

# IECEX CERTIFICATION SCHEMES VERSUS ATEX DIRECTIVES

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**Abstract** - Today, two international certification schemes exist for hazardous area. One scheme is endorsed in Europe under the ATEX Directives the other scheme is the IECEx system which provides a more international but voluntary equipment certification scheme accompanied with the conformity mark license scheme and other certification schemes for service facilities and persons.

This paper targets at audience from plant operators, engineering contractors, installers and equipment manufacturers involved with hazardous area equipment. The paper outlines the similarities and differences between the two schemes in order to help answering questions like:

1. Which certification requirements are applicable to equipment on plants?
2. What is the most convenient way to certify assemblies?
3. What about equipment with certificates of component?
4. What are the benefits of the voluntary IECEx certification scheme?
5. Which scheme is the best choice in which situation?

*Index Terms* — Safety, Market Access, EC Directives, ATEX 95, ATEX137, IECEx System, Certified Equipment Scheme, Certified Service Facility Scheme, Conformity Mark License System, Certified Persons Scheme.

## I. INTRODUCTION

Plant owners and Engineering contractors are faced with the complex task of planning, designing and maintaining a plant which will operate effective, efficient and safe. The design philosophy for making the plant effective and efficient is based on science and experience and is completely in hand of the plant owner and engineering contractor.

But for safety, the plant owner and engineering contractor have to deal with the national legal framework of the country where the plant is going to be built. Safety has to be ensured for employees, the environment and all population surrounding the plant in order to prevent accidents or disasters. National legal frameworks may be based on international schemes or systems, but in many cases there are still individual national requirements to fulfill. An important aspect of complying with the national requirements is the application of equipment which complies with the national requirements.

Plants processing or using flammable gas, vapors or combustible dusts contain hazardous areas where explosive atmospheres may be present. This means higher risks regarding safety. The assignment of

hazardous areas is the responsibility of the plant owners, which might outsource this task to their engineering contractor or consultants. The Equipment applied in hazardous areas has to be designed and approved to cover the applicable safety requirements. This is the responsibility of the equipment manufacturers.

Due to development of industrialization in America on one side and Europe on the other side there are two philosophies for handling risks in hazardous area. One philosophy is based on Classes and Divisions, most common in North America. The other one is based on Groups and Zones as defined in IEC standards and most common in the rest of the world. This paper will concentrate on the details involved in the philosophy of Groups and Zones. A more detailed comparison between these philosophies is described in another paper, "The relationships in product standardization, third party product testing and IECEx certification" [6]. One important message to be given in this paper about both philosophies is that mixing them up on one plant is often not allowed and may impose new risks of danger, which are not addressed in standards anymore and might be of complex nature. North American marking is explained in Appendix A.

This paper addresses the similarities and differences between ATEX directives and IECEx schemes. It explains the benefits of compliance with ATEX and IECEx.

## II. ATEX DIRECTIVES

### A. European law, New approach, EC Directives

The ATEX Directive is a part of a series of European laws, the EC Directives. The main objective of these directives is ensuring health and safety of the people which live within the European Economic Area (EEA). The release of these directives in the 1990's meant a new and much more flexible set of regulations for the EEA. Apart from guaranteeing safety this so called 'New Approach' had to ensure:

1. Free trade between all EEA member states.
2. The possibility of development of new technologies without having to update the directives.
3. Clearly identified responsibilities.

In order to achieve this goal, EC Directives contain essential health and safety requirements instead of restrictive references to standards. The responsible entities have to issue declarations of conformity with the applicable essential health and safety requirements in which it is clearly identified which methods have been used to ensure compliance. All EC directives require self declaration of conformity, in some cases compliance with the directives may be assessed by the responsible entity

in other cases by independent third parties, the Notified Bodies.

### B. Two ATEX Directives

Two EC Directives address the essential health and safety requirements applicable for hazardous area, or potentially explosive atmospheres, short ATEX, derived from the French term: "ATmosphere EXplosible".

