



INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

Non-Electrical Approval by European Manufacturers. Past, Present and the Future The Hague, August 2014



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(prepared by Roger Jones)

- Since 1st July 2003 relevant products could only be placed on the market in the EU territory, freely moved and operated as designed and intended in the expected environment if they complied with ATEX Directive 94/9/EC (and other relevant legislation).

19. 4. 94

Official Journal of the European Communities

No L 100/1

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(Acts whose publication is obligatory)

DIRECTIVE 94/9/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL

of 23 March 1994

on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 100a thereof,

Having regard to the proposal from the Commission ⁽¹⁾,

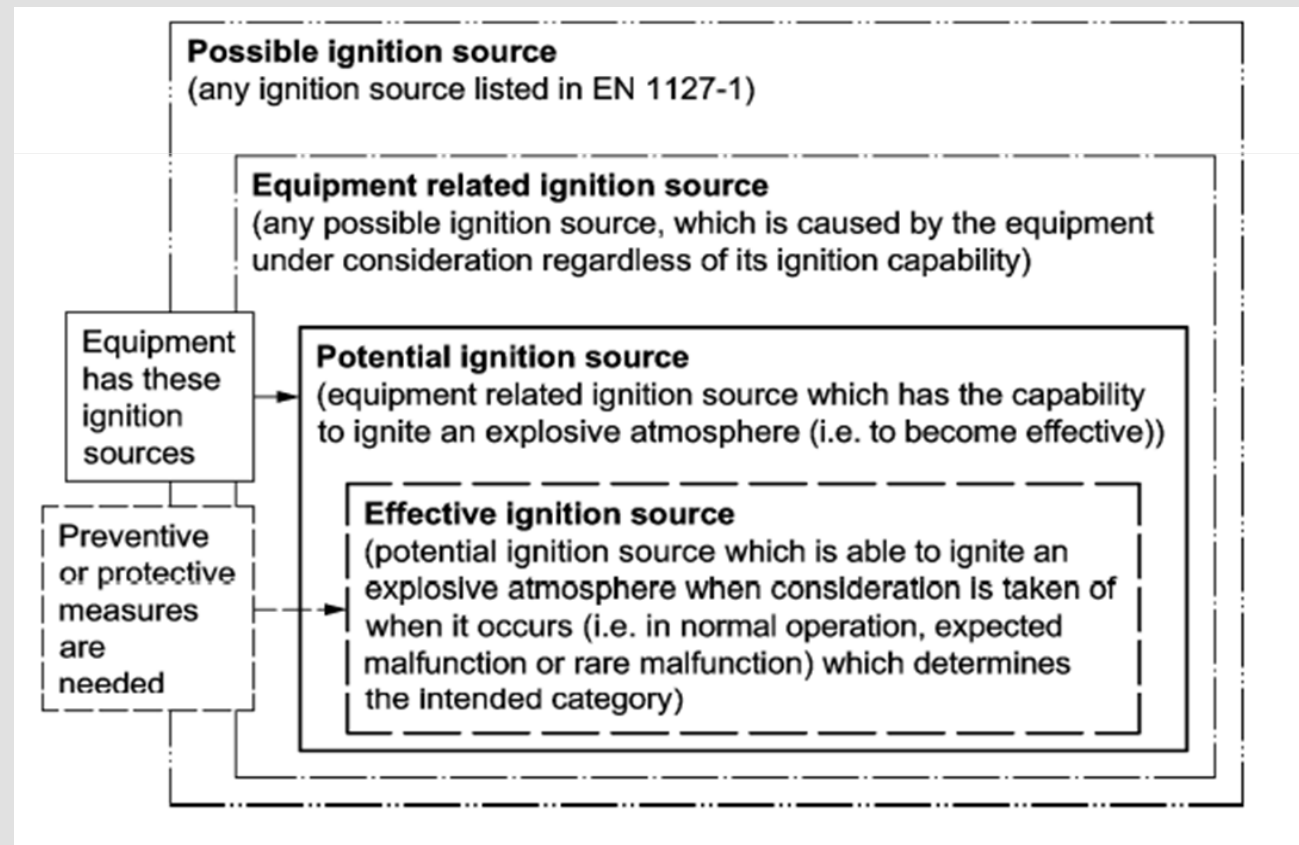
Having regard to the opinion of the Economic and Social Committee ⁽²⁾,

