هيئة الإمارات للمواصفات والمقاييس
Emirates Authority For Standardization & Metrology

IEC Ex – ECAS Ex: A Global Alignment Industry Meeting Dubai, United Arab Emirates

Certification Systems around the world

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WHEN YOU NEED TO BE SURE

Research into Coal Dust Explosions

Coal Dust Explosion in a Mine Gallery

ATEX – European Union Directive 2014/34/EU

Applied throughout the European Economic Area (EEA) since 1 July 2003 (Originally as 94/9/EC)

- The European Union (EU)
- The European Free Trade Association (EFTA)
- Turkey (as a member of the Customs Union)

Became national law in each country by “adoption”

Follows earlier directives from 1970s and 1980s

2014/34/EU replaced 94/9/EC

- Effective from 20 April 2016
- Very little practical change for manufacturers
- Clarifies responsibilities for importers and distributors

ATEX 2014/34/EU

Not primarily about Safety

About Removing Barriers to Trade within Europe (EEA)

- Creates minor barrier to trade between the rest of the world and Europe

Sets only minimum requirements

- To avoid safety concerns being a barrier to trade

Conformity Assessment Requirements

- Not consistent
- Vary with Category of Equipment (EPL of Equipment)
- Less than earlier directives
- Does not require compliance with standards

ATEX 2014/34/EU – Categories / EPLs / Zones

ATEX Category	IEC Equipment Protection Level	Installation Zone
1G / 1D	Ga / Da	0 / 20
2G / 2D	Gb / Db	1 / 21
3G / 3D	Gc / Dc	2 / 22
M1	Ma	Leave on *
M2	Mb	Switch off *

* When flammable gas is detected in the body of the mine

ATEX 2014/34/EU – Conformity Assessment (Certification ?)

Categories ATEX (Annex)	1 + M1	2 + M2 Electrical	2 + M2 Non-Electrical	3
Type Examination (III)	NB	NB		
Production QA (IV)	NB			
Product Verification (V)	NB			
Conformity to Type (VI)		NB + M		
Product QA (VII)		NB		
Internal Control of Production (VIII)			M (+ deposit file)	M
Unit Verification (IX)	(NB)	(NB)	(NB)	(NB)

EPL IECEx process	Ga + Da + Ma	Gb + Db + Mb	Gc + Dc
Equipment Certification (Type Examination + QA)	ExCB + ExTL	ExCB + ExTL	ExCB + ExTL
Unit Verification	ExCB + ExTL	ExCB + ExTL	ExCB + ExTL

ATEX 2014/34/EU – Notified Bodies

A Notified Body is a “third party” body NOTIFIED to the European Commission by a National Government to perform specific actions in relation to a directive

- 2014/34/EU introduced, for the first time, a requirement for a Notified Body to have national accreditation
- Previously, different countries set different criteria for the notification process
- One of the reasons (along with unclear conformity assessment requirements) that Australia, for example, ceased to accept ATEX as a criteria for import
- 2014/34/EU explicitly accepted that the original process was weak and set a higher acceptance criteria but still does not insist on accreditation as the only route

ATEX 2014/34/EU – Standardisation

Cenelec EN 60000 series standards are generally technically equivalent to IEC 60000 series

For EN 60079 series standards, the main difference is the addition of ATEX marking

EN 50000 series standards are not directly based on IEC documents and may not have an international equivalent

- E.g. EN 50495 Safety Systems for ATEX

Dual certification to IEC 60079 series (for IECEx) and EN 60079 series (for ATEX) is common practice

ATEX 2014/34/EU – Standardisation

CEN EN 80079 series standards for non-electrical equipment are generally technically equivalent to the ISO/IEC 80079 series

These standards, published as EN ISO or EN ISO/IEC documents, have replaced earlier EN only documets in the EN 13463 series

For coherence, the 60079 and 80079 documents are treated as an entity and are allocated part numbers from the same sequence. The first ISO/IEC standard in this series became ISO/IEC 80079-34

