

2. LEGAL BASES

Recognised IECEx certification bodies (ExCB = certification body) and IECEx test laboratories (ExTLs) exist worldwide and are accredited on the basis of high standard criteria and regularly monitored. An IECEx certificate is only issued if test sample type testing is successful and an audit verifies that an effective quality management system is in place. However, different regional and national approval procedures currently exist all over the world, including for example the ATEX directive in the European Union or national approvals in the USA (UL, FM).

Besides the IECEx Scheme for testing and **certifying new products** (IECEx Equipment Scheme), for some years now the system has also included **certification of service providers** (IECEx Certified Service Facilities Program). The service provider must prove that it maintains a quality assurance system. It is audited every three years by an accredited auditing body (Ex-CB).

The third component of the IECEx Scheme (IECEx Certification of Personnel Competencies) runs on similar lines. It focuses on the **certification of the personal skills** of professionals working in hazardous areas. This is designed as a guarantee for global operators that employees possess the necessary qualification and experience to perform with perfection highly complex tasks in hazardous areas.

In the "Recognised Training Provider (RTP)" programme the IECEx organisation examines the competence of providers offering explosion protection courses. A list of training providers is available on the IECEx website.

2.2 EXPLOSION PROTECTION IN THE EUROPEAN UNION

Explosion protection is governed by directives and standards in the European Union.

Directives

In 1976 the Council of the European Community established the basis for the free movement of explosion-protected electrical equipment within the European Union with its "Directive on the harmonisation of the laws of the member states concerning electrical equipment for use in potentially explosive atmospheres (76/117/EEC)". This directive has since been continuously adapted to state-of-the-art standards by means of single and supplementary directives, which however only concerned electrical equipment.

Full harmonisation and extension to all types of equipment, both electrical and non-electrical, was achieved in 1994 by the new 94/9/EC (ATEX) directive. This was followed in 1999 by the 1999/92/EC directive, which governs operation in hazardous areas and defines safety measures for the persons working in those areas. In February 2014, Directive 2014/34/EU (ATEX) was published. Actual implementation with regards to equipment certification took place on 20 April 2016, replacing Directive 94/9/EC.

Standards

The European EN 50014 – EN 50020 electrical equipment standards were issued in 1978 and replaced the previous national standards for this equipment valid across Europe. Aside from the electrical equipment standards (published by the European Committee for Electrotechnical Standardization CENELEC), the European Committee for Standardization (CEN) has drafted respective standards for non-electrical explosion-protected equipment.

According to an agreement between the European Committee for Electrotechnical Standardization CENELEC and the International Committee for Electrotechnical Standardization IEC, international standards for electrical equipment have generally been adopted by CENELEC as they stand. The EN 50014 ff series defining requirements for equipment in explosive gas atmospheres has been gradually replaced by the EN 60079 series (at international level IEC 60079). In Germany these standards are issued as VDE 0170.

The requirements of protection types for areas with combustible dust were contained in the IEC 61241 series. In Europe these EN 61241 standards replace the former EN 50281 series. However, since most requirements for gas and dust are similar, they are compiled under the series IEC or EN 60079 (see Table 3).

Table 4: Non-electrical equipment for use in hazardous areas

EN	
Basic Principles and Requirements	EN 13463-1
Protection by flow restricting enclosure "fr"	EN 13463-2
Protection by flameproof enclosure "d"	EN 13463-3
Protection by constructional safety "c"	EN 13463-5
Protection by control of ignition source "b"	EN 13463-6
Protection by liquid immersion "k"	EN 13463-8

After publication of Directive 94/9/EC in Europe, construction regulations for non-electrical equipment were also specified by the EN 13463 standard series (see Table 4). Some protection principles for electrical equipment were adopted, although amendments were made to address the special requirements of non-electrical equipment. Published in 2016, standards ISO 80079-36 and -37 have been adopted as EN ISO 80079-36 and -37.

Other important harmonised standards on explosion protection worthy of mention are EN 11267-1 and -2. They set out methods by which hazards are identified and assessed and outline the respective protection measures. Both preventive explosion protection (avoiding explosive atmospheres and effective ignition sources) and constructive explosion protection (containing explosion effects) are addressed. With the aim of preventing ignition sources as a protective measure, all ignition sources are described and possible measures for their avoidance defined. While Part 2 is relevant for mines, Part 1 deals with other areas (above ground).

- EN 1127-1: Explosive atmospheres – Explosion protection – Part 1: Basic principles and methods.
- EN 1127-2: Explosive atmospheres – Explosion protection – Part 2: Basic principles and methods in mines.