



TECHNICAL PUBLICATION

ATEX CLASSIFICATION OF FILTER HOUSINGS

TP0011



FILTRATION SPECIALISTS

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1.0 Summary

All Amazon Filters standard vessels [except plastic & lined housings] meet the ATEX Directive 94/9/EC Protection level CE Ex II 2 GD c X, which makes them suitable for Zones 1, 2, 21 and 22. For Category 1 equipment (for use in Zones 0 and 20), please contact Amazon Filters for specific designs.

ATEX Directive 94/9/EC Protection Level is defined as:



II

2

GD

c

X

Surface Temperature determined by process (See Note below)

Protection type symbol indicates 'Constructional safety'.

Symbol Indicates that vessels can be used in Gas/vapour /mist and Dust atmospheres. (In a Group II Category 2 environment).

Category 2 (Zone 1, 2, 21 and 22) Equipment in this category can be used in areas in which explosive atmospheres caused by gases, vapours or air/dust mixtures are likely to occur.

Non-mining products Group II

Note: The surface temperature of the filter must not exceed the maximum working temperature for each particular vessel, and must not exceed 80% of the minimum ignition temperature of the gas atmosphere. For dust deposits the surface temperature must be 75°C less than the minimum ignition temperature of the dust layer.

2.0 Background

Explosive atmospheres can be caused by flammable gases, mists or vapours or by combustible dusts. If there is enough of the substance, mixed with air, then all it needs is a source of ignition to cause an explosion. Preventing releases of dangerous substances, and preventing sources of ignition are two widely accepted ways of reducing the risk, but in addition, using the correct equipment can greatly help in this.

'The Dangerous Substances and Explosive Atmospheres Regulations 2002' (DSEAR) place the duty on employers to eliminate or control the risks from explosive atmospheres in the workplace.

2.1 What is an explosive atmosphere?

In DSEAR, an explosive atmosphere is defined as a mixture of dangerous substances with air, under atmospheric conditions, in the form of gases, vapours, mist or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

Atmospheric conditions are commonly referred to as ambient temperatures and pressures. That is to say temperatures of -20°C to 40°C and pressures of 0.8 to 1.1 bar.

2.2 Where can explosive atmospheres be found?

Many workplaces may contain, or have activities that produce, explosive or potentially explosive atmospheres. Examples include places where work activities create or release flammable gases or vapours, such as vehicle paint spraying, or in workplaces handling fine organic dusts such as grain flour or wood.

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2.3 What is ATEX?

ATEX is the name commonly given to the framework for controlling explosive atmospheres, and standards for equipment used in them. It is based on the requirements of two European Directives.

- 1) **Directive 99/92/EC** (also known as 'ATEX 137' or the 'ATEX Workplace Directive') concerns the minimum requirements for improving the health and safety protection of workers potentially at risk from explosive atmospheres.
- 2) **Directive 94/9/EC** (also known as 'ATEX 95' or 'the ATEX Equipment Directive') concerns equipment intended for use in potentially explosive atmospheres. **Amazon Filters, as manufacturers of filter vessels, have therefore classified their standard product's Protection level, as laid down by this Directive.**

3.0 Classification of areas where explosive atmospheres may occur

Employers must classify areas where hazardous explosive atmospheres may occur, into zones. The classification given to a particular zone, and its size and location, depends on the likelihood of an explosive atmosphere occurring and its persistence if it does. Schedule 2 of DSEAR contains descriptions of the various classifications of zones for gases, vapours and dusts.

4.0 ATEX Zones

4.1 Hazard - Gas, Mists or Vapours

- **Zone 0** - A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is present continuously or for long periods.
Zone 1 - A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is likely to occur in normal operation occasionally.
Zone 2 - A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

4.2 Hazard - Dusts

- **Zone 20** - A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is present continuously, or for long periods or frequently.
Zone 21 - A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur in normal operation occasionally.
Zone 22 - A place in which an explosive atmosphere in the form or a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

It is a requirement of ATEX 137 that only certain categories of Group II ATEX certified equipment are used in specific Zones.

Zones 0 & 20	Category 1 Equipment only
Zones 1 & 21	Category 1 or 2 Equipment
Zones 2 & 22	Category 1, 2 or 3 Equipment

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5.0 Selection of equipment and protective systems

Areas classified into zones must be protected from sources of ignition. Therefore equipment intended to be used in zoned areas, should be selected to meet the requirements of the 'Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996'. Equipment already in use before July 2003 can continue to be used indefinitely provided a risk assessment shows it is safe to do so.

6.0 Equipment and protective systems intended for use in explosive atmospheres

The aim of Directive 94/9/EC is to allow the free trade of 'ATEX' equipment and protective systems within the EU by removing the need for separate testing and documentation for each Member State. The Regulations apply to all equipment intended for use in explosive atmospheres, whether electrical or mechanical.

Manufacturers and suppliers (or importers, if the manufacturers are outside the EU) must ensure that their products meet essential health and safety requirements and undergo appropriate conformity procedures. This usually involves testing and certification by a 'third-party' certification body (known as a Notified Body) but manufacturers and suppliers can 'self-certify' equipment intended to be used in less hazardous explosive atmospheres. Once certified, the equipment is marked by the 'EX' symbol to identify it as such.

Certification ensures that the equipment or protective system is fit for its intended purpose and that adequate information is supplied with it to ensure that it can be used safely.

7.0 ATEX Groups and Categories

Equipment and Products that fall within the scope of the Directive are divided into two Groups:

- **Group I** comprises equipment intended for use in mines, above and below ground.
- **Group II** comprise equipment intended for use in other locations endangered by explosive atmospheres.

Equipment and Products in each Group are divided into Categories based on the level of protection required. The categories are as follows:

Group I

- **Category M1** - Equipment in this category is required to remain functional with an explosive atmosphere present.
Category M2 - This equipment is intended to be de-energized in the event of an explosive atmosphere forming.

Group II

- **Category 1** - Equipment in this category is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists or by air/dust mixtures are present continuously, for long periods or frequently.
Category 2 - Equipment in this category is intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur.
Category 3 - Equipment in this category is intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are unlikely to occur or, if they do occur, are likely to do so only infrequently and for a short period only.

For more information about ATEX regulations see:-

<http://ec.europa.eu/enterprise/atex/direct/text94-9.htm>