



Certification Management Limited

United Kingdom

ATEX Symposium 2017 – Zonguldak Karaelmas University



8175

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CMLEx Presenter

Mr. Andrew Holmes BEng (Hons) MIET

What is competence?

‘the ability to do something successfully or efficiently’

CH65 4LZ

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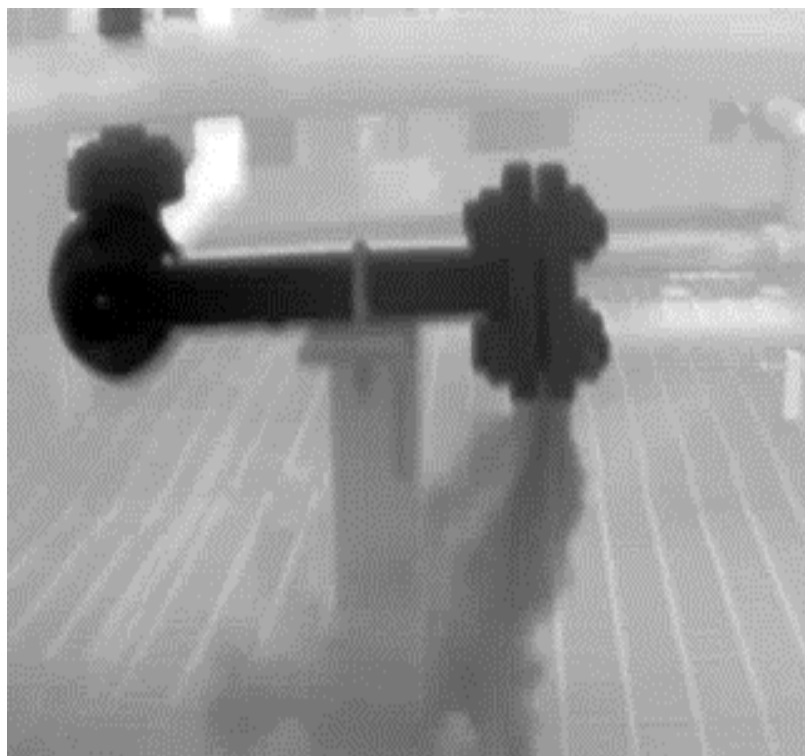


Special thanks to MTM and Trolex for the opportunity to present today.

Explosive Atmospheres

Just Relating to Industry?

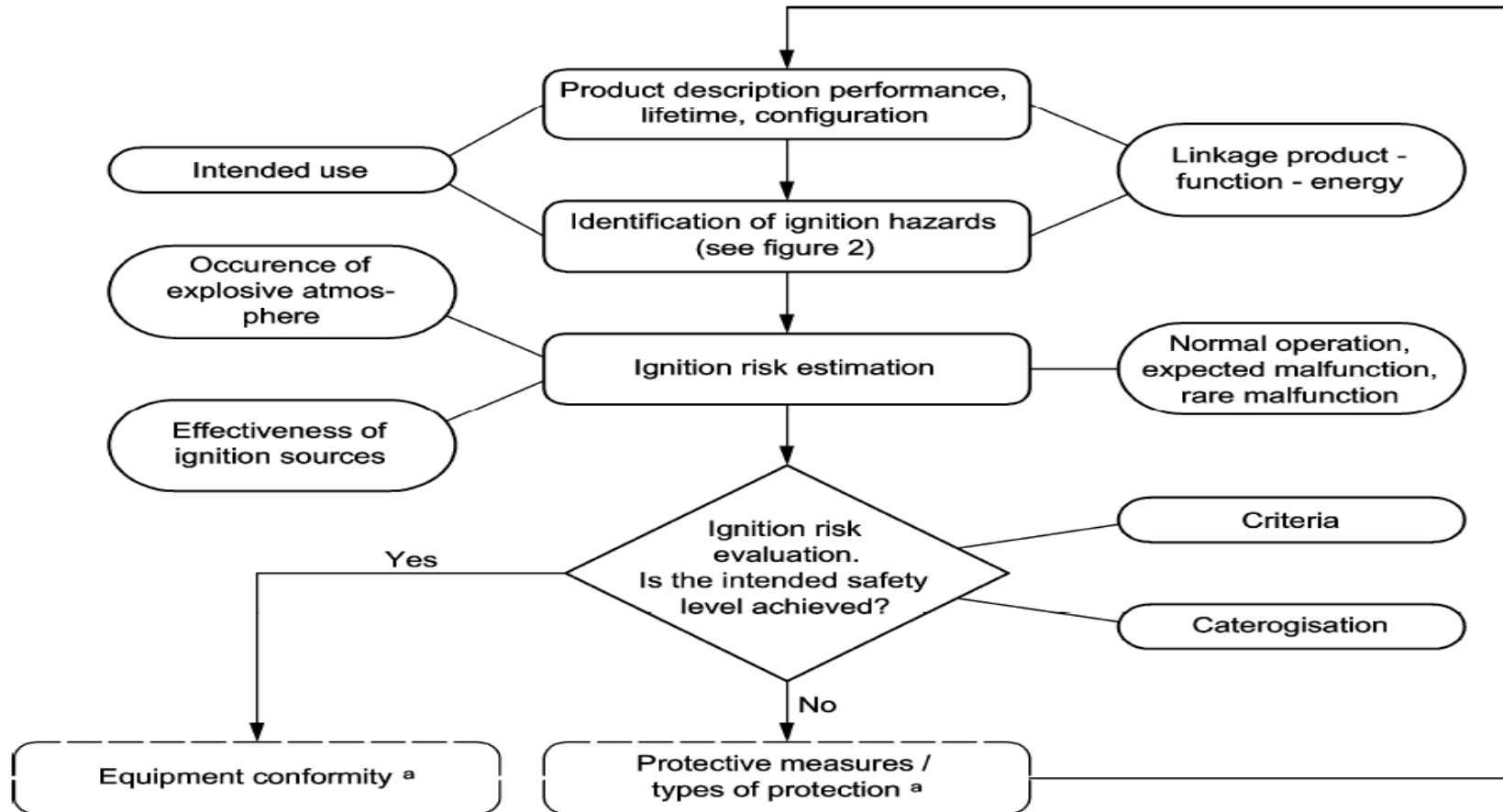
Industrial



Residential



Explosive Atmospheres - IHA



From BS EN 15198:2007

Presentation Structure



- 1. CMLEx Introduction**
- 2. ATEX Directives**
- 3. ATEX Product Conformity Assessment**
- 4. Zone, Category Relationships**
- 5. IECEEx**



1. CMLEx Introduction



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Location

- Located between Manchester and Liverpool
- Units 1 & 7 Newport Business Park
New Port Road
Ellesmere Port
United Kingdom
CH65 4LZ
- Manchester International airport 45 mins

