

TUV India Private Limited Electronics, Electrical & Industrial Machinery Product Testing Laboratory



TÜV NORD GROUP
Expertise for your Success



OUR LABORATORY

TUV India (TUV NORD GROUP) as leading Inspection, Certification and Testing organization has established state-of-the-art Electronics, Electrical & Industrial Machinery Product Testing Laboratory. Our domain experts develop truly excellent solutions making your business more secure, enhancing the quality of your products and services ensuring safety and compliance. Our services offer you important gains in safety, security and quality for technology, processes, product, business decisions and activities. With our expertise in respective local and international standards, we provide single-window solutions to strengthen your product and its credibility in global and local marketplaces. Thus we partner you in your endeavor to achieve prominent position within the competitive market.

Our state-of-the-art facility is equipped with world class infrastructure, competent human resources, high-end test equipment and instruments, latest generation devices to conduct accurate analyses and tests for safety and compliance as per standard method and deliver reliable results. We also provide both in-house and on-site facility which further provides flexibility in terms of meeting timeline in the course of an overall product development lifecycle.



SOLUTIONS

In-House and On-Site Test facility

- Testing and Certification as per National & International Standards
- EMI/EMC Compliance Testing and Certification
- Pre Compliance Testing
- IT & Telecom Product Testing
- Customized Type Testing & Reporting
- Development Assistance for EMI/EMC, Safety & Reliability Testing
- Environmental and Reliability Testing
- Performance Testing

TESTING SERVICES OFFERED

- EMI-EMC Testing
- Battery Testing
- Vibration & Shock Testing up to 6000Kgf
- Environmental & Reliability Testing
- Electrical Safety Testing
- IP Testing up to IP 69
- Medical Electrical Device Testing
- Flammability Testing



PRODUCT CATEGORIES

- Battery (Lithium polymer, Lithium-ion, Lead Acid & Nickel-cadmium)
- Medical Electrical Devices
- Electrical & Electronic Products
- Commercial and Light Industrial Machinery
- Control Panel
- Switchgear and Transformer
- IT Product & Audio/Video Equipment
- Power Supplies and Stabilizers
- Domestic Household Appliances
- Power Tools
- Automotive Parts
- Measurement Control & Laboratory Equipment
- Lamp, Luminaries & AC/DC Control gears
- Defence Application Products
- Railway Application Products
- Power Converters for use in Photovoltaic Power Systems / UPS / Inverter Products

EMI/EMC Testing

Electromagnetic Compatibility (EMC) is the ability of Electrical & Electronic Equipment and systems to function compatible in their electromagnetic environment, by limiting the unintentional generation, propagation and reception of electromagnetic energy which may cause unwanted effects such as electromagnetic interference (EMI) or even physical damage in operational equipment. The goal of EMC is the correct functioning of different equipment in a common electromagnetic environment.

We offer EMI/EMC testing services to various IEC, EN & FCC standards

- EMI/EMC Testing for Appliances and Consumer Electronics
- For Industrial, Residential, Commercial & Light Industrial
- For Medical Electrical Equipment
- For Telecom Equipment (IT)
- For Railway Application Product
- For Defence Application Standards & Wireless Device Testing
- For Automotive Equipment
- EMI/EMC Compliance Testing and Certification
- Development / Pre Compliance Services

EMI / EMC TEST AS PER CISPR/IEC/EN

Conducted Emission Test

- 150KHz to 30MHz
- 1 ϕ , 16A
- 3 ϕ , 50A

Radiated Emission (OATS) Test

- 30MHz to 8GHz

Magnetic Field Measurement (OATS - Loop Antenna)

- 150KHz to 30MHz

Discontinuous Emission (Click) Test

- 150KHz to 30MHz

Disturbance Power Test

- 30MHz to 300MHz

Harmonic Emission Test

- 1 ϕ , 16A

Voltage Fluctuation and Flicker Emission Test

- 1 ϕ , 16A

ESD Immunity Test

- ± 30 KV Air Discharge,
- ± 15 KV Contact Discharge

Conducted RF Immunity Test

- 150KHz to 230MHz (Up-to 30Vrms) 1 ϕ , 16A & 3 ϕ , 63A for Power & Data Lines

EFT / Burst Immunity Test

- Up-to ± 5.3 KV
- 1 ϕ , 16A & 3 ϕ , 32A for Power & Data Lines

Surge Immunity Test

- Up-to ± 6.6 KV
- 1 ϕ , 16A & 3 ϕ , 32A for Power & Data Lines
- Telecom Surge (10/700 μ s)

Power Frequency Magnetic Field Test

- Continuous Field up-to 100A/m
- Short Duration Field up-to 1000A/m

Voltage Dips & Short Interruption Test

- 1 ϕ , 16A & DC Powered Product



ELECTRICAL SAFETY TESTING

Electrical safety is an essential requirement for all electronic and electrical devices, considering safety to the user, device and connected equipment. Safety is evaluated based on various hazards that can occur in day-to-day activities involved while using operating and servicing.

