power 27 KW at 5000 rpm, Torque 59 NM at 2500rpm, stroke 72 mm, bore66.5mm, 796 cc, CR 9.2

Model: code 231

Faculty In-charge:
Dr. P. V. Bhale / Dr Bade Mukund

Contact: pvbhale@med.svnit.ac.in  Lab Name: Internal combustion &Automobile Engineering.
Francis turbine test rig

This test rig consists of Francis turbine connected with eddy current dynamometer used to study performance of Francis turbine and mixed flow pump as turbine for micro hydro application.

Specifications

(A) Francis Turbine Data (available in Lab):

- Head=15m; Discharge=2000 lpm;
- Speed=1250 rpm; Power=3.75 kW;
- Unit speed=2250 rpm; Specific speed=95.5 rpm; Run away speed=2250 rpm; Runner diameter =160 mm; Number of guide vanes= 10;
- Pitch circle diameter= 300 mm;
- Brake rope diameter=16mm.

(B) Supply Feed Pump Data:

- Head =20 m; Discharge=2000 lpm;
- Power =11.2 kW; Speed=14.40 rpm;

Faculty In-charge:

Dr. A. V. Doshi / Dr. V. K. Patel

Contact: avd@medsvn.ac.in

Lab Name: Fluid mechanics & Fluid Machines Laboratory
A centrifugal pump test rig is used to carry out performance test of centrifugal pump at different speed. It helps to find out performance characteristics of centrifugal pump of radial flow type.

**Specifications**
- Pressure head: upto 50 m of H2O
- Flow rate range: upto 50 LPS
- Power of motor: 15 kW
- Motor speed: 3000 rpm (Variable frequency drive installed)

**Faculty In-charge:**
Dr. Dr. A. V. Doshi / Dr V K Patel

Contact: [avd@med.svnit.ac.in](mailto:avd@med.svnit.ac.in)

Lab Name: Fluid mechanics & Fluid Machines Laboratory
Ice Plant Test Rig

This is useful for measuring the CoP of ICE plant and understanding the principle of working of Vapor Compression System. Ice plant with ice making tank of S.S., Brian Agitator with motor, Ice Cans and watt meter. Designed to perform performance test of ice plant.

**Specifications**

Primary Refrigerant: R-134a  
Secondary Refrigerant: Brian Solution

---

**Faculty In-charge:**  
Dr. A.D. Parekh / Dr. V. K. Patel

Contact: [adp@med.svnit.ac.in](mailto:adp@med.svnit.ac.in)  
Lab Name: Refrigeration Laboratory
Refrigeration Test Rig

This is useful for measuring the COP of vapour compression system. Designed to perform performance test of vapor compression refrigeration system and obtain C.O.P.

**Specifications**

Refrigerant: R-134a

**Faculty In-charge:**

Dr. A.D. Parekh / Dr. V. K. Patel

Contact: adp@med.svnit.ac.in

Lab Name: Refrigeration Laboratory
Air Conditioning Test Rig

This is useful to understand the principle of working of an air conditioner. Designed to perform performance test of air conditioning system and obtain C.O.P. and capacity of the system.

**Specifications**

Refrigerant: R-22

Faculty In-charge:
Dr. A.D. Parekh / Dr. V. K. Patel

Contact: adp@medsvn.ac.in

Lab Name: Refrigeration Laboratory
Heat Pump Test Rig

Designed to carry out performance test of Heat Pump Cycle. It works on the vapor compression system.

Specifications
Refrigerant: R-134a

Faculty In-charge:
Dr. A.D. Parekh / Dr. V. K. Patel

Contact: adp@medsvn.ac.in

Lab Name: Refrigeration Laboratory
Electrolux system – Domestic Type

It is an experimental vapor absorption system of Electrolux type designed to carry out performance test and find out C.O.P. of the system. This is a system which uses heat as input for cooling.

<table>
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<th>Specifications</th>
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<tr>
<td>Dimensions(mm): 580×425×439</td>
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<tr>
<td>Refrigerant: Ammonia</td>
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<tr>
<td>Volume: 41 liter</td>
</tr>
<tr>
<td>Input: 65 watt</td>
</tr>
<tr>
<td>Electricity consumption/24 hours: 0.8 kWh</td>
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<td>Net Weight: 14.5 kg</td>
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</table>

Faculty In-charge:
Dr. A.D. Parekh / Dr. V. K. Patel

Contact: adp@med.svnit.ac.in
Lab Name: Refrigeration Laboratory
Cold Storage Plant

It is designed to carry out performance test on Cold Storage Plant. It works on vapor compression refrigeration system.

**Specifications**

Refrigerant: R-134a

**Faculty In-charge:**

Dr. A. D. Parekh / Dr. V. K. Patel

Contact: [adp@med.svnit.ac.in](mailto:adp@med.svnit.ac.in)  
Lab Name: Refrigeration Laboratory
Cascade Refrigeration System

It is designed to carry out performance test on Cascade Refrigeration System. It uses two refrigeration cycles to achieve lower temperature.

**Specifications**
- Refrigerant: R-404a
- Minimum Temperature Achieved: −85 °C

**Faculty In-charge:**
Dr. A.D. Parekh / Dr. V. K. Patel

Contact: adp@med.svnit.ac.in

Lab Name: Refrigeration Laboratory
Sound level meter

It is designed specifically for measuring sound levels in the workplace, in public places and in industry and production. Includes data storage and analysis. Ideal for health and safety inspections and immission control.