### C. ATEX 137 Directive [2]

ATEX 137 is a synonym for directive 1999/92/EC, "137" is the enabling article number of the treaty of Rome. This directive addresses minimum requirements for improving the safety and health protection of workers potentially at risk from Explosive Atmospheres. It is relevant to the erection, operation and maintenance of a plant involving hazardous area. The plant owner is responsible for the compliance. The directive involves amongst others:

1. Risk assessment concerning potentially explosive atmospheres.
2. Assurance that safe equipment and tools are used.
3. Proper maintenance procedures are followed.
4. Training of workers.

Regarding item 1. The plant owner may subcontract the risk assessment to engineering contractors or consultants.

Within the EEA item 2. above is facilitated by the other ATEX directive, see D. *ATEX 95 Directive* below. It is important that equipment is selected and purchased which is compliant with the hazardous area Groups and Zones identified as a result of the risk assessment.

Items 3. and 4. may be facilitated by IECEx schemes 03 and 05, see III. C. *IECEx 02, Certified Equipment Scheme* respectively III. F. *IECEx 05, Certified Persons Scheme*.

### D. ATEX 95 Directive [1]

ATEX 95 is a synonym for directive 94/9/EC, "95" is the enabling article number of the treaty of Rome. This directive contains essential health and safety requirements (Annex II of the ATEX 95 Directive [1]) for following products applied in hazardous area:

1. Electrical and non-electrical equipment.
2. Electrical and non-electrical protective systems.
3. Electrical and non-electrical components.
4. Electrical and non-electrical safety devices.

The party bringing these products to market is responsible for compliance with the ATEX 95 Directive [1]. These are often the manufacturers, but may also be the trade representative like a wholesaler.

The ATEX 95 directive [1] allows all kinds of standards to be used.

1. Harmonized standards:  
Harmonized standards are standards, which provide presumption of conformity with the essential health and safety requirements.  
Products which:  
- are designed and certified according to

harmonized standards;  
- appropriately marked;  
- and accompanied with proper EC Manufacturers Declaration of Conformity and Instructions;  
are presumed to be compliant with the ATEX directive without further explanation.

Harmonized standards are time sensitive. One of the essential health and safety requirements is that the equipment has to comply with the state of the art of technology. Technology changes and so does the knowledge of safety over time and experience. This causes changes in standards. Current harmonized standards are published in the "Official Journal of the European Union" [5]. Many harmonized standards for electrical products are based on IEC TC31 standards with the addition of the European national differences which are mostly limited to additional marking requirements.

2. European standards other than harmonized standards:

These may be used in case no harmonized standards are applicable to the type of product, or:

In case the product does comply with the essential health and safety requirements, but it has been certified to older versions of standards which are not listed in the official journal anymore. When new standard revisions are issued, maybe only a few requirements may have changed, which are not even applicable to the product.

3. National, foreign or international standards:  
These may be used when option 1 and 2 above do not provide requirements for the applicable type of equipment.
4. No standards:

In some cases the only solution for complying with the ATEX 95 Directive [1] is to establish a complete EHSR (Essential Health and Safety Requirements) Checklist without reference to any standard. From a cost and risk perspective this should be used as the last option.

In case of option 2, 3 and 4 above the manufacturers EC Declaration of Conformity has to provide additional evidence or references to evidence which proofs compliance with the ATEX essential health and safety requirements. An EHSR Checklist may be used for this purpose.

Under the ATEX 95 Directive the manufacturers EC Declaration of Conformity has to be based on third party certification by Notified Bodies:

1. Electrical equipment designed for high or very high level of protection, see Appendix B Table 1.
2. Non-electrical equipment designed for very high level of protection, see Appendix B Table 1.

The EC Type Examination Certificates are issued after type assessment and certification by Notified Bodies, which ensures full compliance with the ATEX 95 directive.

For non-electrical equipment designed for high level of protection, the Technical Construction File (TCF) shall be stored (not assessed) by a Notified Body.

For products requiring lower levels of protection, the party bringing the products has to perform the assessment of compliance itself.

### III. IECEX SYSTEM AND SCHEMES

It is important to realize that the IECEX system is not a mandatory system such as the EC Directives are in Europe. The IECEX System provides means for assessment and certification of multiple aspects related to hazardous area.