TUV India offers electrical safety testing for all types of electrical and electronic products in our accredited laboratories.

Electrical safety testing is carried out to evaluate the potential risks of electrical shocks to customers when using their product.

Major brands and new start-ups benefit enormously from electrical safety testing of their products.

We can carry out the testing for the following standards

- IEC 60950-1/IS 13252-1 for IT Equipment
- IEC 60065 for Audio, Video and Similar Electronic Apparatus
- IEC 62368-1 Safety of Audio/Video, information and communication technology equipment
- IEC 60335 for Household equipment including various parts
- IEC 61010-1 for Laboratory and Test & Measurement equipment
- IEC 61058-1 Safety of Switch for Appliances
- IEC/EN 60598 Specifies general requirements for luminaires
- IEC 61439 Low-voltage switch-gear and control gear assemblies
- IEC 62040/IS 16242 Uninterruptible power systems
- IEC 62109 Safety of Power Converters for use in Photovoltaic Power Systems
- IS 15885 Safety of lamp control gear
- Customized Testing Support

Key product categories include

- Information Technology Equipment
- Laboratory & Testing Equipment
- Telecom & Telecommunications Equipment
- Medical Equipment
- Audio and Video Equipment
- Lighting & Entertainment Equipment
- Machinery Equipment Safety
- Consumer, Household and Commercial Appliance Equipment
- Component and Power Supplies Lightning
- Switchgear Testing Control Panel Testing
- Safety Risk Assessments and Customized Testing Support

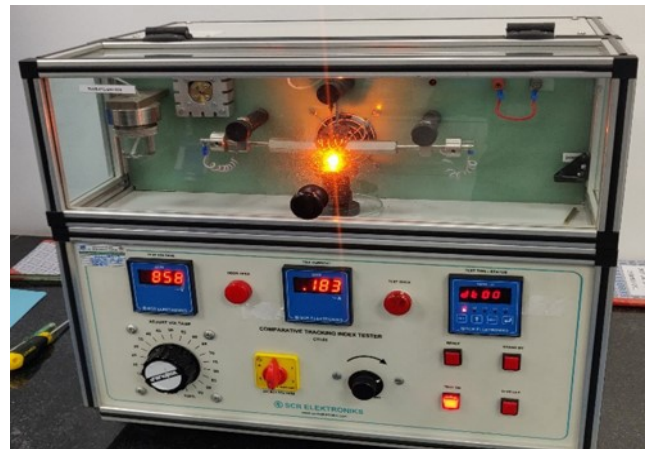
FLAMMABILITY TESTING

Equipment Failure to meet flammability testing requirements is not only a considerable risk to public safety, but it also restricts market access and can lead to enforcement actions by regulatory authorities.

Flammability testing determines how easily a material or finished product will ignite or burn when exposed to or used near fire or heat.

List of Tests

- Needle Flame Test
- Ball Pressure Test
- Glow Wire Test
- Horizontal and Vertical Flammability
- Comparative Tracking Index Test



MEDICAL DEVICE TESTING

A medical device which depends on a source of electrical energy and that the equipment is directly generated by the human body.

Product Safety requirements for medical Electrical devices are tested under the IEC 60601 standard for fulfilment of compliance requirements of the product.

We can carry out the testing for medical equipment under following standards

- IEC 60601-1/IS 13450-1 General Requirements for Basic Safety and Essential Performance
- IEC 60601-1-2/IS 13450-1-2 Electromagnetic disturbances - Requirements and tests
- IS 13450-2-19/IEC 60601-2-19 Particular requirements for the basic safety and essential performance of infant incubators
- IS 13450-2-21/IEC 60601-2-2 Particular requirements for the basic safety and essential performance of infant radiant warmers
- IS 13450-2-24/IEC 60601-2-24 Particular requirements for the basic safety and essential performance of infusion pumps and controllers
- IS 13450-2-25/IEC 60601-2-25 Particular requirements for the basic safety and essential performance of electrocardiographs
- IS 13450-2-27/IEC 60601-2-27 Particular requirements for the basic safety and essential performance of electrocardiographic monitoring equipment
- IS 13450-2-30/IEC 60601-2-30 Particular requirements for the basic safety and essential performance of automated non-invasive sphygmomanometers
- IS 13450-2-34/IEC 60601-2-34 Particular requirements for the basic safety and essential performance of invasive blood pressure monitoring equipment
- IS 13450-2-46/IEC 60601-2-46 Particular requirements for the basic safety and essential performance of operating tables