Acting in accordance with the procedure referred to in Article 189b of the Treaty establishing the European Community,

merely lays down the requirements vital to freedom of movement for the equipment to which it applies;

Whereas the regulations intended to remove technical barriers to trade are required to follow the new approach provided for in the Council resolution of 7 May 1985 ⁽³⁾, which requires a definition of the essential requirements regarding safety and other requirements of society without reducing existing, justified levels of protection within the Member States; whereas that resolution provides that a very large number of products be covered by a single Directive in order to avoid frequent amendments and the proliferation of Directives;

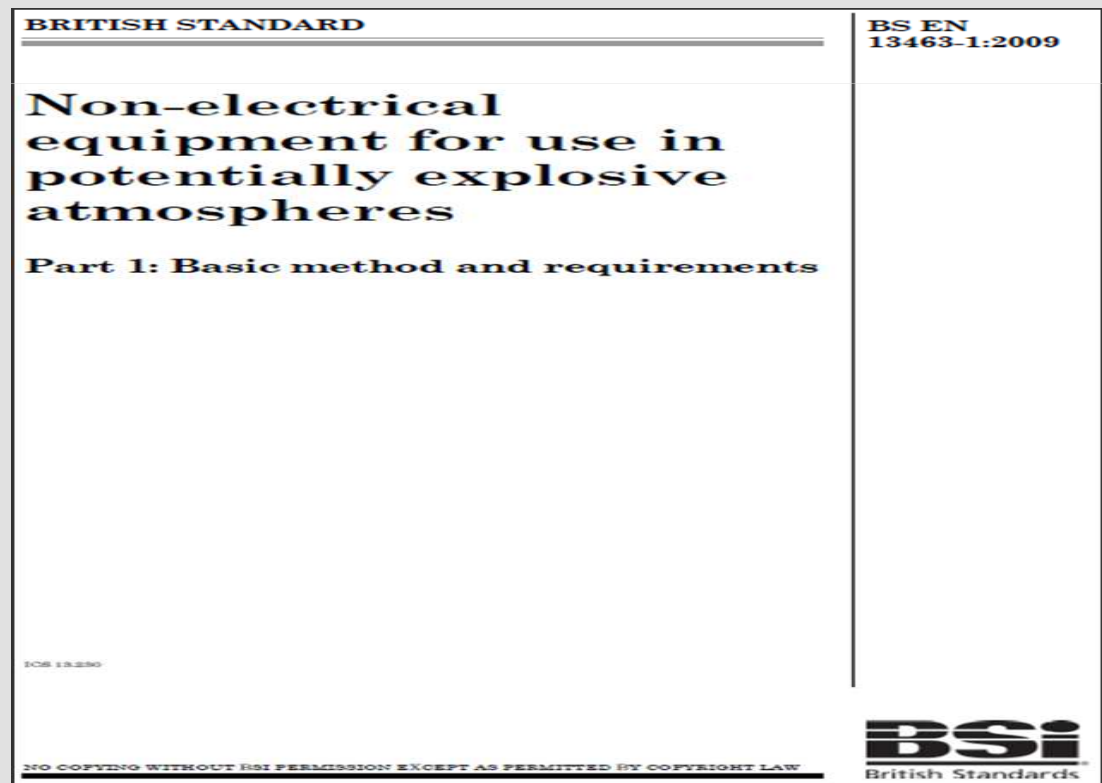
- The Essential Health and Safety Requirements of the ATEX Directive 94/9/EC required the manufacturer to identify all Possible, Potential, and Effective Ignition Sources