The IECEX System publishes the original certificates and licenses on its WEB site [4]. This provides very convenient means to check the validity of the certificates and licenses.

Many nations participate in the IECEX System, either as a full member or applicant member.

#### A. UNECE Framework for national legislation

The worldwide United Nations Economic Commission located in Europe (UNECE) has endorsed the IECEX system as a certification and licensing system in legal framework for countries which have not a legislation installed with respect to safety in hazardous area. Any country may use this legal framework as a basis of their national legislation. The IECEX system is endorsed in this legal framework. Countries adopting the UNECE framework will accept IECEX certificates and or licenses directly, without national deviations.

It is realistic to expect that soon many countries which start to industrialize will join Australia, New Zealand, Malaysia and Singapore to become full participating IECEX members this way. Many of these countries might still accept ATEX certificates today, but once being a full participating IECEX member they might accept IECEX Certificates or Licenses only. It should be noticed that these are most likely the countries where much of the industrial investment will take place in the future.

#### B. IECEX Schemes

The IECEX system comprises four schemes:

1. The IECEX 02 Certified Equipment Scheme.
2. The IECEX 03 Certified Service Facilities Scheme.
3. The IECEX 04 Conformity Mark Licensing System.
4. The IECEX 05 Certified Persons Scheme.

#### C. IECEX 02, Certified Equipment Scheme

This certified equipment scheme may be best compared to the ATEX 95 Directive [2]. The scheme is internationally very well accepted due to the fact that it only allows third party assessment by IECEX approved Testing Laboratories and third party certification by IECEX approved Certification Bodies. Approval is achieved by peer review audits of not only the facilities but also the test reports and certificates.

Certificates of Conformity can only be issued once confirmed that the manufacturers Quality Assurance System complies with the requirements of the IECEX Certified Equipment Scheme.

However the IECEX Equipment certification scheme has currently also its limitations.

Only IEC standards issued by the Technical Committee 31 (TC31) may be used for assessment of compliance.

Currently this Technical Committee works on standards with requirements safety devices, protective equipment and non-electrical equipment, but has not issued these standards officially.

Additionally innovative equipment might not be possible to certify, simple because the IEC TC31 standards do not provide sufficient safety requirements or test procedures for the applied technology.

Currently the ATEX 95 Directive, see II. D. *ATEX 95 Directive [1]*, provides more means for manufacturers or suppliers to proof sufficient level of protection.

It should be noted that the IEC TC31 committee is aware of these issues and is working very hard to solve them.

#### D. IECEX 03, Certified Service Facilities Scheme

This is a very useful tool for plant owners. It helps them to ensure that service facilities providing repair and overhaul service on equipment for use in hazardous area maintain the required level of protection for the environment where it is used.

This scheme may also be applied under the ATEX 137 Directive [2], see II. C. *ATEX 137 Directive [2]* above. There are no equivalent provisions in the ATEX directives.

#### E. IECEX 04, Conformity Mark Licensing System

IECEX Certificates of Conformity may have three possible statuses.

- 1) *DRAFT Status*: Typically equipment or still in the assessment or certification process.
- 2) *CURRENT Status*: The certificate is valid.
- 3) *CANCELLED Status*: The certificate is not valid anymore, because of the fact that the standards to which it is certified are outdated, there have been problems with the equipment in the field or the manufacturers quality assurance system does not comply with the IECEX requirements.

This IECEX System is an International Conformity System where a Mark of Conformity may be granted by approved IECEX Certification Bodies (ExCB's) located in IECEX participating countries for equipment that is covered by an IECEX Certificate of Conformity and hence has been tested and manufactured under systems that are under ongoing surveillance by ExCB's.

The IECEX Mark of Conformity is not mandatory in full participating IECEX member countries yet. But, it will help governments, safety regulators, and industry to have greater assurance that the equipment being operated or supplied for use in areas where flammable gases and vapors and combustible dusts (termed explosive atmospheres) are present, meet the world's most respected and vigorous safety standards.

The Mark can only be placed on products or on packaging and promotional material covered by a valid IECEX Certificate of Conformity issued in accordance with the IECEX System rules.

