

[1] **EC-TYPE EXAMINATION CERTIFICATE**

according to Directive 94/9/EC, Annex III

- Translation -



[2] Equipment and Protective Systems intended for use  
in Potentially Explosive Atmospheres, **Directive 94/9/EC**

[3] EC-Type Examination Certificate Number: **IBExU15ATEX2060 X**

[4] Protective system: **In-line detonation flame arrester**  
GROTH Type 7658B-DN

Connection size DN (inch)	Connection size DN (mm)	Element size (inch)	Element size (mm)	Operating pressure p <sub>o</sub> up to bar absolute / PSIA
8"	200	16"	400	1.08 / 15.7
10"	250	20"	500	1.08 / 15.7
12"	300	24"	600	1.08 / 15.7

[5] Manufacturer: Groth Corporation

[6] Address: 13650 North Promenade Blvd.  
Stafford, TX 77477  
USA

[7] The design of the protective system mentioned in [4] and any acceptable variation thereto is specified in the schedule to this EC-Type Examination Certificate.

[8] IBExU Institut für Sicherheitstechnik GmbH, NOTIFIED BODY number 0637 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that the protective system mentioned in [4] has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.  
The test results are recorded in the Test Report IB-12-2-139/2 of 22 August 2013.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN ISO 16852:2010 and EN 1127-1:2011.

[10] If the sign "X" is placed after the certificate number, it indicates that the protective system is subject to special conditions for safe use specified in [17] in the schedule to this EC-Type Examination Certificate.

[11] This EC-Type Examination Certificate relates only to the design and construction of the specified protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this protective system.

**IBExU Institut für Sicherheitstechnik GmbH**  
An-Institut der TU Bergakademie Freiberg

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[12] The marking of the protective system mentioned in [4] shall include the following:


 **G IIA**

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Fuchsmühlenweg 7 - 09599 Freiberg, Germany  
☎ +49 (0) 3731 3805-0 - 📠 +49 (0) 3731 23650

Authorized for certifications  
- Explosion protection -

Freiberg, 14 April 2015

By order

  
(Dipl.-Ing. Willamowski)



Certificates without signature and seal are not valid.  
Certificates may only be duplicated completely and unchanged.  
In case of dispute, the German text shall prevail.

**Schedule**

[13]

**Schedule**

[14] **to the EC-TYPE EXAMINATION CERTIFICATE IBExU15ATEX2060 X**

[15] **Description of the protective system**

The in-line detonation flame arresters of the type 2 (without restriction on the protected side) of the type mentioned in [4] are used to prevent a flame transmission at unstable detonations as well as deflagrations of flammable gas- and/or vapour/air-mixtures of the Explosion Group IIA, MESG > 0.90 mm, at a maximum operating pressure of 1.08 bar absolute / 15.7 PSIA and an operating temperature of the flame arrester up to 60 °C, in a pipe.

The in-line detonation flame arresters of the type mentioned in [4] consist essentially of two concentric, detonation pressure-proof housing parts with connecting flanges and a flame arrester element, which is installed between the housing parts, in order to prevent a flame transmission. The flame arrester element consists of six filter discs. The filter discs are fixed in an enclosing cage. They are constructed of a crimped and a flat ribbon of stainless steel. The superimposed ribbons with a width of 25.4 mm and a thickness of 0.076 mm (crimped ribbon) and 0.127 mm (flat ribbon) are spirally rolled on top of each other in compact layers. In this manner, triangular channels with a height of 0.46 mm are formed. Through these channels the gas- and/or vapour/air-mixtures can flow. A flame transmission must be prevented.

A wire spacer (Wire mesh .0140[0.356] Wire Dia. Mesh count 24 x 24, two-layer) keeps the filter discs separately from each other on a distance of 1.3 mm.

The In-line detonation flame arresters of the type mentioned in [4] are equipped with one or two temperature sensor(s) (temperature sensor type P/N 93219005, thermocouple type K in a protective tube) for the detection of a burn on the flame arrester element. The temperature sensor(s) must trigger emergency functions in accordance with the requirements of EN ISO 16852:2010.

The constructive design, the materials used and the dimensions of the in-line detonation flame arresters are specified in the Test Report IB-14-2-067 of 11 April 2015.

[16] **Test Report**

The test results are recorded in the Test Report IB-14-2-067 of 11 April 2015.

