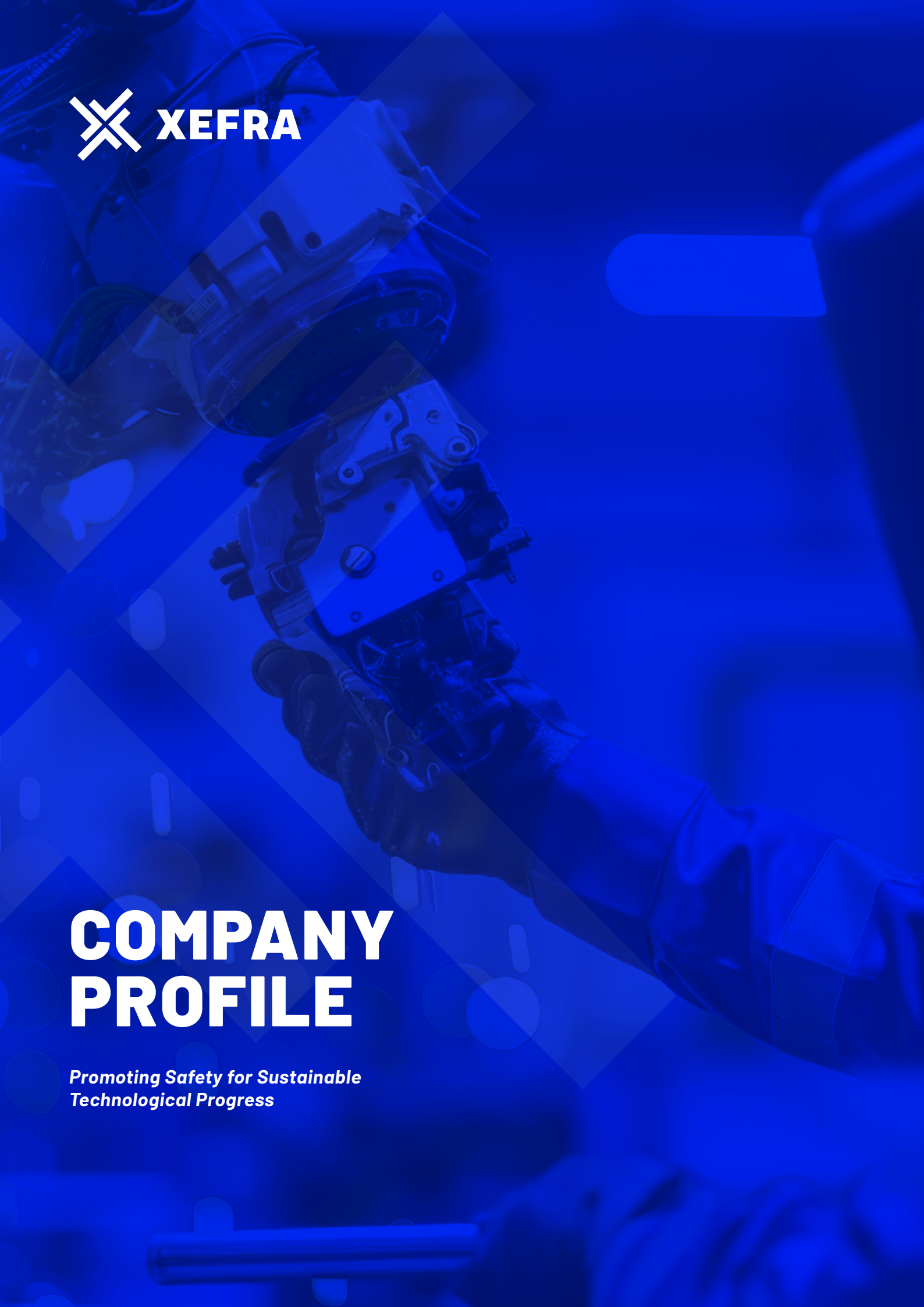
XEFRA



COMPANY PROFILE

Promoting Safety for Sustainable Technological Progress

CORPORATE

XEFRA GROUP STORY

Xefra was established in Italy, by long experienced engineers, who gained their know-how inside of International Certification Bodies and Engineering Companies.

Highly specialized in the entire industrial field, Xefra services are mainly focused on Testing, Inspections, Assessments on Machinery, Assemblies and Equipment to the following specific areas:

- Industrial Automation
- Oil & Gas and Power Generation
- Chemical and Pharmaceutical
- Transport and Mobility
- Industrial Products' Manufacturers
- Mining and Quarrying Industries

The Headquarters is based in Genoa with a strategically located Testing Laboratory in Tortona, we are positioned to serve both Central and Northern Italy effectively.

The Xefra Laboratory is accredited EN ISO/IEC 17025 by ACCREDIA (member of the ILAC MRA Circuit). Accreditation scope is available on ACCREDIA website.

MISSION & VALUES

We are dedicated to assisting businesses in various industries by providing top-tier Testing, Inspection, Assessment, and Audit services for industrial machinery, assemblies, and equipment on both national and international scales. Our accredited Testing Laboratory and our Certification and Notified Body capabilities enhance our overall Work Ethic with Trust and Competence. We are steadfast in our commitment to Safety, Sustainability, and the application of cutting-edge Knowledge and Technology to foster Innovation in a broad spectrum of industry sectors.

XEFRACERT, PART OF XEFRA GROUP

Product Certification Body

Our Institutional role is to Assess the compliance of the product to the EU Directives, on behalf of the economical operators, competently, transparently, neutrally and independently.

The mission of our testing, inspection and certification services is to ensure, with technical competence, professional integrity, independence, high reliability and organisational capacity, full compliance of products with global legislation and applicable technical standards.

XEFRACERT is Notified Body nr. 2772 for ATEX Directive 2014/34/EU of the European Parliament and of the Council, 26th February 2014, concerning the harmonization of legislation of State Members with reference to Equipment and Protective Systems intended to be used in a potentially explosive atmosphere.

The financial support of Xefracert Srl is provided by the application of the rates for the services requested by the body, ensuring our clients to receive value-driven, high-quality testing and certification services.

SERVICE

TESTING

Are you looking for a **reliable and professional product and machinery testing laboratory** that can handle all your needs in **product quality and safety testing**? If so, look no further than **XEFRA, the leading provider of comprehensive and customized testing solutions for a wide range of industries and applications**.

At **XEFRA**, we have the **expertise, test benches, and experience** to test your products and machinery according to the relevant global **standards and regulations**. We can help you ensure the **safety, performance, and compliance** of **your products**, as well as **reduce the risks, costs, and time to market**.

ELECTRICAL SAFETY TESTING

ELECTRICAL TESTING SERVICES FOR SAFETY & COMPLIANCE

As an industry player in electrical testing services, we are dedicated to ensuring the safety and compliance of electrical equipment in line with the IEC & CENELEC product standards. In EU, these standards often also allow our customers to satisfy the requirements for the CE marking of products and machines. Electrical tests can be performed in our laboratory or at our customers' premises.