Specifications
- Range: 30 to 130 dB
- Frequency range: 20 Hz to 8 kHz
- Accuracy: ±1.4 dB
- Resolution: 0.1 dB
- Measuring rate: 0.5 s
- Operating temperature: 0 to +40º C
- Model: TESTO 816-1
- Make: Testo

Faculty In-charge:
Dr. Rupesh Shah

Contact: rds@med.svnit.ac.in

Lab Name: Boiler House & Heat Transfer
Flue gas analyser

This is useful for measurement of composition of exhaust flue gas from engine tail pipe or from boiler stack. It is useful in emission control, via setting and optimization of combustion systems, through to process monitoring. Flue gas analysis instruments serve to optimize operations and save fuel. At the same time, flue gas measurement enables checking and monitoring of flue gas emission limit values laid down by the authorities, along with functional testing of permanently installed emission instruments. Flue gas analysis instruments are increasingly used for monitoring process and product quality.

Specifications
Measuring gaseous: O₂, CO, NO, NOₓ
Measuring range: 0 -25 Vol% for O₂, 0-10000 ppm for CO, 0-300 ppm for NO, 0-500 ppm for NOₓ
Accuracy: ± 0.2 Vol% for O₂ and ± 5% of reading for CO, NO, NOₓ
Resolution: 0.01 Vol% for O₂ and 1 ppm for CO, NO, NOₓ
Operating temperature: -40 to +1200º C
Model: TESTO 340 Flue gas analyser
Make: Testo

Faculty In-charge:
Dr. Rupesh Shah

Contact: rds@med.svnit.ac.in
Lab Name: Boiler House & Heat Transfer
This is widely used for temperature distribution measurement on a given surface. This is becoming an important tool for the health monitoring of a rotating machinery and used extensively in condition monitoring or for preventative maintenance. Signs of wear in machinery often become apparent long before a malfunction, due to an increase in temperature. With a thermal imager, any suspicious changes can be spotted immediately. It is non-contact and can therefore be carried out on all mechanical installations during operation and from a safe distance.

Typical applications for the thermal imager:
Checking engines, Checking bearings and Checking shafts.

**Specifications**
- Measuring range: -30 to 350°C
- Field of view: 32º × 23º
- Thermal sensitivity: <50 mK at 30º C
- Spectral range: 8 -14 µm
- Measurement accuracy: ± 2º C of reading
- Image display: 3.5”LCD with 320 × 240 pixels
- Image analysis: Testo IRsoft thermography analysis software
- Model: Thermal Imager Testo 875- 1i
- Make: Testo

**Faculty In-charge:**
**Dr. Rupesh Shah**

**Contact:** [rds@med.svnit.ac.in](mailto:rds@med.svnit.ac.in)  
**Lab Name:** Boiler House & Heat Transfer
Helium Leak detector

In cryogenics, Helium is generally used as a working fluid and due to its distinct properties of being very thin gas and costly, leak checking is a priority. Helium leak detector is senses leakage by measuring concentration of helium around the examination space.

Make: Aerlinkon leybold vacuum
Model: PhoeniXL300
Max. Inlet Pressure: 15 mbar
Min. detectable He leak rates: $< 5 \times 10^{-12}$
Run-up time: $< 2$ min

Faculty In-Charge:
Dr. H. B. Naik / Dr. K. P. Desai

Contact: hbn@med.svnit.ac.in, kpd@med.svnit.ac.in
Lab Name: Cryogenics Laboratory
Liquid Nitrogen (LN₂) Plant

Liquid Nitrogen is used mainly to maintain cryogenic environment while studying material characteristics or studying biology or to preserve cells and life for a long time. LN₂ plant separates N₂ from air and by using Stirling type cryocooler, liquefies it. This LN₂ is then stored in Dewar vessel attached to the plant.

<table>
<thead>
<tr>
<th>Make: STIRLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model: StirLIN – 1 Economy</td>
</tr>
<tr>
<td>LN₂ production: 5 l/hr</td>
</tr>
<tr>
<td>Cryo generator: SPC-1(500)</td>
</tr>
<tr>
<td>Compressor: SF1_4</td>
</tr>
<tr>
<td>PSA: N2MID601</td>
</tr>
<tr>
<td>Chiller</td>
</tr>
</tbody>
</table>

Faculty In-Charge:
Dr. H. B. Naik / Dr. K. P. Desai
Contact: hbn@med.svnit.ac.in  kpd@med.svnit.ac.in

Lab Name: Cryogenics Laboratory
4 K Pulse tube system

4 K pulse tube system is GM type pulse tube cryocooler. It’s a 2-stage type of system which can yield 0.5 W at 4 K temperature. Using this system, 2.5 K has been recorded in cryogenic lab. It is very well known that such systems are used in MRI machines. It can be used for low temperature calibration.

Make: Cryomech
Model: PT407
2 stage
GM type
Comes with allied He compressor

Faculty In-Charge:

Dr. H. B. Naik / Dr. K. P. Desai

Contact: hbn@med.svnit.ac.in
kpd@med.svnit.ac.in

Lab Name: Cryogenics Laboratory
Vacuum pumps are very important support system in cryogenics wherein it is used to generate effective vacuum as an insulating mechanism to avoid heat leak in. In cryogenics, it can be used either for generating vacuum or for flushing out unwanted particles from the system.

Make: HIND HI VAC
Model: VS 114T
Vacuum Level: up-to $1.10^{-6}$
Equipped with Pinning gauge and Pirani gauge
Equipped with rotary pump and turbo molecular pump

Faculty In-Charge:
Dr. H. B. Naik / Dr. K. P. Desai
Contact: hbn@med.svnit.ac.in  
kpd@med.svnit.ac.in
Lab Name: Cryogenics Laboratory
Cryostat

Cryostat is used to maintain cryogenic temperature within it. It is used to study samples of small size at cryogenic temperature.

Make: Jani’s Research Co. Inc
Model: VPF - 100
Glass window for visual inspection of test piece.

