ATEX, We don't know what we don't know

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Abstract

Understanding the safety concerns regarding hazardous area non-electrical equipment in ATEX & UKEX zones. As end users are ultimately responsible for the employee's safety when working in a potentially explosive atmosphere as per the ATEX directive.

How can they guarantee the hazardous area equipment is safe!

For all types of hazardous area non-electrical equipment, the current ATEX method relies heavily on the manufacturer getting it right. There are several pitfalls in the certification process by both Notified Bodies & manufacturers, **"They don't know what they don't know".**

We show examples of issues with the current standards, & how manufacturers & OEM's conformity assessment is incorrectly reviewed & how Notified Bodies are unaware of the correct EN standards to assess to.

As non-electrical Hazardous area equipment can be manufactured without any independent technical review or testing, this puts end-users at immense risk.

Outlining the standards

Non-electrical equipment has recognised schemes for hazardous area equipment, the main ones are ATEX, UKEX & IECEx

ATEX,

ATEX is the name commonly given to the two European Directives for controlling explosive atmospheres:

Directive 99/92/EC (also known as 'ATEX 137' or the 'ATEX Workplace Directive') on minimum requirements for improving the health and safety protection of workers potentially at risk from explosive atmospheres. The text of the Directive and the supporting EU produced guidelines are available on the EU-website.

Directive 2014/34/EU (also known as 'ATEX 114' or 'the ATEX Equipment Directive') on the approximation of the laws of Members States concerning equipment and protective systems intended for use in potentially explosive atmospheres. The text of the Directive and EU produced supporting guidelines are available on the EU website.

UKEX,

Now the UK has left the EU,UKCA 'Ex' (UKEX) scheme approval came into force from 1st January 2021 with a transitional period lasting up until 1st January 2022. This becomes our new conformity assessment marking scheme. Effectively the UK version of ATEX

For non-electrical equipment both ATEX & UKEX there is no requirement for independent conformity assessment verification by a third party for Zone 1 & Zone 2 equipment. Reviewing the requirements of ATEX & UKEX, manufacturers are not required to conform to **any harmonised** standards or **UK designated standards** in order to issue a declaration of conformity & show compliance to ATEX or UKEX.

IECEx

For IECEx non-electrical equipment standards for conformity assessment are defined by ISO standards & the conformity assessment certificate is issued by IECEx. There is a register of compliant companies & companies are audited via a QAR (Quality Assessment Report) on an annual or biannual base.

Identifying the standard for conformity assessment

If we look at products being supplied into explosive atmosphere, we want to manage any ignition source.

The assessment of electrical equipment can be done via testing.

For non-electrical equipment it is not always possible to test due to the nature of the product.

So, conformity assessment is provided by a risk assessment & looks to identify:

- Ignition hazard
- Determine protective measure

- Estimate how often it might happen
- Decide on your protective measures to reduce or eliminate likelihood of ignition
- Then check your measures
- Use technical standards

The use of standards as part of the product assessment is vital as a benchmark for safety.

- IEC/ISO 80079-36 Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements

- IEC/ISO 80079-37 Explosive atmospheres — Part 37: Non-electrical equipment for explosive atmospheres — Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k‘’

Utilising these standards becomes best practice in the Design, Construction, Testing, Marking, Risk assessment process to determine the equipment protection level. Manufacturers can them decide on the protection concept,

Either: -

- **Constructional,**
- **Control of ignition sources**
- **Liquid immersion**

There might be additional standards that could be adopted due to the safety critical design of the product. Example EN14986 Design of fans working in potentially explosive atmospheres. This standard gives specific constructional designs & safety factors in the manufacture of fans.

Looking at the issues

We now go to look at examples of problems with ATEX & UKEX from companies providing advice, manufactures misunderstanding of the requirements, incorrect standards being applied & even notified bodies wrongly assessing the product.

After a review of BP Deepwater Horizon oil spill, the US Coast Guard.. will not accept ATEX certification because evidence of full testing to the applicable harmonized series of standards by a third-party laboratory is not guaranteed.

So, we can at first hand see there might be an issue with conformity assessment of safety products to ATEX.

We must all be fully aware that to supply a non-electrical safety critical product the manufacturer will just need to have a technical file detailing the risk assessment.

Note: This is not independently reviewed or checked until an incident has occurred.

Example 1 Mechanical failings

Looking at the manufacture of some products where specific guidelines are listed with regards to running speeds & safety factors. We see that mechanical overspeed’s & spark minimisation features have not correctly been adhered too. Yet the product still has a certificate stating compliance to ATEX.

Example 2 Caveats to products being offered

Manufacturers putting riders on proposals to remove liability & to try to exonerate any responsibility

Example 3 Incorrect declaration of conformity

We highlight a number of declarations of conformity with incorrect information, outdated standards, incorrect standards & incorrect markings. This shows that the conformity assessment on the products cannot have been made correctly. Hence the product is not correctly certified.

In reviewing these issues, we also take guidance from

The 'Blue Guide' on the implementation of EU product rules 2022

3.1. Manufacturer

The manufacturer is responsible for designing and manufacturing the product in accordance with essential or other legal requirements laid down by the relevant Union harmonisation legislation and for carrying out conformity assessment in accordance with the procedure(s) laid down by the Union harmonisation legislation….