Our service allows our customers to ensure that their **products** or **machinery** meet safety requirements of the **Low Voltage Directive (LVD) 2014/35/EU** which ensures that electrical equipment within **certain voltage limits** - an input or output voltage of between 50 and 1000 V for alternating current, 75 and 1500 V for direct current - provides a high level of protection for European citizens – as it covers **Health & Safety Risks** on electrical equipment, for both consumer and professional usage - and benefits fully from the single market.

We are able to perform testing on a broad variety of product categories according to the relevant standards: **Electrical equipment for measurement, control, and laboratory use** according to **IEC 61010-1** and **IEC 61010-2-xx; IT and AV products** according to **IEC 60950-1, IEC 62368-1, IEC 62040, IEC 60065; Household appliances** according to **IEC 60335-1; Electrical controls** according to **IEC 60730; Electrical boxes and enclosures** according to **IEC 60670 and EN 60529; Medical equipment** according to **IEC 60601-1-X, IEC 60601-2-X.**

Testing for Electrical Equipment of **Machines & Power Cabinets: Electrical Equipment of Machines** according to **IEC 60204 Series; Low-voltage switchgear and control gear assemblies** according to **IEC 61439 series**.

ATEX TESTING

WE ARE AT THE FOREFRONT OF ATEX TESTING

As an ACCREDIA (the Italian Accreditation Body) Accredited Testing Laboratory, we are at the forefront of ATEX testing, adhering to the rigorous ISO/IEC 17025. Our role as a qualified 'Partner Testing Laboratory' ensures that our ATEX testing services are accepted by several ATEX European Notified Bodies, playing a critical role in the ATEX Directive certification process.

Our **state-of-the-art ATEX testing facilities** are designed to facilitate **a broad range of tests**, ensuring **ATEX compliance and safety** in hazardous environments: Controlled mass flow gas mixing for fast, accurate testing and certified by a GC analysis; Explosion testing in 2 cubic meter chamber (i.e. Ex d Reference Pressure), Flame transmission and Overpressure to 250 bar; Intrinsic Safety Spark testing; Mechanical and PCB physical measurement; Component ignition test bench; Battery testing and Ex e battery box test benches; Humidity, thermal conditioning & cycling, Thermal shock tests; Impact Testing to 20J, Torque tests, Pull tests, Drop test; Temperature measurement (contact, IR); Purge testing (i.e. Ex p, TVR, EN 60079-2, IEC 60079-13); Capacitance and inductance measurement; IP test up to 2.5 cubic meter chamber; Electric Motor Test Bench Up to 10Kw; Mechanical and PCB physical measurements; Electrostatic Test Bench; Safety devices performance; Gas detectors performance for flammable gases.

External Explosion Facilities for Protective Systems - we ensure they meet the stringent ATEX certification requirements, thereby upholding the highest standards of safety and compliance. Some of our activities: **Explosion Suppression Systems; Explosion Venting and Flameless Venting Systems; Flame Arresters; Fast-Acting Valves; Flap Valves; Chemical Barriers**.

ATEX

Dust Explosion Test

We offer specialized dust explosion testing services in a dedicated Lab, where we deal with any problems associated with powder handling and reactive chemical processing to handle intricate challenges related to explosive atmospheres.

Dust & gas explosion services complement our capabilities: **Screening, MIE, DOT, MIT and LIT, LEL, Pmax and Kst, Kg, LOC and Volumetric Resistance of Dust, Combustibility Index (BZ) Test**.
The scope is to provide a strategy to our customers' engineers regarding the design and management of dust processes, to identify the explosion hazards of air/dust mixtures, Compliance with **ATEX Directives 2014/34/EU and 99/92/EC** is a priority, ensuring protection against potentially explosive dust atmospheres.

Electrical Equipment

In standard environments, electrical & electronic equipment, when used correctly and in accordance with specific rules and regulations, is safe.

However, in **hazardous environments**, the adherence to rules and directives becomes critically important to avoid business interruption, property damage, environmental pollution, and, in extreme cases, injuries or fatal incidents. This equipment must be meticulously designed to **reduce or eliminate fire & explosion risks**. Whether you need assistance with electrical safety testing, understanding electrical hazards and risks, or ensuring compliance with explosion risk regulations, we can guide you through the **complex landscape of electrical safety regulations in explosive atmospheres**.

ATEX

Mechanical Equipment

The ATEX Directive 2014/34/EU demands that mechanical equipment to be used in potentially explosive atmospheres is approved for that purpose.

Our Lab specializes in testing of protective devices and systems, **testing of equipment for EX-zones** or **testing to control electrostatic properties** (tested flame arresters, pumps, valves, explosion venting panels, flameless venting systems, explosion isolation systems, and other mechanical equipment). You will receive **in-depth guidance** on the approval process, ensuring that your equipment adheres to the necessary safety standards.

Protective Systems

Deflagration Prevention & Protection Methods

in the field of industrial safety, particularly under the ATEX directive, **protective systems** play a key role in **preventing dust deflagration or protecting against it**. I.e. – PS for Dust Explosion Prevention - methods for dust safety and preventing dust deflagration Dust Cloud Formation Prevention; Inertisation Strategy; Dilution Strategy; and – PS for Dust Explosion Protection - most used methods of protection against deflagration and for dust safety Venting, Suppression, Containment, Isolation, Spark detection & Extinguishing Systems, Secondary Explosion Prevention.

EMC TESTING

WE PROVIDE COMPREHENSIVE EMC TESTING SERVICES

Ensuring electromagnetic compatibility (EMC) for a wide range of electronic equipment. Our services are designed to meet rigorous EMC standards and certifications, providing reliable and efficient solutions for your EMC compliance needs.

Our EMC Testing are conducted in an EMC Lab, under controlled and standardised environmental conditions. Tests are usually performed in semi-anechoic chamber - **Pre compliance test and Assessment; Compliance tests in Semi-Anechoic Chamber; Compliance tests on field**.

Emission Testing DC – 3 GHz: Radiated Emission - we measure them at 3m within our semi-anechoic chamber of 6 x 4 x 7m, perfectly equipped for conducting comprehensive radiated emission tests across a spectrum of DC to 3 GHz according to CISPR 32, CISPR 11, CISPR-2-3, CISPR 25, CISPR 12, EN 50121-3-1; **Conducted Emission**: This includes testing from power supply sources, single phase three phase LISN 64, rail of 1 to 3m cable slide bar for disturbing power to ensure conducted immunity as per global EMC regulations CISPR 32, CISPR 11, CISPR 16-2-1.

Immunity Testing 10 kHz to 3 GHz: **Radiated Immunity** - our tests cover 27 MHz to 3 GHz in our semi-anechoic chamber, according to EN 61000-4-3; **Conducted Immunity** - we perform testing according to EN 61000-4-6; **Magnetic Immunity** - We apply the magnetic field immersion method, according to EN 61000-4-8 and EN 61000-4-9; **Fast transient burst** according to EN 61000-4-4, **surge** according to EN 61000-4-5, electrostatic discharge according to EN 61000-4-2; **Flicker (voltage fluctuations)** and **voltage dips** according to EN 61000-4-11, EN 61000-4-29, EN 61000-4-34; **Automotive transient test simulation** according to ISO 7637 series.

