

# FAQ Flame Arresters

## 1 What is a flame arrester?

A device fitted to the opening of an enclosure or to the connecting pipework of a system of enclosures and whose intended function is to allow flow but prevent transmission of a flame.

## 2 What is deflagration?

**Unconfined deflagration:** The flame occurs in the atmosphere outside a container or equipment. For example, a breathing or ventilation outlet from a tank storing gasoline may have a cloud of flammable vapour next to it. Ignition from such as a cigarette, static electrical discharge or lightning could ignite this vapour and the flame may attempt to enter the tank itself.

**Confined deflagration:** Usually the flame will occur in a pipeline and initially proceed at sub-sonic speed along the pipe. Typically this could occur in industrial or process plant. For example, many coal mines generate flammable and poisonous methane gas below ground which is pumped to the surface along a pipe and then burned in a boiler for heating purposes. Problems with the boiler or the pumping system could ignite the pipe contents and the flame could travel back below ground.

## 3 What is detonation?

**(Confined) detonation:** Usually this is referred to simply as a "detonation" and occurs where the flame travels along a pipe at sonic or even supersonic speeds and is combined with a shock wave. Typically this occurs where turbulence is induced in the mixture by roughness in the pipe walls or interruptions such as bends, valves or changes in section of the pipe, thus causing the flame to accelerate.

It can also occur simply by allowing the flame to continue to accelerate along a pipe. Such a flame rapidly stabilises and travels at sonic velocity. A shock wave is defined as a step change in pressure and density through which the flow velocity changes from being subsonic to supersonic.

## 4 What is an end-of-line flame arrester?

**End of line flame arresters** prevent flames from entering the pipe, and not (as is sometimes believed) from exiting the pipe. Without a weather hood, they may be mounted in almost any orientation but inverted mounting is not a good idea, as this increases the risk of heat being trapped and causing a burn-through. With a weather hood incorporated, they may be fitted in a conventional vertical orientation and be used outside exposed to rain and snow.

## 5 What is an in-line flame arrester?

**In-line flame arresters** are so called because they are located in the process line. If the flame could come from either direction then a bi-directional flame arrester is required. In-line flame arresters can be either deflagration or detonation arresters depending on the conditions under which they are to be used. Pipe orientation is usually not a problem unless liquid is entrained in the gas flow and would tend to collect in the arrester.

## 6 What type of flame arresters do I need?

Flame arresters generally come in three types: End-of-Line Deflagration, In-Line Deflagration and In-Line Detonation. For more information on Elmac's product range for these types of arresters go to the Product Overview page by visiting: [www.elmactechnologies.com/products/product\\_overview.html](http://www.elmactechnologies.com/products/product_overview.html)

## 7 Which model of flame arrester meets my requirements?

The End Of Line Flame Arrester and In-Line Deflagration & Detonation Arrester pages have selection tables to help you choose the product you need, with links to each of the product-specific pages. If you are not sure exactly which product meets your needs, please contact the Elmac Customer Services team.

For end-of-line Flame Arresters visit:

[www.elmactechnologies.com/products/endofline\\_arresters.html](http://www.elmactechnologies.com/products/endofline_arresters.html)

For In-Line Deflagration & Detonation Arresters visit:

[www.elmactechnologies.com/products/inline\\_arresters.html](http://www.elmactechnologies.com/products/inline_arresters.html)

## 8 What are the operating limits for a flame arrester?

The main constraints applying to the use of flame arresters are: operating temperature, operating pressure and run-up length. These are listed for each arrester on its product-specific page.

## 9 What material options do I have when selecting an arrester?

Elmac flame arresters are made from a range of traditional materials, such as carbon steel and stainless steel, as well as more advanced materials, such as aluminium and zinc alloys and Hastelloy. Not all materials are available for every arrester range, so check the product-specific pages for more details.

## 10 Can I request a particular paint specification?

Elmac carbon steel flame arresters are usually supplied painted as standard, however, other coating options can be provided including: offshore paint, galvanised, or PTFE-coated. The Customer Services team will do its best to meet any other coating requests you may have.

## 11 What connection options are available?

Connection options include: Flanged (ANSI 150 or PN 16), Female fixing (BSP/NPT) and Male fixing (BSP/NPT). Options vary according to arrester type, but if you have a particular requirement, please contact our Customer Services team.

## 12 Do Elmac arresters meet ATEX requirements?

Yes. Elmac Technologies has been independently assessed by a notified body against the requirements of the ATEX Directive 94/9/EC. Elmac flame arresters meet the criteria and are supplied with CE and EX markings, an EC Declaration of Conformity and an EC Type Examination Certificate.

## 13 So, is it flame arrester or flame arrestor?

According to the Oxford English Dictionary there is no 'correct' spelling as both versions are valid. Within the deflagration and detonation research and manufacturing community, the spelling 'arrester' is more prevalent, although according to Google, the spelling 'arrestor' is the more commonly used search term.

## 14 I still have more questions, who can I contact?

The Elmac Customer Services team is happy to answer any questions you have regarding the Elmac product range.

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