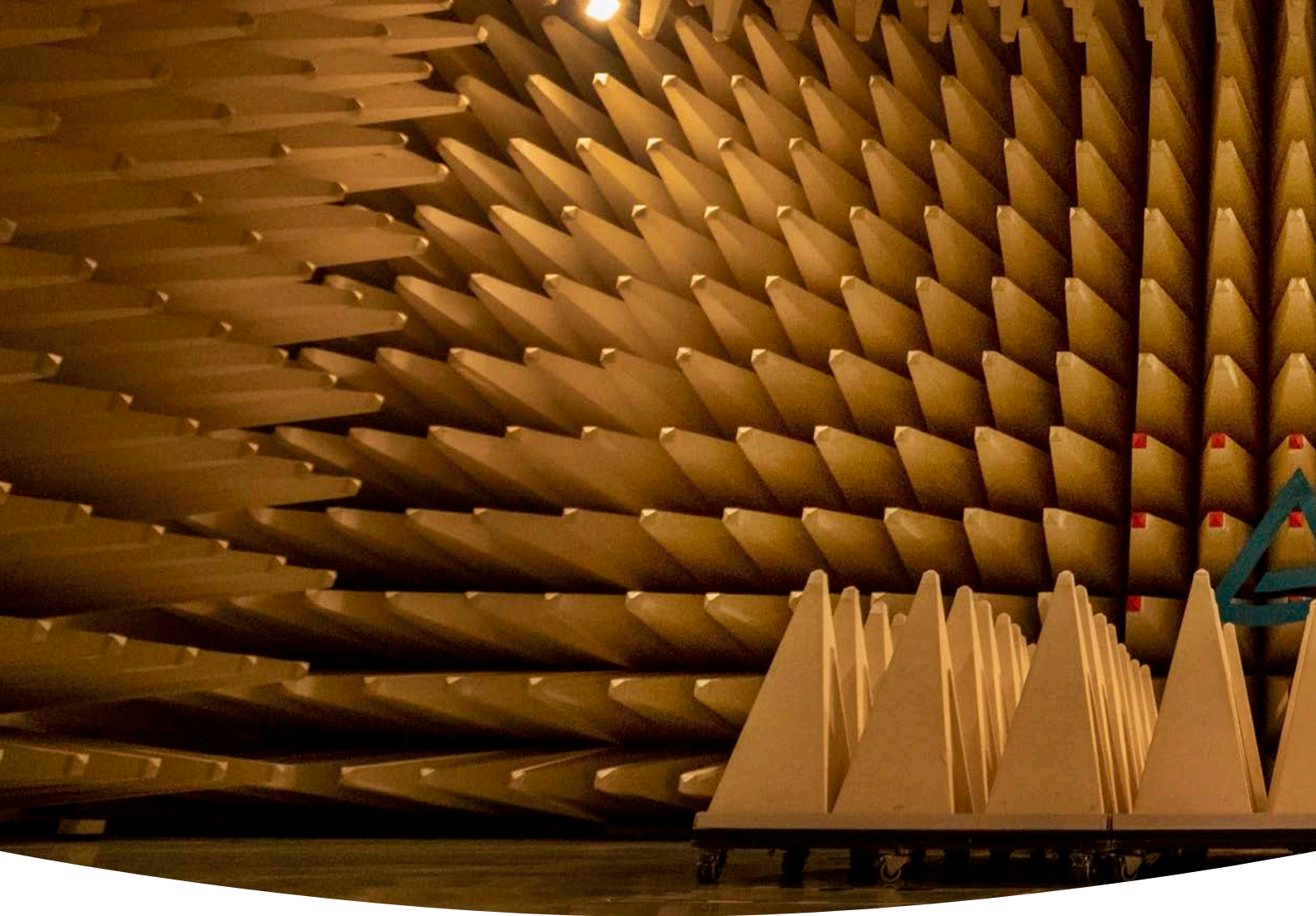




State-of-the-Art Product Testing Services

TÜV Rheinland India operates Testing Facilities in Association with MCCIA Electronic Cluster Foundation (MECF) as per National and International Standards.



