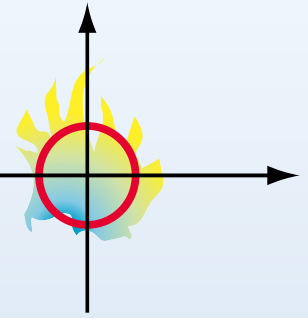
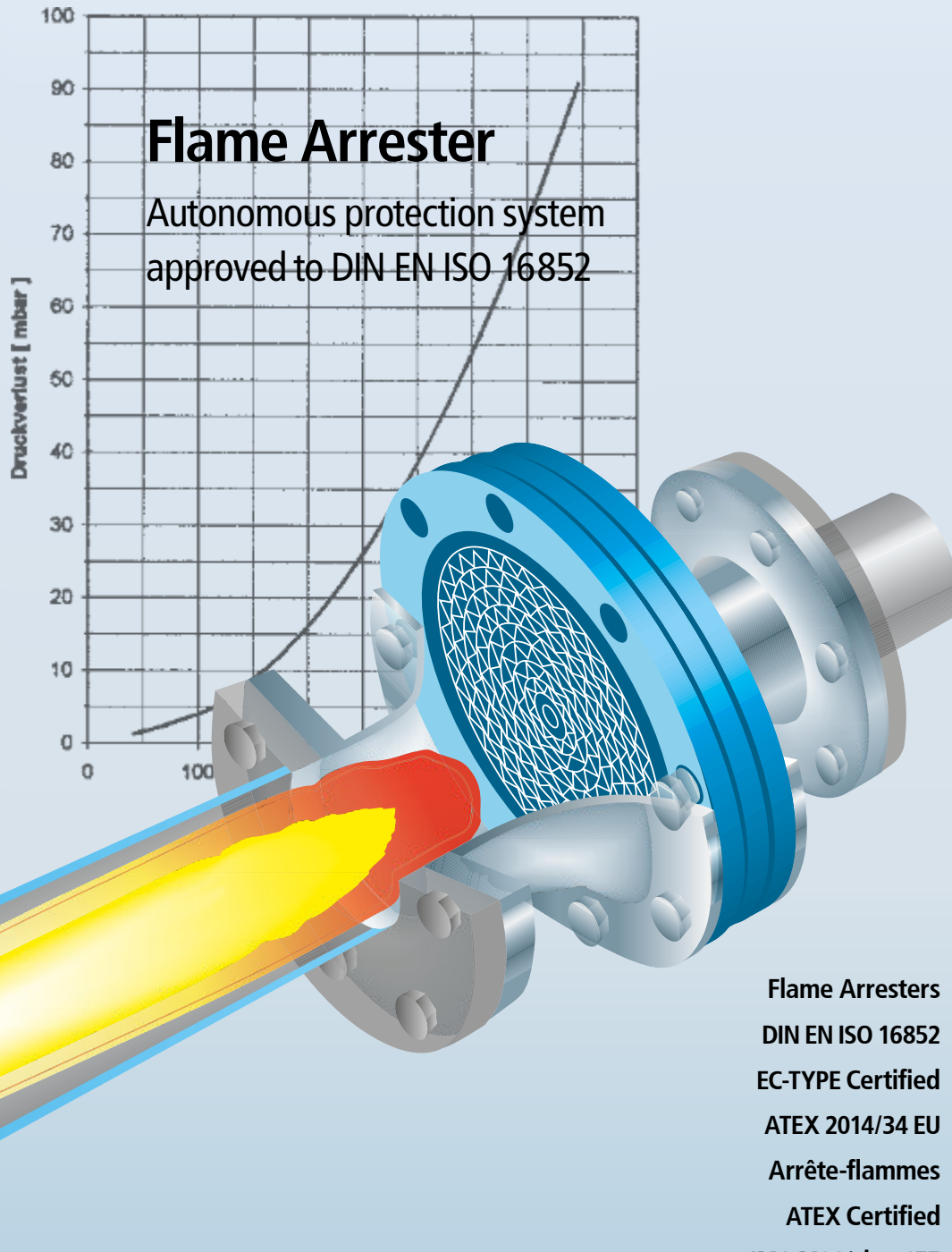


FLAMMER



Flame Arrester

Autonomous protection system
approved to DIN EN ISO 16852



Flame Arresters

DIN EN ISO 16852

EC-TYPE Certified

ATEX 2014/34 EU

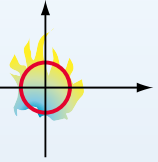
Arrête-flammes

ATEX Certified

IMO MSC/circ. 677

IMO MSC/circ. 1324/1325

Flow Straightener



Flame Arrester

A flame arrester is an autonomous protective system fitted to the opening of enclosures or to the connecting pipe work. The aim of a flame arrester is to allow flow but to prevent the transmission of flame.