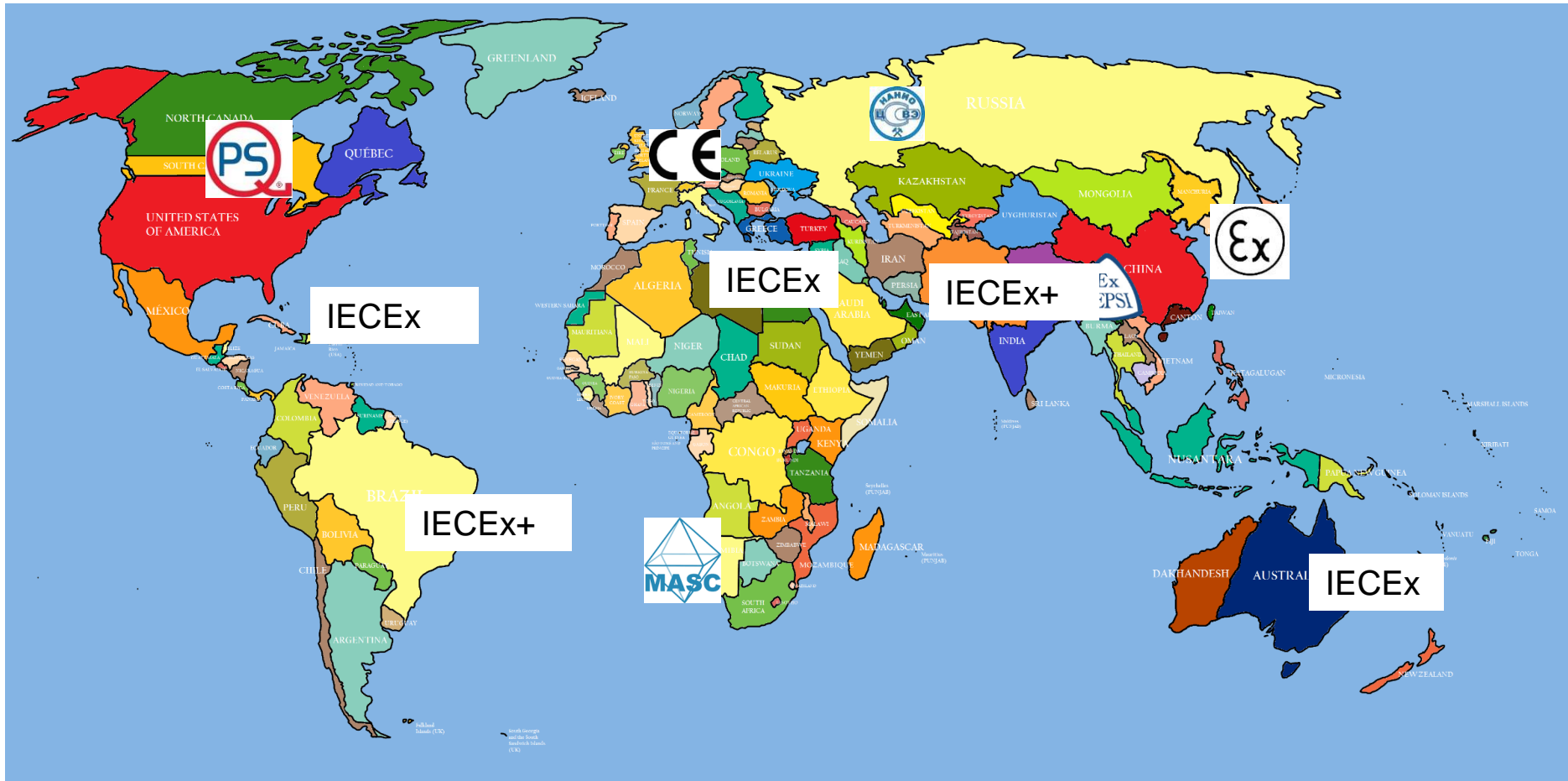


Worldwide availability

US
(CML Inc)
Canada
(QPS)
Japan
Korea
China
Malaysia
India
South Africa
Russia



Service for global markets



Accreditation



- EU
 - ATEX Notified Body (Directive 94/9/EC, 2014/34/EU)
 - UKAS accredited Certification Body (ISO IEC 17065)
 - UKAS test laboratory (ISO IEC 17025)
- IECEx
 - IECEx ExCB
 - IECEx ExTL
- Japan
 - Recognised by Japanese Government
- US Coastguard
 - Recognised by US Coastguard

ATEX and IECEx

ATEX Notified Body (CB)

Full notified body scope
including:

Ex d (Flameproof)

Ex p (pressurised)

Ex e (Increased Safety)

Ex i (Intrinsic Safety)

Ex n (Type 'n')

Ex m (Encapsulation)

Other concepts as well

ATEX Quality audits - QAN

UKAS accredited certification
body and test laboratory

IECEx Accepted Body (CB+TL)

Appointed in April 2014

Comparable scope to ATEX



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2. ATEX Directive's



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Explosive Atmospheres



Safety System – What Needs to Be Actioned?

Major Accident Hazards [Large Storage etc]

Seveso Directive -> 82/501/EEC

Seveso-II -> 96/82/EC

Seveso-III -> 2012/18/EU

Technological Disaster Risk Reduction

*The Directive applies to industrial establishments in the European Union where dangerous substances are used or stored in **large quantities e.g. LPG and LNG***

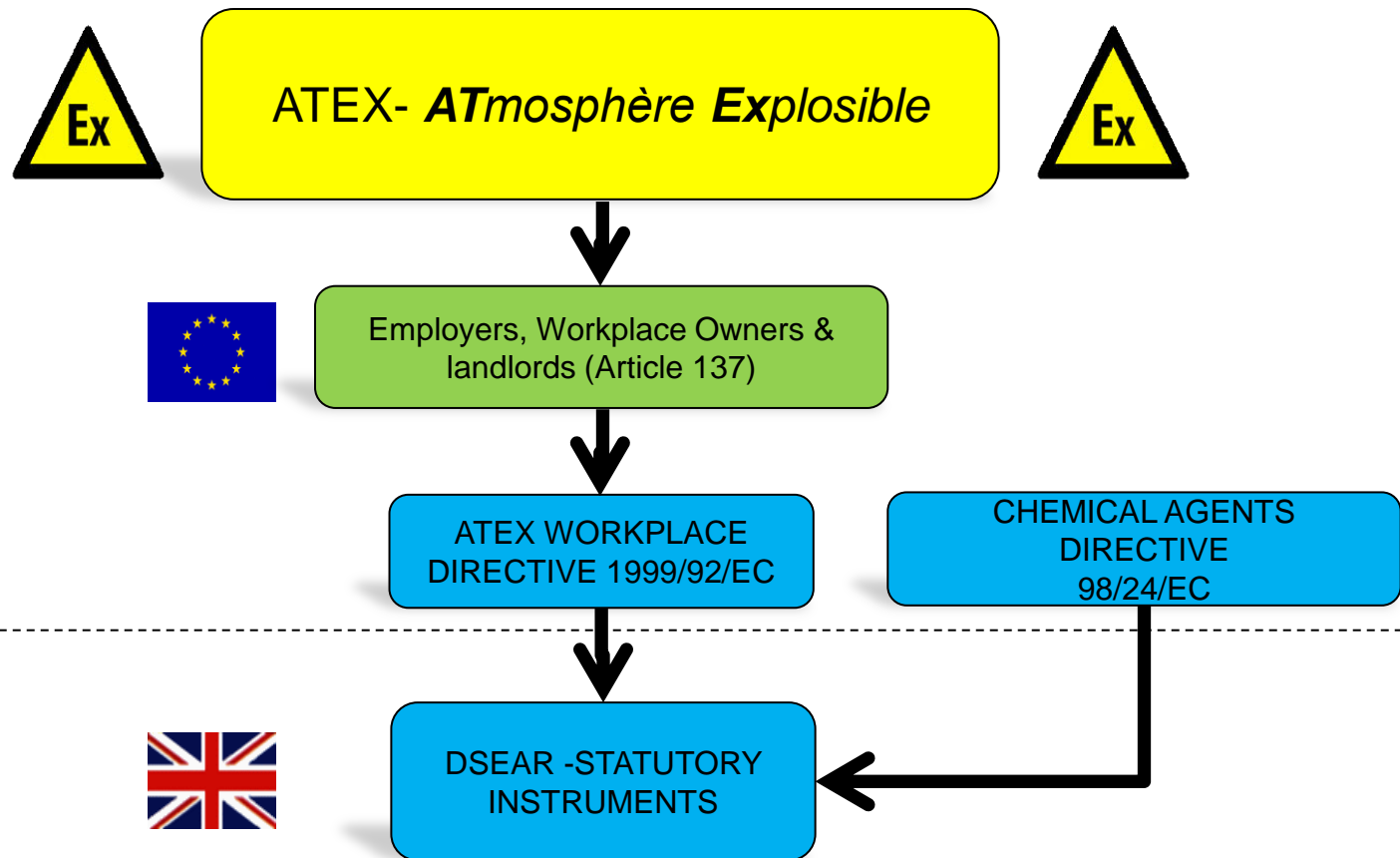
been defined then there is no point purchasing Ex equipment, what would you purchase anyway?