Dual ATEX and IECEx Certification is also possible

ATEX 2014/34/EU – Documentation

Manufacturer's Declaration of Conformity (DoC)

- Made by the manufacturer on SOLE responsibility
- Backed up by the manufacturer's Technical File

For some equipment (Cat. 1/M1 + Cat 2/M2 electrical) backed up by:

- EU-Type Examination Certificate
  - Relating to the design
- Quality Assurance Notification
  - Relating to production
  - Alternative of Product Verification Certificate

DoC is the only document legally obliged to be supplied

ATEX 2014/34/EU – Declarations of Conformity

Theoretically made on the day each individual item of equipment is “placed on the market”

In practice usually pre-printed for serial production – leads to errors

Change in harmonisation status of standards

- Initially not harmonised
- Harmonised
- Not harmonised when superseded
- “State of the Art” issues

Change in authorised signatory

- Who gets prosecuted?

ATEX 2014/34/EU and IECEx – Positives

An IECEx ExTR from any IECEx ExCB can be used to support an application for ATEX EU-Type Examination

- Apart from marking, the technical requirements are almost certainly identical

AN IECEx QAR from any IECEx ExCB can be used to support an application for an ATEX QAN

- The requirements are absolutely identical (ISO/IEC 80079-34)

A European ExCB (as all are also ATEX NBs) will usually issue both sets of documentation together for very little extra cost

ATEX 2014/34/EU and IECEx – Positives

For ATEX Category 3, the IECEx Certificate and ExTR can be used directly to form the technical file supporting the DoC made under the module “Internal Control of Production”

For equipment not conforming directly to an IEC published standard for a defined Type of Protection, IECEx permits the use of IEC 60079-33 “Ex s”

ATEX 2014/34/EU and IECEx – Positives

- For equipment not conforming directly to a Cenelec harmonised EN standard, ATEX permits direct assessment against the Essential Health and Safety Requirements
- IEC 60079-33 has not been published as an EN, although many national standards bodies have published it, for example as BS IEC 60079-33
- The methodology of IEC 60079-33 can support the EHSRs so an IECEx Certificate to IEC 60079-33 can form part of the technical file for ATEX

ATEX 2014/34/EU – Negatives

The controls over direct use of the EHSRs are often believed to be weak and allow manufacturers to pay “lip service” to full conformity

The role of the different Conformity Assessment Modules is not always understood and some countries are (possibly justifiably) not happy that ATEX equates to “proper” certification

The level of competence of the various Notified Bodies is widely believed to be extremely variable (although this has supposedly been addressed in the new directive)

The Answer: Both ATEX and IECEx together

ATEX 1999/92/EC – The "other" ATEX Directive

Minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres

This relates directly to installations and their management rather than the supply of equipment

The IEC standards relating to installations are relevant but are not "harmonised"

- IEC 60079-10-1 /-2 Hazardous Area Classification
- IEC 60079-14 Selection and Installation of Equipment
- IEC 60079-17 Inspection and Maintenance of Equipment
- IEC 60079-19 Repair and Overhaul of Equipment

Requires all installed Equipment to comply with 2014/34/EU

ATEX 1999/92/EC – The "other" ATEX Directive

Unlike 2014/34/EU, 1999/92/EC is a "Safety Directive"

It sets Minimum Requirements

National Governments can implement in different ways and increase the requirements above the minimum in the directive

Introduces

Regional and National Certification Systems

- The world is divided
- Administrations where “certification” alone is the only requirement for market penetration
  - Fairly straight forward
- Administrations where “installation permissioning regimes” apply in addition to or as an alternative to certification
  - More complicated
- IECEx can help with the certification side but not totally with the installation permissioning side
  - This often requires an “in country” agent or representative

Eurasian Customs Union

- Includes Armenia, Belarus, Kazakhstan, Kyrgyzstan and the Russian Federation
- TP TC 012/2011
  - A single regulation applying to all five countries
- Remarkable similarity to ATEX (some phrases identical) but distinct differences
  - Recognises a third level of protection for Mining
  - No equivalent of “Internal Control of Production”
- IECEx certificates and reports specifically recognised
  - subject to review by the local certification body as a vehicle for issuing the local documentation
- Uses IEC standards with some regional differences