In accordance to directive ATEX 2014/34/EU all autonomous protective systems (flame arresters) need a third party certificate. Approved and certified flame arresters have to be marked to ATEX directive 2014/34/EU.

To choose the right flame arrester depends on certain conditions e.g. temperature, operating pressure, pipe size, composition of used gas (explosion group), distance between potential source of ignition and flame arrester. Therefore, it is crucial to use flame arresters only for the conditions they have been designed and certified for. Due to the compact and lightweight design, it is possible to integrate the flame arresters into new and existing systems in a space-saving manner.

Biogas:

To avoid personal injury and property damages, tanks and sensitive system parts into which flames can blow in or out has to be protected through flame arresters. During fermentation of biomass, mainly methane (CH₄) is produced. Biogas air mixture is used as process gas in CHP to create electric power.

Uncontrolled ignition of biogas can injure workers and damage the biogas plant. In order to protect the system in case of an uncontrolled ignition, flame arresters are installed between the CHP and the gas mixer as well as under the flare.

Wood Gas:

Please consider that wood gas contains a great deal of hydrogen. Hydrogen belongs to a higher explosion group (IIC) than methane (IIA1). Consequently, it is not permitted to use flame arresters certified for methane for hydrogen gas.

Flame Arresters for Petrol Stations:

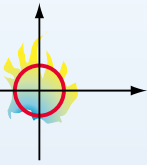
To avoid personal injury and property damages, tanks and sensitive system parts into which flames can blow in or out has to be protected. This is for example fulfilled if the openings are equipped with flame arresters.

If flame arresters at petrol station are to install depends on national regulation. We offer ATEX certified flame arresters for all currently known national guidelines.

Petrol or Diesel Ethanol Blends

The characteristic of petrol changes as soon mixed with ethanol. The flash point of petrol is at < -20°C and for ethanol at +12°C. Even with a small admixture of ethanol in petrol the flash point of the blend changes.

Flash point of diesel is >+55°C according to EN 590 and for ethanol at +12°C. Even with a small admixture of ethanol in diesel the ethanol vapours concentration over the diesel liquid will increase. With change of flash point the vapours are easier to ignite. Consequently, vapours of petrol ethanol or diesel ethanol blends are easier to ignite. Therefore, protection concept of petrol ethanol or diesel ethanol blend supply has to be reconsidered.



Our Goal

Company Flammer GmbH is based in Southern Germany and produces certified flame arresters and flow straightener. Our products are used for analysis, storage, measurement and transportation of gases. Flame arresters are approved to EN ISO 16852 through a notified body (3rd party) in accordance to ATEX Directive 2014/34 / EU – ATEX certificate.

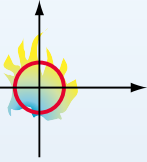
We are supplying high-quality products to our customers in and outside Germany since 1997. As OEM supplier of flame arresters and flow straighteners, we have successfully developed cost-efficient solutions that meet the very high safety and engineering standards of our customers. Our goal is to provide high quality products and to find the best possible technical and cost-efficient solution in close cooperation with our customers.

Customer Satisfaction

The certified small sized flame arresters are especially designed for low pressure drop and easy to maintaining/cleaning. This space saving device makes installation in new and existing plants easy. You can choose from our range of inline deflagration flame arresters approved for short time burning and endurance burning or inline detonation-, liquid- product and end of line flame arresters. All flame arresters are available in stainless steel AISI 316, Hastelloy or in carbon steel, zinc plated and passivated.

Due to the compact and lightweight design, it is possible to integrate the products into new and existing systems in a space-saving manner. Flame arresters tested for short-time and endurance burning are available as well as liquid product flame arresters.

Due economic and technical requirements or the lack of space, installation of standard products is not always feasible. In more than 25 Years we have implemented extensive customized solutions in close cooperation with our customers. If you are interested in specific solutions for flame arresters or flow straightener for fluids or gases, feel free to contact us.

