



NON ELECTRICAL EQUIPMENT IN HAZARDOUS AREAS

The ATEX Directive embodies the European requirements for equipment used in potentially explosive atmospheres. It became mandatory on 30 June 2003.

Prior to the Directive it was only necessary to apply explosion safety principles to electrical equipment. Entirely non-electrical equipment was not considered, relying on 'Good Engineering Practice' to ensure that the ignition risk of hot surfaces or sparks would not occur.

In many countries, individual industry groups applied their own criteria for acceptance, making the movement of a product across international borders difficult. ATEX draws attention to the non-electrical hazards and requires a consideration of these with respect to explosion safety.



ATEX has two aspects - the equipment design and production phases. The requirements become more onerous as the level of risk

increases. The design phase groups products into categories:

Equipment Category 1 or M1

Equipment designed to ensure a very high level of protection, even in the event of an expected malfunction or rare malfunction.

Equipment Category 2 or M2

Equipment designed to ensure a high level of protection, even in the event of an expected malfunction.

Equipment Category 3

Equipment ensuring a normal level of protection.

EC-Type Examination

An EC-Type Examination Certificate, the 'design approval' is issued by a Notified Body. The certificate is not a requirement for all

Quality Assurance Notification (QAN)

A QAN certificate is issued by a Notified Body. The certificate, the most common choice, is not a requirement for all categories of non-electrical equipment.





Internal Control of Production

Internal control of production does not involve a Notified Body. It includes the maintenance of a Technical Documentation file and requires that the manufacturing process guarantees that the manufactured equipment is the same as that covered by the Technical Documentation.

Technical Documentation

In general, Technical Documentation includes:

- A general description of the product.
- Conceptual design and manufacturing drawings.
- Descriptions and explanations necessary to understand the drawings and operation of the equipment.
- A list of standards applied in full or in part and descriptions of solutions adopted where the standards have not been applied.
- Results of design calculations and examination carried out.
- Test Reports (if applicable).
- Declaration of Conformity.

The Technical Documentation for Category 2/M2 equipment must be submitted to a Notified Body for retention.

As a Notified Body, CSA Group can lodge the Technical Documentation for a flat-rate fee, as well as other services including checking and reviewing the documentation for completeness and correctness.

Assemblies of Electrical and Non-electrical Equipment

Non-electrical equipment may be supplied on a skid or as an assembly with electrical equipment. Provided the electrical equipment is suitably certified and installed, the manufacturer does not need additional certification for these items.

A good example is a CE marked, ATEX compliant flameproof motor attached to a mechanical pump or gearbox. When preparing the Technical Documentation, the motor, used as intended, does not need further assessment. i.e. there is a presumption of conformity.



The significant part of the Technical Documentation will concentrate on the non-electrical ignition sources of the pump.

See section 3.7.5 of the ATEX guidelines for more information regarding assemblies.





LEADING STANDARDS IN COMPLIANCE & SAFETY

Ignition Hazard Assessment

The ignition hazard assessment will identify sources of ignition and these can then be dealt with in turn, either through compliance with EN 13463-1 or through compliance with additional parts of that series of standards.

The main task is to establish the ignition risks that are present in normal operation (Category 3), or could be present under certain operating conditions on the equipment.

Examples of these could include an expected Malfunction (Category 2/M2) or rare malfunction (Category 1/M1). EN 13463-1 gives details of how the ignition hazard assessment should be carried out and worked examples in Annex B.

An expected malfunction could be the failure of a bearing or loss of oil in a gearbox. A rare malfunction could be the break up of an air circulation fan.

Some items of equipment will be designed to work across a boundary between zones. For example, a vessel might have a motor driven stirrer or pump where the ullage space in the vessel is Zone 0 and outside the vessel is Zone 1. These arrangements require special consideration to establish the appropriate requirements for each part.

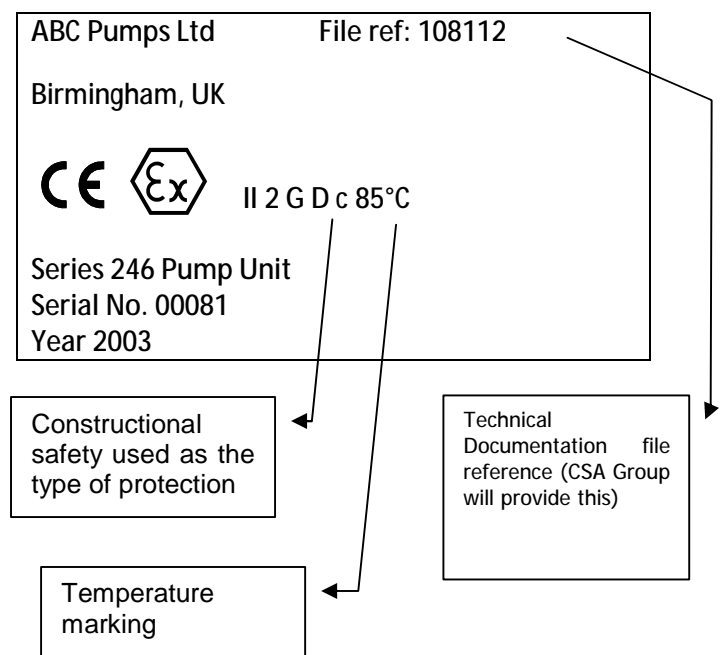
Ignition Sources

There are a number of 'concepts' designed to counter ignition sources that cannot be eliminated through compliance with EN 13463-1. The table below gives general details of the protective measures that can be applied.

Marking

The example below shows a label that might be applied to an item of Category 2 non-electrical equipment. The example equipment is suitable for potentially explosive gas (G) or dust (D) atmospheres, and uses constructional safety (designated 'c' by EN 13463-5) to reduce the risk of ignition sources becoming effective.

For details of marking requirements and examples, refer to EN 13463-1.



More Information

For further information please contact us.

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