F. IECEx 05, Certified Persons Scheme

This IECEx Scheme is an International Conformity Scheme that provides the global Ex industries with a single system for the assessment and qualification of persons meeting the competency prerequisites needed to properly implement the safety requirements based on the suite of IEC International Standards covering explosive atmospheres, e.g. the IEC 60079 and IEC 61241 series of standards.

The Certified Persons Scheme provides the international plant owners, engineering contractors, installers and service facilities with a qualification system that is transportable across borders.

This scheme may also be applied under the ATEX 137 Directive [2], see II. C. *ATEX 137 Directive [2]* above. There are no equivalent provisions in the ATEX directives. The IECEx 05 Scheme provides good control of the qualifications of personnel having different levels of responsibility. It provides evidence for the safety regulators that the personnel have been well trained about the safety aspects of their jobs in hazardous area.

IV. CERTIFICATION REQUIREMENTS FOR EQUIPMENT

A. Plants / Installations

Under the regulation of the ATEX Directive and IECEx system complete plants or installations can not be certified under the equipment certification schemes. Safety of Plants / Installations is the sole responsibility of plant owners, this responsibility can not be transferred to equipment suppliers or certification bodies.

The plant owner has the responsibility to carry out a risk assessment in order to identify the risk of explosions and determine the necessary Groups and Zones.

Under the ATEX directives hazardous area are categorized as Categories.

The good part is that categories are equivalent to Zones. Equipment marking has to include an identifier for the category where the equipment may be used. Very useful if the equipment is certified according to multiple methods of protection. Such a marking requirement is still not mandatory in the IECEx 02 scheme.

The bad part is that categories are numbered only slightly different from zones. For example Category 1 is equal to Zone 0, Category 2 is equal to Zone 1 and so on. Category 1 could easily be confused with Zone 1, which could have catastrophic consequences.

The latest editions of IEC TC31 standards for potentially explosive atmospheres require something similar than Category marking now. The Equipment Protection Levels (EPL). It should be of no surprise that EPL's incorporate yet another numbering format.

The relation between Zones, Categories and EPL's are shown in Appendix B Table 1.

The plant owner can purchase ATEX or IECEx certified equipment, which meets the requirements for the Groups and Zones he determined for his plant. This way he controls the risk of explosions caused by equipment.

In EEA member countries ATEX certification is mandatory, in countries adopting the UNECE legal framework for hazardous areas IECEx will become mandatory. Full participating IECEx member countries allow IECEx certified equipment. In countries which have no legislation for hazardous area both ATEX and IECEx certified equipment might be used. Considering the marking differences between ATEX and IECEx care should be taken to control compatibility of equipment.

B. Assemblies

Complex equipment like generators, pumping stations, filling stations and motors may comprise assemblies of Ex certified equipment and components.

IECEx certification of assemblies:

Certified equipment and components can be accepted without the need for re-assessment and re-testing if they have been assessed and tested according to the IECEx rules and procedures. The best practical proof is the IECEx Test Report (ExTR) of which the summary is published on the IECEx WEB Site. Components which are ATEX approved, but which are not accompanied by such an ExTR do not provide the evidence needed to proof that the IECEx Rules and procedures are followed, even if the Notified Body which has issued the ATEX certificate is also a qualified IECEx Certification Body and the ATEX certificate is based on the latest IEC originated standards. This is an issue currently under discussion in the IECEx 02 Scheme.

ATEX certification of assemblies:

In case the Notified Body is also a qualified IECEx Certification Body, both ATEX and IECEx certified equipment and components can be accepted without the need for re-assessment and re-testing. All IEC TC31 standards for electrical equipment are adopted by the European Standardization Committee CENELEC IECEx member bodies have agreed to accept IECEx Test Reports (ExTR's). This is the reason why ExTR's are so detailed. They enable the Notified Body to confirm that the assessment has been carried out appropriately.