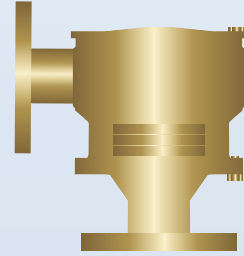


Products

17

Flame Arrester as Elbow Type (90°)

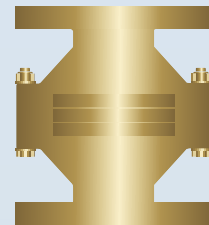
The Elbow type (90°) design of inline detonation flame arrester saves a pipe bend compared to the concentric or eccentric design and allows easy access to the flame arrester element during maintenance.



2

Flame Arrester Concentric

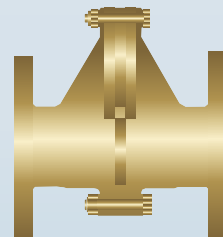
If explosive gas ignites e.g. in a pipe, a deflagration (explosion) is triggered. If a flame front runs through a pipe, the flame speed increases with the pipe length. Up to a certain pipe length / pipe inner diameter ratio, the flame propagates at subsonic speed. If this length is exceeded, the flame accelerates from subsonic to supersonic speed. In order to stop a flame from propagating at supersonic speed, flame arresters tested as inline detonation flame arresters are required.



3

Flame Arrester Eccentric

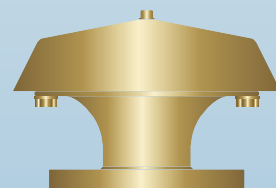
Compared to the concentric design, the eccentric design allows condensate to drain off and allows easy installation in places where the installation is close to the floor or a wall.

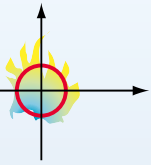


4

Flame Arrester for Atmospheric Explosion (Deflagration)

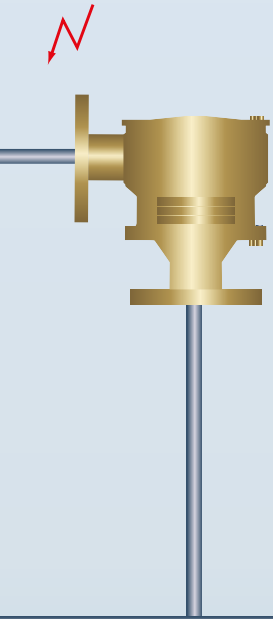
End of line deflagration flame arrester is fitted at the end of vent line. Even at a small pressure difference between storage tank and atmosphere, gas, steam or aerosol escapes through the vent. If this gas, vapor or aerosol is ignited, then flame will propagate through the vent line into storage system. End-of-line deflagration flame arresters stops flame propagation at atmospheric explosion before flame enters into the storage tank.





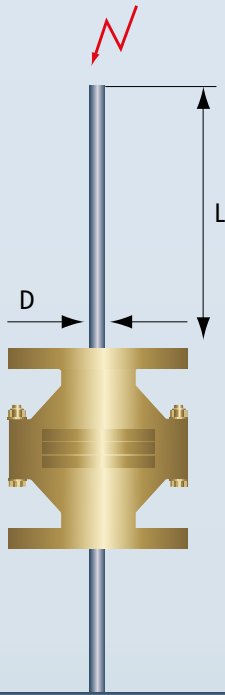
1

Flame Arrester
as Elbow Type (90°)