Faculty In-Charge:
Dr. H. B. Naik / Dr. K. P. Desai

Contact: hbn@med.svnit.ac.in
kpd@med.svnit.ac.in

Lab Name: Cryogenics Laboratory
Five Gas Analyzer

To measure exhaust emissions like CO₂, CO, NO, HC and O₂ from exhaust of the engine.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Make: AVL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured quality:</td>
<td>Measuring range:</td>
</tr>
<tr>
<td>CO:</td>
<td>0... 15 % vol</td>
</tr>
<tr>
<td>CO₂:</td>
<td>0... 20 % vol</td>
</tr>
<tr>
<td>HC:</td>
<td>0... 20000 ppm vol</td>
</tr>
<tr>
<td>O₂:</td>
<td>0... 25 % vol</td>
</tr>
<tr>
<td>NO:</td>
<td>0... 6000 ppm vol</td>
</tr>
</tbody>
</table>

MODEL: AVL 444N

Faculty In-charge:

Dr. B. M. Sutaria / Dr. D. V. Bhatt

Contact: bms@med.svnit.ac.in
dvb@med.svnit.ac.in

Lab Name: Tribology Laboratory
Diesel Engine Test Rig

To measure performance and combustion parameters of diesel engine with varying load conditions.

Specifications
Make: Kirlosker
No. of cylinders: 1
No. of strokes: 4
Bore: 87.5 mm
Stroke: 110 mm
Connecting rod length: 234 mm
Compression ratio: 17.5:1
Rated power: 5.2 kW @ 1500 rpm
Dynamometer: Eddy current type
DAQ: National Instruments
MODEL: 224

Faculty In-charge:
Dr. B. M. Sutaria / Dr. D. V. Bhatt

Contact: bms@medsvnitanv.in
dvb@medsvnitanv.in

Lab Name: Tribology Laboratory
Petrol Engine Test Rig

To measure performance and combustion parameters of petrol engine with varying load conditions.

Specifications

- Make: Kirlosker
- No. of cylinders: 3
- No. of strokes: 4
- Bore: 66.5 mm
- Stroke: 72 mm
- Connecting rod length: 114 mm
- Compression ratio: 9.2:1
- Rated power: 27.6 kW @ 5000 rpm
- Dynamometer: Eddy current type
- DAQ: National Instruments
- Model: 230/230H

Faculty In-charge:

Dr. B. M. Sutaria / Dr. D. V. Bhatt

Contact: bms@med.svnit.ac.in
          dvb@med.svnit.ac.in

Lab Name: Tribology Laboratory
Electronic fuel injection kit

To perform multiple injection in a single thermodynamic cycle of a diesel engine by electronic control.

**Specifications**

Make: Legion Brothers  
Maximum No. of injections per cycle: 4  
Injection pressure range: 200 bar -1200 bar  
Minimum dwell between two injections: 8° CA

**Faculty In-charge:**  
Dr. B. M. Sutaria / Dr. D. V. Bhatt

Contact: bms@med.svnit.ac.in  
dvb@med.svnit.ac.in

Lab Name: Tribology Laboratory
**Smoke meter**

To measure smoke opacity from diesel engine exhaust emissions.

<table>
<thead>
<tr>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make: AVL</td>
</tr>
<tr>
<td>Model: 437C</td>
</tr>
<tr>
<td>Measuring Range: 0-100%</td>
</tr>
</tbody>
</table>

**Faculty In-charge:**

Dr. B. M. Sutaria / Dr. D. V. Bhatt

Contact: bms@med.svnit.ac.in  
dvb@med.svnit.ac.in  

Lab Name: Tribology Laboratory
It is useful for cooling application. Pulsating heat pipes are made from a long capillary tube which is bent multiple times, or from a rectangular plate with capillary channels manufactured in it. The bends are placed at the evaporator and condenser areas of the heat pipe. This type of heat pipe does not require a wick structure to function. Because the diameter of the pulsating heat pipe is small, surface tension plays a greater role in fluid flow than gravity, making the fluid flow almost completely independent from gravity.

**Specifications**

- Fabricated in house
- Capacity : 200 W
- Vibration Frequency : Up to 5 Hz
- Amplitude : 10 – 50 mm

**Faculty In-charge:**

Dr. H. B. Mehta / Prof. A. B. Makwana

Contact: [hbm@med.svnit.ac.in](mailto:hbm@med.svnit.ac.in)  
[abm@med.svnit.ac.in](mailto:abm@med.svnit.ac.in)  
Lab Name: Turbo machine - Simulation
Combination of Hot and Cold Circulating Bath

Cooling and heating circulating bath are ideal for industrial or laboratory applications where a wide variety of temperature controls are needed. The reservoir in the circulating bath tempers samples along with integral pump that circulate fluid both internally and externally.

**Specifications**
Circulating bath temperature range: 
-10°C to 40°C

**Faculty In-charge:**
Dr. H. B. Mehta / Prof. A. B. Makwana

Contact: [hbm@med.svnit.ac.in](mailto:hbm@med.svnit.ac.in)  
[abm@med.svnit.ac.in](mailto:abm@med.svnit.ac.in)

Lab Name: Turbo machine - Simulation
Close loop Pulsating Heat Pipe

This is used to study thermo-hydrodynamics of two phase gas liquid flow through capillary tube. Closed loop pulsating heat pipes are complex heat transfer devices having a strong thermal hydrodynamic coupling governing the thermal performance.

