SENSOR TIP

What is ATEX ?

On 1 July 2003 the ATEX Directive will become mandatory for all electrical and mechanical equipment used in potentially explosive atmospheres.
After this date, products without ATEX certification will be illegal on the European market, and cannot feature the new CE mark.

Most manufacturing and process industries generate potentially explosive atmospheres using substances from solvents to flour. Under the CE mark regime, the onus is on the manufacturer, authorised representative or importer to ensure products meet the requirements of ATEX, and keeping up-to-date documentation to demonstrate compliance is essential - before and after the CE mark declaration of conformity has been signed.

Despite an eight-year transition period, there is still a large group of manufacturers completely unaware of the new directive and how it will affect their operations.

ATEX - What Does it Mean ?

Designed to open up free trade across Europe, the ATEX Directive 94/9/EC (ATmosphere EXplosive) sets out to align technical and legal requirements across member states for equipment and protective systems used in potentially explosive atmospheres.

From 1 July 2003 it will be mandatory for all electrical and mechanical equipment used in potentially explosive atmospheres to be compliant with the ATEX Directive 94/9/EC. The burden also falls on the end user with a second ATEX Directive 1999/92/EC and its equirement to assess an area for explosion risk.

Previously there has been no obligation to use certified equipment or to grade an area as potentially explosive, merely to conform to the Health And Safety At Work Act and satisfy the Health and Safety Executive. Users requested third party certification on any quipment specification to show safety requirements were met.

ATEX Directive (1999/92/EC)

There are also new requirements for users. ATEX Directive (1999/92/EC) - also known as European Directive 137 or the "ATEX Use Directive" - covers the health and safety of workers at risk in these areas and makes it mandatory under European law to assess for an explosion risk and classify accordingly.

Once an area is classified, the 'Use Directive' requires only equipment suitable for safe operation under those risk conditions to be used. This will increase the amount of 'Classified or Zoned' areas and, in turn, increase the demand for ATEX certified equipment -an obvious opportunity for manufacturers to develop equipment to satisfy this increased demand.

SENSOR TIP

ATEX Directive (94/9/EC)

Also known as ATEX 100a and ATEX 95, this directive allows movement throughout the European Union and has been in existence through statutory regulations in the UK since March 1996, since when manufacturers have been in a transitional period.

Forcing manufacturers to gain certification of electrical and/or mechanical products to be used in potentially explosive atmospheres created by flammable gases, vapours, mists or dusts, the directive applies to equipment and protective systems in potentially explosive areas below ground, on the surface and on offshore fixed facilities.

ATEX 94/9EC does not affect equipment which is already installed and in use. Products 'not placed in the market' are exempt - this can be products or equipment made by companies for their own use or by a manufacturer specifically for markets outside of the European Economic Area.

The new directive brings under control three types of equipment. These are: non-electrical equipment (eg. mechanical equipment); equipment for use in dust atmospheres (eg. equipment for flour or saw mills) and safety related devices (eg. vent systems, flame arrestors, suppression systems) and safe area equipment.

From July 2003, all equipment and protective systems for use in higher risk areas must be marked legibly and indelibly with the name and address of the manufacturer, CE mark and number of Notified Body, designation of series or type of equipment, specific explosive protection 'Ex' hexagon logo, year of manufacture and serial number. It may also need to carry the EC Type Examination Certificate details.

For CE marking, as well as compliance with ATEX, all hazardous area equipment must comply with any other applicable directives. Currently, the CE mark does not prove ATEX compliance as some hazardous area equipment may be CE marked through compliance with other mandatory directives.

Under ATEX, manufacturers must design and test components to prevent or minimise the risk of explosion due to the production or release of explosive atmospheres. Essentially, manufacturers must consider every possible electrical or non-electrical source of ignition. And, at the same time, consider all potentially hazardous environments a product could operate in; the different ways it could be applied and the technical ability of the person using the product.

Product Approval

As with all new regulations, all new products must be assessed and all existing products reassessed. There are two elements to gaining product approval - Product Type Approval (testing and assessment) and Production Control (quality systems in manufacture).