The Past – ATEX 94/9/EC

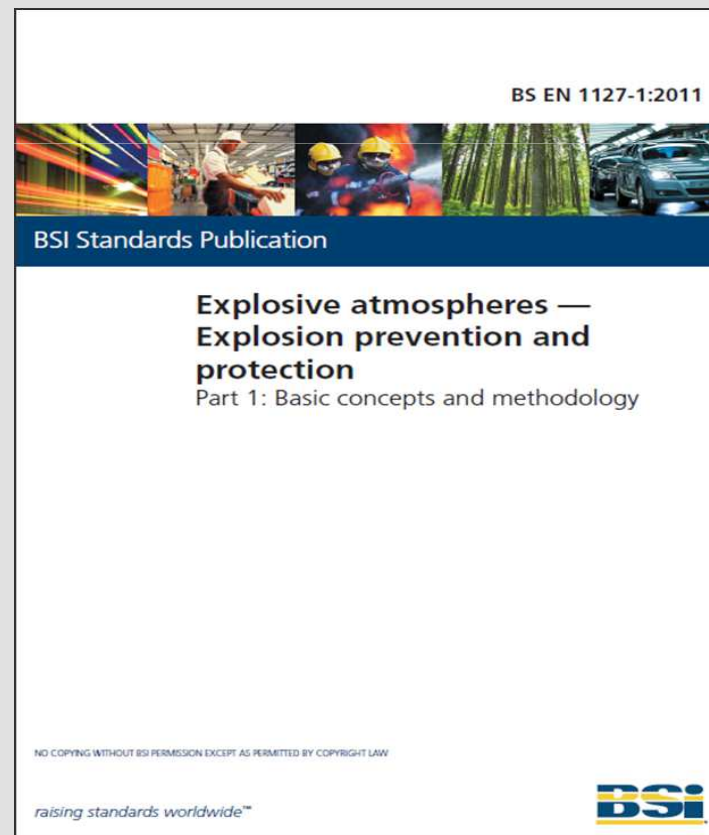
- The ATEX Directive 94/9/EC provided for the first time harmonised requirements for non-electrical equipment, and equipment intended for use in environments which are potentially explosive due to dust hazards and protective systems.



- **For over 10 Years European Manufacturers have been complying with the ATEX Directive 94/9/EC and the requirements for Non-Electrical Equipment. Over this period a great deal of experience has been gained and a lot of lessons have been learnt.**
- **It should be noted that the majority of Non-Electrical assessments have been Self-Assessed by the European Manufacturers and there has been very little input from Notified Bodies.**



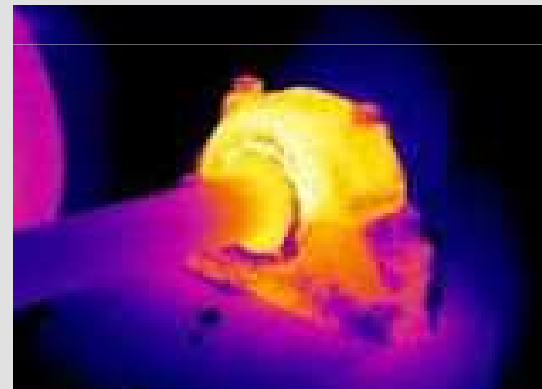
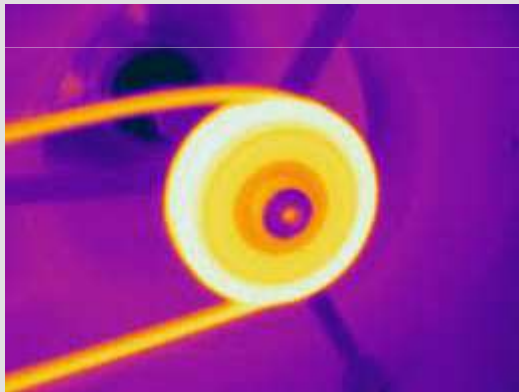
- Presently the “majority” of European Manufacturers of ATEX Non-Electrical Equipment follow the procedure detailed within the EN1127-1 Standard



- **EN1127-1 lists 13 Possible Ignition Sources that must be considered by the Manufacturer as being Possible, Potential, or Effective Ignition Sources.**

5	Possible ignition sources	13
5.1	Hot surfaces	13
5.2	Flames and hot gases (including hot particles)	13
5.3	Mechanically generated sparks.....	14
5.4	Electrical apparatus.....	14
5.5	Stray electric currents, cathodic corrosion protection.....	14
5.6	Static electricity	15
5.7	Lightning.....	15
5.8	Radio frequency (RF) electromagnetic waves from 10^4 Hz to 3×10^{11} Hz	15
5.9	Electromagnetic waves from 3×10^{11} Hz to 3×10^{15} Hz.....	16
5.10	Ionizing radiation	16
5.11	Ultrasonics	16
5.12	Adiabatic compression and shock waves	16
5.13	Exothermic reactions, including self-ignition of dusts.....	17

- **EN1127-1 Hot Surfaces – Currently Manufacturers perform detailed Temperature Rise Tests and Thermographic Surveys to establish the maximum surface temperature of their equipment.**