Specifications
Copper Tube: ID 2 mm OD 4mm L 40 mm
Glass Tube: ID 2 mm OD 4mm L 40 mm

Faculty In-charge:
Dr. H. B. Mehta / Prof. A. B. Makwana
Contact: hbm@medsvnит.ac.in abm@medsvnит.ac.in
Lab Name: Turbo machine - Simulation
Closed Loop Pulsating Heat Pipe Mini Channel Test Section

This is used for the understanding of number of turns influence on cooling systems. Closed loop pulsating heat pipe mini channel test section with arrangement of heating, cooling and orientation along with thermocouple and pressure measurements.

Specifications

1. Pressure Transmitter:
   Range: -760 to +200 mm of Hg
   Sampling: 20 HZ
   Accuracy: +/- 0.5%

2. K Type Thermocouple
   Range: 0-1370 DEG C
   Sampling: 20 HZ
   Accuracy: 0.25% of F.S.

Faculty In-charge:

Dr. H. B. Mehta / Prof. A. B. Makwana

Contact: hbm@med.svnit.ac.in
         abm@med.svnit.ac.in

Lab Name: Turbo machine - Simulation
Two Phase Flow Test Rig

Flow visualization of Two-phase flows like stratified, plug, slug, annular and bubbly etc. The experimental flow facility includes a test section, water and air delivery systems, a two-phase mixing section and a data acquisition system. Compressed air is supplied in using screw compressor. Distilled water is pumped using centrifugal pump. Heat exchanger is used for maintaining water temperature. Test section transparent acrylic pipes. With pivot arrangement at the center and chain and pulley at end setup can be inclined.

Specifications
Pipe ID: 50, 25 and 12 mm
Pipe Length: 14m
Setup control software: SCADA

Faculty In-charge:
Dr. J. Banerjee
Contact: jbaner@gmail.com
Lab Name: Advanced Fluid Dynamics
Thermal Dispersion Test Setup

Analysis of thermal dispersion of hot effluent in normal lake like laboratory scale model.

The experimental flow facility includes hot water unit, ambient water unit, and test section and temperature measurement unit.

<table>
<thead>
<tr>
<th>Specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir max capacity</td>
<td>1000 liters</td>
</tr>
<tr>
<td>RTD</td>
<td>PT-100</td>
</tr>
<tr>
<td>Rotameter</td>
<td>1000LPH</td>
</tr>
<tr>
<td>Centrifugal Pump</td>
<td>Crompton 3HP</td>
</tr>
<tr>
<td>(monoblock pump)</td>
<td></td>
</tr>
</tbody>
</table>

Faculty In-charge:
Dr. J. Banerjee

Contact: jbaner@gmail.com

Lab Name: Advanced Fluid Dynamics
Wave flume

Used for experimental study of ocean waves and its practical applications like wave breaking, wave energy converter, wave-structure interaction. The setup is a replica of real conditions in which waves of desired parameters is generated using flap type wave maker. Beach of variable inclination is provided to damp the wave energy. A wave energy converter can be fitted to study the wave power generation characteristics.

<table>
<thead>
<tr>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions: 6 m×1 m×0.6 m</td>
</tr>
<tr>
<td>Material of construction: Acrylic sheet</td>
</tr>
<tr>
<td>Major components: Flap type wave-maker and a tilted beach</td>
</tr>
<tr>
<td>Motor Specifications: 3 hp motor with a constant torque output</td>
</tr>
<tr>
<td>Stroboscope accuracy: ±0.1 rpm</td>
</tr>
</tbody>
</table>

**Faculty In-charge:**

Dr. J. Banerjee

Contact: jbaner@gmail.com  
Lab Name: Advanced Fluid Dynamics
Phase change materials are used for energy storage. It is important to study the stability of it. The automated thermal stability test rig is designed and developed to test the thermal characteristics of phase change materials after the number of melting and solidification cycles.

It has a capacity to carry out thermal cyclic test for six different PCMs at a time. The range of the melting temperature of the PCM will be 35°C to 85°C.

**Specifications**
- Setup configuration: 20 cm height x 45 cm width x 65 cm length
- Container size: 9 cm height x 8 cm diameter
- Maximum temperature: 100 °C
- Temperature uncertainty: ±0.1°C

**Faculty In-charge:**
Dr. M. K. Rathod

Contact: mkr@med.svnit.ac.in

Lab Name: Advanced Heat Transfer Lab
Shell and Tube Type Latent Heat Storage Unit with different inclination

This is the advanced shell and tube storage unit in which thermal performance is established at different inclined orientation of unit.

The test section can be easily replaceable and the effect of addition of fins like longitudinal, radial and spiral can also be established.

**Specifications**

- Length: 600 mm
- Inside diameter: 30 mm
- Outside diameter: 92 mm
- Different inclinations: 0°, 15°, 30°, 45°, 60°, 75°, 90°
- Flow rate: 1 to 5 lpm

**Faculty In-charge:**

Dr. M. K. Rathod

Contact: mkr@med.svnit.ac.in  
Lab Name: Advanced Heat Transfer Lab
The Automobile radiator test rig is developed to carry out thermal performance of flat tube radiator using different coolants which includes water, ethylene glycol, mixture of water and ethylene glycol and Nanofluids.

<table>
<thead>
<tr>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Radiator dimension:</strong></td>
</tr>
<tr>
<td>Height: 405mm</td>
</tr>
<tr>
<td>Thickness: 36mm</td>
</tr>
<tr>
<td>Width: 483mm</td>
</tr>
<tr>
<td><strong>Water pump:</strong></td>
</tr>
<tr>
<td>Power: 0.5 HP</td>
</tr>
<tr>
<td>RPM: 2700</td>
</tr>
<tr>
<td><strong>Water heater:</strong></td>
</tr>
<tr>
<td>Capacity: 3 kW (2 nos.)</td>
</tr>
<tr>
<td><strong>Rotameter:</strong></td>
</tr>
<tr>
<td>Flow rate: 1 to 10 lpm</td>
</tr>
<tr>
<td><strong>blower:</strong></td>
</tr>
<tr>
<td>power: 5HP</td>
</tr>
</tbody>
</table>

**Faculty In-charge:**

Dr. M. K. Rathod

Contact: mkr@medsvnits

Lab Name: Advanced Heat Transfer Lab
Liquid Solid Interface Visualization setup

The unit is developed to visualize the solid liquid interface of PCM filled in different shaped configuration during melting process.