BATTERY TESTING

Our battery testing services are applicable to an extensive range of applications such as electric vehicles, stationary batteries, 2-wheel vehicles, grid storage, grid balancing, backup applications, uninterruptable power supplies (UPS), e-bikes etc.

Battery safety and reliability is also a key concern for the renewable energy industry, which utilizes a wide selection of technologies for solar energy storage and other uses.

List of applicable standards

- UN 38.3/IEC 62281 Safety of primary and secondary lithium cells and batteries during transport
- IS 10893 Sealed Nickel Cadmium Button Type Rechargeable Single Cells
- IS 1651 Stationary cells & batteries lead acid type with tubular
- EN 50342 Lead Acid Starter batteries - Part 1 General Requirements
- IS 7372 Lead acid storage battery for motor vehicle
- IEC 60254-1/IS 5154-1 Lead Acid Traction Batteries Part 1 General Requirements
- IEC 60254-2/IS 5154-2 Lead Acid Traction Batteries Part 2 Dimension of cells, terminal & Marking of polarity on Cells
- IS 14257 Lead acid storage battery for motor vehicle with light weight & high cranking performance
- IEC/EN 60896-21 & 22 Stationary Lead Acid Batteries Vented Types
- IS 15549 Stationary Valve regulated lead acid Batteries
- IS 10918 Specification for vented type Nickel Cadmium Battery
- BS EN 61427/IS 16270 Secondary Cells & Batteries for Renewable Energy Storage
- BS 6290-2 Lead Acid stationary cells & Batteries
- IS 16046-1 & 2/IEC 62133-1 & 2 Secondary cells & batteries containing non-acid electrolyte for Nickel & Lithium System
- IEC 61960-3 Secondary Lithium cells & batteries for Portable applications / secondary lithium batteries
- IEC 61957-1 & 2/IS 16048-1 & 2 Nickel metal Hydride
- IEC 62660-1, 2, 3 & 4 Secondary lithium-ion cells for the propulsion of electric road vehicles

Tester	Specification
Universal Battery Tester 1	<ul style="list-style-type: none"> • 18V, 25A Charging / Discharging • Charge Voltage: 0 to 18V • Discharge Voltage: 15 to 0V • Current: 0.25 to 25A • Switching time between Charging & Discharging: 20ms • Temperature Measuring Range: -40°C to 100°C
Universal Battery Tester 2	<ul style="list-style-type: none"> • 60V, 50A Charging/ Discharging • Charge Voltage: 10 to 60V • Discharge Voltage: 60 to 5V • Current: 0.50 to 50A • Switching time between Charging & Discharging: 20ms • Temperature Measuring Range: -40°C to 100°C
High Rate Discharger	<ul style="list-style-type: none"> • 15V, 500A high rate Discharger • Discharge Voltage: 15 to 0V • Discharge Current: 5.0 to 500A • Temperature Measuring range: -40°C to 100°C
IGBT Regenerative, Battery Pack Tester	<ul style="list-style-type: none"> • IGBT Regenerative Battery Pack Tester • DC output Voltage: 400VDC/ Circuit • DC output Current: 60ADC/ Circuit • DC output Power: 24KW/Circuit • Switching time between charge to discharge: 50ms



VIBRATION TESTING & ANALYSIS (SINE, RANDOM, RSTD & SHOCK TEST)

Ensure the integrity of your products using Vibration Analysis, Mechanical Shock and Vibration Testing.

Vibration testing reduces the risk of product failure in the field by simulating the vibration conditions that products are exposed to during their lifetime. Test specification defines the applied vibration levels as well as response defined testing and analysis.