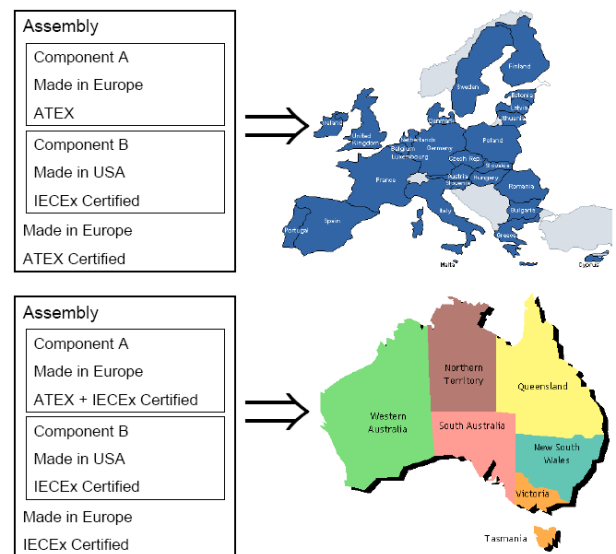


Fig. 1 Routing of Ex equipment and components in assemblies.

For a supplier the following is very important to understand:

A piece of Ex equipment or component may be sold to a company manufacturing the assembly in Europe. In case the assembly is then shipped for example to Australia, the assembly shall be IECEx certified. Even though the component is sold in Europe, it has to be IECEx certified, since it has to be put on the Australian market. For Australia either IECEx or local Australian certification (in this example not considered an option) is mandatory.

### C. Equipment

Equipment is an apparatus having an autonomous function. In the EEA member countries in Europe it is obligatory to have the equipment accompanied by manufacturers EC Declaration of Conformity.

As described under II. D. *ATEX 95 Directive [1]* above certain equipment has to be certified by Notified Bodies. Notified Bodies of IECEx participating countries have to accept IECEx Test Reports for ATEX certification, but shall ensure that the marking complies with the ATEX directive. This has to be properly documented, but re-testing or detailed technical re-assessment is in most cases not necessary.

In the IECEx 02 Certified Equipment Scheme all Ex equipment and components must be certified by Certification Bodies.

Achieving ATEX certification for IECEx certified equipment is mostly a matter of just adjusting the marking and instruction manual to requirements of the ATEX 95 Directive [2].

The other way around: achieving IECEx certification for ATEX certified equipment involves the drafting of the IECEx Test Reports (ExTR) by an IECEx Testing Laboratory (ExTL) and the endorsement of that report by an IECEx Certification Body (ExCB). One difference to ATEX is that the ExCB is not allowed to issue the IECEx Certificate of Conformity (CoC) without having checked the manufacturers Quality Assessment Report (QAR) for possible non conformities in the quality system. Under the ATEX directive this is considered the manufacturers own responsibility.

### D. Components

Components are products which are part of Ex equipment or assemblies, but which do not have an autonomous function. For example empty enclosures, terminals, bushings, breathing elements, sensors or simply parts which are used in many different ways.

Components can easily be recognized by the "U" on the certificate and are not allowed to be used separately. They have to be used in assemblies. Assemblies of certified components are not allowed to be used unless these assemblies are assessed and certified as equipment by a Notified Body under the ATEX 95 Directive and a Certification Body (ExCB) under the IECEx 02 Scheme. Assemblies may be complex and it has to be ensured, that all components are suitable to be used with each other.

Components which are put to the market in EEA member states must be ATEX certified if they are not directly imported by assembly manufacturers, but put to the market by agents or retail channels.

Glands, which are considered to be commodity products, are an exception regarding the definition of components. Although they do not have an autonomous function, they are often certified as equipment without an "U". The reason for this is that much equipment is certified without glands. The local requirements for cable connections differ between countries and often per application. In order to avoid that this equipment has to be re-certified with each different gland, glands are often certified as equipment. This does not relieve the party, putting this equipment to the market, from its obligation to assess: whether the gland is suitable for the environment and whether it is correctly installed according to the instruction manual.

Furthermore the requirements for equipment also apply for components, see C. *Equipment* above.

## V. CONCLUSIONS

With the content of this paper it is possible to answer the question of the abstract.