VIBRATION TESTING

XEFRA'S VIBRATION TESTING LAB

Our Lab is specialized in vibration testing for materials, components, assemblies, prototypes, and series devices across various industries. We support our clients in sectors such as energy, railway technology, automotive, aerospace, shipping, and medical, ensuring that your equipment meets the highest reliability standards.

OUR VIBRATION TESTING METHODS

Vibration testing process is crucial for verifying the mechanical strength of machinery, components, or equipment under various stress levels. By reproducing a certain type of stress, considered of max impact on the item to be tested, we assess the **durability and performance** of your item in its intended operational environment. The environment where this item would mostly be utilised it is relevant also to this particular test.

Our experts utilise advanced **vibration testing methods**, ensuring **adherence to industry-specific standards** and will indicate the **appropriate technical testing standard to be applied for a specific device**.

3-AXIS VIBRATION TESTING

We offer detailed **3-axis vibration testing**, including: **EN 60068-2-6** for sinusoidal vibration; **EN 60068-2-27** for shock testing; **EN 60068-2-64** for vibration and broadband random.

Our vibration testing process not only **comply with industry standards** but also play a vital role **in improving the design and manufacturing** of **mechanical and electronic systems**. Through our rigorous testing, we ensure the **reliability** and **durability** of your products, **preventing recalls** and ensuring safety.

FUNCTIONAL SAFETY

OUR EXPERTISE IN TESTING & ASSESSMENT

We specialize in elevating the standards of FS across a spectrum of critical industries.

Our expertise extends to FS services for safety critical embedded systems, ensuring **compliance with rigorous functional safety standards** like **IEC 61508, EN ISO 13849-1, IEC 62061** for **industrial automation safety components**, **ISO 26262** and **ISO/PAS 21448 for automotive control systems**, **EN 50126, EN 50129, EN 50128, EN 50657, EN 50716** for the **railway sector**.

Our Team: extended experience - we are present as specialists in RAMS, FS Testing, V&V, Hazard Identification and Risk Assessment; we provide **customised solutions** - tailored to your specific needs; we pride ourselves with our **accredited services** in safety critical SW testing - as we guarantee the highest standards of quality and safety in every project we undertake.

Our efforts aimed at: **Automation Safety Components**: our services include automation safety components, integrating cutting-edge technology with safety standards; **Automotive Control Systems**: precision and reliability are crucial for safety and performance; **Medical Devices Safety**: recognizing the critical nature of medical devices, our FS services encompass this vital sector; **Railway Control Systems Safety**: our expertise in railway control safety systems ensures reliability and compliance in a demanding industry.

Our Services include **HARA** Hazard Identification and Risk Assessment; **HW & SW FMEDA, FTA** Safety Analysis; **DFA** Dependent Failure Analysis; **FFI** Freedom from interference analysis; **RAM** Analysis; **HW platform** verification & testing; **SW components** verification and testing; **HW/SW integration** testing; **HIL** testing; **FS Management System**.

FUNCTIONAL SAFETY

Automation safety components

In the rapidly evolving world of autonomous driving, ensuring FS is paramount. As the integration of AI & ML advances, autonomous and semi-autonomous vehicles SW developers encounter unique safety challenges.

Addressing them requires a comprehensive understanding of **FS standards**, particularly **ISO 21448**, also known as Safety Of The Intended Functionality (**SOTIF**). Adhering to its guidelines, it is possible to move effectively in the complex landscape of **autonomous vehicles safety**. By integrating these safety standards and concepts, the automation safety components of vehicles can achieve the highest levels of FS, paving the way for reliable autonomous driving experiences.

Automotive control systems

Our commitment to automotive control systems is underpinned by a robust safety management approach

The aim is to design processes in such a manner as to achieve safety targets by **correctly identifying responsibilities, decisions, planning, methods**. Our foundation is built on **internationally recognized standards such as ISO 26262**. We support Manufacturers & Automotive Managers by providing: Project Management; Evaluation & Optimisation of MS; Safe Operation Procedures; Quality Assurance and Control; Safety Audits; HARA, **Automotive FS analysis** is used to evaluate the safety level achieved by the product and it involves quantitative evaluations like **FMEDA** and qualitative assessments such as **DFA**.

Medical devices

FS is critical in the medical device industry and covers every step of a device's lifecycle.

From concept and design, through hazard analysis and risk assessment, reaching to the definition and development of the **safety requirements, specifications and implementation**. The ultimate manufacturer's goal is to **design the medical device lifecycle in a preventive manner**, preventing dangerous failures or being able to control them if/when they occur. Medical Device development and manufacturing is an **extensive regulated sector**. We can guide you through all the **relevant rules, national and international regulations and standards relevant to a specific device** intended to be developed and destined to the general public use.

Railway control systems

Our commitment to the railway industry revolves around ensuring the highest standards of FS.

Completing a project successfully is the **demonstration of having met customer and standards requirements**. Our approach applies the **European standard V cycle**, a cornerstone in the rai industry for functional safety. By performing thorough **V&V activity**, we ensure that our customers reach the final acceptance phase with all safety aspects meticulously covered in accordance with the Standard. Our main services to demonstrate **compliance with CENELEC EN 50126** include: Safety Concepts Assessment; Verification of Development Documentation; Safety Requirements Verification and Tracking; Qualitative and Quantitative Analyses; Hazard and Risk Analyses; Hazard Log Maintenance; Test Strategy Definition; Availability & Maintainability analysis; Penetration Analysis and Analysis of SW Development Processes.

SOFTWARE TESTING

WE ARE A SOFTWARE TESTING ACCREDITED LABORATORY

That provides cost efficient software testing for safety and security critical projects. Our specialisation in software testing services addresses vital sectors such as automation, automotive, and railways, ensuring the highest standards of safety and security.

Our commitment to excellence in software testing services involves an **integration with your engineering team** (development/testing), as our dedicated and extremely customer-faced Account Manager ensures your satisfaction and handles escalations.

WHY IS SOFTWARE QUALITY TESTING IMPORTANT?

The evolution of the machine industry has resulted in the increasing use of digital means, and software is playing an increasingly important role in machine design. As a result, the definition of machine has been adapted. Software - which performs a safety function and is independently placed on the market - must be considered a **safety component. Companies must be aware about how to develop, test, verify and validate it**. Our expertise in the certification of application software is critical, ensuring compliance with the latest functional safety standards.

We are the First Italian Laboratory accredited ISO IEC 17025 by ACCREDIA for the Railway Sector - EN 50128/AC + IEC 62279; Railway applications – Communication, signalling and processing systems – Software for railway control and protection systems. Key areas include - #4 Objectives, conformance and software safety integrity levels; #5 Software management and organization; #6 Software Assurance.

Testing with release of accredited Test Report can be provided according to **3 different approaches**: Testing Lab, Testing at our Customer's Premises, Witness Testing.

