

Inspection and QA Services

TCR Engineering Services
A Material Testing Laboratory in India

Inspection and Quality Assurance

TCR Engineering Services, from its offices in Mumbai, provides inspection and quality assurance services to help retailers, trading partners, importers and manufacturers assess product quality and meet the regulatory requirements of their industry vertical. Our independent, third-party quality assurance services result in improved product quality, with a reduction in customer complaints, noncompliance and product recalls.

The on-site inspection team covers all the states across India. The pricing structure for the on-site inspection services is set competitively and is based on man-day charges.

Our inspection services include:

Factory Audit

TCR Engineering Services Factory Audit service verifies the capability of a manufacturer to meet contract conditions for quality, quantity and delivery terms. Such assessments are often tailor-made as per a client's needs and requirements. By availing of this service, we eliminate the need for a client to be present on-site at the manufacturer's plant or factory.

OEM Development

TCR Engineering Services with 31 years of experience has a team possessing a strong engineering background. This team stands ready to offer consultation based on the latest technological advances, incorporating current national and international norms and standards. TCR can help assist in creating a first production prototype, technical documentation, standards evaluation, establishing production and quality criteria, and technical transfer to the supplier.

Picking of Samples and Testing Coordination

Our inspectors can select a pre-determined number of samples from production at a factory and seal them, label & send them to our material testing laboratory for testing according to customer requirements. At the TCR Engineering Services material testing laboratory, we provide Mechanical Testing, Chemical Analysis, Positive Material Identification (PMI), Non Destructive Testing, Metallography, Corrosion Testing, Failure Analysis, Raw Material Inspection, Metallurgical Product evaluation, Engineering Research and Consulting.

Initial Production Check

The inspection team from TCR Engineering Services can perform a visual inspection of products as available at the beginning of the production cycle against a client's instructions and Purchase Order specifications. The "Initial Production Check" when combined with a "Final Random Inspection" and any other on-line production checks, helps in taking corrective actions at an early stage of production cycle. The inspection team will send out intermediary reports to the client and keep them informed about the production progress relative to the delivery terms.

In-Production Check

The inspection team performs a visual inspection of products as available during production. The inspection team may subject some products for random material testing. The in-production check service helps in reducing the final random inspection failure risk.

Random Inspection

The TCR Engineering Services inspection services team performs a final random inspection comprising of a detailed visual inspection of goods before shipment. It is generally conducted on the premises of the manufacturer, on samples selected according to defined sampling procedures. The inspection criteria covering quality, quantity, marking and packing are based on the client's specifications and reference samples, as provided. Upon completion of the final random inspection a detailed inspection report is sent to the client and the inspection certificate issued to the supplier if all findings are positive.

Random Inspection can be chosen as an independent service or for a tighter check on the production, the Random Inspection service can be performed in conjunction with the "Initial Production Check" and "In-Production Checks." Upon completion of this inspection we will issue a TCR Engineering Services Inspection Certificate certifying the product quality.

Loading Supervision

To further manage the product delivery, the TCR Engineering Services inspection team offers Loading Supervision which involves, "as appropriate," the checking of the container condition, identification of the loaded packing units with the previously inspected consignment, tallying of the total number of shipping packing units and sealing of the container. Loading Supervision service is offered in combination with the Final Random Inspection.

Raw Material Inspection Services

As part of all product inspection and/or material sourcing projects, TCR undertakes Raw Material Inspection Services. We conduct on-site visits to the supplier / manufacturer's plant to determine evaluate fabrication techniques, assembly procedures or quality issues, and ensure that the production is as per client specified requirement. Inspection can range from a simple walk through to extensive sample retrieval and onsite analysis. Our sample custody is continuous from on-site photography and logging, through laboratory analysis and secure storage. Prior to initiating a raw material inspection service, TCR seeks to obtain a data sheet for the assignment.

Material Inspection Services are essential to ensure that all material supplied meets client / project defined specifications. TCR can perform quality analysis (QA) on all engineering goods sourced from India and validate them as per ASTM, BS, GS, JS, IS and other international standards.

The TCR Engineering Consulting and Sourcing staff is supported by TCR's material testing laboratory which provides full chemical, mechanical, non destructive testing, metallographic, XRF-based positive material identification, corrosion testing and component testing services, including portable spectrometers, and digital photography. TCR also has access to scanning electron microscope and EDAX attachments.