1. Which certification requirements are applicable to equipment on plants?  
Plants or installations can not be certified as equipment. A risk analysis determines the hazardous area zones for plants. Equipment shall than be purchased meeting the requirements for those hazardous area zones.  
Technically speaking it does not make a big difference if IECEx or ATEX certified equipment is applied. In EEA member states the ATEX Directives are law and have to be met. In countries outside Europe IECEx will dominantly be applied.
2. What is the most convenient way to certify assemblies?  
For ATEX certification of assemblies both ATEX and IECEx certified equipment and components can be accepted by the Notified Body.  
For IECEx certification of assemblies, practically only IECEx certified equipment and components can be accepted by the IECEx Certification Body.
3. What about equipment with certificates of component?  
Certificates of components ("U") certificates are required for distributing the components to market. Components are not allowed to be used on bases of their "U" certificate. They may only be used in assemblies which are assessed and certified as complete piece of equipment.  
For new components it is recommended to start with IECEx certification, since the manufacturer may not know the country where his component is finally put to market. Should the component be put to market in Europe individually, i.e. not as part of an assembly, compliance with the ATEX directive is mandatory.
4. What are the benefits of the voluntary IECEx certification scheme?  
It is international and with the endorsement within a UNECE legal framework most likely to get a very

high acceptance level outside of the traditional industrialized countries.

Who knows even within the new ATEX Directives, which are in development at this moment, IECEx may play an official role.

5. Which scheme is the best choice in which situation?

The authors trust that this paper has provided sufficient information for most stakeholders to be able to make up their minds for each individual case.

Legally ATEX and IECEx are not comparable. In Europe ATEX is mandatory but the IECEx Certified Service Facility Scheme and Certified Persons Scheme of the IECEx system seem to fill up the gaps in the ATEX directives. Outside of Europe the UNECE legal framework together with the endorsed IECEx system offers all stakeholders means to provide a level of protection sufficient high enough for all hazardous area applications.

For equipment manufacturers the IECEx Certificate of Conformity is a very sound basis for ATEX certification. It is recommended to certify new developed components or equipment for IECEx, either before or together with ATEX certification.

## VI. NOMENCLATURE

ATEX 95	French: "ATmosphere EXplosible". European Directive, 94/9/EC, obligatory certification scheme for Equipment intended for use in Potentially Explosive Atmospheres (ATEX).
ATEX 137	French: "ATmosphere EXplosible" European Directive, 1999/92/EC, minimum requirements for improving the safety and health protection of workers potentially at risk from Explosive Atmospheres.
CENELEC	French: "Comité Européen de Normalisation ELECTrotechnique", English: European Committee for Electro-technical Standardization.
CoC	Certificate of Conformity
CE	French: "Conformité Européenne", English: European Conformity.
EC	European Community. English (French) .
EEA	European Economic Area.
EHSR	Essential Health and Safety Requirements.
EPL	Equipment Protection Level.
EU	European Union.
ExCB	IECEx Certification Body.
ExTL	IECEx Testing Laboratory.
ExTR	IECEx Test Report.
IEC	International Electrotechnical Commission.
IECEx	International Electrotechnical Commission System for Certification to Standards Relating to Equipment for use in Explosive Atmospheres (IECEx Scheme).
QAN	ATEX Quality Assurance Notification.
QAR	IECEx Quality Assessment Report.
TC31	CENELEC and IEC Technical Committee: Equipment for explosive atmospheres.
TCF	Technical Construction File.
UNECE	United Nations Economic Commission for Europe.

## VII. ACKNOWLEDGEMENTS

Special thanks to:

1. Mr. Theo Pijpker for providing background information regarding the ATEX 137 Directive.
2. The standards committee's members who help make the standardization work possible and strive for harmonization of national and international standards.

## VIII. REFERENCES

- [1] ATEX 95 Directive (ATEX Directive 94/9/EC).
- [2] ATEX 137 Directive (ATEX Directive 1999/92/EC)
- [3] EMC Directive (EMC Directive 2004/108/EC)
- [4] IECEx WEB-site: [www.iecex.com](http://www.iecex.com).
- [5] Official Journal of the European Union, Commission communication in the framework of the implementation of the Directive 94/9/EC of the European Parliament and the Council on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres, C 20/16 of 27.1.2009, published on: <http://ec.europa.eu/enterprise/newapproach/standardization/harmstds/reflist/atex.html>
- [6] B. Johnson, P. House, R.Pommé, R. Mulder and T. Pijpker, "The relationships in product standardization, third party product testing and IECEx certification", technical paper AM-43 presented at PCIC Europe 2006 and published in IEEE Industry Applications magazine January / February 2008.