A product is designed for use in a specific zone and hazardous graded atmosphere.

http://ec.europa.eu/growth/sectors/mechanical-engineering/atex_en

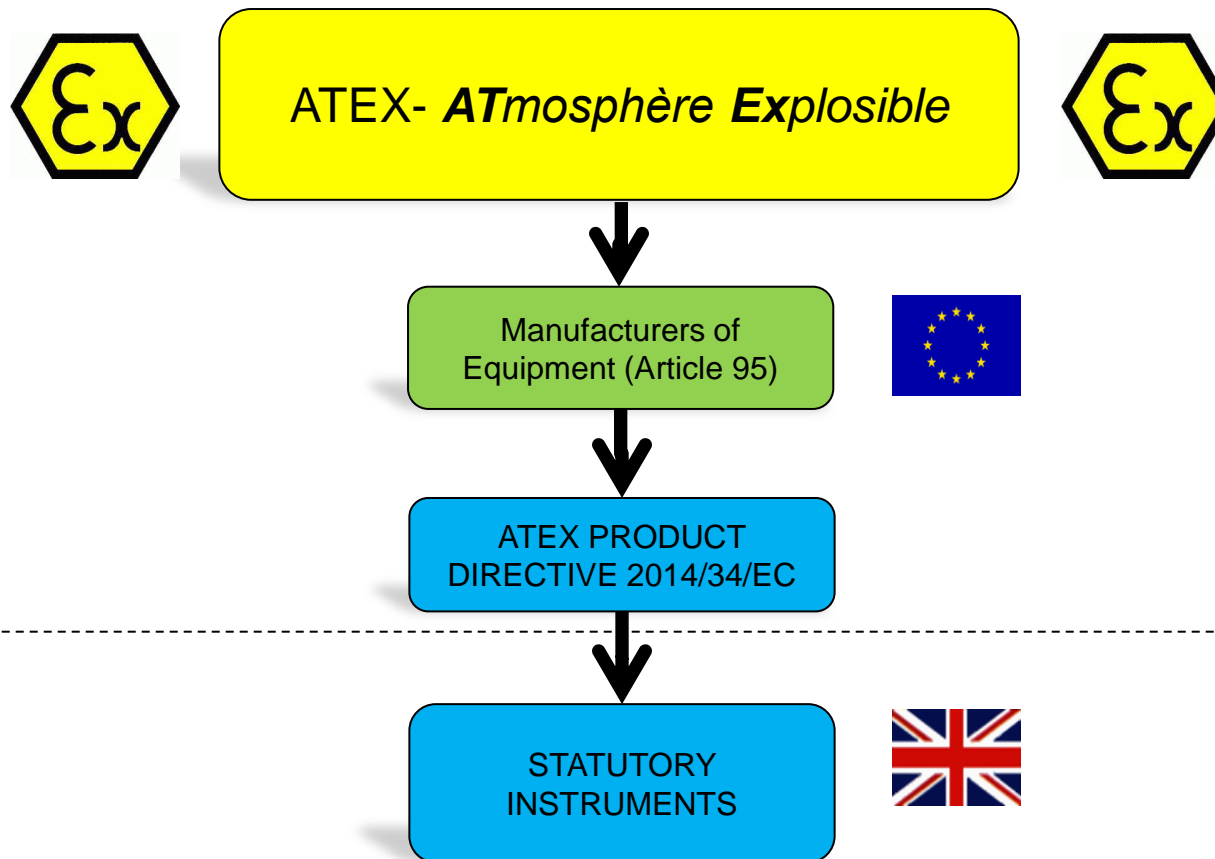
Explosive Atmospheres

Legislation - Users



Explosive Atmospheres

Legislation - Manufactures



Explosive Atmospheres

ATEX Labels – Basic Symbols

ATEX Directives



ATEX 95 Equipment Directive – Intended to harmonise equipment and protective systems intended for use in potentially explosive atmospheres.



The original ATEX equipment directive 94/9/EC has been now been replaced with **2014/34/EU**.



ATEX 137 Workplace Directive – Minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres.



The ATEX workplace directive (99/92/EC) has been incorporated in the UK into the Dangerous Substance and Explosive Atmospheres Regulation.

ATEX - Main changes between 94/9/EC and 2014/34/EU

- EC-Type Examination changes to EU-Type Examination
- Certificates *may* have an expiry date
- Clarification of the content of the Declaration of Conformity
- Requirement for importers to check conformity assessment has been carried out, and to label the product with their name and contact details
- Requirement for distributors to check CE marking has been applied, the product has a Declaration and instructions, and the manufacturer and importer labels are present



3. ATEX Product Conformity Assessment



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ATEX PRODUCT APPROVAL



- Firstly, understand from market research and investigation, **where** you would like to sell your product.

This will define the product category

- Conduct an **Ignition Hazard Assessment** on the product design.
Harmonised standards EN 1127-1 and EN 1127-2 [Mines] shall be used.
- Select **harmonised standards** to show a presumption of conformity to the ATEX product Directive **Essential Health & Safety Requirement's**.
- Review the ATEX product Directive EHSR to confirm all requirements are fulfilled.
- Depending upon equipment Category, involve a Notified Body for testing and Quality Management Requirements.
- Instructions, maintenance manuals → **Declaration of Conformity [DoC]**

ATEX PRODUCT APPROVAL



An Overview of the Conformity Assessment Procedure

Obligation of Manufacturers

Determining the Product's Hazardous Area (explosion) Classification

Article 2 of 2014/EU/34 defines the equipment groups and categories of products based on their intended use, and Annex I defines the criteria for determining these groups and categories.

Equipment group I

Equipment intended for use in underground parts of mines and the surface parts of installations, such as mines, endangered by fire damp and/or combustible dust.

ATEX equipment category M1

Equipment remains functional in an explosive atmosphere. It has either at least two independent levels of protection, or the protection is assured with two independent faults occurring.

ATEX equipment category M2

Equipment is de-energised in the event of an explosive atmosphere. The level of protection is assured during normal operation and also in the case of more severe operations.