The former involves compliance with the Essential Health and Safety Requirements (EHSRs) described in Annex II of the directive. Electrical equipment is well covered, but few standards cover non-electrical equipment. Production Control involves a Quality Assurance type procedure often with the responsible manufacturer being audited by a Notified Body for compliance with the relevant annex dependent on the type of equipment and QA system currently in place.

The route to compliance with EHSRs will see most manufacturers choosing to prove conformity with the latest edition of the harmonised standards for electrical equipment for use in potentially explosive atmospheres. For all equipment this will require testing and production of test reports. For the higher risk equipment - electrical categories I and

2 and mechanical category I - this testing must be conducted by a Notified Body, normally
culminating with the issue of an EC Type Examination Certificate. The details of this certificate must also be marked on the equipment.

Manufacturers must also supply other evidence of compliance such as proof of a consideration of issues including general electrical safety and EMC. New standards are currently being introduced almost every month, so working with a chosen Notified Body at each stage of the process will help manufacturers keep abreast of current methodology and standards.

Protection Zones and Categories

Under ATEX, all products must be categorised by the level of protection they offer against the risk of becoming a potential source of ignition in an explosive atmosphere. Defined categories for equipment conformity are divided between surface and mining applications. The 'Use Directive' describes zones to reflect the explosion risk.

The ATEX Directive makes Notified Body involvement mandatory in both equipment assessment and monitoring of production for equipment for use in Zone 0 areas (highest risk) and for equipment to be used in Zone 1 areas (medium risk). For equipment to be used in Zone 2 areas only (least risk) the manufacturer has to maintain technical documentation which includes evidence of testing and production control, although a Notified Body is not necessarily involved.

To simplify the route to ATEX compliance, the CE mark regime allows manufacturers to pick and choose a Notified Body to suit their requirements. Careful planning and working with a testing organisation with direct experience of the CEmark regime will help speed up time to market.

ATEX Certification coding example...

CE - Ex - II - 2 - G - EEx - d - IIC - T4 - T amb

CE
This means CE mark permitted by the European Commission to show compliance with all EU directives applicable to a product.

Ex
Distinctive community mark to show suitability for explosive atmospheres

II
Group II - surface industries
Group I - for use in mines

2
Equipment category

G
G = tested for gases
D = tested for dusts

EEx
EEx means equipment tested under the latest European Harmonised Standard for use in Explosive atmospheres

d
Certification Production concept
e.g. d(flameproof) to EN50018

IIC
Apparatus Group

T4
Temperature classification
T1 = 450 Deg.C
T2 = 300 Deg.C
T3 = 200 Deg.C
T4 = 135 Deg.C
T5 = 100 Deg.C
T6 = 85 Deg.C.

T amb
Ambient temperature range in service
(Standard between -20 and +40 Deg.C)

A further Directive covers the minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres, requiring risk assessments by effected employers, but this article will concentrate on the equipment aspect of ATEX.

The Directive applies to equipment and protective systems in potentially explosive areas below ground, on the surface and on offshore fixed facilities. Manufacturers need to

design and test components to prevent or minimise the risk of explosion, and must consider every possible electrical or non-electrical source of ignition.

There are two distinct elements to gaining product approval Product Type Approval (testing and assessment) and Production Control (quality systems in manufacture). Notified body involvement is mandatory in both equipment assessment and monitoring of production, for equipment for use in Zone 0 areas (highest risk) and for equipment used in Zone 1 areas (medium risk).

For equipment used in Zone 2 areas only (least risk), the manufacturer has to maintain technical documentation that includes evidence of their own testing and production control. This latter type of equipment may appear to meet the requirements without having been subjected to full test or certification procedures, hence users of category 3 equipment should check with the supplier to ensure that evidence of conformity is acceptable.

The definitions of the terms Category and Zone are interrelated.
Category 1 equipment may be used in Zones 0,1 and 2. Category 2 equipment may only be used in Zones 1 and 2, whilst category 3 equipment may only be used in Zone 2. The Certification coding (see coding example) defines the hazardous conditions in which a particular type of equipment may be used and should be clearly shown on the certification. It may also be necessary to use an IS barrier with a sensor. If in doubt ask the supplier. The ATEX Directive is also a CE mark directive, so all equipment must be CE marked, which also means that it must conform with all other relevant directives such as the EMC and Low Voltage Directives.