ENVIRONMENTAL TESTING

WE PERFORM ENVIRONMENTAL TESTS

On materials, components, assemblies, prototypes, and series devices for all industries.

Our environmental testing laboratory provides comprehensive testing services for a range of sectors, including energy, railway technology, automotive, aerospace, shipping, and medical industry. Our clients are supported through every phase of environmental testing.

COMPREHENSIVE ENVIRONMENTAL TESTING SERVICES

Temperature Testing: We provide thorough temperature testing to ensure products withstand various thermal conditions. Adhering to standards such as EN 60068-2-1 Cold, EN 60068-2-2 Dry heat, EN 60068-2-14 Change of temperature, EN 50155 railway standard, EN 60068-2-30 Damp heat, cyclic, EN 60068-2-38 Composite temperature/humidity cyclic test.

Axis Vibration Testing: Our 3-axis vibration test follows standards like EN 60068-2-6 Vibration (sinusoidal), EN 60068-2-27 Shock, EN 60068-2-64 Vibration, broadband random, simulating real-world mechanical stresses that products may encounter.

Corrosion Resistance Testing: We conduct corrosion tests, including salt mist tests (sodium chloride solution, Test Ka) as per EN 60068-2-11, EN ISO 9227, and EN 60068-2-52, and cyclic tests (sodium chloride solution, Test Kb) to evaluate the durability of materials in corrosive environments.

Protection Class Testing: Ensuring product safety and durability, we perform tests according to EN 60529 (IP Code) and EN 50102 (IK Code) standards.

Our dedicated team of experts is committed to providing top-tier environmental testing services that drive innovation and ensure market readiness.

XEFRA'S ACOUSTIC LABORATORY

PERFORMANCE TESTING SOLUTIONS

We have the capability to provide comprehensive performance testing solutions for materials, products, and machineries, ensuring reliability in acoustical properties.

Our expertise in product performance testing covers various domains, including **R&D testing, performance qualification tests**, and **on-site tests**: measuring of physical and acoustical parameters of building sound-insulation and sound-absorbing products and sound power emitted from products and machineries.

REVERBERATION CHAMBERS

Our Lab is equipped with **three reverberation chambers**, that allow us to test all types of construction products performance and to measure sound powers of equipment and machineries specially designed to measure very low sound power levels. The rooms have **openings ranging from 12 m2** and with wide access to the test chambers for tests, according to EN ISO 10140-2, and a room floor for the test according to EN ISO 10140-3.

OUR TESTING SERVICES

1. **Sound Power Assessment** according to ISO 3744: Understanding the sound power emitted by products and machineries is crucial for performance testing.

2. **Sound Insulation Testing**: Measuring the acoustical performance of building materials and products to ensure they effectively block sound transmission according performance standards like ISO EN 10140-2 and ISO EN 10140-3.

3. **Sound Absorption Testing**: Assessing the ability of materials and products to absorb sound and reduce noise levels in various settings according to EN ISO 354.

XEFRA'S ACOUSTIC LABORATORY

Sound absorption

Is a critical factor in the acoustic treatment of rooms, particularly ceilings, to mitigate reverberated sound energy.

The use of **sound absorbing materials** helps to control reverberation time and depending on their proximity to the sound source, can significantly reduce the overall sound pressure level in the room. **Absorption of emitted sound energy** is a highly effective method of reducing noise within enclosed spaces, such as ducts or insulated enclosures designed to isolate sound sources. Absorbent materials are also used in the construction of sound barriers to reduce the reflection of sound from their surface. In our **Lab**, we specialise in determining the **sound absorption of materials or composite structures using standardized methods**: diffuse incidence in a reverberation chamber and normal incidence. The **ISO 354 standard** also specifies, quite appropriately, how the different types of structure under test are to be assembled in the laboratory.

Sound insulation

Is a paramount aspect in the construction of residential units, particularly to reduce disturbance caused by external noises or sounds transmitted between flats.

Understanding the experimental data on **acoustic sound insulation** or, more precisely, the **soundproofing power** of materials used, is essential from the design stage. In our Lab, we specialise in **sound insulation measurements according to ISO EN UNI 10140-3 standards**. Our facility consists of **two adjacent semi-reverberation chambers** with a common wall containing the test opening. This setup is designed to minimise lateral sound.
Acoustic Measurement and Insulation Testing - in our acoustic reverberation chamber, a **meticulous approach** is taken to determine the existence of any sound leaks due to faulty assembly of the sample. This includes a **phonometric check of the edges of the structure and any joints** before each measurement. By overcoming these challenges, we ensure the **integrity** and **accuracy of our sound insulation measurements**, in accordance with the strict standards set by ISO.

NON-DESTRUCTIVE TESTING

WE OFFER EXPERT NDT SERVICES

Conducted by our qualified inspectors who ensure the safety and integrity of welds. NDT of welds is performed in-house or at field locations by our certified inspectors, in accordance with the ISO and EN standards.

Non-destructive tests are the set of **tests conducted using methods that do not alter the material and do not require the destruction or removal of samples** from the structure under examination aimed at searching for and identifying any imperfections and/or structural alterations.

NDT guarantees the **quality of the product** - for example the EN 1090, applicable in the structural carpentry sector, requires 100% control of the welded joints plus any additional PT, MT or UT controls.

Specialized Weld Testing Services – our NDT experts provide the following specialized weld testing services required to assure conformance and safety of welds: **Visual Inspection (VT), Ultrasonic Testing (UT), Magnetic Particle Testing (MT), Liquid Penetrant Testing (PT)**.

Advanced Mechanical Integrity Assessments - we utilise NDT alongside **Finite Element Analysis (FEA)** to assess the existing condition, thicknesses, welds and attachments. Loads cases are determined based on codes and include wind, thermal, dead and live loads, etc. The object is then modelled in a FEA application to generate colour coded stress levels.

FEA of Structures - 3D modelling is used to develop the structure geometry.

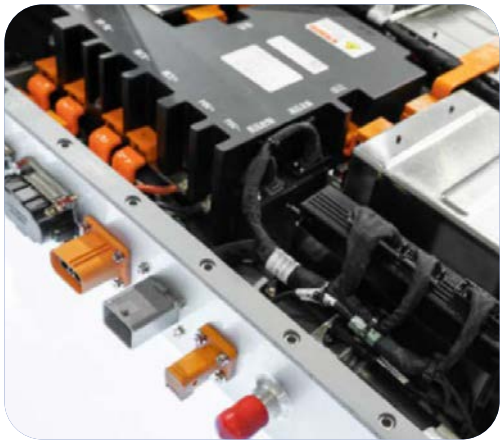
FEA of Vessels - Pressure vessels are analysed utilising several software.

XEFRA's on-site NDT capabilities allow us to conduct tests directly at the customer's premises. We ensure compliance with current regulations and standards. Our non-destructive testing guarantees product quality, particularly in sectors that require rigorous control.

BATTERY TESTING

BATTERY TESTING SERVICES TO IMPROVE SAFETY AND PERFORMANCE

Whether a plug-in hybrid or a fully-fledged electric vehicle, automotive manufacturers are challenged to find alternatives to the conventional combustion engine. We ensure that batteries meet the highest standards of power, reliability, and safety.



