

## The Two ATEX Directives – Legal and Practical Issues

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There have, in fact, been five ATEX Directives but the three older directives, from the late 70's and early 80's were repealed from the first of July 2003 which is the mandatory operational date for the two later directives.

ATEX is a contraction of "Atmosphere Explosible", the French term for "Potentially Explosive Atmosphere". This has a legal distinction from "Atmosphere Explosive", which is an atmosphere that is immediately explosive.

The notion of potentiality is important because it emphasises that the law applies where there is a risk of an explosive atmosphere occurring, rather than just at the time when it is occurring.

The ATEX Product Directive (94/9/EC) applies to the manufacture, and distribution of equipment and protective systems intended for use in (or in association with) potentially explosive atmospheres. It is under the responsibility of DG Enterprise of the European Commission. First published in the Official Journal of the European Communities (OJEC) in 1994, it became operational on a voluntary basis throughout Europe from 1996, giving a seven year lead in to allow industry to prepare. In the UK, it was adopted as a Statutory Instrument in 1996 but, despite significant publicity from both HSE and DTI, there are many manufacturers of equipment falling within the scope of the directive who have failed to meet the July 2003 deadline.

The ATEX Worker Protection Directive (1999/92/EC) applies to the installation and use of such equipment. It is under the responsibility of DG Employment and Social Affairs of the European Commission. Unlike the product directive, individual countries could adopt or adapt this directive in anyway they saw fit, provided that the essential principles were included. In the UK, it has been adopted (with minor deviations) as part of the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) which first went out for consultation in 2000 and were finally adopted in 2002. DSEAR has a basic operational date of July 2003 but a derogation until July 2006 for some aspects of existing installations.

The combined effect of both directives is that, from July 2003:

It is illegal to "place on the market within the European Economic Area" (i.e. sell for the first time) equipment intended for use in a potentially explosive atmosphere;

It is illegal to "put into use" (i.e. complete the commissioning of) such equipment within a plant where there may be a potentially explosive atmosphere;

unless such equipment is accompanied by a "Declaration of Conformity" in accordance with Annex X of 94/9/EC. In order to substantiate that Declaration of Conformity, the manufacturer must follow the appropriate conformity assessment modules outlined in Annexes III to IX of the directive. The Annexes are applied as follows:

| Annex - Module                        | Category | 1 & M1 & Prot. Systems | 2 & M2 Electrical | 2 & M2 Non-Electrical  | 3      |
|---------------------------------------|----------|------------------------|-------------------|------------------------|--------|
| III - Type Examination                |          | NB +                   | NB +              |                        |        |
| IV - Production QA                    |          | NB or                  |                   |                        |        |
| VII - Product QA                      |          |                        | NB or             |                        |        |
| V - Product Verification              |          | NB                     |                   |                        |        |
| VI - Conformity to Type               |          |                        | NB                |                        |        |
| VIII - Internal Control of Production |          |                        |                   | Manuf. + Dossier to NB | Manuf. |
| IX - Unit Verification (alternative)  |          | (NB)                   | (NB)              | (NB)                   | (NB)   |

Thus Notified Body (NB) involvement is compulsory where the highest Category (1 or M1) is required.

1999/92/EC allocates categories of equipment to zoned areas of hazard, but does allow those responsible for the plant to make an argued case for not conforming to the normal allocation, which is as follows:

|        |         |        |         |        |         |
|--------|---------|--------|---------|--------|---------|
| Zone 0 | Zone 20 | Zone 1 | Zone 21 | Zone 2 | Zone 22 |
|--------|---------|--------|---------|--------|---------|

| Category 1G | Category 1D | Category 2G | Category 2D | Category 3G | Category 3D |
|-------------|-------------|-------------|-------------|-------------|-------------|
|-------------|-------------|-------------|-------------|-------------|-------------|

Categories M1 and M2 for mining applications cover firedamp (methane) and coal dust only and are not related to zones. Protective Systems, such as Venting and Suppression facilities, are always treated like Category 1 Equipment for conformity assessment purposes.

Both directives are written from a standpoint which assumes that any single item of equipment has only one category. However, this simple view does not cover frequently occurring situations where equipment actually handles the source of the hazard. In particular, there has been a lot of debate about how to deal with equipment which may have different “zones” inside and outside.

