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ATEX and IECEx

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What is ATEX?

There are two ATEX Directives

• 94/9/EC The ATEX Product Directive
  – Applicable to the manufacture and placing on the market of Ex Equipment

• 1999/92/EC The ATEX Use Directive
  – Applicable to the installation, inspection, maintenance and use of Ex Equipment
What is ATEX?

• A European Union Directive is not, itself, law but becomes law in each member state when it is “adopted” into national legislation.

• The EU determines the time period during which each directive must be adopted.

• Some directives (including 94/9/EC) apply to the whole of the European Economic Area (EAA) which also includes Norway, Iceland, Lichtenstein and Switzerland.
The ATEX Product Directive

• When people refer to ATEX colloquially, they usually mean 94/9/EC
• Adoption in all countries has been on an equal basis in order to ensure an even playing field for TRADE
• The only differences relate to criminal penalties for non-compliance (subsidiarity)
• Because of the equality, it is normal to refer to ATEX as if it is the law
The ATEX Use Directive

• Sets a MINIMUM standard for Health and Safety of workers, etc., related to risks of explosion in areas with a hazardous atmosphere

• Because the location is fixed in a single country, the adoption has varied slightly in different countries where additional measures have been brought in

• More often known by the local legislation
  – In the UK this is DSEAR

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The Two Directives

- Both directives were implemented on a compulsory basis from July 2003.
- The Use Directive requires that all new equipment to be installed in a hazardous area complies with the Product Directive.
- Second hand equipment can be installed based on a risk assessment (but must comply with the product directive if being imported into the EEA).
The ATEX Product Directive

• Technical Requirements
  – Expressed as “Essential Health and Safety Requirements”
  – Several pages of generalised technical requirements
  – Theoretically certification can be directly against these requirements with supporting technical research
  – Easier to use “harmonised” standards
Harmonised Standards

• To avoid having to prove a method of compliance, use of a harmonised standard may be presumed to demonstrate compliance with the EHSRs.

• In practice, for most products, compliance with a harmonised standard is the only realistic way of complying with the EHSRs.
Harmonised Standards

- Currently there are about 60 standards issued by CEN for non-electrical equipment and protective systems
  - Generic EN 13463 series for equipment
  - Several particular standards for specific types of equipment, e.g.
    - Diesel engines
    - Fork lift trucks
    - Flame arrestors

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Harmonised Standards

• Currently there are about
  – 30 standards issued by Cenelec for electrical equipment
    • Originally EN 50014 series
    • Now mainly EN 60079 series
    • Most are identical to related IEC 60079
    • Some EN only standards remain where IEC has not yet published an equivalent, e.g. EN50495 – Safety related devices
Harmonised Standards

• A standard is harmonised when its number is published in the Official Journal of the European Union
• This follows evaluation by a consultant appointed by the European Commission

or via the links on www.baseefa.com

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Categories

- ATEX recognised the need to identify a relative value for the “safety” of any particular item of equipment
  - The “safer” the equipment, the more arduous the Zone in which it can be placed
  - 94/9/EC defines Categories as a property of the equipment
  - 1999/92/EC defines Zones as a property of the installation and allocates Categories to Zones “subject to risk assessment”
Categories

• Category 1
  – A very high level of protection
  – Corresponds to IEC Equipment Protection Level Ga or Da

• Typified by protection
  – Ex ia
  – Ex ma
  – Ex ta
Categories

• Category 2
  – A high level of protection
  – Corresponds to IEC Equipment Protection Level Gb or Db

• Typified by protection
  – Ex d
  – Ex e
  – Ex ib, Ex mb, Ex tb
Categories

• Category 3
  – A normal level of protection
  – Corresponds to IEC Equipment Protection Level Gc or Dc

• Typified by protection
  – Ex nA, Ex nC, Ex nR
  – Ex ic, Ex mc, Ex tc
Categories

• Category 1M
  – Mining equipment to remain energised in the presence of gas in the mine air
  – Corresponds to IEC EPL Ma

• Category 2M
  – Mining equipment to be de-energised in the presence of gas in the mine air
  – Corresponds to IEC EPL Mb
Categories and Conformity Assessment

- ATEX requires a higher level of proof of conformity for the higher categories.
- Electrical equipment and internal combustion engines require a higher level of proof than non-electrical.
- Protective Systems are treated as if they are Category 1 Equipment for conformity assessment purposes.
<table>
<thead>
<tr>
<th>Categories</th>
<th>1 + M1</th>
<th>2 + M2 Electrical</th>
<th>2 + M2 Non-electrical</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Annex in 94/9/EC)</td>
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<tr>
<td>Type Examination (III)</td>
<td>NB</td>
<td>NB</td>
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<tr>
<td>Production QA (IV)</td>
<td>NB</td>
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<tr>
<td>Product Verification (V)</td>
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<tr>
<td>Conformity to Type (VI)</td>
<td>NB + M</td>
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<td>Product QA (VII)</td>
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<tr>
<td>Internal Control of Production (VIII)</td>
<td></td>
<td>M (+ deposit file)</td>
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<td>M</td>
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<tr>
<td>Unit Verification (IX)</td>
<td>(NB)</td>
<td>(NB)</td>
<td>(NB)</td>
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</tbody>
</table>
Notified Body?

