



Add value.
Inspire trust.

Put safety at the heart of your railway operations

Your connection for safety and
security, reliability and efficiency



Our global accreditations and recognitions

Inspection body

- According to DIN EN ISO/IEC 17020 Type A
- In Europe, China and Korea

Testing body

- According to DIN EN ISO/IEC 17025
- For tank container test according to CSA B625
- Machinery Directive Annex 4 for safety components
- UIC 541-00 and 541-05 for wheel slide protection tests and monitoring during operation

CNAS lab

- According to ISO/IEC 17025
- For fire protection

Certification body

- According to DIN EN ISO/IEC 17065
- For ECM certification of freight wagons

Notified Body (NoBo)

- According to EU Directive 2008/57/EC and (EU) 2016/797

Designated Body (DeBo)

- In Germany and other European countries

Assessment Body (AsBo)

- According to EU Regulation 402/2013/EU and (EU) 2015/1136

EBC

- Associated partner of EBC

EBA

- EBA approved experts, including ECM

BOStrab

Reliability and safety of infrastructure and rail operations are the basis of every railway system.

Your partner for safety, security, reliability and efficiency

TÜV SÜD supports rail manufacturers, operators and authorities with a comprehensive portfolio of inspection, testing, certification and training services.

Our competencies in conventional, high-speed, metro and light rail are backed by many years of experience working on international rail projects with railway authorities and stakeholders worldwide. We operate our own railway testing facilities and

have proprietary testing tools for rolling stock and railway components.

Our multidisciplinary experts support you during every phase of your project lifecycle, helping you to avoid costly reworks that cause project delays, as well as to increase operational efficiencies that generate real business value.

We provide comprehensive services for the rail industry

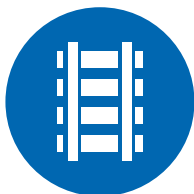
ACTIVITIES	SERVICES
WORKSHOPS	<ul style="list-style-type: none">■ FOR SPECIFIC STANDARDS AND REGULATIONS (E.G. IEC 5012X, IEC 62443)■ FOR FUNCTIONAL SAFETY (E.G. IEC 61508)
ANALYSIS	<ul style="list-style-type: none">■ RAMS-ANALYSES■ CSM-ANALYSES■ DAMAGE AND GAP ANALYSES
SAFETY MANAGEMENT	<ul style="list-style-type: none">■ EVALUATION OF SAFETY MANAGEMENT SYSTEMS
TESTING	<ul style="list-style-type: none">■ VERIFICATION & VALIDATION■ PRODUCT TESTING■ INDEPENDENT CHECKING ENGINEER (ICE)■ PHYSICAL TESTING OF RAIL VEHICLES AND THEIR COMPONENTS: LABORATORY TESTS AND ON-TRACK TESTS
INSPECTION	<ul style="list-style-type: none">■ TSI-CONFORMITY ASSESSMENT■ ASBO AND DEBO■ SUBSYSTEM-ISA, OVERALL-ISA AND IV&V
CERTIFICATION	<ul style="list-style-type: none">■ NOBO - ACCORDING TO 2008/57/EC AND (EU) 2016/797 OF RAILWAY INTEROPERABILITY CONSTITUENTS AND SUBSYSTEMS■ CERTIFICATION OF SAFETY COMPONENTS - ACCORDING TO MACHINERY DIRECTIVE 2006/42/EC AND OTHER STANDARDS (E.G. IEC 61508, EN 5012X)■ CERTIFICATION OF MANAGEMENT SYSTEMS (E.G. ACCORDING TO IRIS, ISO 9001, ISO 14000)

Your one-stop service provider for all your railway needs

We provide testing and certification services in the following project phases:

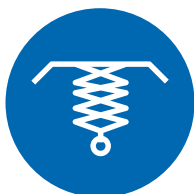
- Design
- Production, construction and installation
- Operation
- Maintenance

INFRASTRUCTURE AND E&M SERVICES



- Proof checking (e.g. rail infrastructure and E&M design, structural analysis)
- ISA and O-ISA for rail infrastructure (e.g. earthworks, civil works and trackworks) and E&M (e.g. according to EN 50126)
- EC-certification of subsystem infrastructure
- BOStrab evaluation
- Construction supervision, quality control and safety audits
- Testing and certification of track components (e.g. according to EN, TSI) and FATs
- Assessment of fire protection, emergency and rescue concepts for tunnels and stations
- Assessment of concepts for personal protection and safety

RAIL ENERGY SERVICES



- Plan and design verification
- Acceptance testing
- Verification and validation of traction power equipment and installations, earthing and bonding installations
- Electric and magnetic field measurement
- ISA and EC-certification of subsystem power supply