DG Employment and Social Affairs have confirmed that it is the intention that 1999/92/EC should apply to enclosed volumes of potentially explosive atmosphere, “where such an atmosphere is capable of endangering life should there be an explosion”. Thus small well controlled volumes of hazardous materials (such as may be found in laboratory bench experiments) may be considered as outside the scope of 1999/92/EC and therefore associated equipment can also be considered outside the scope of 94/9/EC.

However, for production plant, it will normally be necessary to assume that all atmospheres are within the scope of 1999/9/EC and that related equipment should comply with 94/9/EC.

Equipment handling gasses liquids and vapours, if not normally intended to be mixed with air, can usually be classified Zone 2 internally, just to cover start-up and shut-down conditions. However, equipment handling potentially explosive dust air mixtures must often be considered as Zone 20, if the dust or powder is normally within flammable concentrations. Different parts of the process line may require different considerations. For example, a fan on the clean air side of a filter will normally be manufactured to Category 3 to allow for the infrequent possibility of rupture of a filter bag, this being a simpler solution to designing a Category 1 or Category 2 fan for use at the inlet to the filter.

Particular consideration has to be given where powders are processed with flammable solvents. Different ignition mechanisms may apply to the vapour and the powder. The flammable limits will also change and the resulting explosion may have different characteristics to the components igniting separately.

It is this type of situation that leads to the blurring of responsibility between the manufacturer and the user of the equipment. However, carefully adhering to the structure of the directives, it is up to the user (purchaser), having performed a risk assessment, to specify the nature of the hazard and the required category for the equipment. It is for the manufacturer (through the distribution chain if necessary) to supply a product which meets the purchaser’s specification and which is accompanied by all the necessary instructions to enable correct commissioning, operation and maintenance.

Where a product is being manufactured speculatively (i.e. not directly in response to a customer’s order), the manufacturer must fully specify all explosion safety aspects to enable a purchaser to make a correct selection.

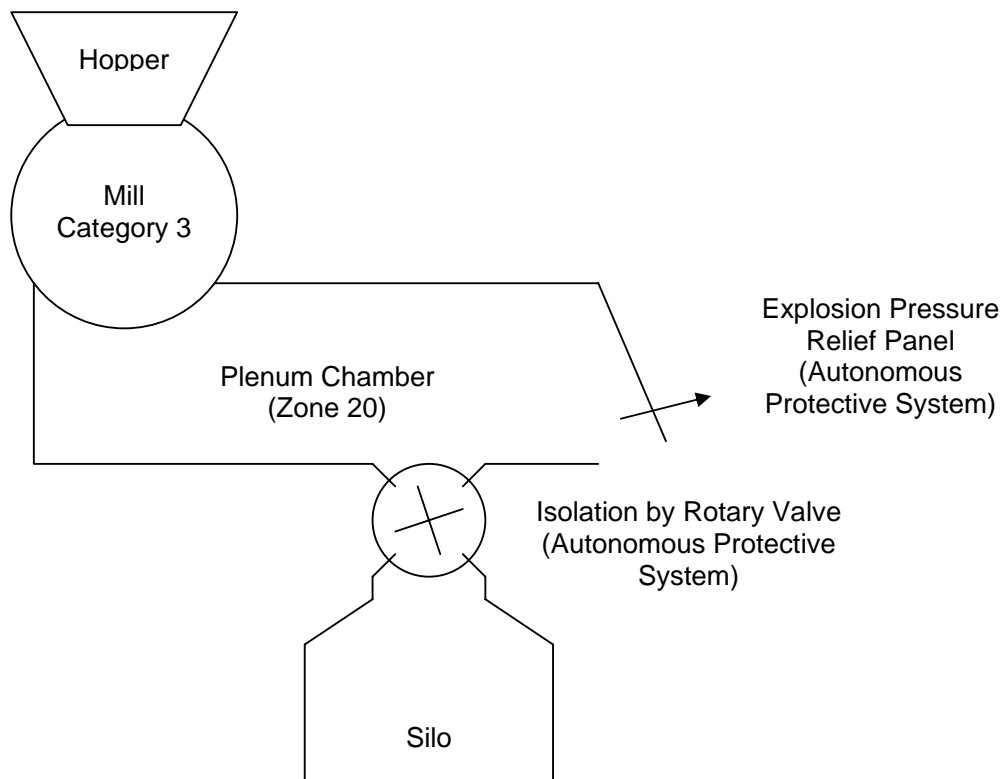
In constructing equipment, the manufacturer is positively guided down the route of using Harmonised Standards. A standard becomes harmonised when its reference is published in the OJEC. Harmonised versions of the well known electrical standards, published by CENELEC, have been available for a number of years. However, even by July 2003, CEN was still struggling to bring out final texts of the many non-electrical standards that are being written in support of the directive.