Specifications

Visualization tank:
Dimension: 500 mm (l) X 500 mm (b) X 300 mm (h)

Heater:
Load: 3 kW

Electric pump:
Capacity: 28W with 2800 rpm

Faculty In-charge:
Dr. M. K. Rathod

Contact: mkr@medsvnitan.in
Lab Name: Advanced Heat Transfer Lab
Thermosyphon (Heat pipe)

Heat pipe is highly conductive device consisting of evaporator, adiabatic section and condenser. Heat is absorbed through evaporator and released through condenser via working fluid. This test rig is used to evaluate its performance with different working fluids and inclinations.

<table>
<thead>
<tr>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length:</strong></td>
</tr>
<tr>
<td>Condenser: 400 mm</td>
</tr>
<tr>
<td>Adiabatic section: 200 mm</td>
</tr>
<tr>
<td>Evaporator: 400 mm</td>
</tr>
<tr>
<td><strong>diameter:</strong> 15 mm</td>
</tr>
<tr>
<td><strong>thickness:</strong> 0.9 mm</td>
</tr>
</tbody>
</table>

**Faculty In-charge:**
Dr. M. K. Rathod

Contact: mkr@med.svnit.ac.in

Lab Name: Advanced Heat Transfer Lab
A magnetic stirrer is used to disperse the nano particles in the base fluid to a small extent. It uses a rotating magnetic field, which rotates a rod to rotate quickly. This rotating field is produced by a rotating magnet, or by stationary electromagnets, placed beneath the platform. A heater is placed below to maintain the working fluid at the required temperature.

**Specifications:**

- **Dimension:**
  - Length: 342 mm
  - Width: 210 mm
  - Height: 115 mm

- **Maximum stirring quantity:** 5 liter
- **Stirrer plate diameter:** 157 mm

**Faculty In-charge:**

Dr. M. K. Rathod

Contact: [mkr@med.svnit.ac.in](mailto:mkr@med.svnit.ac.in)  
Lab Name: Advanced Heat Transfer Lab
Probe type sonicator produces high-frequency vibrations which are used to disperse the nanoparticles into fluid.

**Specifications**
- Volume handling capacity: 250 mL to 1 liter
- Ultrasonic power: 750 W
- Power supply: 230V single phase 50Hz
- Frequency: 20 kHz with built in auto tuning facility

**Faculty In-charge:**
Dr. M. K. Rathod

Contact: mkr@med.svnit.ac.in  
Lab Name: Advanced Heat Transfer Lab
Stir Casting Furnace (Model: EN.RH1500)

Furnace for melting/alloying metals for making conventional castings and metal matrix composites.

**Specifications**
- **Size:** 150 x 150 x 200 mm
- **Max. Temperature:** 1000 °C (approx.)

Pulsed TIG Welding Machine (Lincoln Make)

An equipment for welding thin sheets of ferrous/nonferrous and dissimilar metals.

**Specifications**
- **Current (Max.):** 300 A
- **AC frequency:** 0.1-100 Hz

Faculty In-charge:

Dr. Jyoti Menghani / Dr. S. N. Pandya

Contact: jvm@med.svnit.ac.in, s.pandya@med.svnit.ac.in

Lab Name: Metallurgical Laboratory
FDM Based 3D Printing Machine

Used to print prototypes from various materials like ABS, PLA, Nylon, Wood, Carbon, etc.

**Specifications**
- **Build Volume:** 500 mm x 500 mm x 500 mm
- **Printer Dimensions:** 550 x 550 x 560 mm
- **Extruder:** Dual type
- **Model:** JAK - Omega

Rapid I Vision Measuring System

Dimensions of a tiny components with Profile drawing and image magnification/Processing, can be carried out

**Specifications**
- **Size:** 200 mm x 200 x 150 mm
- **Resolution:** 3 micron
- **Model:** RAPID I

**Faculty In-charge:**

Dr. A. A. Shaikh / Dr A. Lal

**Contact:** [aas@med.svnit@ac.in](mailto:aas@med.svnit@ac.in)

**Lab Name:** Reverse Engineering
A CNC router used for cutting various hard materials, such as metals, wood, composites, aluminum, steel, plastics, glass, and foams.

** Specifications**
- Size: 300 mm x 450 mm
- Spindle Speed: 2000-8000 rpm
- Spindle Power: 1.5 kW
- Model: YD-450

---

**Faculty In-charge:**
Dr. A. A. Shaikh / Dr. A. Lal

Contact: [aas@medsvn@ac.in](mailto:aas@medsvn@ac.in) Lab Name: Reverse Engineering
Sensor Technology Trainer

It has different types of sensors, AC synchronous motor, PLC with 8 inputs/outputs, buzzer and lamps to conduct PLC interfaced experiments. With its stability and linearity, ATL’s cutting-edge sensor technology is setting new standards for teaching technology.

A PLC is an example of a real time system since output results must be produced in response to input conditions within a bounded time, otherwise unintended operation will result.