## IX. VITA

Rudolf Pommé, Project Manager Explosion Safety with an IECEx Certification Body, IECEx Testing Laboratory and ATEX Notified Body in The Netherlands, fifteen years of experience in application engineering, production, product development and certification of equipment for use in potentially explosive atmospheres in the Petrochemical Industry. He graduated from the Institute of Technology with a Bachelor of Engineering in Applied Science, Industrial Engineering and Management Science. He is a member of NEC31, IEC MT 60079-30 and WG IEEE 515. He participated in two technical papers and one tutorial at PCIC Europe as author, co-author and presenter of which the last was a technical paper in 2009 with the title "Importance of instruction manuals for use with hazardous area equipment".

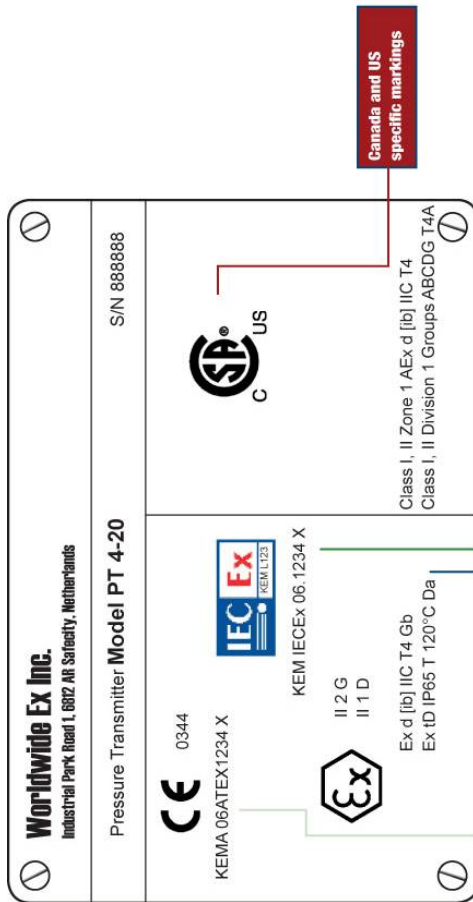
Hendrik Jan Sijrier, Project Manager Explosion Safety with an IECEx Certification Body, IECEx Testing Laboratory and ATEX Notified Body in The Netherlands, 10 years of experience in Industrial and Process Industry and 5 years experience in certification of equipment for use in potentially explosive atmospheres in the Petrochemical Industry. He graduated from the Institute of Technology as a Bachelor of Mechanical Engineering and Energy Engineering (Power Plants). He participated as author and presenter in the technical paper at PCIC Europe in 2009 with the title "Importance of instruction manuals for use with hazardous area equipment".

# APPENDIX A

## EX MARKING EXAMPLE AND LEGEND FOR ATEX, IECEX, US AND CANADA

### Example marking:

Following marking can be found on a flameproof pressure transmitter with an intrinsically safe signal output certified according to ATEX, IECEX, Canada and the US. Suitable for use in explosive atmospheres endangered by the presence of flammable gas or combustible dust.



**Specific IECEX markings:**

IECEX mark indicates that manufacturer has chosen to have a license under the IECEX scheme. Certification Body that issued the license to the manufacturer

License number

Certification Body that issued the certificate of conformity

IECEX scheme

Year of issuance

Sequence number of IECEX Certificate of Conformity

Certificate Number Suffix

See Table 3

**Marking required by the standards used under ATEX and IECEX**

Ex d [Ib] IIC T4 Gb

Ex

d [Ib]

IIC

T4

Gb

Ex tD IP65 T 120°C Da

Ex

tD

IP65

T 120 °C

Da

Indicates that the product corresponds to one or more of the types of protection which are subject of the specific standards listed in the general requirements standards

Indicates the type(s) of protection used for flammable gas

Gas group

Temperature Class

IEC equipment protection level

Indicates that the product corresponds to one or more of the types of protection which are subject of the specific standards listed in the general requirements standards

Indicates the type of protection used for combustible dust

Ingress protection level

Maximum surface temperature

IEC equipment protection level

See Table 2

See Table 4

See Table 1

See Table 4

See Table 1

**Canada and US specific markings:**

The CSA mark with the indicators "C" and "US" means that the product is certified for both the U.S. and Canadian markets, to the applicable U.S. and Canadian standards. If a product has features from more than one area the mark indicates compliance to all applicable standards.