ATEX PRODUCT APPROVAL



An Overview of the Conformity Assessment Procedure

Obligation of Manufacturers

Determining the Product's Hazardous Area (explosion) Classification

Equipment group II

Equipment intended for use in areas (other than mines) endangered by explosive atmospheres.

ATEX equipment category 1G or 1D

Equipment intended for use in an areas where explosive atmospheres are present continuously, for long periods of time or frequently. It has a 'very high' level of protection by either, at least two independent levels of protection, or is assured with two independent faults occurring.

ATEX equipment category 2G or 2D

Equipment intended for use in areas where explosive atmospheres are likely to occur occasionally. A 'high' level of protection has to be assured during frequently occurring disturbances, or with equipment faults that normally have to be taken into account.

ATEX PRODUCT APPROVAL



An Overview of the Conformity Assessment Procedure

Obligation of Manufacturers

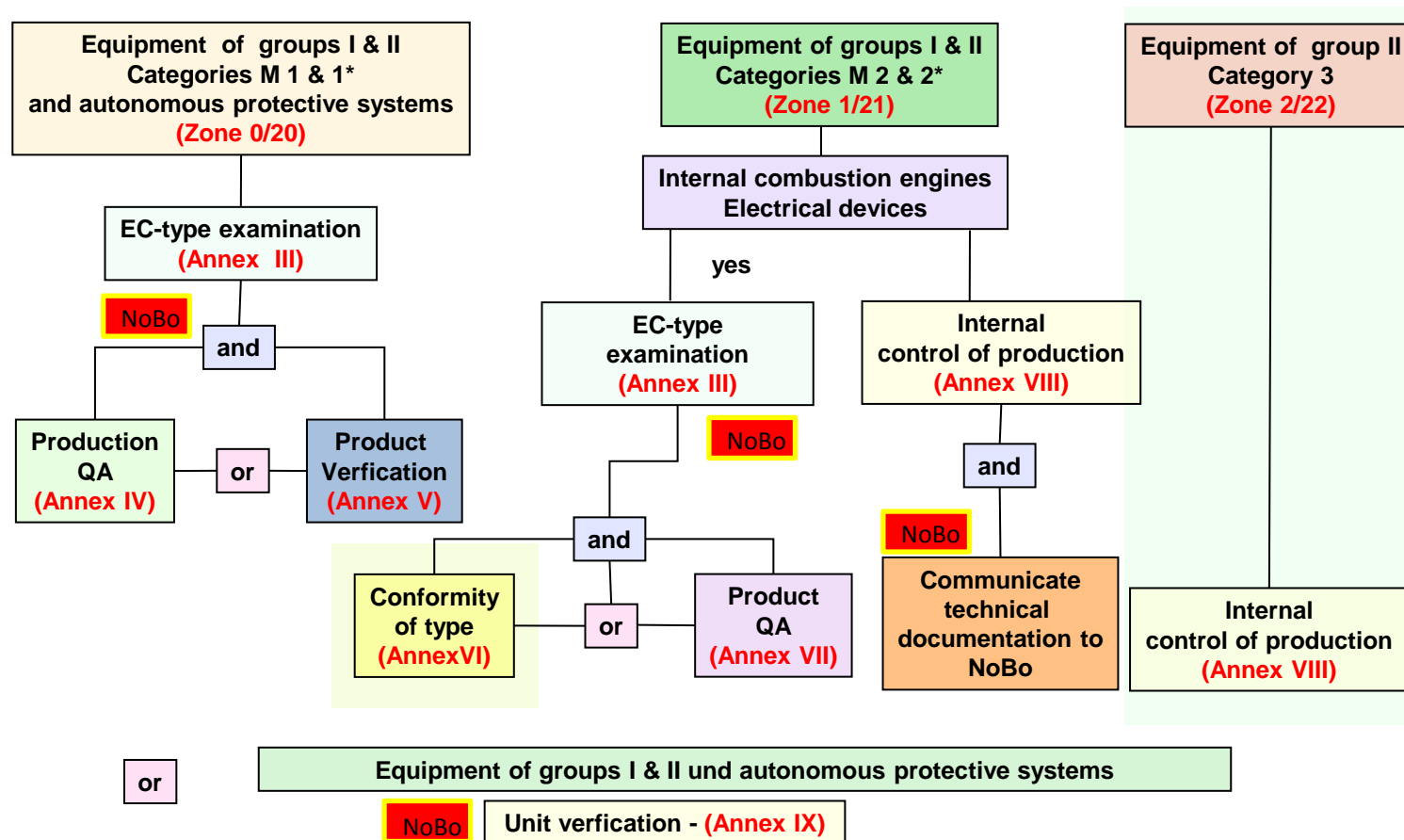
Determining the Product's Hazardous Area (explosion) Classification

Equipment group II

Equipment category 3G or 3D

Equipment intended for use in areas where explosive atmospheres are unlikely to occur, or occur very infrequently and for only short periods of time. A 'normal level' of protection has to be assured during normal operation.

ATEX PRODUCT APPROVAL



Harmonised Standards

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GROWTH
Internal Market, Industry, Entrepreneurship and SMEs

European Commission

Single Market and Standards | Industry | Entrepreneurs and SMEs

Search

European Standards

Standardisation Policy

Harmonised Standards

Formal objections

Notification System

Standardisation requests

Key Players

Standardisation and SMEs

Vademecum on European standardisation

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News

Events

Tools and Databases

Contracts and grants

Public consultations

Publications

Equipment for explosive atmospheres

Directive 2014/34/EU

Short name:	Equipment for explosive atmospheres (A)
Base:	Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws, regulations, administrative provisions and standards relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast). Applicable from 2017 OJ L 96, 29.3.2014
Modification:	[-]
Directives repealed:	Directive 94/9/EC of the European Parliament and of the Council of 13 December 1994 on the approximation of the laws, regulations, administrative provisions and standards relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast). (applicable until 20 April 2016): OJ L 100 of 19 April 1994
Guide for application:	<ul style="list-style-type: none"> Guidance on CE marking for professional Directive 2014/34/EU: Guidelines on the
Commission contact point:	Directorate-General for Internal Market, Industry and Innovation Mr Mario GABRIELLI COSSELLU, Tel +32 2 25 55 55 55 Email Webpage on equipment and protective systems intended for use in potentially explosive atmospheres - ATEX

For information about the content and availability of European Standardisation Organisations.

8.9.2017

8.9.2017

EN

Official Journal of the European Union

C 298/1

IV

(Notices)

NOTICES FROM EUROPEAN UNION INSTITUTIONS, BODIES, OFFICES AND AGENCIES

EUROPEAN COMMISSION

Commission communication in the framework of the implementation of Directive 2014/34/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres

(Publication of titles and references of harmonised standards under Union harmonisation legislation)

(Text with EEA relevance)

(2017/C 298/01)

ESO ⁽¹⁾	Reference and title of the standard (and reference document)	First publication OJ	Reference of superseded standard	Date of cessation of presumption of conformity of superseded standard Note 1
(1)	(2)	(3)	(4)	(5)
CEN	EN 1010-1:2004+A1:2010 Safety of machinery — Safety requirements for the design and construction of printing and paper converting machines — Part 1: Common requirements	8.4.2016		

Harmonised Standards

Conformity Assessment Tests and Checks

The next step is for the manufacturer to supply the necessary product samples for the conformance testing and compliance checks.