**Summary of the results:**

The model of the in-line detonation flame arresters of the type mentioned in [4], which was submitted for the examination, has in tests carried out in accordance with EN ISO 16852:2010 with a test mixture of the Explosion Group IIA (propane/air-mixture, safe gap of  $0.94 \pm 0.02$  mm) prevented a flame transmission at unstable detonations as well as deflagrations (initial conditions: pressure before ignition  $p_{TB} = 1.08$  bar absolute and normal ambient temperature).

The model of the in-line detonation flame arresters of the type mentioned in [4], which was submitted for the examination, has in tests carried out in accordance with EN ISO 16852:2010 with a test mixture of the Explosion Group IIA (propane/air-mixture, safe gap of  $0.94 \pm 0.02$  mm) prevented a flame transmission also at short time burning of  $t_{BT} = 20$  min (initial conditions: atmospheric pressure and normal ambient temperature).

In accordance with EN ISO 16852:2010 and in compliance with chapter [17] the in-line detonation flame arresters of the type mentioned in [4] can be used as in-line detonation flame arresters of the type 2 pursuant to EN ISO 16852:2010 under atmospheric conditions (maximum permissible temperature of the flame arrester of 60 °C) as well as up to a maximum permissible operating pressure as per table in [4] for the protection against unstable detonations, deflagrations and short time burning on the flame arrester element of explosive gas- and/or vapour/air-mixtures of the Explosion Group IIA, MESG > 0.90 mm.

If the integrated temperature sensor(s) indicate(s) a thermal load of the flame arrester, an emergency function must be released within  $0.5 \cdot t_{BT}$ . Either the further gas flowing through the flame arrester must be stopped or inert gas must be released upstream of the flame arrester for extinguishing the flame.

It is possible to use temperature sensors made by other manufacturers for the temperature sensors, if their measuring characteristics are identical with the measuring characteristics of the temperature sensor used during testing and if the electrical explosion protection provided by the applied temperature sensors is suitable for the given respective conditions at which the flame arrester will be operating.

**Test documents**

The test documents are listed in the Test Report IB-14-2-067 of 11 April 2015.

**[17] Special conditions for safe use**

1. Routine check

The manufacturer is obliged to carry out routine checks in accordance with EN ISO 16852:2010. The manufacturer must guarantee by means of a routine check of each in-line detonation flame arrester that

- a) the dimensions, fits and materials used as well as the number of screws correspond to the submitted drawings,
- b) the flame arrester is designed in accordance with the submitted drawings,
- c) all parts are manufactured from faultless materials,
- d) welded connections are faultless,
- e) the flame arrester is tested on mechanical resistance and tightness.

2. Restriction of use

The in-line detonation flame arresters of the type mentioned in [4] may only be used if their materials resist the mechanical and/or chemical effects and corrosion, under the respective operating conditions, so that the explosion protection is always maintained. This applies particularly to the filter discs of the flame arrester element, whose protection against flame transmission can be compromised by corrosion among others.

It is pointed out that the in-line detonation flame arresters of the type mentioned in [4] are not tested on safety against flame transmission in case of a stabilized burn on the flame arrester element for an unspecified time (endurance burning).

The specifications in the operating manual - Installation, Operation & Maintenance Model 7658B Detonation Flame Arrester, IOM-7658B of 15 November 2014 are valid.

3. Installation instruction

The in-line-detonation flame arresters of the type mentioned in [4] must be installed in accordance with the specifications in the checked operating manual - Installation, Operation & Maintenance Model 7658B Detonation Flame Arrester, IOM-7658B of 15 November 2014.

The potential ignition source must be located on the unprotected side (installation side of the temperature sensor). When installed in a horizontal mounting position, the temperature sensor must be directed upwards (connection side in twelve o'clock position).

4. Inspection

The operating company is obliged to adhere to the specifications in the operating manual - Installation, Operation & Maintenance Model 7658B Detonation Flame Arrester, IOM-7658B of 15 November 2014 with regard to inspections of the in-line detonation flame arresters in regular intervals.

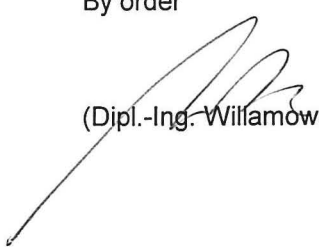
The manufacturer is obliged, pursuant to EN ISO 16852:2010, sec. 11.2, to label each in-line detonation flame arrester and to enclose a correct documentation with each in-line detonation flame arrester.

**[18] Essential health and safety requirements**

Confirmed by compliance with standards (see [9]).

By order

Freiberg, 14 April 2015

  
(Dipl.-Ing. Willamowski)