EMC Testing Services.

Safety and compliance are the twin pillars of EMC certification.



ELECTROMAGNETIC COMPATIBILITY

TÜV Rheinland is a one-stop shop for all Pre Compliance / Full Compliance Testing, Inspection, Assessment, Training and International Certification requirements for Automotive Sub-assembly Components, Industrial, Commercial, IT, Audio Video, Medical Products & Household Appliances as per IEC, CISPR, EN, ISO, IS, SAE, AIS, ECE regulations and OEM specific standards.

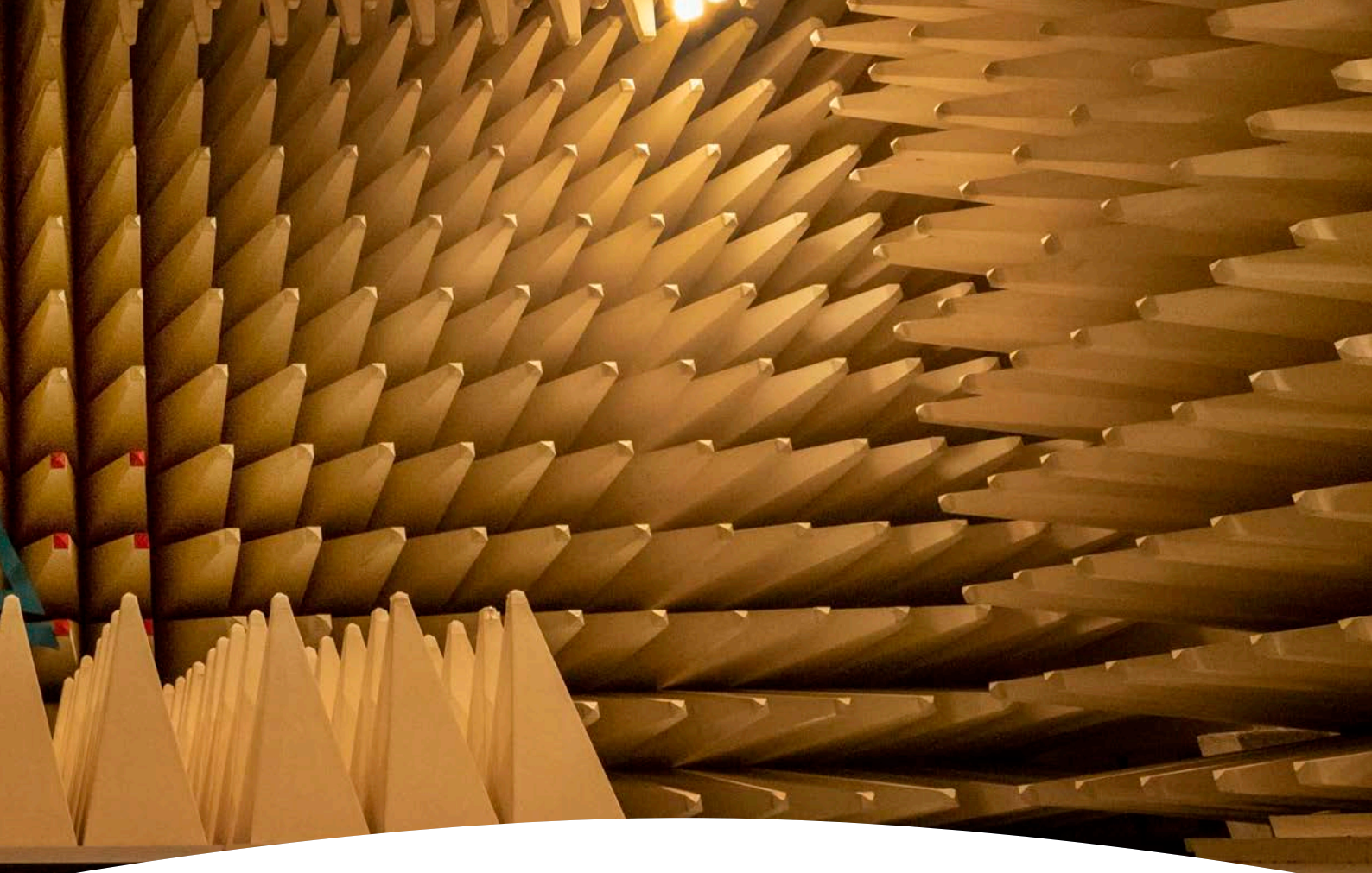
Radiated Emissions Measurement of radio disturbance characteristics of components and modules for the protection of receivers used on board vehicles as per CISPR 25, CISPR 12, AIS 004, ECE R10, ECE R116, and OEM specific standards.