In this respect, the economic operator that places the product on the market under its name or trademark becomes automatically the manufacturer for the purposes of Union harmonisation legislation. Therefore he takes the entire responsibility for the conformity assessment (design and production) of the product, even if this has been actually done by somebody else. Furthermore he must be in the possession of all documentation (such as the technical documentation including any relevant test reports) and certificates necessary to demonstrate the conformity of the product, but these do not need to be under his name. In such cases, it must be clear that the documentation and certificates demonstrate compliance of the specific product placed on the market.

4.5.1.3. Who must (not) affix the CE marking

—*The CE marking is affixed by the manufacturer (established inside or outside the Union), or by his authorised representative established within the Union.*

—*By affixing the CE marking the manufacturer declares on his sole responsibility that the product conforms to all applicable Union legislative requirements, and that the appropriate conformity assessment procedures have been successfully completed.*

5.2.2. Roles and responsibilities

The manufacturer in particular retains, however, the overall responsibility for the conformity of the product with all the requirements of the applicable legislation, even if some stages of the conformity assessment are carried out under the responsibility of a notified body.

The conformity assessment procedures applicable to the product, is the responsibility of the manufacturer only, whether the Directive provides for the involvement of a notified conformity assessment body, or not.

The responsibility on the manufacturer to assess products correctly is clearly defined. But if the manufacturer does not know what they need to assess too they will get it wrong!

We had further information from the office of product safety & standards. (OPSS)

- *"All manufacturers should know what standards are applicable, because they are placing the products on the market."*
- *"It is the manufacturers responsibility to find out what standards their products should be assessed too"*

Example 4

The final example comes from the notified bodies, where they have examined a mechanical piece of equipment electrically. When the notified body was questioned regarding this the reply was

"The entire fan was assessed as an electrical equipment according to EN14986".

So how can a mechanical standard be assessed electrically?

We must all understand that notified bodies are commercial organisations & will only assess what the manufacturer as asked to be assessed. In this case they were asked to assess EN14986 electrically

The End User

The end user will ultimately bare the cost for any failing with the equipment being used in a hazardous area.

The end user is not an economic operator with respect to above Regulations but may have responsibilities for workplace safety under the Health & Safety at Work Act & the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) but these are in relation to the product's use, rather than supply – both Regulations are responsibility of HSE.

The end user will need to undertake due diligence checks that the equipment he is installing is compliant, has a CE/UKCA mark, the Declaration of Conformity and that the product is accompanied by the required documents/instructions etc. and installed correctly.

As all the examples above are a long way from showing compliance to the ATEX directive, how can the end user fully perform their due diligence on any self-certified piece of equipment?

Conclusion

If manufacturers don't know what they don't know, If notified bodies don't know what they don't know & if end users don't know what they don't know how can we ensure safety.

At present any manufacturer performing a conformity assessment without 3rd party verification are setting their own exam questions & marking it themselves.

In this case the manufacturer will always pass!!!

The end user is at risk & could be viewed as not doing their due diligence as they have not checked the products are compliant

So, what is the answer,

Do end users never accept compliant products?

Do we have all hazardous area products 3rd party certified?

Alternatively, do we already have the answer with IECEx

Although not a directive it provides an enhanced assurance with regards to the safety of products.

With IECEx

- Self-certification of products is not permitted
- Confidence among Bodies (Labs + Certifiers),
- Has a dedicated Website Instant access to information, including "On-Line" Certificates for verification

As an industry sector we need to have a look at how we can be proactive. As my examples have shown we are far from being safe.

So, the final note, just take some time to review all your current equipment, check the declaration of conformity to see if the conformity assessment is correct to the relevant ISO/EN standards.

Abbreviations

Reference

'**Blue Guide';** COMMISSION NOTICE The 'Blue Guide' on the implementation of EU products rules 2016

ATEX DIRECTIVE; 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014

Directive 99/92/EC Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (15th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)

Directive 2014/34/EU Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast) (Text with EEA relevance)

UKCA; UKCA marking (UK Conformity Assessed marking) is the UK product marking requirement that will be needed for all Ex products being placed on the market in Great Britain (England, Scotland and Wales), substituting the EU requirements for CE Marking (CE marking will continue to be accepted in Northern Ireland). UKCA 'Ex' (UKEX) approval came into force from the 1st January 2021 with a transitional period lasting up until 1st January 2022

IECEx Certified Equipment Scheme; IECEx provides a means for manufacturers, regulators and users of equipment used in hazardous areas to address the risk of fires or explosions from flammable gases or dusts. Testing and certification of equipment, services and competence of persons to international standards facilitates the sale of safer products internationally at a lower cos

IEC/ISO 80079-36 Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements

IEC/ISO 80079-37 Explosive atmospheres — Part 37: Non-electrical equipment for explosive atmospheres — Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k''

EN14986 Design of fans working in potentially explosive atmospheres

International labour organisation

Marsh report 100 Largest Losses in the Hydrocarbon Industry 1974-2019

Allianz Global Corporate & Specialty SE