• An independent (3rd party) conformity assessment body
• Appointed by the responsible authority in a member state
• Notified by that authority to the European Commission.
EC-Type Examination

- Colloquially “ATEX Certification”
- Identical process as producing an IECEx Test Report (ExTR)
- BUT
  - Is against the EHSRs not standards (although standards are normally used)
  - Allows the NB to use judgement on application of the standards
EC-Type Examination

• Not mandated for
  – Category 2 (and M2) non-electrical
  – Category 3

• Notified Body cannot issue EC-Type Examination for these

• Notified Body may issue a voluntary certificate provided that it does not claim to do it as a Notified Body
Production QA

• Identical to IECEx QAR procedures
• Normally used even if Product QA is mandated
  – QAN document refers to both modules
• Based on ISO/IEC 80079-34
  – Replacing OD 005 from IECEx
  – Replacing EN 13980 for ATEX
• Note EN 80079-34 contains additional annex material for non-electrical equipment
Product Verification/
Unit Verification

• Product Verification follows EC-Type Examination, whereas Unit Verification stands alone
• IECEx Unit Verification covers both these modules
• Production is directly validated by the NB
• Avoids need for Production QA
  – Saves cost when only a few products are to be made
  – Not logical for serial production
Internal Control of Production

- Manufacturer alone responsible for all aspects of design and production
- Manufacturer has sole responsibility for creating the Technical File
- For Category 2 + M2 Non-electrical Equipment, the Technical File is to be deposited with a Notified Body
- Notified Bodies can assist manufacturers on a voluntary basis (e.g. file review)
Declaration of Conformity (DoC)

- Top level document for ATEX, delivered by manufacturer on sole authority without intervention of NB

- Attestation of Conformity for components that don’t bear the CE Marking – identical purpose and format
Declaration of Conformity

- Name and address of Manufacturer or Authorised Representative
- Description of product
- Relevant provisions fulfilled by product
  - Category, Standard Coding, etc.
- Name, number and address of NB (if app.)
- Reference to harmonised standards used
- Reference to other specifications used
- Reference to other directives applied
- Identification of empowered signatory

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Declaration of Conformity

- DoC plus instructions are the only documents that ATEX requires to be delivered with the equipment
- Both should be in paper form
  - Can be read anywhere
  - No need for Ex computer to read a CD Rom
- Purchaser will find the certificate more useful, but supply is not mandated
CE Marking Requirement

ATEX marking

Standard marking e.g.

Ex d IIB T5

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IECEx strength vs ATEX weakness

• Supervision and accreditation of Certification/Notified Bodies
  – IECEx by peer review (not involving own country)
  – ATEX by own country against varying criteria – often using assessors not familiar with hazardous area techniques and standards
IECEx strength vs ATEX weakness

- Top Level Documentation
  - IECEx Certificate on-line, issued by the certification body, based on ExTR and QAR
    - currency checkable on-line
  - ATEX Declaration of Conformity, issued by the manufacturer, who has sole authority either for internal control of production or for ensuring that separate type examination and production modules are in place
    - currency not checkable except via manufacturer
So why ATEX?

• Without it, you can’t sell in Europe
• Until the Ex’s “Special Protection” standard IEC 60079-33 is published and IECEx gears up to certify to it, ATEX is one way to get flexibility where needed to apply changing technology ahead of standards development.
So how ATEX?

• Because the standards are effectively technically identical, an IECEx ExTR provides the technical basis for issuing an ATEX EC-Type Examination Certificate

• An IECEx QAR can form the basis of an ATEX QAN
So how ATEX?

- Two for the price of one?
  - An IECEx ExCB that is also an ATEX NB can issue both sets of documentation for about the same cost as IECEx alone.
  - There is a standard IECEx format to report the minor additions (normally just marking) for ATEX.
So how ATEX?

- Any IECEx ExCB in the world can produce the IECEx ExTR and QAR that can be turned into ATEX documentation by any European NB.
- The NB will read the reports and ask for clarification on any points not clear to them.
  - This is normal within the IECEx System.
ATEX – The near future

• 94/9/EC currently being modified and reissued with a new number

• European Commission recognised that many “new approach” directives were failing to deliver
  – New directive will tighten procedures for notifying NBs and for market surveillance

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ATEX – The near future

• As currently drafted, the new directive will not make serious differences to “good” manufacturers and “good” Notified Bodies

• Additional duties will be placed on importers to maintain documentation for 10 years
ATEX – The distant future

• The European Commission is aware of the work from UNECE and not against implementation
  – How to make IECEx interface easily with the basic framework of European Directives that are entrenched?
• The question is not “if?”, but “how?” and “when?”