OUR SERVICES:

- Conducted and Radiated Emission
 - Radiated & Conducted Susceptibility
 - 3 PH Voltage Dips & Interruptions
- Harmonic Current Emissions
- Flicker Emissions
- Electrostatic Discharge (ESD)
- Magnetic Field Immunity
- EFT and Surge Immunity

We conduct EMI and EMC Testing according to a range of standards for Industrial (IEC 61000-6-2, IEC 61000-6-4, CISPR11), Multimedia Equipment (CISPR 32, CISPR 35), Medical Equipment (IEC 60601-1-2), Household Appliances (CISPR 14-1, CISPR 14-2), Commercial Equipment (IEC 61000-6-1, IEC 61000-6-3), and Laboratory & Measurement Equipment (IEC 61326-1).



Additionally, we adhere to the comprehensive IEC 61000-4 series of standards for EMI and EMC Testing.



DO NOT DISTURB AND DO NOT GET DISTURBED

EMC directive conformity evaluation can be combined with testing according to FCC/IC, AS/NZS standards providing additional economic benefits and encompassing certification as well as design support.



EFFICIENT EMC SOLUTION

As a 'Notified Body' and international service provider, we have been providing professional services for conformity assessment for CE marking. Our strength is our laboratory infrastructure, accreditation, and global network.



PRODUCT EXAMPLES

We test all automotive & electronic and electrical sub-assemblies/ products and components.

Other product categories are:

- Energy Meters, Multifunction Meters
- Relays and Switchgear Panels
- Timers, Motors, Submersible Pumps
- VDSL – Ethernet Modem, Telecommunication Products
- Control Panels

- UPS, SMPS and other Power Modules
- Electric Control System (ECS) for Air Inflation Systems
- Electrical Vehicle Chargers
- Injection Molding Machines
- Refrigerators
- Washing Machines
- Air Conditioners
- Laboratory and Measurement Equipment
- Industrial Machinery





Reliability Testing Services

TÜV Rheinland India Operates Testing Facility as per National and International Standards.



FOR SAFETY, QUALITY AND SUSTAINABILITY.

Reliability tests accelerate the aging process of the product in order to predict its lifecycle and analyse probable future causes of failure.



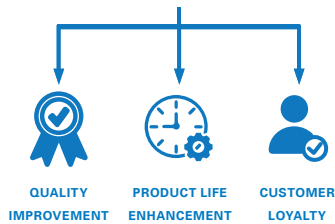
RELIABILITY TESTS



LIFECYCLE PREDICTION



PRODUCT IMPROVEMENT



These tests help improve the product's design and implement changes at the product developmental stage, thereby improving product quality and life while ensuring customers remain loyal to your product. Reliability tests may be performed at various stages to rectify potential defects - from the prototype to the final production stage

basis the manufacturer's requirement. TÜV Rheinland India, as an independent testing and certification body, has best-in-class reliability testing services for a range of products including commercial, industrial, electronic sub-assemblies for consumer electronics, household, medical, lighting, and many more.