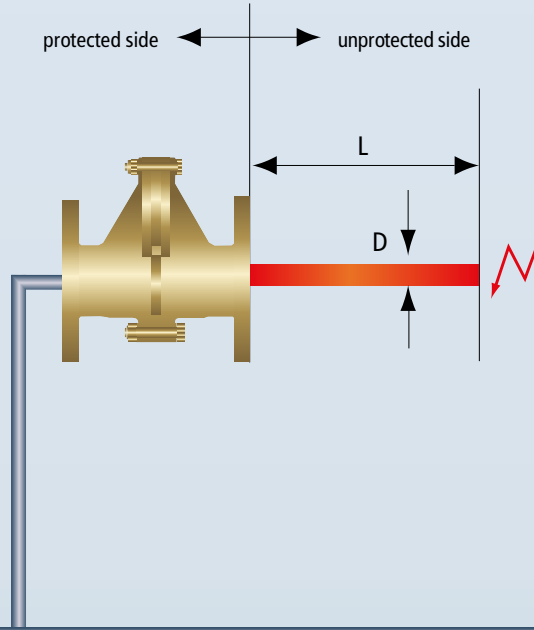
2

Flame Arrester
Concentric



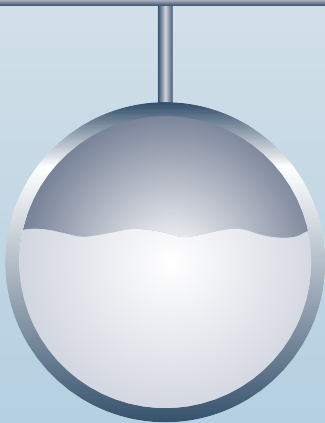
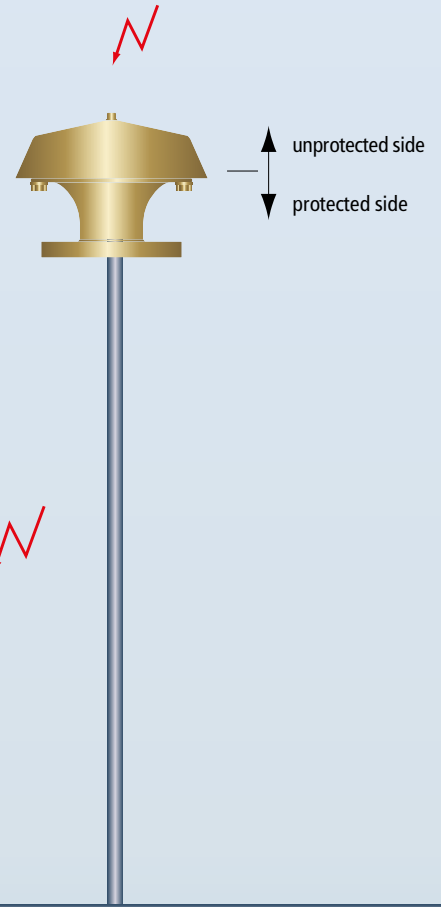
3

Flame Arrester
Eccentric



4

Flame Arrester
for Atmospheric Explosion (Deflagration)



$L < 50 * D =$ Deflagration
subsonic speed

$L > 50 * D =$ Detonation
supersonic speed

(valid for explosion group A1, IIA, IIB1, IIB2 and IIB3)

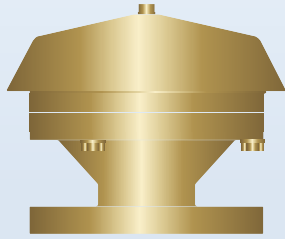
$L < 30 * D =$ Deflagration
subsonic speed

$L > 30 * D =$ Detonation
supersonic speed

(valid for explosion group IIB and IIC)

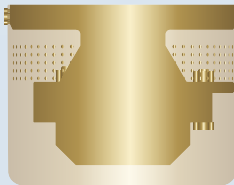
L = distance between source of ignition and
flame arrester

D = Pipe inside diameter between
potential source of ignition and
flame arrester



5 End of Line Flame Arrester for Endurance Burning

In case of overpressure in storage tank, gas, vapor or aerosol escapes through vent to atmosphere. In case gas, vapor or aerosol mixture is ignitable then a flame will burn on the top of the vent as long (endurance burning) as the pressure in storage tank is higher than atmospheric pressure. As soon gas flow ends or the storage tank pressure is nearly atmospheric, then the flame will propagate in direction to the storage tank. End of line deflagration flame arrester tested for endurance burning prevents the flame from striking the storage tank when the gas flow decreases, despite the heating caused by the fire. To prevent unnecessary heating up of the flame arrester the rain cover removes automatically after a short time. After the flame will burn as long as the overpressure in the system supplies gas.



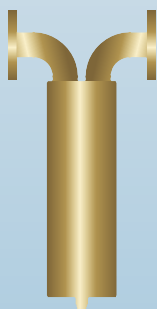
6 Foot Valve – End of Line Liquid Product Flame Arrester

Foot valve flame arrester prevents light-back at deflagration and stable detonation of potentially explosive vapor-air, and or gas-air mixtures in a pipe that is located upstream of the ignition source. Foot valve flame arrester is installed inside the storage tank at end of suction line. Foot valve flame arrester has two functions. At first, the tank is protected in case of flame propagation from pump side to the tank through the liquid in the strainer and second the liquid column is preserved by the integrated check valve.