The testing and checks undertaken is dependent on the requirements of the **applicable harmonised standards** and on the design and construction of the product being assessed.

The following are some typical conformance tests from the General Requirements harmonised standard:

ATEX PRODUCT APPROVAL

Conformity Assessment Tests and Checks

Resistance to impact

A 1kg weight with a 25mm steel ball is dropped from a pre-determined height

The type of protection must be not be invalidated



Ingress protection (IP)

This can be for objects, dust protection, dust tight, dripping water, sprayed water, water jets, submersion.

Certain protection types require a certain level of IP rating.



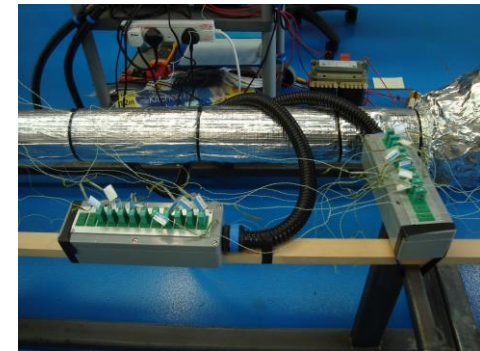
ATEX PRODUCT APPROVAL

Conformity Assessment Tests and Checks

Temperature measurement

To determine the maximum surface temperature of the equipment for the T class.

Or, to ensure components remain within their operating temperature range.



Thermal conditioning

Non-metallic enclosure materials and potting compounds (sealing cements), have to be thermally conditioned before they can be conformance tested.



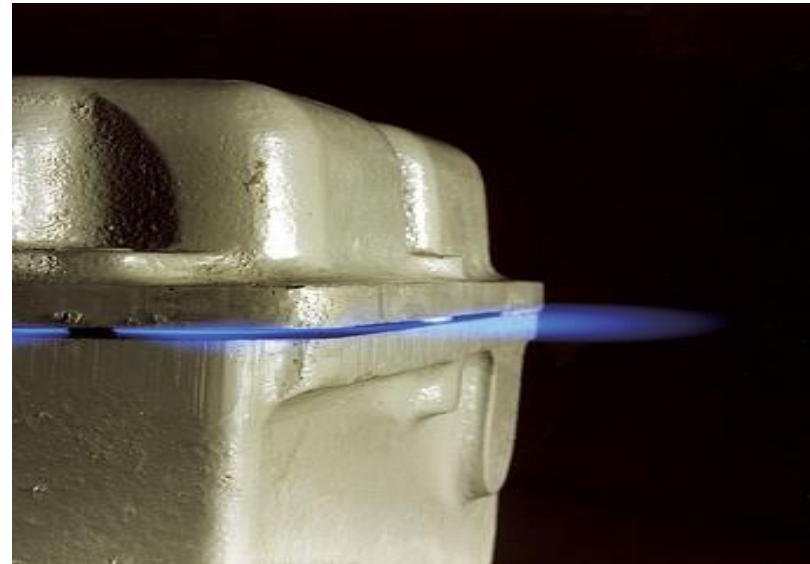
ATEX PRODUCT APPROVAL

Conformity Assessment Tests and Checks

In certain cases, the product samples may have to be modified, by the manufacturer, for the relevant assessment test, for instance:

Flamepath dimensions
(flameproof equipment)

Enclosure flamepaths have to have a certain gap and length for flame transmission testing.

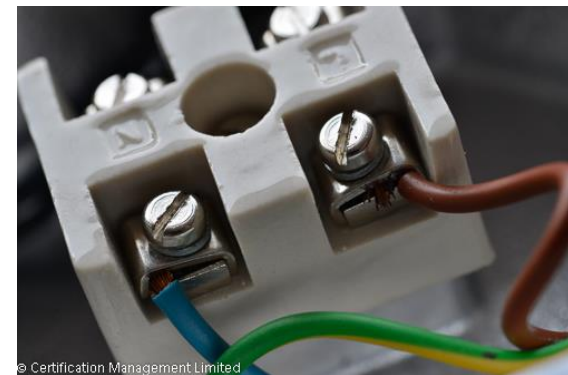


ATEX PRODUCT APPROVAL

Conformity Assessment Tests and Checks

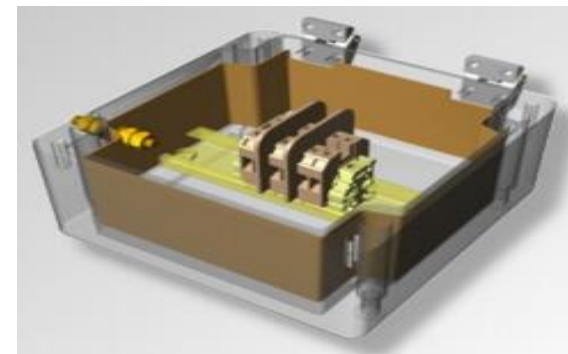
Electrical creepage and clearances

Creepage and clearance distances on electrical terminations for Increased Safety and Intrinsically Safe equipment.



Internal and external earth connection

The general requirements standard defines the requirements for earth Connections.



ATEX PRODUCT APPROVAL



Assessment Report

Upon the successful completion of the applicable conformance testing and compliance checks, the notified body will prepare an Assessment Report.

This report will include:

- The name and address of the manufacturer.
- Product name, product range (model numbers), variants, etc.
- Product rating, e.g. voltage (range), maximum current, speed (rpm).
- Product marking, both ATEX and the harmonised standards marking.
- List the applicable harmonised standards used for the assessment.
- A general description of the product.
- Supporting conformity assessment.
- The conformity tests and compliance checks conducted and their results.
- Certification documentation.
- Any conditions for safe use ('X' on certificate number)
- Conditions of manufacture e.g. routine tests and checks.
- Conclusions.

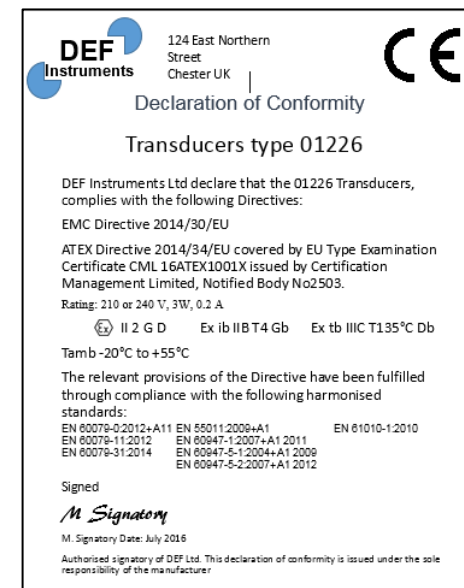
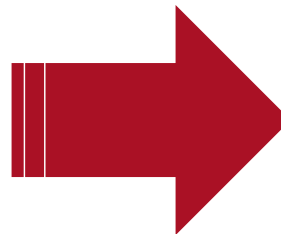
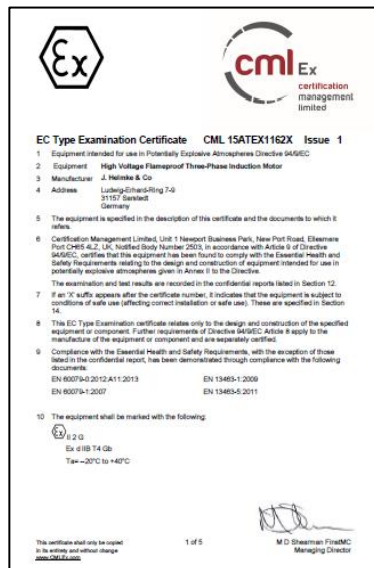
ATEX PRODUCT APPROVAL



Declaration of Conformity

Why have a Declaration of Conformity?