Standards for Vibration and Shock Testing

- IEC 60068-2-6 Environmental testing Vibration (sinusoidal)
- IEC 60068-2-27 Environmental testing (Shock)
- IEC 60068-2-64 Environmental testing Vibration, broadband random and guidance
- IEC 61373 Railway applications - Rolling stock equipment - Shock and vibration tests
- MIL 810 Series Environmental Engineering Considerations & Laboratory Tests Methods
- JSS 55555 Environmental Test for Electronic And Electrical Equipment
- QM 333 Environmental Testing of Telecommunication Equipment

Vibration machine Specification

- Rated Force:
 - 6000Kgf peak SINE
 - 6000Kgf peak RANDOM
 - 12000Kgf peak SHOCK
- Frequency 5 to 2000Hz
- Max Acceleration: 100'g' for Vibration (Bare Table)

- Maximum Acceleration: 200'g' for Shock (Bare Table)
- Armature Diameter: 440mm
- Max Displacement 76mm (p-p)
- Velocity 2000mm/s (Sine) & 2500mm/s (Shock)
- Payload Capacity: 550Kg

Digital Switching Power Amplifier & Digital Logic Unit

- PWM technology, Class-D type, Solid-state power amplifiers
- In-built sine oscillator for generating frequency from 5 to 2000Hz

Horizontal & Vertical Load Support Platform

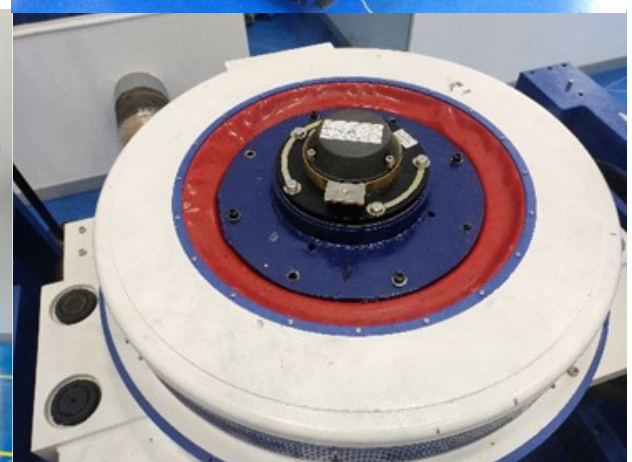
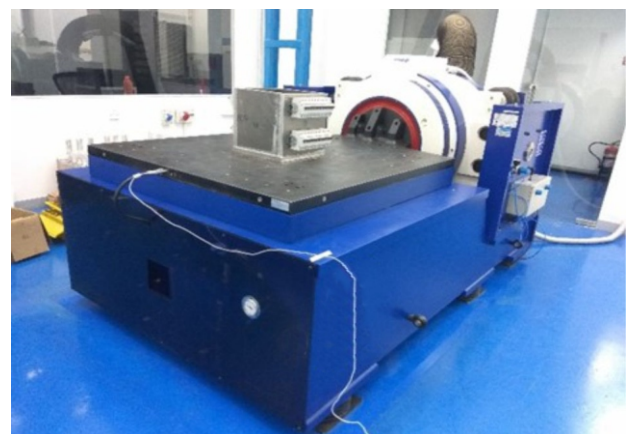
- 1200mm x 1200mm working platform
- Light weight Mg-alloy webbed structure
- M10/M12 SS inserts with 100mm X 100mm matrix pattern

8 Channel Digital Vibration Controller

- 8 Channel Controller (all simultaneous inputs)
- Resolution: 24 bit
- Built-in Signal Conditioner

Shear Accelerometer

- Unidirectional accelerometer
- Tri-axial accelerometer



RELIABILITY TESTING (ENVIRONMENTAL TESTING)

The testing procedure is useful for exposing technical products and devices to the kind of real-world stresses and strains a device will undergo.

List of Tests

- IEC 60068-2-1 Cold
- IEC 60068-2-2 Dry Heat
- IEC 60068-2-14 Change of Temperature
- IEC 60068-2-30 Damp Heat, Cyclic
- IEC 60068-2-78 Damp Heat, Steady State
- IEC 60068-2-11 Salt Mist
- IEC 60068-2-52 Salt Mist, Cyclic
- JSS 55555 Methods for Electronic and Electrical Equipment
- QM 333 Environmental Testing of Telecommunication Equipment
- MIL 810 Series Environmental Engineering Considerations & Laboratory Tests
- Thermal Shock Test