Inspection Procedure followed by TCR Engineering

1. Following information is sought from vendor / buyer on whose behalf inspection is to be carried out:
 - Name, Address, Telephone & Fax No of Vendor.
 - Details of Materials ordered along with specification (IS/BS/ASTM etc).
 - Details, Quantity, any special requirement and testing requirements.
 - Sampling plan, if any.
2. TCR's inspection department will then get in touch with the supplier to ascertain availability of material for inspection. If available, an inspection visit is fixed within 24 hours.
3. TCR inspector would carry out normal visual inspection (capturing detailed size measurements) and mark each and every item (or random sampling, as specified by the client) with some "identification" number or TCR Test Certificate Number (if material testing is ordered as well) and TCR Stamp. Extra stamping would be done on materials randomly drawn for testing as per sampling plan of the buyer. If no specific sampling plan is given by the buyer, it is normal practice of TCR to draw a minimum of 2 No. of samples and one additional sample for each 10 Nos. This ensures assessment of uniformity of the lot. TCR inspector will also mark the material from which requisite length of sample is to be cut.
4. If the samples are to be cut by the vendor; the same must be delivered to TCR's Lab ensuring that TCR stamp numb. & identification markings are intact.
5. TCR will test the sample when delivered to its lab and carry out all tests as required by the buyer. Step by step tests are also carried out at the request of vendor who is not too sure of the quality and does not want all tests to be carried out if the material is not meeting some requirements. Test in such cases are stopped once it is established that sample is failing in certain test. Please note that this may delay the job.
6. All samples drawn from a particular lot must pass all the tests, which are required by the buyer. If any sample fails, the entire lot is rejected and then in order for acceptance, the vendor must agree to test each and every bar / plate of the lot to be tested in respect of the failed test. All samples passing the test only will be cleared for dispatch. A test certificate is issued confirming the acceptance of the sample and material.
7. All bills for testing & inspection charges are normally raised on to the vendor and the buyer may reimburse the same to the vendor for all accepted materials.
8. All materials dispatched from the vendor to the buyer must carry TCR stamp and Serial / TC Number, so that it can be easily co-related by the inspection department of the buyer.
9. In case of failure, vendor is advised to offer a new lot and entire procedure is repeated once again. In case of minor deviation from standard specification, vendor may get clearance from the buyer and such clearance is to be directly communicated to TCR by the buyer. Such items can then be cleared for dispatch.

Engineering Consulting on Product Sourcing

TCR Engineering Services, with over 30 years of operations in India, has a well established reputation in the area of Engineering and Consulting. We have an in depth knowledge of the Metal / Steel industry in India, including all small and big enterprises.

TCR Engineering Services provides valuable guidance in sourcing a product from India. TCR sourcing experience includes castings & forgings, sheet metal, bars, pipes, cast iron, stainless steel sheets, nuts, bolts, engineering goods, ferrous and non-ferrous metals, non-metallic materials (such as polymers, ceramics, glass), machined parts, and tool components. Our product sourcing database covers all manufacturers, small and large, in India.

We are unbiased in our sourcing efforts and strive to help all customers find the right product which meets international quality standards. TCR Engineering Services does not participate in any price negotiations; however, our knowledge of the Indian Metal / Steel Market often leads us to the well-priced supplier.

Cost of Product Sourcing

The Product Sourcing service is a fixed-price effort from TCR Engineering.

About TCR Engineering Services

Founded in 1973, TCR Engineering Services (TCR) is India's most reputed and established, NABL and ISO 17025 accredited independent material testing laboratory. The core services TCR provides include Mechanical Testing, Chemical Analysis, Positive Material identification (PMI), Non Destructive Testing, Metallography, Corrosion Testing, Failure Analysis, Raw Material Inspection, Metallurgical Product evaluation, Engineering Research and Consultancy.

TCR has pioneered in introducing latest analytical facilities and has upgraded the same every decade. TCR has state-of-the art testing facilities for testing of Engineering Goods, Ferrous and Non-Ferrous Metals, Non-Metallic Materials such as Polymers, Ceramics, Glass, etc.

More than 1000 Quality driven clients (in India and a select few globally) in Aerospace, Automotive, Oil Refineries, Petrochemical plants, Chemical Processing, Defense, Nuclear Power and Capital Goods manufacturing trust TCR to handle their Material Testing and Research & Development requirements.

Engineers, Chemists, Metallurgists & Technicians, at TCR, have the qualifications, the education and the experience to meet rigorous standards in the testing field, whether serving the Private and Public Sector, Government or the Military.

Customer Service Representatives, at TCR, provide clients with up-to-the-minute information on the status of your sample through our in-house laboratory automation software. The need for responsiveness is something understood by everyone in the company. We have improved turnaround time without sacrificing quality by operating 12 hours a day in the lab, 16 hours a day in the machine shop.