The Declaration of Conformity lists all the product directives that the equipment or protective system conforms too.





Zone, Category Relationships



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Where are these hazardous areas?



Where to start



- **ATEX user Directive – 99/92/EC**

Site owners shall use this Directive and associated standards / technical guidance & industrial practices to assess their workplaces and where necessary zone potentially explosive areas.

In the United Kingdom assessments are carried out in accordance with the **D**angerous **S**ubstances and **E**xplosive **A**tmosphere **R**egulations to prove site compliance with the Directive.

- **Zoning**

If assessments show that potentially explosive atmospheres may exist, zone(s) will need to be declared.

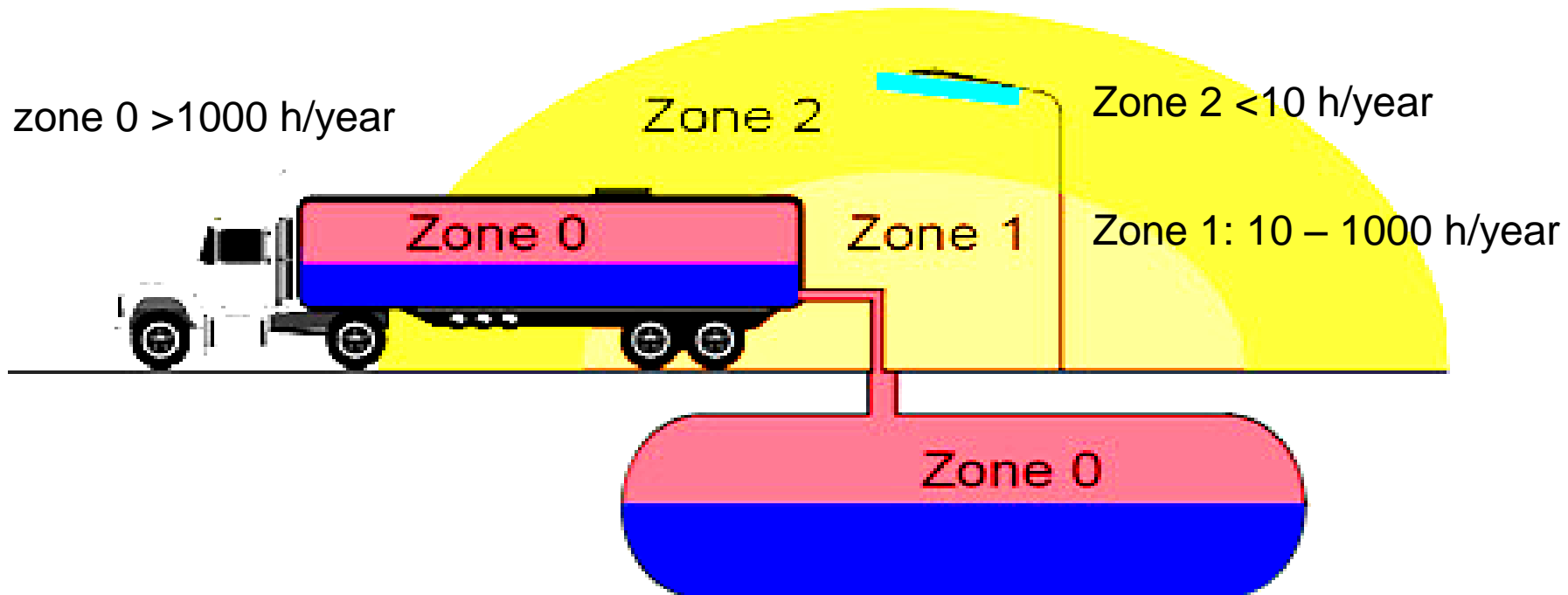
The user / plant owner shall conduct assessments using European standards and associated industrial guidance.

Typically for surface industry:

EN 60079-10-1 [Classification of areas – Explosive gas atmospheres]

EN 60079-10-2 [Classification of areas – Explosive dusts or combustible flyings]

Hazardous Area



Explosion Protection Document



(Article 8 of the 99/92/EC Directive, Regulation 5 of DSEAR) - kept up to date.

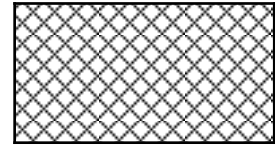
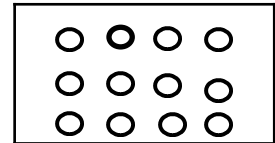
- that the explosion risks have been determined and assessed
- that adequate measures will be taken to attain the aims of this Directive
- those places which have been classified into zones in accordance with Annex I
- those places where the minimum requirements set out in Annex II will apply

Applies to small & medium facilities!

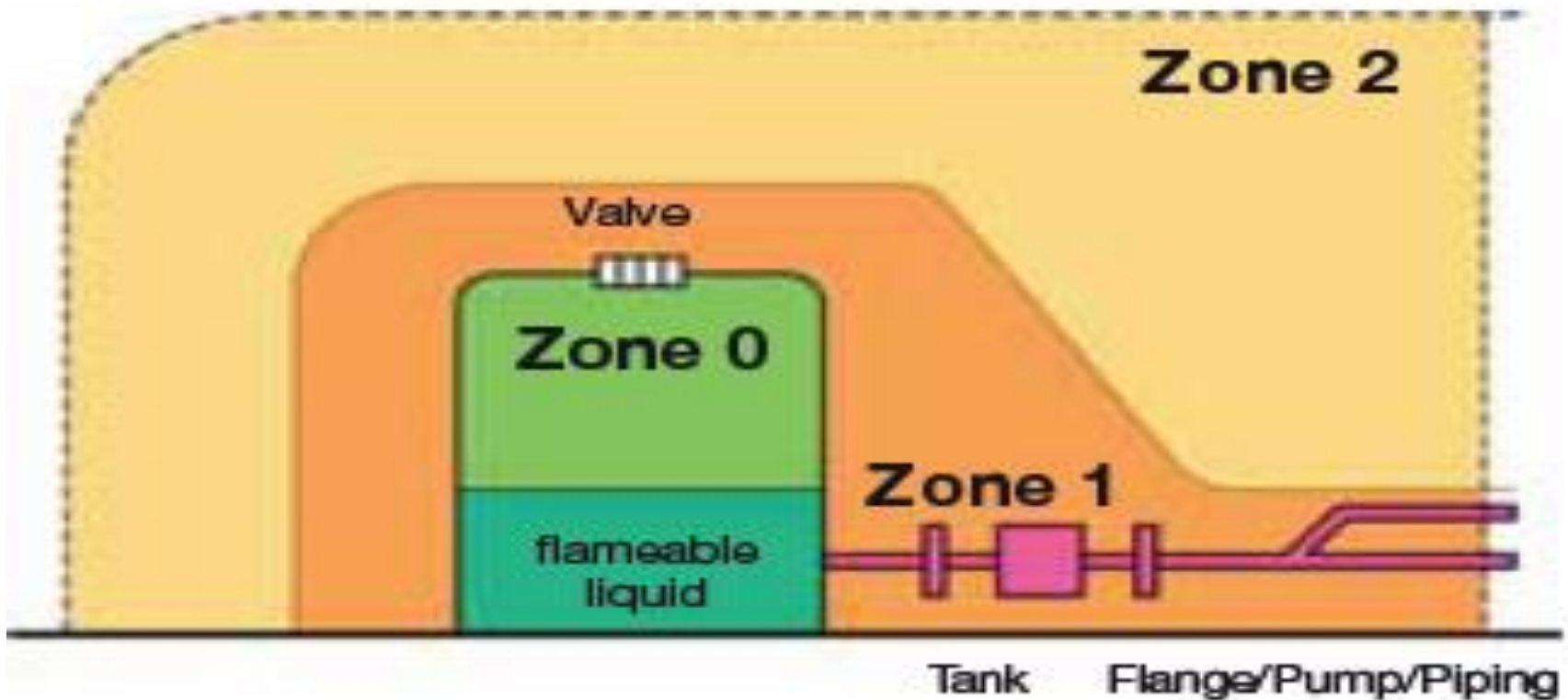
- arrangements have been made for the safe use of work equipment
- The explosion protection document shall be drawn up prior to the commencement of work and be revised when the workplace, work equipment or organisation of the work undergoes significant changes, extensions or conversions.
- The employer may combine existing explosion risk assessments, documents or other equivalent reports produced under other Community acts.