Classification for flammable gas and combustible dust according to the National/Canadian Electrical Code

The IEC hazardous area zone

Indicates that the product corresponds to one or more of the types of protection which are subject of the specific standards listed in the general requirements standards. Prefix A indicates application of American Standards.

Indicates the type(s) of protection used for flammable gas

Gas group

Temperature class

Classification for flammable gas and combustible dust according to the National/Canadian Electrical Code

The traditional North American area classification

The apparatus group

The temperature code

See Table 2

See Table 1

See Table 2

See Table 4

See Table 2

See Table 1

See Table 2

See Table 4

**Specific ATEX markings:**

CE mark indicates compliance with all applicable CE directives.

Identification number of the Notified Body responsible for the surveillance of the Quality management system of the production site(s)

Notified Body

Year of issuance

EC Type Examination Certificate with sequence number 1234

Certificate Number Suffix

Indicates suitability of this product in explosive atmospheres endangered by the presence of flammable gas (G) or combustible dust (D).

See Table 3

See Table 1

## APPENDIX B

### EX CLASSIFICATION, GROUPING AND T-CLASSES FOR ATEX, IECEX, US AND CANADA

**Table 4. Temperature Class and Code**

Description	Zones		Divisions	Maximum Surface Temperature [°C]
	Canada, US, IEC-ATEX	Temperature Class		
Explanation	T 1		T 1	450
	T 2		T 2	300
			T 2A	280
			T 2B	260
			T 2C	230
			T 2D	215
	T 3		T 3	200
			T 3A	180
			T 3B	165
			T 3C	160
	T 4		T 4	135
			T 4A	120
T 5		T 5	100	
T 6		T 6	85	

**Table 1. Equipment Groups, Categories and Divisions**

Description	Equipment Group ATEX	Equipment Category ATEX	Equipment Protection Level (IEC)	Level of Protection	Presence or Duration of Explosive Atmosphere	G Flammable Gas / Vapour or D Combustible Dust Substances (ATEX)	Correlation with Hazardous Area Zones (ATEX, IEC)	Correlation with Divisions (Canada, US)
Explanation	I Underground mines and associated surface installations	M1	Ma	Very High	Constant Risk of Presence	Firedamp / Coal Dust	--	--
		M2	Mb	High				
II All other surface metal-layers		1	Ga	Very High	Continuous Presence	G	Zone 0	Division 1
		2	Gb	High	Likely to Occur	D	Zone 20	Division 1
		3	Gc	Normal	Unlikely to Occur	D	Zone 21	Division 2
			Gd			D	Zone 2	
			Ge			D	Zone 22	
			Gf			D		

**Table 2. Classification and Groups**

Description	Canada and US (Divisions)		IEC and ATEX (Zones)	
	Classification	Apparatus Groups	Description	Gas or Dust Groups
Explanation	Canada, US	Canada, US	Flammable (Gas) or Combustible (Dust) Substances	Flammable (Gas) or Combustible (Dust) Substances
	N/A	N/A	Gas	Gas
	Class I	Group A	Gas	Group IC
		Group B		Group IB
		Group C		Group IA
		Group D		Group IIC
	Class II	Group E	Dust	Group IIB
		Group F		Group IIA
		Group G		Group IIIA
		N/A	Fibers / Flyings	Group IIIB
				Group IIIB
				Group IIIB

**Table 3. Certificate Number Suffix**

Description	Suffix	Description
Explanation	X	Symbol used to denote conditions of use specified in the instruction.
	U	Symbol used to denote an Ex component which is not intended to be used alone and requires additional consideration when incorporated into electrical apparatus.