Critical features include interference-free interaction with the on-board electronics, resistance to environmental influences such as humidity, salt, and extreme temperatures, and resistance to vibrations and knocks. In the rapidly evolving world of electric vehicles, **we provide battery testing and certification services**, ensuring batteries comply with international safety and performance standards, and are **able to perform**:

- **Environmental Resistance Testing**: Employing temperature and climate cabinets with electrical operation, we test batteries against environmental factors.
- **Vibration Resistance Evaluation**: Through **electrodynamic vibration systems**, we assess the battery's durability against physical shocks and vibrations.
- **EMC Measurements**: Utilizing **shielded cabins** and **absorber halls**, we ensure batteries maintain interference-free operation with onboard electronics.
- **Corrosion Resistance Assessment: Salt fog chests** and **corrosive gas testing systems** evaluate the battery's resilience to corrosive environments.
- **Electrical Safety Tests**: Covering scenarios like overcharge, overdischarge, and short circuit to ensure operational safety.
- Comprehensive **test-specific security technology**.
- **Temperature control systems**: simulating the internal cooling circuit.
- **Leak Tests**: Measuring equipment for leak testing.
- **Tests for the reliability of electric vehicles**: Ensuring the primary safety and functional safety of Battery Management Systems (BMS).

SERVICE

PRODUCT CERTIFICATION

XEFRACERT is an Independent Product Global Compliance Assurance Body with the mission to:

Certify that your machinery and products meet international safety, quality, and performance standards. Our team of experts delivers reliable and efficient services, maintaining the highest levels of integrity and independence.

From design evaluation to testing, documentation, and auditing, Xefracert supports you through the entire conformity assessment and certification journey. We provide guidance on complying with the ATEX Directive and other essential standards and rules, by accompanying you through regulations such as **Functional Safety, Explosion Safety, Machinery Safety, Low Voltage**, and ***EMC***, ensuring the best industry-specific solutions for your needs.

Accredited Certification Expertise:

Xefracert, as an **ACCREDIA-recognized Product Certification Body, according to ISO 17065** excels in ensuring product compliance and as a **Notified Body** for the **ATEX Directive 2014/34/EU**, is dedicated to a transparent and independent conformity assessment process.

Choose Xefracert for certified safety, reliability, and compliance with European Legislation, ensuring your products' market success.

EU NOTIFIED BODY

XEFRACERT SRL IS NOTIFIED BODY NR. 2772 FOR ATEX DIRECTIVE 2014/34/EU

Xefracert is your competent partner when it comes to test and certify equipment, components and protective systems which are to be used in potentially explosive atmospheres.

As **EU NB #2772**, we evaluate the conformity of your product to the **ATEX Directive 2014/34/EU**, being authorised by the National Governments' Authority and notified to the European Commission for the Certification of Products to be used in a potentially explosive atmosphere.

Our NB is authorized to perform the certification process with reference to the procedures of conformity assessment, described in the enclosures III, IV, V, VI, VII and IX of ATEX Directive.

Xefracert is furthermore authorized to conduct the storage of the technical documentation in accordance to art. 13 b of the Directive.

Products in the scope of the Directive are: electrical equipment and components, non-electrical equipment and components, protective systems, assembly, safety controlling and monitoring devices.

Xefracert is notified for EU type of examination, Quality assurance notification and CoC.

SITE & EX ASSEMBLIES INSPECTION

Our technicians ensure that each piece of equipment, to be installed within the Potentially Hazardous Area is: supplied correctly as per equipment specifications, installed using suitably specified accessories, installed to meet any specific conditions of use. We guarantee that installation is tested, documented and verified. The steps are initial detailed and then periodic inspection for Ex Atmospheres.

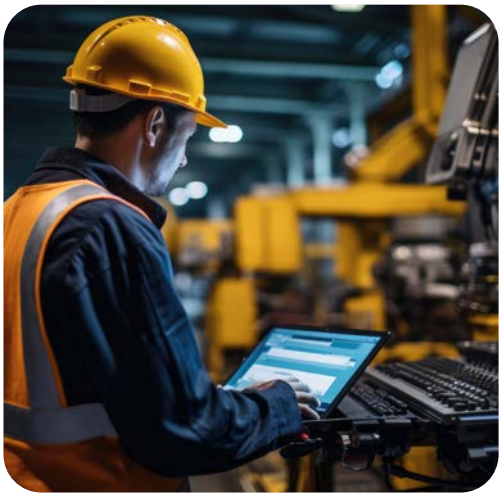
ELECTRICAL EQUIPMENT FOR HAZARDOUS AREA

XEFRACERT makes **qualified personnel available to its customers**, particularly active in the Oil & Gas and Explosive Atmospheres sector. We can carry out **inspection activities on Electrical Equipment for Hazardous Area**, according to **IEC 60079-14** and **IEC 60079-17**.

FUNCTIONAL SAFETY

PRODUCT FUNCTIONAL SAFETY ASSESSMENT BODY

XEFRACERT assesses and certifies that products have been meticulously designed and developed in alignment with the IEC 61508 and related FS standards, such as ISO 26262 or CENELEC En 5012x standards.



These standards outline the requirements that suppliers must follow during **product development** to ensure their offerings exhibit robustness against both **random hardware failures** and **systematic design flaws**.

Certification Benefits: Third-Party Validation, Reduced Field Failures and **Market Recognition**.

XEFRACERT has experience and is the top choice for: automatic guided vehicles, collaborative/autonomous robots, automation systems, autonomous mobile platforms/vehicles, industrial robot cybersecurity, ground vehicle automation, IIOT security, mobile robots, signalling systems for railway, smart sensors and actuators, safety PLC and relays, Electro-Sensitive Protective Equipment, ADAS systems.

MACHINE LEARNING & ARTIFICIAL INTELLIGENCE

Integrating Intelligence in Safety-Critical Systems: it presents distinct challenges, mirroring those encountered in any sophisticated system: requirements and architectural design, integration, validation, and operation.

Tailored ML Solutions for Complex Challenges: ML's versatility extends from general-purpose applications (conversational bots), to specialized tasks (sensor fusion for obstacle detection).

Guidance for Safe and Reliable ML Deployment: we determine the optimal timing & methodology for implementing ML models, ensuring safety, reliability, and dependability.

Pioneering ML Initiatives: (semi)autonomous vehicles, machinery, robotics, and the process industry.

Comprehensive ML Services Spectrum: best engineering acumen for services from data set and architecture advisory to full certification and compliance assessment in line with both existing and forthcoming standards.

SERVICE

INDUSTRIAL SERVICES

Xefra stands as your **trusted partner**, offering a suite of **specialized industrial services** that encompass **testing, rigorous inspections, precise assessments, and comprehensive support** to various industry sectors.