Brazil

- INMETRO Certification
  - INMETRO is Brazil's national accreditation body
  - INMETRO also manages certification schemes
  - INMETRO does not certify products
- INMETRO Directive 179 of May 18, 2010
  - As with TP TC 012/2011, certain phrases from ATEX are recognisable
  - Specifically references the NBR versions of the IEC standards but confirms that they are adopted without deviation
  - Allows any Brazilian certification body to base INMETRO certification on IECEx documentation
  - Greatly frees the market compared with previous regulations
  - But added restrictions re QA from mid 2014

India – Local Certification for Indian manufactured products

- Both Certification and Permission
- An Indian laboratory issues a report/certificate
- For Ex d Ex e or Ex i equipment BIS issues a license
- PESO (Petroleum and Explosives Safety Organisation) issues a permission to install based on Laboratory Certificate and BIS License (Group II)
  - Note PESO insist on a BIS License for Ex d but not for Ex e or Ex i
- DGMS (Director General of Mines Safety) issues permission based on report/certificate and BIS License (Group I)

India – IECEx Certification for non-Indian manufactured products

- Manufacturers outside India should use their IECEx Certificate directly if they have an Indian representative or agent who can be shown to take responsibility for follow-up servicing of the equipment
- As with Indian manufactured products, the full procedure for application to PESO or DGMS for permission to install is required, if the installation site is within their jurisdiction
- Note that PESO are insisting on IECEx Certification to the current edition of the standards and will not allow non-Indian products to be certified in India
  - This means that slightly different standards are used depending on the country of manufacture

China

- Mining and Non-Mining regimes are different
  - Equipment for use in mines requires direct certification and permission from MA using MA standards which are not directly compatible with IEC standards
  - Certification of non-mining equipment is performed by Testing Laboratories, rather than Certification Bodies
  - Any of the Testing Laboratories active in the IECEx Scheme as ExTLs will accept an ExTR from outside China as the basis for creating the local certificate
  - China has its own standards but, other than for mining, they are closely based on the IEC 60079 series.

USA – The most difficult market ?

- Divisions versus Zones
  - USA has joined IECEx but only in respect of equipment destined for Zoned Areas
  - The default installation in USA is almost invariably based on their historical “Division” system with only a few on Zones
  - This assists USA exporters, but because OSHA have not given permission for the use of IECEx reports (albeit reports with national differences overtly considered) to support certification of equipment destined for Division Areas there is an effective uni-directional trade barrier in existence
  - A brighter note: The US Coastguard looks favourably on IECEx as a route in for equipment in the Gulf of Mexico, where it is accepted that the technical construction of equipment to the IEC 60079 series of standards offers many benefits compared with the Division equipment

USA – An extended market ?

- USA has an extended influence in the Oil and Gas market outside its own territory
- Divisions and Zones do not mix
  - With the possible exception of some carefully specified intrinsically safe equipment (where the standards are similar, though not identical) installations should be one or the other
  - The reason most Division Explosion Proof equipment is so much heavier (and more expensive) than the equivalent IEC Flameproof equipment is that it has to withstand higher explosion pressures relating to the use of conduit wiring systems

Direct legal acceptance

- There are five countries in the world that have written IECEx into their national legal requirements as an accepted alternative to the national certification (albeit with some minor restrictions)
  - Australia
  - New Zealand
  - Singapore
  - India
  - Israel
- Many other countries where the law does not prescribe a particular certification scheme also accept IECEx in preference to any other regional or national scheme

Indirect legal acceptance

- All regions and countries with an IECEx ExCB are committed to indirect acceptance via their own certification bodies
  - Sometimes this is actually written into the legislation
  - Brazil
  - Customs Union (Armenia, Belarus, Kazakhstan, Kyrgyzstan and the Russian Federation)
- Single exception is USA for Divisions

IECEx is a passport to either direct or indirect entry to most markets throughout the world

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