7 End of Line Liquid Product Detonation Flame Arrester

End of line liquid product detonation flame arrester is installed inside the storage tank at end of supply line. The liquid product is used as a flame arresting medium, in order to prevent flame transmission of a detonation or deflagration. If the supply line to the storage tank is not constantly filled with product, an ignitable mixture can accrue. In case of ignition, the end of line liquid product detonation flame arrester is approved to stop the flame propagation. The End of line liquid product detonation flame arrester only works after total filling with the actual used liquid product for storage or transport. It is only usable for filling applications. Usage for e.g. siphoning is not permitted.

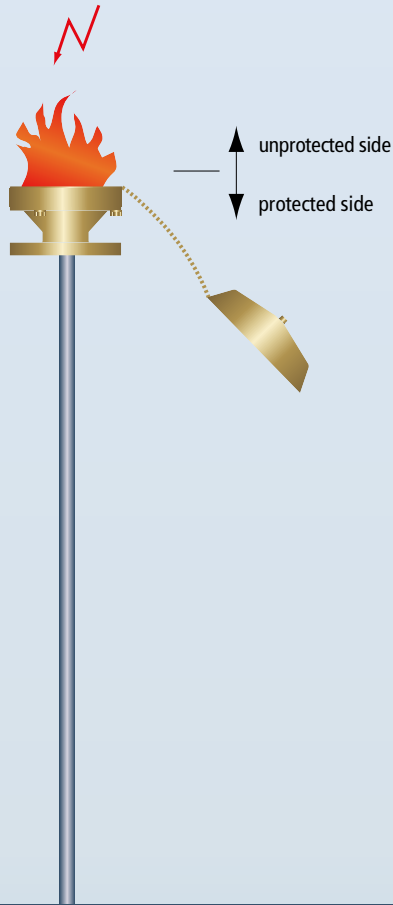


8 Inline Liquid Product Detonation Flame Arrester

Flame arrester in which the liquid product is used as a flame arresting medium, in order to prevent flame transmission of a detonation or deflagration. If the supply line to the storage tank is not constantly filled with product, an ignitable mixture can accrue. In case of ignition, the inline liquid product detonation flame arrester is approved to stop the flame propagation. The inline liquid product detonation flame arrester is only usable for filling applications and works after total filling with the actual used liquid product for storage or transport. It is to ensure, that the inline liquid product detonation flame arrester always remains filled.

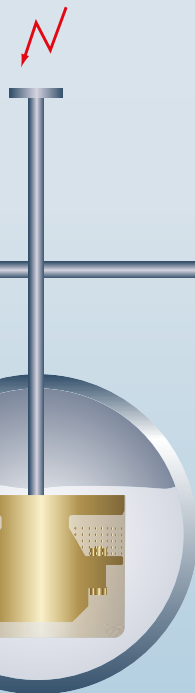
5

End of Line Flame Arrester for Endurance Burning



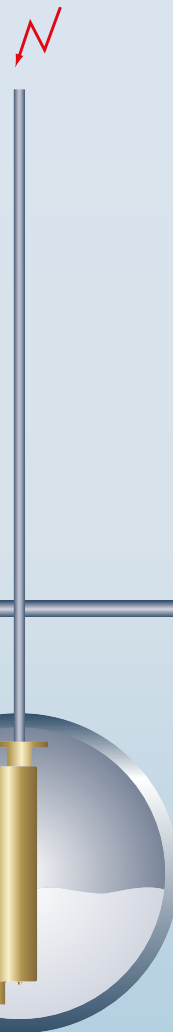
6

Foot Valve – End of Line Liquid Product Flame Arrester



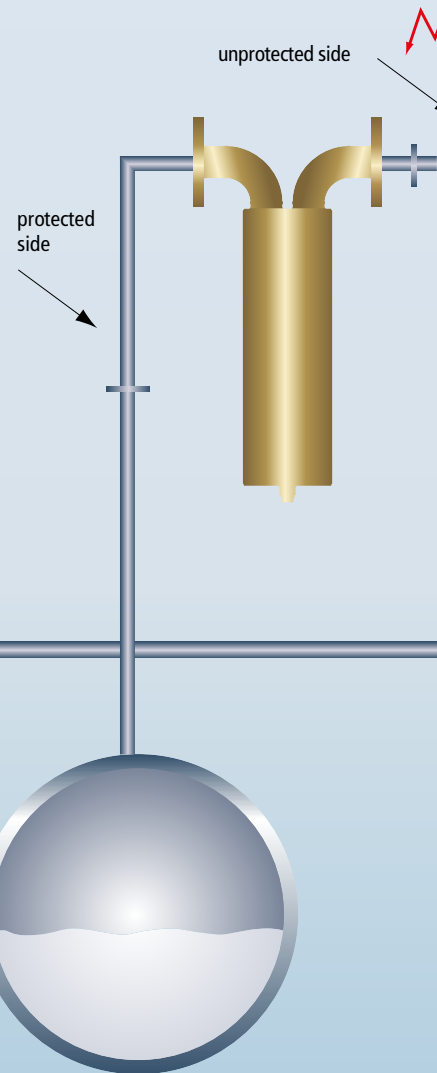
7

End of Line Liquid Product Detonation Flame Arrester



8

Inline Liquid Product Detonation Flame Arrester





THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

DQS Holding GmbH has issued an IQNet recognized certificate that the organization