Thanks to a mix of in-depth skills of our experts, we guarantee complete support on all specific issues relating to **Machinery Compliance**, in several specific industry applications, including: **Automatic Machinery**: packaging, palletizers, robot systems, painting booths; **Oil & Gas**: expertise in drilling rigs, skids, gas analysers; **Food & Chemical Industry**: sifters, dryers, bucket elevators, screws; **Ironmaking**, **Steelmaking & Cokemaking**: heat treatment furnaces, coke oven batteries and machinery, quenching, and gas treatment processes; **Woodmaking**: feeders, crushers, and more.

Our commitment to **compliance management** ensures our services are aligned with the **current regulatory requirements**, through **Risk Mitigation** and **Compliance Assurance**, and leading to **Performance Optimization, Cost Savings**, and our clients' ultimate **Peace of Mind**.

PROCESS SAFETY

EMBRACE THE FUTURE OF PROCESS HAZARD ANALYSIS WITH XEFRA'S PROCESS SAFETY SERVICES!

Our cutting-edge approach revolutionizes traditional methodologies like HAZOP and LOPA, integrating advanced process modelling & solution. Our seasoned experts thus simulate intricate scenarios and execute comprehensive analysis, along the entire process.

HAZARD AND OPERABILITY (HAZOP) STUDIES

The purpose of HAZOP is to prevent the release of hazardous materials and energy, followed by mitigation of the consequences should a release occur. Our approach is to use a semi-quantitative HAZOP that incorporates LOPA to assess the reliability and number of safeguards. HAZOP is a brainstorming exercise of a team ideally limited in size, in which individuals from different disciplines participate.

LAYERS OF PROTECTION ANALYSIS (LOPA)

LOPA is a quantitative screening tool which provides a consistent, objective, and defensible approach. For components of a process-control system, such as safety instrumented systems and other components such as relief valves and rupture disks, it is important to know or estimate the probability of failure on demand.

FUNCTIONAL SAFETY

IEC 61508 & IEC 61511 define FS requirements for electronic systems and industrial applications to ensure that organizations maintain robust protections for all their processes. With our FS services, we carry out Functional Safety Assessments (FSA) to ensure that your SIS includes the required Safety Instrumented Functions (SIFs) and that these are effective and reliable and maintain the required Safety Integrity Levels (SILs) through all the Safety Lifecycle.

Our Methodology: Preparation - Analysis and Simulation - Review of Results

Partner with XEFRA for a smarter, faster, and more precise approach to Process Safety Services.

FIRE AND EXPLOSION RISK ASSESSMENT

THROUGH A FIRE AND EXPLOSION RISK ASSESSMENT - F.E.R.A. STUDY

Engineers, Procurement & Construction (EPC) contractors, and end-users are supported in finding the best design solutions for conformity and loss prevention, through specific activities like:

- **Facility siting** and **Layout Checklist**

- **Prevention Layers** design and verification (Ignition control, Safety Instrumented Systems, Asset Integrity and Reliability, Fire and Explosion safety management Systems)

- **Protection Layers** design and verification (Detection and Alarm, Fire Resistance, Fire Active Protection Systems, Explosion venting, suppression and isolation, Emergency planning)

Being a **comprehensive study** that evaluates the **potential hazards and risks** associated with flammable materials or other ignition sources within a facility or workplace, our **F.E.R.A. related services** include:

- **FERA Gap Analysis or Audit**

- **Fire Safety Engineering FSE**

- **Explosion Safety Engineering FSE**

- **Hazard Identification and Risk Analysis**

- **Laboratory specific services, such as:** Gas/Dust Explosion testing, Ex Inspection, CFD Simulation, Functional Safety Assessment, Structural Fire-Resistant Assessment

- **Conformity assessments and Certifications**

Conducting a F.E.R.A study with XEFRA ensures safety, continuity of operations, and informed decision-making regarding fire and explosion risks, as we provide clear recommendations for risk reduction, through implementation of prevention, detection, control, and mitigation measures.

RAMS FOR RAILWAY

CSM-RA - COMMON SAFETY METHOD FOR RISK EVALUATION AND ASSESSMENT

The objective of a railway system is to always achieve a certain level of traffic, operate safely and under the cost established limits, avoiding loss of value.

The application of the **RAMS process** allows to determine the confidence with which this objective can be reached. The **RAMS values** determine the safety and quality level the railways service is offered to the customer. **RAMS parameters** are achieved by applying established engineering concepts - methods – tools - techniques, and determine the **dependability of a system,** by the combination of interrelated characteristics related to **Reliability** – **Availability** - **Maintainability** - **Safety**.

RAMS **CENELEC standards** and **Regulation No. 402/2013** (CSM RA), as amended by **Regulation 2015/1136**, establish the requirements to be fulfilled by railway subsystems and components. **RAMS safety standards** establish the safety process to be applied for new developments or modifications of railway subsystems.

At **XEFRA**, we combine a **deep competence in RAMS** together with the **specific expertise** for each **railway subsystem**: Rolling Stock. Control-Command and Signalling Systems, Energy and Infrastructure.

RAMS safety process: PRA (Preliminary Risk Analysis) - **HAZOP** - **FMECA** - **FTA** (Fault Tree Analysis) - **RAM** Availability Studies - **FS - SIL** Assignment and Demonstration Hazard Log Risk Management and Register - **V&V** Process - Safety Case RAMS Safety Process Demonstration

Our experience in **wayside and on-board railway signalling**, spans from: Interlocking, Track circuits, Axle counters, Wayside objects (point machines, level crossing, signals), LEUs, Radio Block Center, CBTC to On board ETCS (EVC - DMI - BTM), Eurobalise, ERTMS/ETCS subsystem, TCMS – Train Control MS, Braking system, Railway Subsystem Integration, Onboard Fire detection.