**Specifications:**
- AC synchronous motor
- Relays
- Buzzer
- Lamps

**Sensors:**
- Analog inputs interfaced with PLC (RTD & TC)
- Transmitter
- Proximity Sensor (Inductive type)
- Proximity Sensor (Capacitive type)
  - Photo diffusion
- Photo reflective
- Transmitter & Receiver
- Reed switch (Magnet operated)
- Limit switch (Mechanical type)

**Model:**
ADTRON 3073

---

**Faculty In-charge:**
Dr. R. Venkata Rao

Contact: rvr@med.svnit.ac.in

Lab Name: Industrial Automation
Transducer & Instrumentation Trainer

It introduces students to input sensors, output sensors, signal conditioning circuits & display devices through a wide range of hands-on practical activities. This self-contained trainer has all the necessary resources on board to perform various experiments.

Features:
- An introduction to basic control systems.
- An evaluation of the various Input devices.
- Practical investigation of the various output devices.
- Practical investigation of the Display devices.
- Applications in practical systems, evaluation of input requirements.

Model Make: Dyna-TnIT

Faculty In-charge:
Dr. R. Venkata Rao

Contact: rvr@med.svnit.ac.in

Lab Name: Industrial Automation
Comprehensive Mechatronics Training System

It provides hands on experience on Servo Controller, PLC, Pneumatics, Sensors, Electronic interfacing between different components of Automation. The ControlX software combines the power of the latest software technologies together with the simplicity of Windows based graphical programming to offer users complete control over all the components.

It provide comprehensive training on various mechatronic systems including the virtual laboratory software.

Manufacturer of Equipment:
Cybermotion Technologies Pvt. Ltd.
Hyderabad

Faculty In-charge:
Dr. R. Venkata Rao

Contact: rvr@med.svnit.ac.in
Lab Name: Industrial Automation
A coordinate measuring machine (CMM) is a device that measures the geometry of physical objects.

**Specifications:**
Measuring Range: 400mm×400mm×300mm
Max. Table Loading: 180 kg
Machine Accuracy ISO 10360-2 (20°C±1°C):
\[ E=(3.0+4.0 \frac{L}{1000})\mu m \]

Model:
M442 Crysta Plus

**Faculty In-charge:**
Dr. Shalindra Kumar / Dr. H. K. Raval

Contact: skbudhwar@med.svnit.ac.in
Lab Name: Metal Forming
3-D Printer (FDM)

FDM based Delta Wasp 3D printer has polar coordinate system. It is used to print components from various materials like ABS, nylon, PLA, PS, PET, FLEX, clay, silicone, resins.

**Specifications:**
- Layer Resolution: 50 to 70 microns
- Nozzle Diameter: 0.4 mm to 0.9 mm
- Model: Delta wasp Turbo 2040

3-D Laser Scanner

3D laser scanner allows high resolution and faster 3D digitizing over other conventional metrology technologies and techniques.

**Specifications:**
- Measurement System: MLT Technology
- Field Size: 5"×4" (Macro) and 13"×11" (wide)
- Sensor: 4.0 to 8.0 Mega pixel COMS
- Model: M442 Crysta Plus

Faculty In-charge:

Dr. Shalindra Kumar / Dr. H. K. Raval

Contact: skbudhwar@medsvnitacln Lab Name: Metal Forming
Rockwell Hardness Testing Machine

HR-110 MR is hardness measuring equipment. It is indentation hardness type device.

<table>
<thead>
<tr>
<th>Specifications:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution:</td>
<td>0.5 HR graduation</td>
</tr>
<tr>
<td>Testing Force:</td>
<td>1000 N</td>
</tr>
<tr>
<td>Model:</td>
<td>HR-110MR</td>
</tr>
</tbody>
</table>

Precision Surface Roughness Tester

Surftest SJ-411 has 4 types of contour analysis functions including step, step amount, area and coordinate differences.

<table>
<thead>
<tr>
<th>Specifications:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring Range:</td>
<td>X-axis : 25 mm, Z1Axis (detector unit) : 800 microns</td>
</tr>
<tr>
<td>Model:</td>
<td>SJ-411</td>
</tr>
</tbody>
</table>

Faculty In-charge:

Dr. Shalindra Kumar / Dr. H. K. Raval

Contact: skbudhwar@med.svnit.ac.in Lab Name: Metal Forming
Electronic Tensometer

The electronic Tensometer is a compact horizontal Tensile Testing Machine of capacity 20 KN. This Equipment is used for testing tensile, compressive, Shear, Flexural properties of different materials.

**Specifications:**
- Capacity: 2 KN to 20 KN
- Gripper: Wire chuck, Disc wire chuck, Cord grips, Eccentric roller grip
- Model: PC 2000

Erichsen Cupping Testing Machine

The Erichsen cupping testing machine is employed to evaluate the ability of metallic sheets and strips to undergo plastic deformation in stretch forming.

**Specifications:**
- Punch diameter: 20 mm
- Measuring capacity: 70*90 mm²
- Model: RET-20

Faculty In-charge:

Dr. Shalindra Kumar / Dr. H. K. Raval

Contact: skbudhwar@med.svnit.ac.in  Lab Name: Metal Forming
A CNC machining centre is a combination of milling and drilling machine. It includes an automatic tool changer.

<table>
<thead>
<tr>
<th>Specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Table:</td>
<td>700 x 420 mm</td>
</tr>
<tr>
<td>Spindle Power:</td>
<td>3.7 kW</td>
</tr>
<tr>
<td>Spindle Speed:</td>
<td>60-8000 rpm</td>
</tr>
<tr>
<td>Controller:</td>
<td>Siemens</td>
</tr>
</tbody>
</table>

Model: Batliboi DART

Faculty In-charge:

**Dr. Ravi Kant / Dr. Sandeep Soni**

Contact: ravi.kant@med.svnit.ac.in  
s.soni@med.svnit.ac.in
A CNC turning centre is a Computer Numerically Controlled lathe machine.