WHY TÜV RHEINLAND:

- Our one-of-a-kind testing facility has an in-house Reliability Testing Laboratory equipped with Environmental Chambers, Vibration and shock Test Equipment, Combined Shaker and Integration Test Equipment, Free Fall Drop Test Equipment, and Ingression Protection Test setup up to IP68
- We offer a one-stop-solution for all Reliability Testing, Safety Testing and EMC Testing and Certifications
- Manufacturers can save time and cost by considering compliance and testing requirements during the design and development stage



TYPES OF RELIABILITY TESTS:



- Standard Specified Tests: Test conducted as per particular IEC/EN/ISO/BIS/IS standards
- OEM Specified Tests: Test conducted as per OEM's DVP
- Customer Usage Profile: Tests based on realistic expectation of customer usage
- Development Tests: Test taken during the design phase of a product:
 - Component Level Testing
 - System Level Testing
 - Environmental and Accelerated Testing
 - Shipping Test
- Manufacturing Tests: Normally taken up post design finalization and release for production, where we tend to measure the manufacturing process
 - Functionality testing and Burn-in
 - Extended Post-production testing

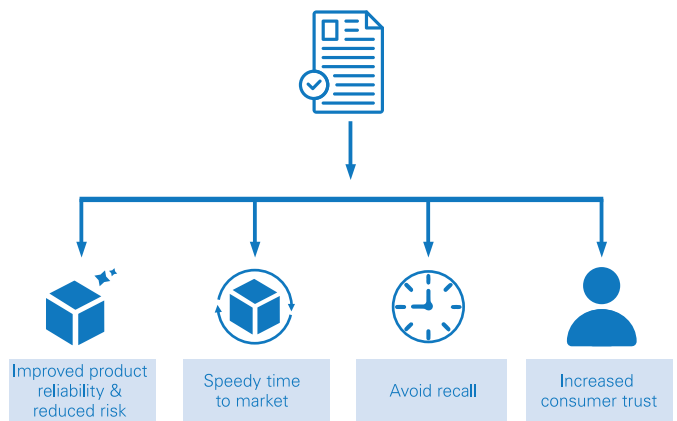
- Design/ Process change Verification



BENEFITS AT A GLANCE:

- Reliability testing helps to improve your product reliability and reduce the risk encountered
- Enable a speedy time to market
- Avoid unnecessary product recall
- Increase the trust of consumers on your product and safeguard your brand

TEST BENEFITS





LED Lamps and Luminaires

LED luminaires have revolutionized the lighting industry, with the demand for LEDs growing across the globe. Besides serving as a light source, LEDs are now part of various lighting applications, including general luminaires, entertainment and medical products. If your product includes LEDs and you are looking to expand your market, take advantage of TÜV Rheinland's services to get access to domestic as well as international markets.

Our experts offer a range of testing and certification services in line with prescribed directives and standards. We test the energy efficiency, usability and safety of your products, whether your lamps, lights and LEDs are designed for personal or industrial use, whether they run on main or battery power. The support provided by our experts range from intermediate testing during product development to securing international approval for your products.

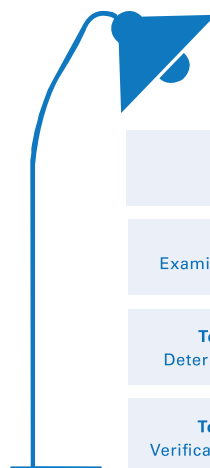
Use testing and certification for lamps and lights to comply with legal requirements and communicate a high-quality standard to your customers. Benefit from the extensive experience of our inspectors who test and assess your lights as an independent third party.



QUICK TESTING TURNAROUND TIME AND SPEEDY MARKET ACCESS:

Testing and certification of lamps provides a competitive advantage through our neutral and internationally recognized test mark. It documents that the products comply with prescribed safety standards and are of high quality. As a result of our speedy turnaround time for testing, your products can reach global markets much faster.

OUR TESTING SERVICES FOR LAMPS, LIGHTS AND LEDs



Testing for electrical
As per DIN EN/IEC 60598-1 / IS 10322-1

Environment simulation tests
Examination of the influence of environmental factors on functionality

Testing for usage properties and service life
Determination of effectiveness, efficiency and safety

Testing for electromagnetic compatibility (EMC)
Verification of ability to integrate with electrical networks



OUR SERVICES:

We offer a wide range of services for every kind of lighting product - from industrial lighting to lights for living spaces and LED lamps, modules and emergency lamps. – from industrial lighting to lights for living spaces and LED lamps, lighting, modules and emergency lamps.