It is possible to declare compliance directly to the Essential Health and Safety Requirements (EHSRs) which are given in Annex II of the directive, but the level of technical justification required is so much higher that it is not a route to be taken lightly. For this reason, it has become normal to work to (and to quote compliance with) draft standards before they are published. This does present difficulties for manufacturers who may have difficulty knowing such standards exist, let alone getting hold of the most recent copies. Baseefa has been active on the CEN committees drafting these standards, so can work with manufacturers to make sure that they have the best advice available.

Baseefa has also been active on a small working group preparing advice for the European Commission’s Standing Committee which will discuss the subject of “inside” atmospheres at its next meeting in December 2003. The subject has arisen from many directions, but the draft advice takes as an example a typical powder mill. It is not normally practical to construct this in a way to totally rule out the possibility of ignition (for example through the ingestion of tramp metal), yet it produces a stream of ignitable dust which flows into

a collecting silo. The need is to minimise danger from an explosion in the mill and to ensure that it cannot propagate to the silo.

#### Non-Explosive Feedstock



Information on the integration of equipment to form an assembly is given in 3.7.1 of the “ATEX Guidelines” which can be downloaded from the European Commission web site at <http://europa.eu.int/comm/enterprise/atex/index.htm> Provided that a Notified Body has been involved in the conformity assessment of the two autonomous protective systems, the “assembler” can prepare the documentation for the Category 3 mill in accordance with the module “Internal Control of Production” and place with it an analysis that shows how the two protective systems have been integrated in accordance with their known limitations. Thus, it is not necessary to involve a Notified Body in the assessment of the complete assembly. However, if the protective systems do not have their own ATEX documentation, the manufacturer may declare the assembly as effectively Category 3 with respect to the external atmosphere (provided that the relief panel vents through a duct to a safe area), and Category 1 with respect to the interface to the silo (i.e. the internal atmosphere further down the process line). In this case, a Notified Body must be involved with conformity of the entire assembly.

This concept of “interfacing atmospheres” is being developed in some detail, to try and give practical advice that relates to the majority of processing plant.

The ignition risk assessment approach which is being developed in the CEN EN 13463 series of standards feels foreign to those who have worked with the electrical standards. In fact, this is because the assessment for electrical equipment is so simple that it does not need amplification: Electrical equipment is deemed capable of causing an ignition unless it is protected.

In contrast, it is not always obvious whether or not an ignition mechanism may be present in non-electrical equipment. Consider a quick acting solenoid valve. Is the swept volume of the plunger such that rapid movement can lead to compression ignition ?

It is recommended that the risk assessment examples given in the Annex to EN 13463-1 should be studied carefully to develop a feel for how the assessment is undertaken. Legally it is not enough to go with just a

gut feeling that an equipment has no ignition source; it is necessary to write down the thought process that led to that conclusion.

When making the Declaration of Conformity (DoC), there is a requirement to state the protective measures taken. Compliance with a harmonised standard just needs a reference to that standard. Compliance directly to the EHSRs requires a considerable amount of detail. There is nothing better to focus senior management's attention on a product, than the request for the signature on the DoC.

Similarly, the plant owner must also complete the ignition hazard assessment for the installation and this has to be signed off at an appropriate level.

Between the two directives, the intention is that the individuals responsible for safety should sign their names to the paperwork so that there is no argument where the buck stops, whether it is with the manufacturer or the installer.