EMBEDDED SYSTEMS AND SOFTWARE SERVICES



- Hardware, software and system analyses incl. probabilistic methods
- Gap analyses of safety development processes
- Testing and assessment of safety features
- EC-type examination according to the Machinery Directive
- Safety element out of Context (SEooC) and generic products: certificate of conformity
- Environmental testing (EMC, electrical safety and optical characteristics)
- Certification of electronic systems and applications according to functional safety standards
- Certification of functional safety management systems (FSMS)
- Certification of products and processes according to industrial IT security standards
- Relevant standards are e.g. IEC 61508, ISO 13849, ISO 26262, Machinery Directive, EN5012x, IEC 62443

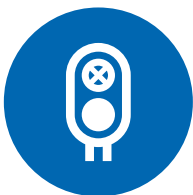


ROLLING STOCK SERVICES



- Conformity assessment according to TSI, NNTR, CSM
- Certification of vehicles and components (incl. TCMS)
- Certification of maintenance procedures and workshops (ECM)
- Assessment of refurbished vehicles and network access conditions
- Assessment of personal protection safety concepts
- Testing and modelling of running dynamics, special expertise for wheel-rail contact and instrumented wheel sets (IWT4)
- Crash and rail impact tests for complete vehicles, components and tank containers
- Derailment safety tests, testing of buffers, automatic couplers and drawgears
- Static and dynamic testing of brake systems including WSP tests and functional tests
- Strength tests
- Fire protection tests
- Testing of pantograph-catenary interaction including uplift and arc measurement
- Testing of aerodynamic, machine dynamics, electric/EMV and acoustics

SIGNALLING SYSTEMS SERVICES



- Basic and detailed design verification (PT1/PT2)
- Acceptance testing
- Validation and assessment of generic products, generic and specific applications
- Conformity assessment and certification according to Directive (EU) 2016/797 of components (e.g. crossings, ETCS, PZB/LZB, etc.), CCS onboard, CCS trackside (e.g. RBC, interlocking, axle counter, switches, etc.), CBTC

COMPLETE RAILWAY SYSTEMS SERVICES



- Overall-Independent Safety Assessment (O-ISA)
- Assessment of subsystem interfaces and subsystem integration
- Assessment of Operation and Maintenance (O&M)
- Independent Verification and Validation (IV&V)
- Testing and assessment of IT-security

Ensure a safe future with TÜV SÜD

TÜV SÜD recognises that your business must harness innovative solutions to remain at the forefront of the rail industry. Our multidisciplinary experts understand the challenges and complexities associated with the latest technologies and rail innovations. TÜV SÜD's rail industry experience enables us to foster visions of the future, supporting our clients to assess modern technologies and new testing techniques.



Innovative technologies:

- Drive systems for vehicles based on hydrogen/fuel cells
- Metros with supercap or battery storage technology
- Computer platforms with multicore processors
- Computer platforms for autonomous driving
- IT-security

Modern testing techniques:

- Simulations for driving dynamics
- Pantograph testing
- Mobile torsion test bench
- IT-based testing tools for ETCS components

Working with TÜV SÜD puts your future in the best hands. Our global services address the technical challenges of the rail market of tomorrow, reflecting our commitment to innovative solutions with a high level of quality and safety.

Why choose TÜV SÜD?

Multidisciplinary expertise

Our multidisciplinary rail experts understand the complexity of railway systems and the interfaces between the various subsystems. We offer you world-class services based on best practices and profound knowledge.

Independent and impartial

Our global reputation as an independent technical service provider guarantees you impartial and reliable services.

Recognised experts

Our rail experts are recognised worldwide as railway safety assessors and technical experts by railways and European and international authorities.

Full-service partner

We offer inspection, testing and certification services along your entire project lifecycle – from design, production, construction and installation to operation and maintenance.

In-market expertise and support

We have more than 25,000 employees across 1,000 locations and a network of international and local experts, as well as partners in all key markets worldwide.

Proven track record

With over 150 years of experience, our services are backed by best practice case scenarios, making us a holistic service provider and a project implementation expert.



Your business benefits

Save time and money – Our dedicated team of experts are committed to increasing safety and adding tangible economic value to your technical solutions by supporting you with our testing and certification services along the entire product lifecycle, from the initial planning to operation and maintenance.

Minimise risk – Our holistic approach covers the whole railway system to ensure a safe integration, including all relevant interfaces between subsystems and to its operational environment.

Gain a holistic approach – We offer a comprehensive range of services from the assessment of the planning stage right through to the final safety assessment.

Improve quality, safety and reliability – The results of our certification and testing projects help you to improve your technical solutions.

Work with a global partner – We work alongside a reliable network of international and local experts.



Contact us to find out how we can support you across the entire project lifecycle

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