**Specifications**
- Distance between centers: 380 mm
- Maximum turning diameter: 225 mm
- Speed Range: 50-5000 rpm
- Positioning Accuracy: +/- 0.005 mm (X-axis), +/- 0.0075 mm (Z-axis)
- Controller: Siemens
- Model: Batliboi Sprint 16 TC

**Faculty In-charge:**
Dr. Ravi Kant / Dr. Sandeep Soni
Contact: ravi.kant@medsvn.ac.in, s.soni@medsvn.ac.in

Lab Name: Workshop
Electro Discharge Machining (EDM)

EDM is mainly used to machine difficult-to-machine materials and high strength temperature resistant alloys. EDM can be used to machine difficult geometries in small batches or even on job-shop basis.

### Specifications

- **Work Table Size**: 600 mm x 300 mm
- **X–Y–Z Travel**: 300-200-175 mm
- **W Travel**: 175 mm
- **Model**: JM 322 + AZ50R

Lab Scale Single Screw Extruder

Single screw extruder is used to extrude Polymer filament in the size of 1.75 mm diameter. Special dies are required for changing shape or size of filament.

### Specifications

- **Extruder Capacity**: 25 Kg/Hr.
- **Screw diameter**: 50 mm
- **L/D ratio**: 36:1
- **Model**: CR 50

**Faculty In-charge:**

Dr. H. K. Dave / Dr. K. P. Desai

Contact: [hkd@med.svnit.ac.in](mailto:hkd@med.svnit.ac.in)

Lab Name: Advance Manufacturing Lab
### Table Top Microscope

The surfaces of the specimens are examined at very high magnification directly. Surface morphology is shown in stereoscopic detail with images in contrast.

<table>
<thead>
<tr>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnification: 15 to 30,000X</td>
</tr>
<tr>
<td>Observation condition: 5kV/15kV/EDX</td>
</tr>
<tr>
<td>Maximum sample size: 70 mm in diameter</td>
</tr>
<tr>
<td>Model: TM 3030</td>
</tr>
</tbody>
</table>

### Vision Measurement System

Vision systems can locate and measure features with high precision by physical contact.

<table>
<thead>
<tr>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range (mm): 250 x 200 x 200</td>
</tr>
<tr>
<td>Resolution: ±1 micron</td>
</tr>
<tr>
<td>Magnification: Up to 450X</td>
</tr>
<tr>
<td>Model: SDM- TRZ5 300</td>
</tr>
</tbody>
</table>

### Faculty In-charge:

Dr. H. K. Dave / Dr. K. P. Desai

Contact: hkd@med.svnit.ac.in  
Lab Name: Advance Manufacturing Lab
Welding Simulator

Weld simulator allows the user to perform virtual welding operation in real time in similar manner as in actual welding. It can be used to train the operator to perform better in actual welding conditions without utilizing the raw materials. It has inbuilt facility to perform welding in different positions such as 1G, 2G, 3G, 4G, 5G and 6G with provision to change weld joint configurations such as butt, lap, fillet, pipe to pipe, pipe to plate, etc. Welding process specifications (WPS) can be set according to various industrial jobs in accordance with materials’ requirements by changing process parameters such as current, arc voltage, specimen thickness, etc. It has capability to generate reports at the end of each exercise for the user progress and skill evaluation.

Highlights:
- It has facility of simulated SMAW process
- Current range can be varied from 50A-500A
- Physical electrode is used and same has been retracted while simulating the consumption of electrode
- Provision of defect analysis such as porosity, spatter, burn through, inclusions, etc. is available

Model: NA

Faculty In-charge:
Dr. Vivek D. Kalyankar

Contact: vkalyankar@med.svnit.ac.in  Lab Name: Advance Welding Laboratory
Slurry abrasion test rig (Ducom TR-44) is very useful to evaluate the slurry abrasive wear resistance of various metallic materials for several applications as per ASTM G105 standard. This test rig is critically useful in characterizing abrasive wear mechanism, wear loss, co-efficient of friction for industrial components such as engineering valve, slurry pipes, etc. utilized in petroleum, nuclear, marine, and power industries. For research purpose, this test can also be performed with varying loads, wheel speed, different size and concentration of abrasive sand to understand the effect of these parameters.

**Highlights**
- Loading capacity: 100-300 N
- Revolution counter: 0-9999
- Test speed: 20-250 RPM

**Model:** NA

**Faculty In-charge**
**Dr. Vivek D. Kalyankar**

Contact: [vkalyankar@med.svnit.ac.in](mailto:vkalyankar@med.svnit.ac.in)

Lab Name: Advance Welding Laboratory
Plasma transferred arc welding (PTA-400A) is exclusively used as weld overlay process to deposit advance grade alloying powders in order to improve surface characteristics like wear and corrosion resistance. This weld surfacing technique is used to improve surface characteristics of different industrial components such as regulating valves in chemical processing plants, ground engaging tools used for heavy machineries in oil and gas, construction and mining industries, automobile, nuclear power plants, aerospace and steam power plants, etc. Plasma transferred arc welding machine is an emerging research area in the fields of surface engineering.

**Highlights:**

- Encoder based semi-automatic computer controlled control panel
- Welding positioner for workpiece fixture arrangement
- Digital oscillator for high deposition rates and weaving pattern deposition
- Digital display of all control variables for investigation and research aspect

Model: NA

**Faculty In-charge:**

Dr. Vivek D. Kalyankar

Contact: vkalyankar@medsvn.ac.in

Lab Name: Advance Welding Laboratory
Gas Metal Arc Welding Machine

GMAW machine (Fronius make 320 A) is pulse synergic machine used for joining of ferrous and nonferrous alloys as well as for weld deposition of hardfacing alloy in order to improve surface characteristics. This machine is used to prepare welding joints for further investigations in welding research aspects such as weldability, tensile strength and impact strength, etc. The machine is capable of all positions and high productive defect free welding which are essential need of industrial components such as engineering valves, thermal shield, turbine blades, etc.