VERIFICATION & VALIDATION

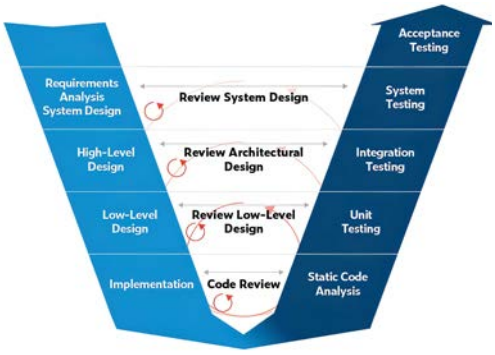
AS A TESTING LABORATORY, XEFRA CAN EASILY EXTEND ITS ACTIVITY TO ALL V&V TASKS

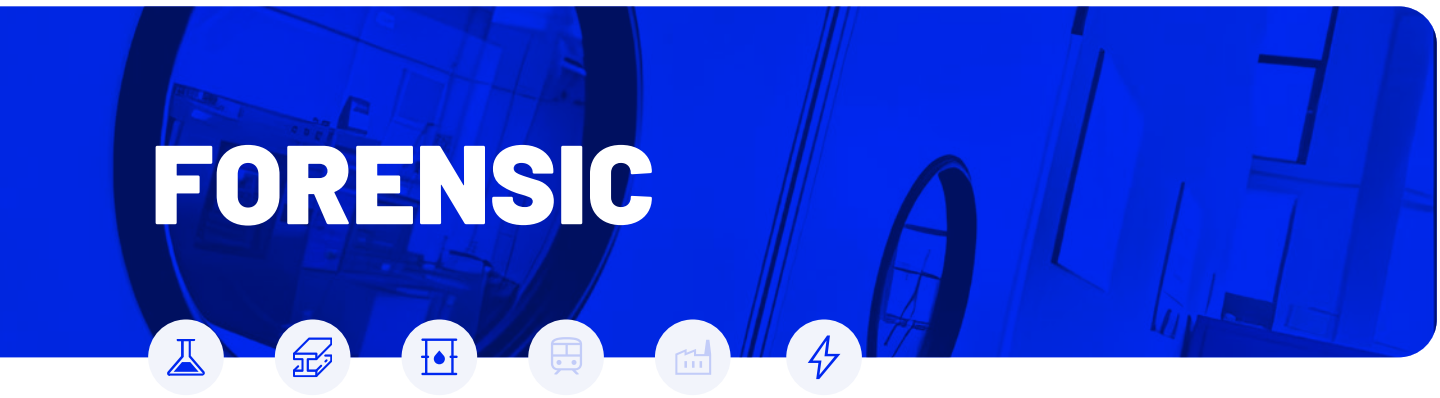
being two distinct procedures used together to ensure the quality and reliability of a product, service, or critical system.

We deploy **skilled and experienced specialists** able to handle in outsourcing all **V&V phases**, given that verification checks compliance with regulations and specifications, while validation ensures the product aligns with user needs and expectations. Our capability span from railway signalling components & systems, automotive control system, burner management system, safety devices for industrial automation (safety light curtains, safety light barriers or safety laser scanners, safety relay, safety PLC, power drive system with integrated safety functions), to safety smart sensors and actuators, industrial thermo-processing equipment (IThE), household appliances, medical devices, robot and cobot control systems, fire & gas components, embedded FuSa platforms, SoC, communication protocols and compilers.

We help our customer in demonstrating the **Compliance to the Functional Safety Standards** through: Verification of development documentation, Safety Requirements Verification and Tracking during the whole V-cycle, FMEA System, Functional Block FMEDA, Component FMEDA, Quantitative analyses (Markov, FTA), Hazard Log management and Test Strategy Definition, Work products management.

Software and Firmware Testing & Verification - we test your software by performing static and dynamic analysis, integration with the HW platform on different development environments and programming languages (e.g. C, C#, IEC 61131-3 Programming Languages are LD, SFC, FBD, CFC and ST). We also carry out tests on Safety-related communication in transmission systems and protocols.





FORENSIC

FORENSIC INVESTIGATION AND ENGINEERING

At XEFRA, we specialize in forensic investigation, harnessing our advanced analytical skills and state-of-the-art investigative laboratory tests to meticulously reconstruct accident scenarios. Our approach is grounded in the collection of objective evidence, which proves to be invaluable in the realm of forensic engineering.

Our team of experts is not only skilled in **forensic analysis** but also possesses a profound understanding of the claims and litigation processes. Our extensive experience working alongside prestigious law firms and reputable insurance companies has equipped us with the insight to effectively navigate these intricate areas.

In the face of **large loss accident sites**, our interactions with authorities extend to critical areas such as product liability, process safety, and occupational H&S. Our proactive engagement ensures that all regulatory aspects are addressed, and compliance is maintained throughout the investigative process.

XEFRA FORENSIC LABORATORY

The cornerstone of our investigative process lies within our forensic laboratory. Here, activities are spearheaded by our multidisciplinary team of seasoned experts and rigorously trained technicians. Our facility is designed to facilitate a comprehensive examination, testing, and secure storage of physical evidence collected from loss sites. Our commitment to excellence is reflected in our meticulous evidence handling procedures, ensuring that every piece of evidence is preserved in its most authentic form. This attention to detail is what sets XEFRA apart, making us a **trusted partner in forensic investigation**.

If you are entrusting your case to us - a team that values precision, integrity, and expertise - we shall commit to uncovering the truth and provide the answers you need to achieve justice and closure.

IT/OT CYBERSECURITY ASSURANCE

WE ARE COMMITTED TO SAFEGUARDING YOUR DIGITAL ASSETS

Through robust cybersecurity assessment and testing. Our comprehensive tailored services address the unique challenges faced by organizations in today's interconnected world.

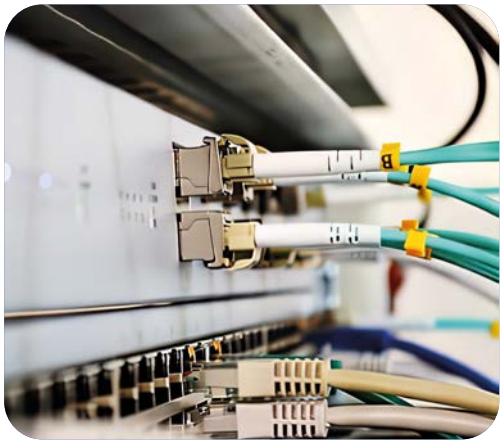
Our experts conduct thorough assessments to identify weaknesses and assess the effectiveness of your security controls, such as **Vulnerability Scanning** and **Security Audits**.

Security Risk Management: **TARA** Threat Analysis & Risk Assessment as by ISO/SAE 21434; **Risk Mitigation Strategies** - preventive measures; **Security Incident Response Planning** - preparing for emergencies.

Secure Software Development: Secure Code Reviews - identifying vulnerabilities early in the development process; **Security Testing** - validating SW against common threats; **Secure SDLC** (Sw Development Life Cycle) - integrating security practices throughout development.

Network Security to protect your infrastructure with **Firewall Configuration & Monitoring** - prevent unauthorized access; **Intrusion Detection & Prevention Systems** (IDPS); **Network Segmentation** - isolating critical assets; **Security Compliance & Certification** - we guide you through compliance requirements and certifications: **IEC 62443 - CENELEC CLC/TS 50701 - ISO/IEC 27001 – NIST**.

Security Awareness Training to empower your workforce with knowledge on best practices: **Staff Training** - phishing, social engineering, safe online behaviour; **Security Policies & Procedures** – clear guidelines.



Incident Response & Recovery: Incident Handling Plans, Forensic Investigation and Business Continuity Planning.

We can fortify your **cybersecurity defences**, so reach out to our experts for personalized solutions that align with your business goals.

MACHINERY AND PLANT ASSESSMENT

MACHINE SAFETY REFERS TO THE SAFETY-RELATED DESIGN OF A MACHINE

This means minimizing any potential hazards that a machine might pose, such as operating errors, excessive heat or noise, open and dangerous components, mechanical vibrations, exposure to poisonous substances, dangers posed by electricity or radiation.