TCR laboratories are located in Lower Parel, Mumbai and Electronic Zone, Navi Mumbai with a sample collection office in the Mumbai Metal market. TCR Advanced Services, a TCR Engineering affiliate company, has its laboratory in Baroda. Engineering professionals travel across India to conduct on-site material testing. International clients are served by a sales office in Washington DC, USA.

ISO 17025 Accredited Laboratory in India

TCR Engineering Services is a Bureau of Indian Standards and NABL accredited laboratory. NABL approval is from Department of Science and Technology, Government of India. NABL provides laboratory accreditation services to laboratories that are performing tests / calibrations in accordance with ISO 17025.

TCR is one of the select few test houses, in India, to be on the approved list of such organization as Bharat Heavy Electrical Ltd., Nuclear Power Corporation of India Ltd. (NPCIL), Larsen & Toubro Ltd. (L&T), Engineers India Ltd. (EIL), Toyo Engineering India Ltd., Oil & Natural Gas Commission (ONGC), Bhabha Atomic Research Centre (BARC), Vikram Sarabhai Space Centre (VSSC), Dept. of Defense, DGS&D, Indian Railways, Mumbai Municipal Corporation, Dept. of Telecommunications, Electronic Corporation of India Ltd and others.

TCR is also approved by international recognition bodies such as American Bureau of Shipping (USA), Bureau Veritas (France), Lloyds Register of Shipping (UK), Det-Norske Veritas (Norway), SGS (India) Ltd. and others.

Material Testing Laboratory Services

TCR Engineering Services' ability to provide value to our metal testing customers is based on organizing our talents into a focused set of technological capabilities. This gives us the unique ability to apply appropriate combinations of capabilities and expertise to provide multi-disciplinary solutions for our clients.

We have several testing services, but, no matter which discipline we use, one thing is certain. When you send a sample to TCR, you can have confidence in the results, because you are working with a company that has a reputation for being meticulous.

The list of services offered by TCR includes:

Mechanical and Physical Testing

Comprehensive range of Mechanical Testing with a dedicated machine shop to assist in sample preparation. Capabilities include: Tensile, Impact, Weldability, Bend, Compression, Flaring/Flattening, Hardness, Dynamic Loading, Drop Weight, Proof Load, Fasteners, Hydraulic/Pneumatic, Component Testing, and more.

Chemical Analysis

State of the art Chemical Analysis laboratory allows our expert chemists to analyze ferrous and non-ferrous metals, ceramics, glass, refractories, mineral and ferro alloys in PPB or PPM level or in percentage. Our capabilities include: Wet Chemistry, Optical Emission Spectroscopy (OES), Inductively Coupled Plasma (ICP) Spectrometer, Automatic Combustion based Carbon and Sulfur determination, Glow Discharge spectrometer for (GDS) chemical depth profiling, and more.

Positive Material Identification (PMI)

TCR Engineering's Positive Material Identification service is fast becoming an integral part of process safety management in the petroleum refining, petrochemical and electric power generation industries in India, Middle-East and Asia-Pacific. Our capabilities include: Portable Optical Emission Spectrometer and a number of Portable X-Ray Florescence (XRF) Spectrometers.

Failure Analysis and Metallography Testing

Our facilities include Optical Microscope with Image Analysis system, Micro Hardness Tester, In-situ Metallography Kits, Stress Analyzer, Dilatometer, and Electronic Polishing and Etching system. TCR can procure on-hire basis, a scanning electron microscope and an elemental analysis by EDAX.

Corrosion Testing

TCR performs a wide range of Corrosion and Stress Corrosion Tests as part of the AST, NACE or client supplied specifications. Senior staff members are available to help and advise on corrosion problems or materials selection in laboratory or on-site inspection. Routine tests undertaken to evaluate the corrosion resistance of materials to environmental corrosion, pitting corrosion, resistance of materials to stress corrosion and inter-granular attack, including HIC, and SCC tests.


Specialized Non Destructive Testing (NDT) Services

Radiography Testing, Ultrasonic Flaw detection, Magnetic Particle and Liquid Dye Penetrant Testing, Portable Hardness detection, Ultrasonic Thickness Gauging survey and Raw Material Inspection. Residual Life Assessment (RLA) of Boilers and pressure vessels.

Locations

We welcome service and technical inquiry, from simple questions to more involved interpretations of codes and specifications. We are located at:

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Sample collection centers in India:

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