**Highlights**

- Material based synergic control panel with latest artificial intelligence
- Provision of penetration stabilizer to obtain constant penetration throughout the welding joint
- Provision of arc length stabilizer to obtain less human interference for defect free welding
- For research and evaluation, documentation is possible of all welding parameters like current, voltage, wire feed speed, heat energy input, etc.

Model: NA

**Faculty In-charge:**

Dr. Vivek D. Kalyankar

Contact: vkalyankar@med.svnit.ac.in

Lab Name: Advance Welding Laboratory
**High Speed Camera**

For Image Capturing, Flame and Flow Visualization.

**Specifications**
- Sensor: 1280 x 1024 pixels, 10um pixel size, 12-bit ADC
- FPS: up to 8 lacs
- Model: Photron Fastcam Mini UX50/100

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**Proximate Analyzer**

For determination of Fixed Carbon, Ash Content, Volatile Matter and Moisture Content for any Solid Fuels including Sludge, Rice Husk and any type of Biomass.

**Specifications**
- Temperature range: Ambient to 1000°C
- Temperature resolution: ±2 °C
- Sample size: 50 mg to 5g
- Model: Leco TGA701

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**Faculty In-charge:**

Dr. Jyoti Mengani / Prof. S. A. Channiwala

**Contact:** sac@med.svnit.ac.in; jvm@med.svnit.ac.in

**Lab Name:** Sophisticated Instrument Laboratory
XRF Analyzer

For characterization on element (with atomic number greater than 17) basis of any material including Metals, Alloys, Sludge, Coal, Soil, Ores, Biomass, Heavy Metals, etc.

**Specifications**

Element Range: Na(10) to U(92)

Model:

Rigaku ZSXmini (DR05003)

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**Faculty In-charge:**

Dr. Jyoti Mengani / Prof. S. A. Channiwala

**Contact:**

sac@med.svnit.ac.in; jvm@med.svnit.ac.in

Lab Name: Sophisticated Instrument Laboratory
**Portable Alloy Analyzer**

For determination of any type of alloy and its composition at any site.

**Specifications**

| Test piece surface temperatures | 400°C |
| Model: Oxford X-met 5000 |

**XRD Analyzer**

For solid metal characterization and phase detection of any powder material.

**Specifications**

| Detector: Scintillator Nal (Ti) |
| Scanning Speed: 0.01-100 Deg/min |
| Model: Rigaku Miniflex |

**Faculty In-charge:**

Dr. Jyoti Mengani / Prof. S. A. Channiwala

**Contact:** sac@med.svnit.ac.in; jvm@med.svnit.ac.in

**Lab Name:** Sophisticated Instrument Laboratory
Portable Flue Gas Analyzer

For onsite measurement of flue gas composition and emissions.

**Specifications**
- Measuring range: -20 to +50 °C
- Resolution: 0.1 °C (-20 to +50 °C)
- Accuracy: ±0.2 °C (-10 to +50 °C)
- Model: Testo 350

Ultimate Analyzer

For determination of elemental composition i.e. Carbon, Nitrogen, Sulphur and Hydrogen for any Solid or Liquid Fuels including Sludge, Rice Husk and any type of Biomass.

**Specifications**
- Temperature Range: 1450 °C
- Sample size: 2mg to 1gm
- Model: Leco TruSpec CHNS

Faculty In-charge:

Dr. Jyoti Mengani / Prof. S. A. Chaniwala

Contact: sac@med.svnit.ac.in; jvm@med.svnit.ac.in

Lab Name: Sophisticated Instrument Laboratory
Scanning Electron Microscope

For Study of Surface Morphology, Catalyst Characterization, Corrosion Study etc.

Specifications
- Five Axis Motorized
- Resolution: 3nm
- Magnification range: 5 to 2 lac
- Model: Hitachi Series 3400N

Faculty In-charge:
Dr. Jyoti Mengani / Prof. S. A. Chaniwala

Contact: sac@med.svnit.ac.in; jvm@med.svnit.ac.in

Lab Name: Sophisticated Instrument Laboratory
**Bomb Calorimeter**

For Determination of Gross and Net Calorific Value of any Solid or Liquid Fuels Including Sludge, RiceHusk and any type of Biomass.

**Specifications**
- Measurement Range: 0.5 to 50 MJ/kg
- Resolution: 1 BTU/lb
- Precision range: <= 0.05% RSD
- Model: Leco AC 350

**Gas Chromatograph**

To analyze/measure the content of various components in a gas sample.

**Specifications**
- Operating Temp: Ambient to 400°C
- Sensitivity: >0.017 coulombs/gm
- Model: NETEL MICHRO 9100

**Faculty In-charge:**

Dr. Jyoti Mengani / Prof. S. A. Channiwala

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Lab Name: Sophisticated Instrument Laboratory
Thermal Imager

For Measure temperature distribution of wall/bearing, etc.

**Specifications**
- Resolution 160 × 120 or 320 × 240* pixels
- Thermal sensitivity < 50 mK
- Temperature range up to +550 °C
- Model: Testo 875-2i

Pocket LED Stroboscope

For High Speed Measurement

**Specifications**
- Speed Range: Up to 3 Lacs RPM
- Accuracy/Resolution .002% of setting or +/- 1 lsd/ 0.01 FPM
- Color Temperature 5600°K
- Model: Monarch Instrument 6235-011

Faculty In-charge

Dr. Jyoti Mengani / Prof. S. A. Channiwala

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Lab Name: Sophisticated Instrument Laboratory