We can assist our customers in all the steps necessary for the machinery safety and plants, according to the **Machinery Directive 2006/42/EC**:

- **Legislative Framework and Safety Requirements** Identification: research into global legislative & regulatory requirements applicable to your machines, from North America, Europe, China, Australia, Brazil etc., supported by a network of trusted collaborators;
- **Machinery Hazard Identification and Risk Analysis**: according to EN ISO 12100 and ISO/TR 14121-2;
- **Machinery electrical equipment analysis and test**: according to CEI EN 60204-1
- **Machinery fluidic systems analysis and tes**t the analysis of pneumatic and hydraulic equipment, to verify compliance with EN ISO 4413 and EN ISO 4414;
- **Instruction manual consolidation**: verifying the machine's manual;
- **Machinery safety testing**: the execution of instrumental tests (noise, vibrations, ROA, electrical safety EN 60204-1, EMC)
- **Machinery Safety control system verification and testing**: according to EN ISO 13849-1 and EN ISO 13849-2; EN ISO 13849-1 and EN ISO 13849-2

MACHINERY AND PLANT ASSESSMENT

Pressure Equipment

PED the Pressure Equipment Directive (2014/68/EU) applies to the design, manufacture, and conformity assessment of stationary pressure equipment with a maximum allowable pressure greater than 0,5 bar.

It affects most pressure equipment & assemblies: Containers & Pipe systems – parts for piping systems, intended for transport of fluids; Boiled or otherwise heated equipment – that produce steam or superheated water exceeding 110°C; Safety equipment – devices for protection of pressure equipment against exceeding of permitted limits; Units – several pieces of pressure equipment assembled by the manufacturer into a functional whole.

We have a wide experience in the verification of piping and pressure vessels including their mechanical integration and supporting structures through our 3D modelling capability.

Risk-Based Inspection & Maintenance

RBIM is a service provided to users of complex plants who, through survey techniques, build a forecasting model of the deterioration of their assets, and define a plan of periodic interventions, aimed to extend their life cycle.

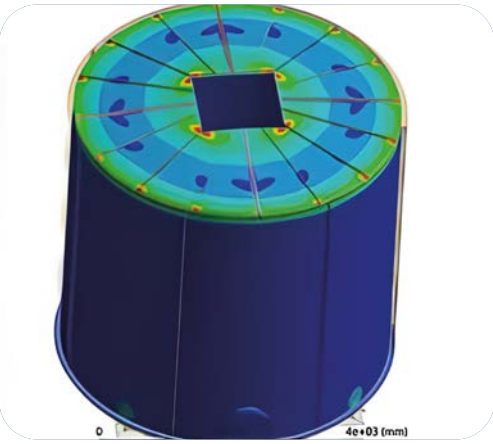
The steps are asset classification and life-cycle model elaboration with CAPEX, OPEX and RISKEX; analysis of the negative events probability; consequences of failure associated with each equipment, component or structure; inspection and maintenance programme development; inspection and predictive maintenance techniques (NDT, vibration of rotating machines, thermal analysis of electrical and mechanical parts, lubricate oil analysis); periodic follow-up.

Benefits are operations optimisation, cost-effective inspection and maintenance programmes within an asset and risk-management context.

XEFRA SIMULATION LABORATORY

OUR SIMULATION LABORATORY IS AT THE FOREFRONT OF CUTTING-EDGE NUMERICAL ANALYSIS

We deliver comprehensive and intricate simulations, backed by rigorous validation in our state-of-the-art Lab. Whether you're in aerospace, automotive, or any other industry, our services ensure safety, efficiency, and innovation throughout your product lifecycle.



Our **Simulation Capabilities**

- **Safety Requirements Verification & Tracking** (V-cycle) – verified at every stage of your project, ensuring compliance with industry standards

- **Static Stress Analysis** - using both linear & non-linear material models, we assess structural integrity under various loads

- **Thermal Analysis** - of thermal behaviour within structures, predicting temperature gradients and identifying potential hotspots

- **Noise Analysis** – of environmental factors, in compliance with noise regulations, to minimize noise impact

- **Electromagnetics Analysis** - measuring electromagnetic fields in your environment, our simulations guide EMC design and mitigate interference risks

- **Fatigue Analysis & Fracture Mechanics** - we assess material fatigue, predicting component lifespan and identifying critical areas prone to failure

- **Fire & Smoke Simulations** – our simulations model fire scenarios, smoke dispersion, evacuation routes, so we optimize fire safety for buildings, vehicles, and industrial facilities

Our **Methodology**: **Expertise** - our engineers blend knowledge with cutting-edge tools; **Precision** - accurate simulations drive informed decisions and reduce costly iterations; **Collaboration** - we work closely with our clients; **Innovation** – we push boundaries, ensuring products meet safety & performance standards.

Unlock the **power of simulation** with us, to get customized solutions that elevate your engineering processes and enhance safety across industries.

ACADEMY

XEFRA 's Technical Academy is our way to develop and provide innovative learning initiatives to industrial businesses and their staff.

Delivering quality training programs, it has become an essential process capability for great organizations, as the most important resource for a business, it still is its human capital and, consequently, their skills and capabilities.

Whether you want to learn about **process and product safety** or need to improve your knowledge and skills in **explosive atmospheres**, in Xefra we can help. You can choose from our selection of qualifications or request a **customised course**, perfectly tailored to your organisation's needs.

XEFRA TRAINING EXPERTS

Our experienced tutors and trainers are experts in process safety, and they will support your resources to gain the necessary knowledge and skills in order to implement, establish and maintain excellent **safety levels** in your organisation.

DURATION FLEXIBILITY

The duration of our courses may vary depending on the in-depth study level desired. The modules may also be delivered on different dates, to be agreed with the client at the time of course design and scheduling.

1. **8-hour** (2 modules of 4h): this option is ideal for a general overview of the topic. It covers the key points and provides an overview. It is suitable for those who need a basic knowledge.
2. **16-hour** (4 modules of 4h): this option offers more in-depth study. In addition to the basic concepts, it addresses specific details, practical cases and best practices. It is recommended for those who want an advanced understanding of the topic.

COURSE CATEGORIES

ATEX

EU DIRECTIVES & REGULATIONS

CERTIFICATION OF MACHINES & PRODUCTS

PROCESS SAFETY

MACHINERY SAFETY

FUNCTIONAL SAFETY

CYBER SECURITY

EXPERT TRAINING

Talk to one of our Technical Training Experts to find the training program your company needs and to define the delivery method that suits you best (classroom, on-line or hybrid). For more information on our courses, please send an e-mail to: academy@xefracert.com

CONTACTS

Phone: +39 010 455 6368
E-mail: info@xefracert.com

Our Headquarter office is based in Genoa inside the Prestigious Prince Palace.

Our Testing Laboratory is located in Tortona, in the Scientific and Technological Park, strategically positioned midway between the Centre and Northern Italy.

HEADQUARTERS

Piazza del Principe 4, 16126 Genova (GE) – Italy
+39 010 455 6368

Our office is located in the heart of the old city, at a 2 minutes walking distance from the main Railway Station – Genova Piazza Principe.

We are honoured and privileged to have our office based inside The Villa del Principe (Prince's Palace), one of the main historical villas in Genoa, built in the 16th century in an area that was outside the city walls at the time of its construction.

TESTING LABORATORY IN TORTONA

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