Gas/vapour/mist zones

- **Zone 0** - flammable atmosphere present continuously or for long periods or frequently
- **Zone 1** - flammable atmosphere likely in normal operation occasionally
- **Zone 2** - flammable atmosphere unlikely in normal operation and, if occurs, will exist only for a short time

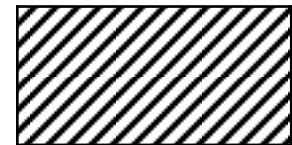
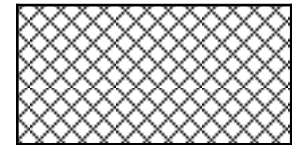
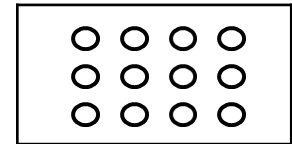


Typical Gas/Vapour zoning

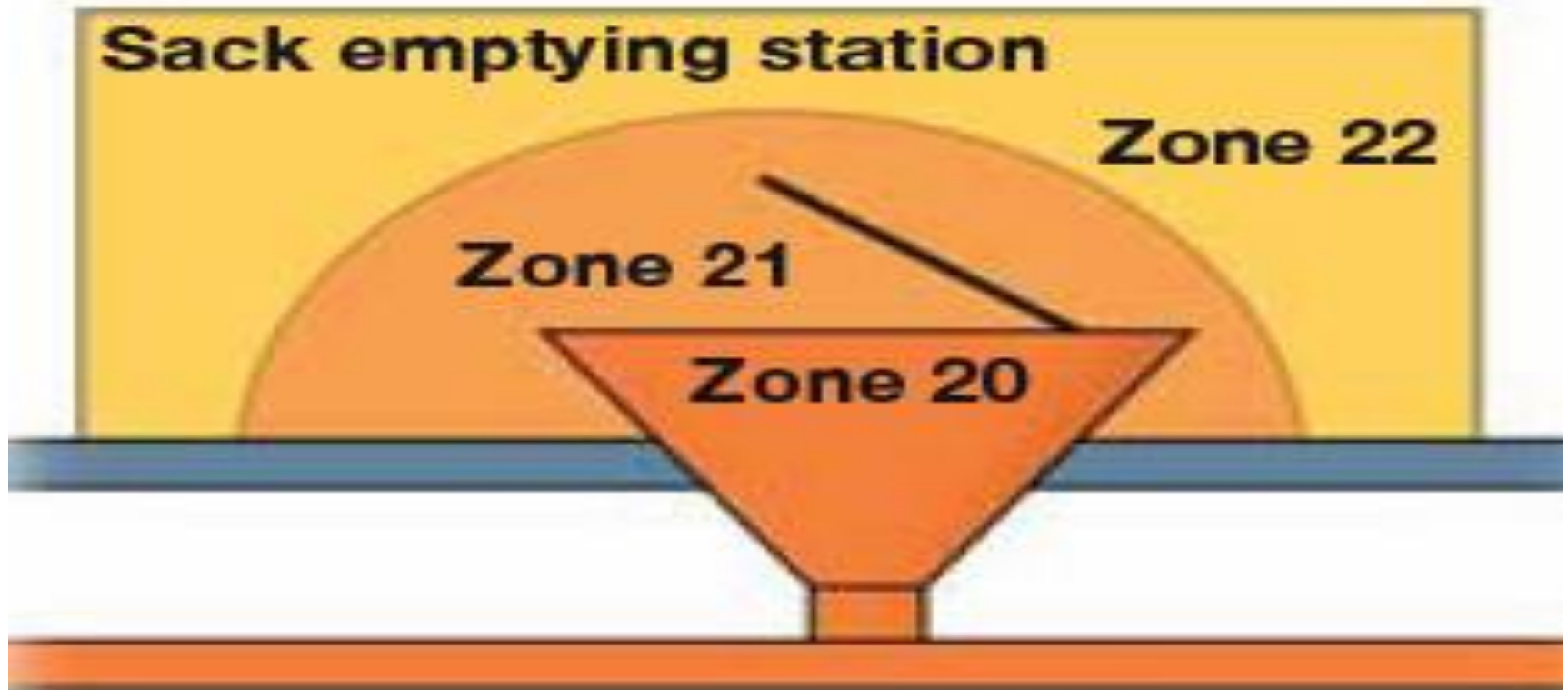


Dust zones

- **Zone 20** - flammable atmosphere present continuously or for long periods or frequently
- **Zone 21** - flammable atmosphere likely in normal operation occasionally
- **Zone 22** - flammable atmosphere unlikely in normal operation and, if occurs, will exist only for a short time



Typical Dust zoning



Zone & Category linking

For Category		For Zone	In explosive atmosphere of:
1	1G 1D	0,1,2 20,21,22	Gases, Steams & Fogs Dusts
2	2G 2D	1,2 21,22	Gases, Steams & Fogs Dusts
3	3G 3D	2 22	Gases, Steams & Fogs Dusts

Life Cycle

START POINT

99/92

UK

defined e.g.

Review Process - Periodically
Any Changes

e.g.

New Chemical Used (MSDS)
Extension to plant

LIFE CYCLE needs to start
again!

