CLASSIFICATION:
The Protectoseal 670E Series Flame Arresters are classified as End-of-Line Deflagration Flame Arresters. They are suitable for arresting an unconfined deflagration propagating into a vessel or enclosure. The markings on the arrester identify restrictions concerning the use of a specific arrester with respect to gas/vapor group and maximum operational temperature/pressure.

OPERATIONAL LIMITS:
The Protectoseal Series 670E Flame Arresters are suitable for use under the following limitations:

- Materials may include aluminum, carbon steel or stainless steel
- Maximum Operational Temperature = 60°C (140°F)
- Maximum Operational Pressure = 1.1 bar (15.9 PSIA)
- Explosion Group (Ex. G.) = As marked on the arresters:
  - Group IIB 3 or Group IIA
- Not for use in stabilized burning situations

MARKINGS:
Each Protectoseal 670E Series Flame Arrester includes two labels: an Identification Label and a Warning Label.

Identification Label

Warning Label

The Warning Label indicates that limitations to the installation and application criteria for the arrester exists and identifies type designation according to ISO 16852.

<table>
<thead>
<tr>
<th>DEF</th>
<th>Lw/D = n/a</th>
<th>BC: c</th>
<th>Tο = 60°C</th>
<th>pο = 1.1 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex.G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Identification Label includes:
1. SIRA certificate number
2. Deflagration arrester and gas/vapor explosion group designation
3. Burn time designation
4. Maximum operational temperature
5. Maximum operational pressure
6. Model number and unique serial number
7. Standards designations
8. SIRA identification number

CAUTION:
If any questions arise concerning the proper installation or maintenance of our products, please contact Protectoseal or one of our Authorized Representatives.

When installing any Protectoseal device, the legal, corporate and advisory safety regulations and procedures appropriate for the specific installation site must be fully understood and followed.
**IN STALLATION PROCEDURE:**

1. Check carefully to insure that no packing materials remain on or inside the arrester housing or element.
2. Make sure that the wing nuts mounting the weatherhood to the housing are hand tightened securely.
3. Mount the arrester to the appropriate end-of-line, outlet connection using thread sealant or gasket compatible with service conditions.
4. Arrester should be located at least 0.3 metres (1 foot) from equipment or structure that could impede access to the arrester or impair flow through the device.

**MAINTENANCE:**

Protectoseal recommends that our products be inspected and maintained according to the normal maintenance schedule of the facility. At a minimum, maintenance should be conducted annually. More frequent maintenance may be required, and should be scheduled, for unusual service conditions.

**CAUTION:** When maintaining any Protectoseal device, the legal, corporate and advisory safety regulations and procedures appropriate for the specific installation site must be fully understood and followed.

**CAUTION:** Tank vapor space pressure or vacuum should be relieved before any maintenance operations are undertaken.

**MAINTENANCE PROCEDURE:**

1. Loosen the wing nuts on the weatherhood. Remove the weatherhood to expose the flame arrester element.
2. The arrester element assembly consists of a series of circular plates, separated by precise embossed teats or spacers.
3. Inspect the arrester assembly. The passages between the individual plates should be even and clear of debris. Blow out any loose dirt or foreign material. If necessary, the arrester assembly may be removed from the tank and immersed in a suitable solvent to remove gums and deposits.

**CAUTION:** Do not remove plates from stud. Do not bend plates. Contact Protectoseal if any questions arise.

4. If plates are damaged or if spacing between plates is uneven, the arrester should be removed from service immediately and replaced.
5. Reinstall weatherhood and secure by hand tightening the wing nuts.
The Protectoseal Company
EU Declaration of Conformity

Manufacturer:  The Protectoseal Company
225 Foster Avenue
Bensenville, IL 60106
USA

Quality Assurance Notification Certificate Number:
SIRA 10 ATEX M458 issued by
SIRA Certification Service (CSA Group Testing U.K Ltd)
(Notified Body No. 0518)
Unit 6 Hawarden Industrial Park
Hawarden
Deeside
CH5 3US, UK.

The Protectoseal Company herewith declares that the equipment detailed below is in conformity with the applicable provisions of the ATEX Directive 2014/34/EU and has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

Equipment: Type 670E Range of End-of-Line Flame Arresters
EC Type Examination Certificate #SIRA 09ATEX9196X issued by SIRA Certification Service (CSA Group Testing U.K Ltd) (address as listed above) – Notified Body No. 0518, in accordance with Article 17 of Directive 2014/34/EU.

Applied Standards/Marking:

![ISO 16852:2016](image)

Michael Collins
Engineering Manager– Engineering
Document Number: SPEC-670E Revision: 9
Issue Date: March 7th 2019
OBJECTIVE
The Series 670E Flame Arresters are designed to provide flame stopping protection for a tank’s vapor space when mounted to the end of a tank nozzle leading directly to atmosphere. Maximum operating pressure is 1.1 bara (15.9 PSIA). The arresters prevent a flame front generated by an unconfined deflagration occurring outside the tank from propagating into the vapor space. Arresters are not for use in stabilized burning situations.

VAPOR GROUPS
The arresters as designated by model number, are intended for use with vapors equivalent to International Electrotechnical Commission Explosion (IEC) Groups IIB3 or IIA, National Electric Code (NEC) Group C or D.