Flammer GmbH

Daimlerstraße 3
74389 Cleebrom
Germany

has implemented and maintains a **Quality Management System**.

for the following scope:
Development, production and sales of protective systems and explosion protected safety devices

which fulfills the requirements of the following standard:

ISO 9001 : 2015

Issued on: 2025-11-27
Expires on: 2025-11-27

This attestation is directly linked to the IQNet Partner's original certificate and shall not be used as a stand-alone document.

Registration number: DE-266837 QM15



Alex Stuchlik
President of IQNet

Michael Drechsel
Managing Director of
DQS Holding GmbH



IQNet Partners:

ADMOR Spain AFNOR Certification France ANPCER Portugal CQC China CIBG Italy
CQC China CQM China CQS Czech Republic CxI Cert Canada DQS Holding GmbH Germany SAGLE Certification Group USA
TQAV Brasil FONDQ/QRMA Universidad ICAATEC Colombia Inspektei Sertifikasi Di Pulau Jawa ANTECO Costa Rica
IRAW Argentina JQA Japan KPC Korea MBTEC Greece NSZT Hungary Nankas AS Norway RSM Ireland
NYCE-USA Mexico PQC Poland Quality Australia Australia IRI Russia SII Israel SIO Slovenia
SIRIM QAS International Malaysia SGS Switzerland SRAC Romania TEST SI Petersburg Russia TSE Turkey TÜRK Sertifikasyon
* The list of IQNet partners is valid at the time of issue of this certificate. Update information is available under www.iqnet-certification.com



NOTIFICATION

OF CONFORMITY TO TYPE BASED ON
QUALITY ASSURANCE OF THE PRODUCTION PROCESS
(Translation)

- (1) Equipment or protective systems or components intended for use in potentially explosive atmospheres - Directive 2014/34/EU
- (2) Notification number: PTB 03 ATEX Q005-6
- (3) Notification number: flame arrestor, fittings and components in the decisive type of protection "1"
- (4) Product group(s): The list of products covered by this notification is held as a separate list under the responsibility of the Notified Body.
- (5) Manufacturer: Flammer GmbH
Daimlerstr. 3, 74389 Cleebrom, Germany
- (6) Manufacturing locations: Flammer GmbH
Daimlerstr. 3, 74389 Cleebrom, Germany
- (7) The Physikalisch-Technische Bundesanstalt (PTB), Notified Body No. 0102 for Annex IV in accordance with Article 21 of the Council Directive 2014/34/EU of February 26, 2014 notifies to the applicant that the manufacturer has a production quality system which complies with Annex IV of the Directive. This quality system in compliance with Annex IV of the Directive also meets the requirements of Annex VII, CONFORMITY TO TYPE BASED ON PRODUCT QUALITY ASSURANCE.
- (8) This notification is based on audit report No. 20-20141, issued on December 10, 2020. This notification is valid until February 26, 2024 and can be withdrawn if the manufacturer no longer satisfies the requirements of Annex IV.
- (9) Results of periodical reassessments of the quality system are part of this notification. According to Article 15 (3) of the Directive 2014/34/EU the CE mark shall be followed by the identification number 0102 of PTB as the Notified Body involved in the production control stage.

Konformitätsbewertung des Herstellers für Explosionschutz
On behalf of PTB: Braunschweig, January 20, 2021



Sheet 1/1

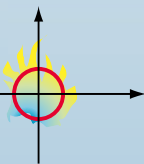
Notifications without signature and official stamp shall not be valid. This notification may only be reproduced in the entirety and without any change. Changes or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.
Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38110 Braunschweig • GERMANY

Flammer GmbH - certified according to ISO 9001 : 2015 based in Southern Germany is a manufacturer of flame arresters and flow straightener.

You can reach us:



FLAMMER



Official Supplier



FCE

TECHNICAL SERVICES