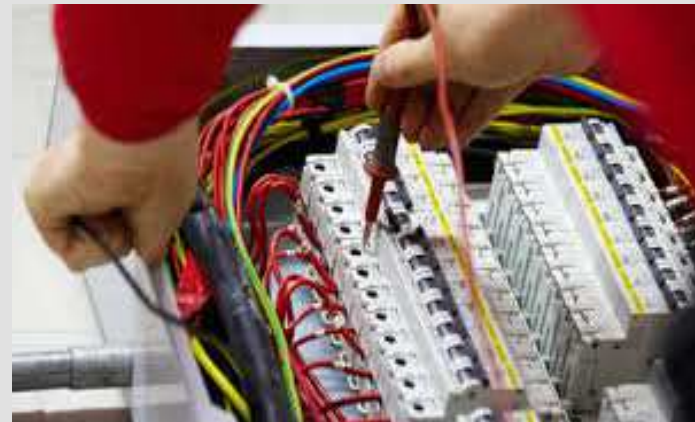
- **EN1127-1 Flames & Hot Gases – Manufacturers now design their equipment to reduce the risk from Flames & Hot Gases. For example Hydraulic Hose Lines have a high degree of protection and Rotating Mechanical Equipment is able to safely vent gases without any transmission to the surrounding atmosphere.**



- **EN1127-1 Mechanical Spark – Manufacturers design their ATEX Non-Electrical equipment with increased tolerances between fixed and rotating parts to ensure the risk of impact is vastly reduced. Materials are also selected to comply with requirements of the European EN13463 Series of Standards (E.g. Magnesium Content)**



- **EN1127-1 Electrical & Stray Currents – All Electrical Components are purchased ATEX Approved and installed & inspected in accordance with the requirements of EN60079-14, EN60079-17 and EN60079-25.**



- **EN1127-1 Static Electricity – To reduce the risk from static electricity Manufacturers specify Non-Metallic Materials and Conductive Hose Lines to comply with requirements of the European EN13463 Series of Standards.**





The Present – ATEX 94/9/EC

- Manufacturers document their EN1127-1 Ignition Hazard Assessment by following the examples in the standards.

Possible Ignition Sources (List from EN 1127-1)	Equipment Related Yes/No	Reason
Hot surfaces	Yes	Inside and Outside - Gas compression, Vane friction, Particle ingress
Mechanical sparks	Yes	Particles could produce hot-spots
Flames, hot gases	Outside No Inside Yes	inside Compression temperature To be measured - gas temperature directly at exhaust
Electrical sparks	No	Not Present
Stray electric currents and cathodic corrosion protection	No	Not present
Static electricity	Yes	Vanes, Lipseal, Exhaust filter, float valve
Lightning	No	Not present
Electromagnetic waves	No	Not present
Ionising radiation	No	Not present
High frequency radiation	No	Not present
Ultrasonics	No	Not present
Adiabatic compression	Yes	Inside chamber
Chemical reaction	Yes	Possible with process fluid/gas

The Present – ATEX 94/9/EC

- **European Manufacturers create a Non-Electrical Technical File which contains all the information necessary to demonstrate compliance with the ATEX 94/9/EC Directive.**





The Future – ATEX 94/9/EC & the NLF

- Under the New Legislative Framework the old ATEX 94/9EC Directive is being replaced by the ATEX Directive 2014/34/EU. It is envisaged that that there will be very little impact on the process currently being implemented by European Non-Electrical Manufacturers





The Future – Advantages to Manufacturers of the new IECEx Non-Electrical Scheme

- **Internationally accepted Test & Certification Scheme**
- **Global Confidence in Quality Assessment Programme**
- **IECEx Database of Certified Non-Electrical Equipment**
- **No Self Assessment by Manufacturers – all are equal**
- **Acceptance by Government Agencies & Inspectors**





The Future – Manufacturers concerns regarding the IECEx Non-Electrical Scheme

- **No Self Assessments and increased Test Programme**
- **IECEX Certification Bodies Mechanical Experience & Staff**
- **Manufacturers will have to implement new QA Systems**
- **No Guidance on how the IECEx Standards will be applied**
- **Ultimately design & manufacturing cost may increase**





The Future – What can the IECEx Scheme do to help Manufacturers

- **Issue Clear Guidance on the new IECEx Standards**
- **Verify if the scheme applies to Products & Assemblies**
- **Clarify implementation of QA Scheme (Unit Verification)**
- **Develop Non-Electrical Installation/Inspection Standards**
- **Be aware that the Mechanical World is very different**





Any Questions ?





The End

THANK YOU