TECHNIQUE
The arrester is mounted on the end of a vent pipe from the tank. Vapors are allowed to escape into the atmosphere and air can be drawn into the tank through the specially designed flame arrester grid assembly. If an ignition source outside the tank is encountered, the flame arrester provides protection for the tank contents.

SPECIAL FEATURES
Easy Inspection, Installation and Maintenance. Design and light weight of unit permit easy, convenient handling for inspection, installation and maintenance. The weatherhood is readily removable by loosening just a few wing nuts.

Automatic Condensate Drainage. Vertically mounted, circular plate-type flame arrester is employed for self-drainage of condensate. This prevents accumulation of condensate subject to freezing and consequent clogging of the arrester under low temperature conditions.

Positive Flame Arresting. The Series 670E employs a precisely-spaced, circular plate type flame arrester to protect tank contents by preventing the propagation of fire into the tank. Precision embossings or spacers provide correct gaps for flame arresting function. Plates are fabricated from heavy gauge stainless steel to resist distortion and bending.

Sizes Available. DN 25 (1”), DN 50 (2”), DN 80 (3”) and DN 100 (4”) and DN 150 (6”). Please refer to dimension chart on reverse for flange connection options.


PRO-FLOW® Sizing and Selection Software. Use PRO-FLOW® to calculate flame arrester flow requirements in accordance with API 2000, ISO 28300, NFPA 30 and OSHA 1910.106.

Quality Assurance. Each unit is inspected to meet Protectoseal’s high standards prior to shipment.

CONSTRUCTION
A comprehensive range of materials is offered as shown in the chart below.

Available Options.

<table>
<thead>
<tr>
<th>Series</th>
<th>Body</th>
<th>Hood</th>
<th>Nipple/Flange</th>
<th>Flame Arrester Grid Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>A670E</td>
<td>Aluminum</td>
<td>316 SS.</td>
<td>Aluminum</td>
<td>316 SS.</td>
</tr>
<tr>
<td>F670E</td>
<td>316 SS.</td>
<td>316 SS.</td>
<td>316 SS.</td>
<td>316 SS.</td>
</tr>
<tr>
<td>S670E</td>
<td>Steel</td>
<td>316 SS.1</td>
<td>Steel</td>
<td>316 SS.</td>
</tr>
</tbody>
</table>

Please refer to charts on reverse for ordering options. Note 1: Hood on 6" size is constructed of Steel.
Specifications

Series 670E
End-of-Line Deflagration Flame Arrester

SERIES 670E PART NUMBERING SYSTEM

<table>
<thead>
<tr>
<th>Digit #</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Material</td>
<td>671E10-9</td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>Series No.</td>
<td>67</td>
</tr>
<tr>
<td>4</td>
<td>Size</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>Type</td>
<td>E</td>
</tr>
<tr>
<td>6</td>
<td>Connection</td>
<td>FNPT</td>
</tr>
<tr>
<td>7</td>
<td>Flange / Nipple</td>
<td>None</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>Vapor Group</td>
<td>C</td>
</tr>
</tbody>
</table>

**DN 25 (1”), DN 50 (2”), DN 80 (3”) & DN 100 (4”) Sizes**

- Connection: ANSI DIN 16 PN RF Flange
- Material: Aluminum Body, 316 S.S. Element & Hood
- Type: E
- Flange / Nipple: None
- Vapor Group: C

**DN 150 (6”) Size**

- Connection: ANSI DIN 16 PN RF Flange
- Material: Aluminum Body, 316 S.S. Element & Hood
- Type: E
- Flange / Nipple: None
- Vapor Group: C

**DIMENSIONS**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Connection</th>
<th>Ht</th>
<th>Dia. A</th>
<th>Dia. C</th>
<th>B.C.</th>
<th>Dia. E</th>
<th>Holes N</th>
<th>Type Approval</th>
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<tbody>
<tr>
<td>671E10-9</td>
<td>1&quot;</td>
<td>-</td>
<td>73mm</td>
<td>80mm</td>
<td>16mm</td>
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<tr>
<td>671E2</td>
<td>- 1&quot;</td>
<td>-</td>
<td>112mm</td>
<td>85mm</td>
<td>14mm</td>
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<td>-</td>
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<tr>
<td>671E3</td>
<td>- 2&quot;</td>
<td>-</td>
<td>117mm</td>
<td>150mm</td>
<td>18mm</td>
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<td>-</td>
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<tr>
<td>672E10</td>
<td>- 3&quot;</td>
<td>-</td>
<td>203mm</td>
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<tr>
<td>674E2</td>
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<td>330mm</td>
<td>314mm</td>
<td>24mm</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>674E3</td>
<td>- 7&quot;</td>
<td>-</td>
<td>330mm</td>
<td>314mm</td>
<td>24mm</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**PART NO. EXAMPLE:**

- Description: Body, Element & Hood - 316 S.S.
- Size: DN 50 (2”)
- Connection: DIN PN 16 RF Flange
- Flange / Nipple: 316 S.S.
- Vapor Group: Explosion Group IIB3 (NEC Group C)

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V-670E/2