Review and Confirm
System is Controlled and
Safe to Operate

EN 60079-17

ATEX Equipment Selection



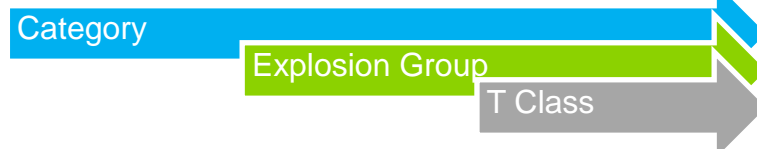
Material Safety Data Sheet



ZONE 2 IIC T5

Area Classification Gas Group	Apparatus Suitable
IIA	IIA, IIB, IIC
IIB	IIB or IIC
IIC	IIC

Ref Table 3 of EN 60079-14



Cat 1	✓	IIA	✗	T1-450	✗
Cat 2	✓	IIB	✗	T2-300	✗
Cat 3	✓	IIC	✓	T3-200	✗
				T4-135	✗
				T5-100	✓
				T6-85	✓



generally used to assess products

5. IECEx



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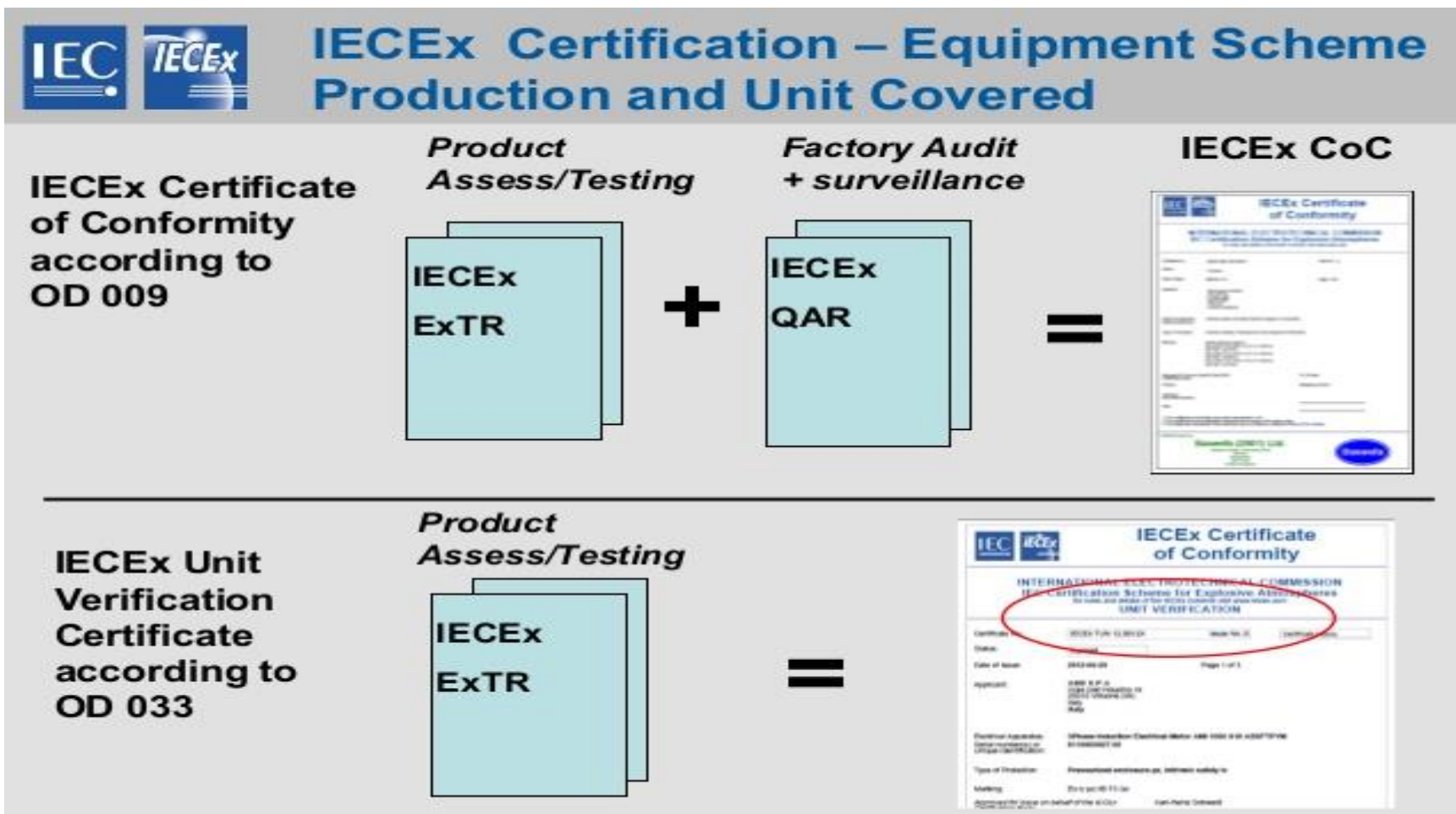
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IECEx Schemes



- Certified Equipment
- Certified Service Facility Scheme
- Conformity Marking Licencing System
- Certified Persons Scheme

IECEX Certified Equipment



IECEX Certified Equipment



ITEM	IECEX	ATEX – Product Directive
Conformity Assessment	<p>For IECEX Certified Equipment Program:</p> <p>ExTR + QAR = IECEX Certificate of Conformity (CoC)</p> <p>ExTR = IECEX Test Report QAR = IECEX Quality Assessment Report</p> <p>Applicable to ALL products, no difference between Zones or products</p> <p>CoC issued via Secure IEC Website ensures FULL Public access to issued Certificates</p> <p>Self Certification not permitted</p>	<p>Declaration of Conformity by Manufacturer to declare that he is in possession of necessary documents and reports.</p> <ul style="list-style-type: none"> - Certificate issued by ExNB only for category 1 / 2 and M 1 / 2 electrical equipment - Self certification allowed for Category 3 and Category 2 Mechanical.

Info taken from: IECEX 'Brief' Comparison between IECEX and ATEX

IECEx Certified Equipment



ATEX versus IECEx

ATEX allows self assessment for Category 3 products. Under the IECEx scheme this is not allowed. Manufacturers shall obtain an ExTR, QAR and CoC for the product. Therefore all products within the IECEx scheme will have an ExTR, QAR and associated CoC.

Categories only refer to ATEX, IECEx does not have these.

EPLs are referenced to protection concepts and Zones of usage (reference EN 60079-14).

Both use the same protection concepts e.g. Exd, however:
select ATEX standards from the harmonised standards, check!
IECEx standard used shall be referenced by Edition (allowed to use one previous version).

Majority of products certified will be to both ATEX and IECEx, to reach different markets.

IECEX Competence



How can someone be competent?

Education from academic processes and teachings

Industrial experience from carrying out project work – pier / pier relationship and token change master to slave.

Additional training in appropriate areas to support job function and educational development.

IECEx Competence



Why is competence required.....from where?

Installation [IEC 60079-14] and repair standard [IEC 60079-19] -> clause 4.4

For the owner / operator, person how takes care of plant safety -----to use qualified persons.

Assessing the individual not the company

Independent from company instruction and teachings

IECEX Competence



IECEX CoPc has been developed

IECEX 05 Scheme rules based on ISO/IEC 17024 – (general requirements for ExCB certifying persons).

Operational documents

OD501 – Assessment procedure for CB's

OD502 – Application for personnel competence

OD503 – ExCB Procedure for issuing and maintaining certificates

OD504 – Specification for units of competence assessments

Good Summary Items

Online certification in the same principle as product, individuals can be searched for on IECEX WEB Site

3 year surveillance once issued – certificate has a valid time period...so re-test required.

IECEx Competence



IECEx Units	IECEx ATEX – Product Directive
Ex 001	Application of basic principles of protection [foundation course]
Ex 002	Area classification
Ex 003	Installation of equipment and wiring systems
Ex 004	Maintenance of equipment
Ex 005	Overhaul and repair of equipment
Ex 006	Testing of installations and equipment
Ex 007	Performance of visual and close inspections
Ex 008	Performance of detailed inspection
Ex 009	Design of electrical installations in hazardous areas
Ex 010	Performance of audit inspections

Also available CompEx Scheme <https://www.compex.org.uk/>

Thank You

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