- **Individual or Full Testing**

Complete or partial testing for your lights, lamps and LEDs, and issuing of the necessary certificate.

- **Testing and Certification according to various standards and laws**

This includes electrical compatibility, suitability for integration, electromagnetic compatibility, usage properties, service life and environment simulation test.

- **Support during Product Development**

Structured overview of the relevant standards, limits and testing requirements as well as optional intermediate testing for prototypes.

- **Production Monitoring and Goods Inspection**

Inspection measures to maintain the existing certificate; inspection and verification to evaluate whether products still correspond to the certified product sample.

- **Conformity Assessment**

Testing of lights and lamps according to relevant standards and directives.

- **Support for Export**

Our certifications and registrations support you in getting approval for successful export of your products to global markets.



YOUR QUALIFIED PARTNER FOR TESTS AND CERTIFICATIONS ACCORDING TO DIN EN 60598:

Our qualified experts offer you a range of product specific services with short testing times. Thanks to our active involvement in the development of standards, we are always up to date when it comes to the lamp and lighting market. This way, we can offer you individual and product-specific support.

You will also benefit from our extensive experience of approval regulations pertaining to export of products.

ACCREDITATIONS:

We are under the process of accreditation for IS 10322-1, IEC/EN 60598-1 (which encompasses different sections of both IS/IEC), 16102-1, and LM-79 standards.

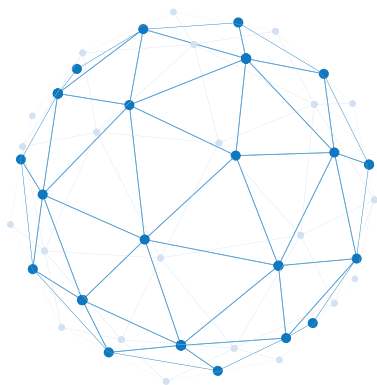
Do you want to learn more about our services for lamps, lights and LEDs? Make an appointment with our experts today!



Electrical Safety

Compliance Testing & Certification Services.

Selecting the right regulatory testing and compliance service partner is essential for thriving in the current business landscape. By choosing TÜV Rheinland, you benefit from our global network of technical experts who possess localized market knowledge and who offer swift solutions for your products to gain speedy market access with our globally accepted test mark. With TÜV Rheinland's comprehensive portfolio of solutions, you can navigate through unforeseen regulatory challenges and fulfill critical global rollout timelines, which translates into significant time and cost savings.



OUR SERVICES:

- **IT, Telecommunication & Office Equipment:**

This product category encompasses a wide range of products including Radios, Telecommunication Equipment, Notebooks, Printers, PDAs, Switching Power Supply, Visual Display Terminals, Charging Stations, Scanners, Copiers, Paper Shredders and more.

- **Household Appliances:**

This product category comprises various types of appliances including;

- White Goods: Refrigerators, Washing Machines and Water Heaters
- Brown Goods: Kitchen Appliances (Mixers, Grinders, Toasters), Hair Dryers, Iron Boxes and more.

- **Lab Equipment:**

Includes products such as:

- Measuring Equipment
- Monitoring Equipment
- Control Equipment
- General Electrical Equipment commonly used in laboratories

- **Luminaries / LED:**

Covers a broad range of products including:

- Luminaries (indoor and outdoor applications)
- Self-Ballasted Lamps
- LED-Based Lighting Assemblies
- Electronic Control Gears

- **Audio/ Video:**

Covers the following product categories:

- Televisions
- Audio Amplifiers
- Video Games
- Image Processors
- Set-top Boxes
- Electronic Music Systems



IMPORTANCE OF ELECTRICAL SAFETY TESTING:

Electrical Safety Testing is highly beneficial for both established brands as well as start-ups since it offers the following advantages:

- Ensuring compliance with various regulations and standards in global markets
- Demonstrating commitment to safety while meeting customer expectations
- Identifying and resolving issues in the product at an early development stage
- Preventing costly product recalls
- Mitigating the risk of expensive litigation arising from injury caused by faulty products



ELECTRICAL SAFETY TESTING:

To evaluate the electrical safety of a product, TÜV Rheinland offers the following tests:

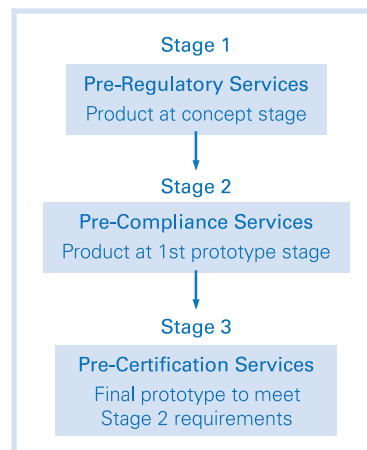
- High Voltage Test (Dielectric Withstand Test) measures the product's ability to withstand a high voltage between its electrical circuit and the ground
- Leakage Current Test assesses whether the current flowing between an AC source and the ground exceeds a specified limit
- Insulation Resistance Test determines the quality of electrical insulation used in the product
- Ground Continuity Test ensures that there is an unobstructed path between all exposed metal surfaces and the power system ground

BIS COMPULSORY REGISTRATION - MANDATORY REQUIREMENTS FOR IT & ELECTRONIC GOODS

The Indian government has introduced the "Electronics and Information Technology Goods Order 2012" that mandates compulsory registration of Electronic and IT Goods. This move ensures the safety of Indian consumers by ensuring that manufacturers bring safer products to the market. Additionally, it has established a common platform for both Indian and foreign manufacturers to adhere to Indian standards such as IS 13252 / IEC 60950-1, IS 616 / IEC 60065

PRE-REGULATORY SERVICES / PRE-COMPLIANCE / PRE-CERTIFICATION

Failing to ensure compliance during a product's design phase can directly impede the company's ability to meet its time-to-market objectives. Collaborating with TÜV Rheinland during the product's concept planning stage can be the ideal solution. We offer a range of services during the product design stages such as:



- Stage 1: Pre-Regulatory Services: Product at concept stage
- Determining the technical entry barriers in target markets including country and regional certifications



- that may be mandatory or voluntary
- Providing preliminary information on various certifications required by target markets such as safety, EMC, wireless, type approval, license marks, in-country testing, pre-shipment/post-shipment inspection and others
- Identifying relevant standards based on the product's intended use and functionality
- Offering research support for new market entry, including a comprehensive document that covers all the details mentioned above for a specific country where the manufacturer plans to introduce their product
- **Stage 2: Pre-Compliance Services: Product at 1st prototype stage**
 - Re-evaluating identified standards during Pre-Regulatory Services after observing prototype function and final application
 - Reviewing product design to ensure compliance with established norms
 - Identifying critical components and certification requirements
 - Verifying labels, manuals and other documents meet relevant standards and country-specific requirements

- **Stage 3: Pre-Certification Services: Final prototype to meet Stage 2 requirements**
 - Identifying critical tests to ensure the product complies with standards
 - Utilizing the lab's resources for iterative testing during product development to achieve compliance with test limits and guidelines
 - Conducting applicable tests in the right sequence and as per relevant test criteria. If the product passes all tests on the first attempt, it is considered as compliant and ready for necessary certification activities

WHY TÜV RHEINLAND?

TÜV Rheinland's global network of fully-accredited laboratories provides comprehensive Electrical Safety Testing Services. Our team of engineers is proficient in testing an extensive range of consumer electronics as well as industrial, laboratory and commercial equipment. We ensure quick scheduling and timely execution of tests which enables manufacturers to obtain certification in the shortest possible time.

TÜV Rheinland (India) Pvt. Ltd.

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