Chamber Specifications

Chamber	Specification
Climatic chamber	<ul style="list-style-type: none">• Volume: 1540 liters approx.• Dimensions: 1100mm (W) x 1475mm (D) x 950mm (H)• Temperature Range: -40°C to +180°C• Humidity Range: 10% to 98% RH• Temperature Change Rate (as per IEC 60068-3-5): 2.5°K/min. (Cooling) 3.5°K/min. (Heating)
Walk-in Chamber	<ul style="list-style-type: none">• Dimensions: 3000mm (W) x 3000mm (D) x 3000mm (H)• Temperature Range: -40°C to +100°C• Humidity Range: 20% to 95% RH• Ramp up rate (Average): 5°C/min• Ramp down rate (Average): 3°C/min
Thermal Shock Chamber	<ul style="list-style-type: none">• Volume: 120 liters approx.• Temperature Range for the Hot Chamber +50°C to +220°C• Temperature Range for the Cold Chamber -80°C to +70°C• Cabinet Dimension: 400mm (W) x 600mm (D) x 330mm (H)• Transportation Time: <10 Sec



INGRESS PROTECTION TESTING

Ingress protection (IP) testing reduces the risk of product failure in the field by assessing the degree of protection provided against mechanical intrusion, dust, accidental contact and water into casings and enclosures.

IP codes are widely used to indicate the degree of water-proof and dustproof properties of electric equipment.

The IP codes defined in IEC 60529 classifies the degree of protection against the ingress of foreign material (including steel balls, copper wire, dirt and dust, water) into the enclosure of electrical and mechanical products.

Applicable Standards

IEC 60529/ EN 60529: Degrees of protection provided by enclosures (IP Code)

Solid (First Numeral)	Water (Second Numeral)
IP 0X - Non Protected	IP X0 - Non Protected
IP 1X - Objects Probe ≥ 50mm Diameter	IP X1 - Vertically Dripping Water
IP 2X - Objects Probe ≥ 12mm Diameter	IP X2 - Dripping Water (15° Tilted)
IP 3X - Objects Probe ≥ 2.5mm Diameter	IP X3 - Spraying
IP 4X - Objects Probe ≥ 1.0mm Diameter	IP X4 - Splashing
IP 5X - Dust Protected	IP X5 - Jetting
IP 6X - Dust Tight	IP X6 - Powerful Jetting
-	IP X7 - Temporary Immersion
-	IP X8 - Continuous Immersion
-	IP X9 - High Pressure and temperature water Jet



About Us

TUV India Pvt. Ltd. (TUV NORD GROUP) is a customer-focused, innovative, and independent, technical, quality & safety services organization, dedicated to providing future-proof solutions through technological excellence for the success of its customers with the highest level of integrity. With a presence at over 40 strategic locations in India; a branch office in Sri Lanka; state-of-the-art laboratories at Pune, Bangalore & Jamnagar; 100 important countries worldwide and through digital means, we are always connected to you, our esteemed customer, anywhere, anytime.

We are proud to provide increasing levels of services to the best known, largest global and national companies as well as medium and small industries in diverse sectors like Oil & Gas, Petrochemical, Nuclear, Renewables, Infrastructure, Food, Power, Manufacturing, Chemicals, Pharma, Paper, Automobiles, Railways, Aerospace, Defence, IT, Health, Hospitality, Retail, etc.

Over 1200 competent and experienced TUV India experts spread across India and over 14000 TUV NORD experts all over the world, enthusiastically support our clients by providing value-added services in Industry Inspection, European / International Approvals, Management System & IT Certification, Sustainability, Energy audit, Water audit, Carbon Services, Building Infrastructure & PMC, Renewable Energy, Food & Packaging Testing, Food Certification & Inspection; Product Testing – Electricals, Electronics and Industrial Machinery; Product Certification; Petroleum, Chemicals & Gas Cargo Inspection; Petroleum, Chemicals & Gas Testing; Railway Technology; Engineering, Safety Studies, and knowledge enhancing training programs under TUV India Training Academy.

Why testing & certification?

- Fast market access for your product
- Competitiveness in more markets
- Send a signal to potential clients that quality is your major focus
- Get higher ratings when you're evaluated by retailers & importers
- Improved reliability – market leading third party proof of product conformity

Services Portfolio

- Industrial Inspection Services
- Management Systems & IT Certification
- Building Infrastructure & PMC Services
- Renewable Energy
- Food & Packaging Testing
- Food Certification & Inspection
- Product Testing - Electricals, Electronics & Industrial Machinery
- Product Certification
- Petroleum Chemical Gas Cargo Inspection Services
- Petroleum Chemical Gas Cargo Testing Services
- Railway Technology
- TUV India Training Academy

Who can benefit from this test facility?

- Manufacturers planning to target global market and want free movement for their product in the market.
- Manufacturers who believe in manufacturing world class quality product & want to get it Endorsed through a neutral third party & use it as marketing tool .

TUV India Private Limited

Electronics, Electrical & Industrial Machinery Product Testing Laboratory

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