



IECEX System



IECEx (IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres) has the mechanisms in place to help industry, authorities and regulators ensure that equipment (electrical and non-electrical) as well as the people working in Ex areas benefit from the highest level of safety.

Overall objective

The overall objective of IECEx is to facilitate international trade in equipment and services for use in explosive atmospheres, while maintaining the required level of safety.

The IECEx System offers:

- reduced testing and certification costs to manufacturers
- reduced time to market
- international confidence in the product assessment process
- one international database listing
- confidence in equipment and services covered by IECEx certification throughout the world

“Built and maintained for industry and community by representatives of industry and community in response to the stated needs of industry and community regarding Ex areas.”

What is an Ex area?

Places where flammable liquids, vapours, gases or combustible dusts are likely to occur in quantities sufficient to cause a fire or an explosion are referred to as Ex areas.

Ex areas can be described by different names such as hazardous locations, hazardous areas, explosive atmospheres.

While the increasing application of industrial automation in hazardous areas has improved the efficiency and safety of installations, it may also have increased the risk of fire or explosion hazards, thus increasing the need for equipment specifically designed for Ex areas, namely Ex equipment.



Where do you commonly find Ex equipment?

Ex equipment can be found in:

- automotive refuelling stations or petrol stations
- oil refineries, rigs and processing plants
- chemical processing plants
- printing, paper and textiles industries
- hospital operating theatres
- aircraft refuelling and hangars
- surface coating industries
- underground coal mines
- sewerage treatment plants
- gas pipelines and distribution centres
- grain handling and storage
- woodworking areas
- sugar refineries
- food processing
- metal surface grinding, especially aluminium dusts and particles

Ex areas are by no means limited to industrial sites. In fact you may have visited one today – to fill your car with petrol – or you may even work in an Ex area or close to one.



IECEX certification system

In addition to the preparation of international standards, the IEC facilitates the operation of conformity assessment systems. One such system is the IECEX System.

The IECEX System comprises the following:

- The IECEX certified equipment scheme
- The IECEX certified service facilities scheme
- The IECEX conformity mark licensing system
- The IECEX scheme for certification of personnel competence

About the IEC

The IEC (International Electrotechnical Commission) is the leading global organization that publishes consensus-based international standards and manages conformity assessment systems for electric and electronic products, systems and services, collectively known as electrotechnology.

Technology is becoming more and more complex, and users and consumers are depending increasingly on products whose design and construction they may not understand. Conformity assessment (CA) provides the reassurance they need.

CA refers to any activity that determines whether a product, system or service corresponds to the requirements contained in a specification. A specification, often a standard, is a technical description of the characteristics a product, service or object is required to fulfil. If CA is done properly (i.e. the “IEC way”), consumers can be confident that products are safe to use, energy efficient, environmentally friendly, and perform to expectations.

Truly global CA systems

The IEC owns and operates four CA systems, each of which operates schemes based on third-party conformity assessment certification. Together they establish that a product is reliable and meets expectations in terms of performance, safety, efficiency, durability and other criteria.



The multilateral IEC Conformity Assessment Systems, based on its international standards, are truly global in concept and practice, reducing trade barriers caused by different certification criteria in various countries and helping industry to open up new markets.

Removing the significant delays and costs of multiple testing and approval allows industry to be faster and cheaper to market with its products.

The four IEC CA Systems comprise:

- IECCE (IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components)
- IECEx (IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres)
- IECQ (IEC Quality Assessment System for Electronic Components)
- IECRE (IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications)

Note that the IEC is not a certifier and IEC CA services (test reports, certificates, etc.) are provided by other organizations that have been assessed and accepted against stringent criteria designed to ensure consistent quality of CA services.

History of IECEx

Since its inception in 1996, IECEx has grown from less than a dozen member countries to being a truly global system comprising approved certification bodies (ExCBs) in more than 33 countries and has become an essential compliance assessment tool for the global Ex industry.

While the initial market demand was focused on Ex electrical equipment, in recent years it grew to include non-electrical (mechanical) equipment as well. Then, Ex stakeholders worldwide realized the need to expand the scope of IECEx into the service sector. This scheme is now recognized and valued in the market with consequent acceptance and growth. These are evidence that IECEx is meeting its main objective, i.e. to provide a framework to facilitate international trade in equipment and services related to explosive atmospheres, while maintaining the required level of safety and system integrity.

The deliverables are measured in terms of the ability of the system to:

- reduce testing and certification costs to manufacturers
- reduce time to market
- achieve international confidence in the product assessment process

“The IECEx System as designed to meet the needs of the market by market stakeholders seeks to avoid accidents and fatalities by addressing the underlying causes that will reduce or eliminate risks.”

The IECEx System enables a whole lifecycle approach to safety.

Efforts of manufacturers to design and manufacture Ex equipment compliant with the requirements specified in international standards developed by IEC Technical Committee 31 (IEC TC 31): Equipment for explosive atmospheres, and having an IECEx certificate are potentially cancelled, wasted or eroded over time if:

- inappropriate or incorrect equipment is selected at design stage
- the correct equipment is selected but it is not installed or operated correctly
- the necessary inspections at various stages of installation and operation are not conducted correctly or on time
- it is installed and operated correctly but is not maintained or repaired correctly

The tests done on equipment, and the ongoing surveillance of the capability of the manufacturer to produce product identical to the tested samples, are done to assure compliance with the design, operational and performance requirements of the relevant standards. Subsequently, the ongoing compliance with these critical aspects is beyond the control of the manufacturer. Others need to understand and accept their responsibility in maintaining the expected safety of the certified equipment.

So how do you know...

...who you can trust to have the knowledge and capability of making a valid assurance of compliance with all relevant requirements needed to provide an expected level of protection from potential fire and explosion?

The IECEx System has a foundation of third-party certification of:

- equipment
- systems and assemblies
- service providers
- people

It provides independent verification of conformity to specifications or standards prepared and maintained by experts who input new ideas, new technologies or accidents that have revealed previously unforeseen risks that need to be addressed.

... and how do you check to provide the confidence that equipment, installations and systems are manufactured, operated and maintained in compliance with IEC International Standards; confidence that persons working in Ex areas are well protected from Ex hazards?

Instant verification of the current validity of all issued IECEx certificates is available on the IECEx website.

Safety however is not just about properly designed and manufactured equipment that meets the requirements of international standards.

Personnel competence

We need to consider the importance of the competence (an ability to apply skills, knowledge and experience) of people and service providers. For example: If you are about to undergo surgery, surely you will only subject yourself to the work of a competent surgeon – to do otherwise may have unpleasant outcomes for you. If you are taking your family on a vacation to another city or country, surely you will fly on an airline that has a good safety record and is supported by competent pilots, ground staff, engineers etc. – to do otherwise may have unpleasant outcomes for you and your family.

Don't you think that it is only reasonable and socially and legally responsible that similar, if not more, care is taken when designing, installing, inspecting, operating, maintaining, repairing and overhauling equipment in





explosive atmospheres, where errors can be potentially catastrophic for people, manufacturing facilities and the community living nearby, not to mention the long-term effects on the community, environment and economy? If yes, why do we continue to see reports in the media of accidents, fatalities, damage to assets and infrastructure that are often attributable to problems related to:

- wrong or inappropriate equipment
- wrong, poor or incomplete installation
- wrong operation or operator error
- lack of maintenance
- and much more

In recognition of the global value of the IECEx System, the United Nations, through the UN Economic Commission for Europe (UNECE), has endorsed the IECEx System as the internationally recognized certification system for promoting the safety of equipment, services and personnel associated with devices, systems and installations used in Ex areas.

The role of standards...

Standards, certification requirements, and conformity assessment related to Ex equipment have been in existence for many decades. The basic principles of explosion protection are codified in IEC and ISO International Standards which cover specific requirements for all types of Ex equipment and systems.

These international standards have been embraced by all sectors of the Ex industry and are used by manufacturers, suppliers, service providers and end users of Ex equipment to ensure safety in their products and processes. They are also adopted in various countries at the national and regional level, either in whole (without differences), or in part (with identified differences).

... and conformity assessment

Most manufacturers, suppliers, service providers and end users trade on the global scene and have to meet the strict requirements put in place by national regulations and legislations. As a prerequisite for safety in a sector where hazards are substantial and may involve severe damages and casualties, most national regulations require that conformity assessment be carried out by independent, third-party certification bodies. This creates a problem for manufacturers, suppliers, service providers and end users that trade internationally: equipment may have to undergo repeated testing and conformity assessment for each of

the national markets to which it is exported, resulting in increased cost of the equipment without a corresponding increase in safety for workers and end users.

While strict regulatory requirements governing Ex equipment or services exist in many countries, there are also many countries that lack a technical infrastructure in the Ex area, and need to rely on systems developed elsewhere. For this and other reasons, an internationally recognized



certification system is very important and beneficial in order to reduce unnecessary costs and delays due to duplication of testing and assessment, while preserving an acceptable level of safety, as reflected by international standards, such as those developed by IEC Technical Committee 31.



Information about IECEx



IECEx certificates/reports



About the IEC

Key figures

173

members and affiliates

>200

technical committees

20 000

experts from industry, test and research labs, government, academia and consumer groups

>10 000

international standards published

4

global conformity assessment systems

>1 million

conformity assessment certificates issued

>100

years of expertise

The IEC, headquartered in Geneva, Switzerland, is the world's leading publisher of international standards for electrical and electronic technologies. It is a global, independent, not-for-profit, membership organization (funded by membership fees and sales). The IEC includes 173 countries that represent 99% of world population and energy generation.

The IEC provides a worldwide, neutral and independent platform where 20 000 experts from the private and public sectors cooperate to develop state-of-the-art, globally relevant IEC International Standards. These form the basis for testing and certification, and support economic development, protecting people and the environment.

IEC work impacts around 20% of global trade (in value) and looks at aspects such as safety, interoperability, performance and other essential requirements for a vast range of technology areas, including energy, manufacturing, transportation, healthcare, homes, buildings or cities.

The IEC administers four conformity assessment systems and provides a standardized approach to the testing and certification of components, products, systems, as well as the competence of persons.

IEC work is essential for safety, quality and risk management. It helps make cities smarter, supports universal energy access and improves energy efficiency of devices and systems. It allows industry to consistently build better products, helps governments ensure long-term viability of infrastructure investments and reassures investors and insurers.



A global network of 173 countries that covers 99% of world population and electricity generation



Offers an affiliate country programme to encourage developing countries to get involved in the IEC free of charge



Develops international standards and runs four conformity assessment systems to verify that electronic and electrical products work safely and as they are intended to



IEC International Standards represent a global consensus of state-of-the-art know-how and expertise



A not-for-profit organization enabling global trade and universal electricity access

Further information

For further information, please visit the IEC website at www.iec.ch. In the “Who we are” section, you can contact your local IEC National Committee directly. Alternatively, please contact the IEC Central Office in Geneva, Switzerland or the nearest IEC Regional Centre.

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