Certificate no.:
TAP000033U

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Detonation Flame Arrester

with type designation(s)
UFDB-2, -3, -4, -6, -8, -10, -12, -18, -24

issued to
Topsafe Co., Ltd.
Gimhae-si, Gyeongsangnam-do, **Korea, Republic of**

is found to comply with
DNV rules for classification – Ships Pt.5 Ch.5 Oil tankers
DNV rules for classification – Ships Pt.5 Ch.6 Chemical tankers

Application:

Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV.
Sizes: DN 50, 80, 100, 150, 200, 250, 300, 450, 600

Issued at **Høvik** on **2026-03-05**
This Certificate is valid until **2031-03-04**.
DNV local unit: **Busan, CMC Korea**

for **DNV**

Approval Engineer: **Marc Avice**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

Product description

In-line stable detonation flame arresters with flame arrester element consisting of five (5) filter discs with a gap with of 0.55mm and flanged connections according to ANSI/ASME B16.5 #150 & #300 and JIS 5k & 10K, made from materials listed below:

Description		*Material*
Body	:	Carbon Steel (ASTM A216, ASTM A395), Stainless Steel (ASTM A351, ASTM 890, ASTM A995), NI-Al Bronze (ASTM B148-97), Hastlloy-C, Monel, Inconel (ASTM A494/494M) or Alloy
Stud bolt/nut	:	A193-B8 / A194-8(STD) & High-Grade Steel (ASTM A193/A193M, ASTM A194/A194M) or Alloy
Element assembly	:	Stainless 316L (A240-316L) & High-Grade Steel (ASTM B575-04, ASTM B127, ASTM B168 UNS N06600, ASTM B443 UNS N06625, ASTM B670 UNS N07718, ASTM B424 UNS N08825) or Alloy
Element gasket	:	Non-Asbestos, Graphit, Teflon

Design conforming to:

1- **IMO MSC/Circ. 677 rev. 1** (as amended by MSC.1/Circ. 1009 and MSC.1/Circ. 1324) – Revised standards for design, testing and locating of devices to prevent the passage of flame into cargo tanks
2- **ISO/IEC 80079-49:2024** - Explosive atmospheres – Part 49: Flame arresters – Performance requirements, test methods and limits for use

Application/Limitation

The products covered by this certificate are approved to be used as in-line deflagration flame arresting devices on tanks carrying apparatus group IIB3 with Maximum Experimental Safety Gap (MESG) equal or greater than 0.65mm.

Flame arresters covered by this certificate can be used under atmospheric conditions (maximum permissible temperature of the flame arrester of 60°C) and up to a maximum permissible pressure of 1.1 bar (absolute).

Model no.	Connection size DN (mm)	Max operational pressure, p_0 (barg)
UDFB-2	50	1.1
UDFB-3	80	
UDFB-4	100	
UDFB-6	150	
UDFB-8	200	
UDFB-10	250	
UDFB-12	300	
UDFB-18	450	
UDFB-24	600	

Flame arresters are not tested on safety against a flame transmission in the case of a stabilized burning on the flame arrester element (short-time burning and endurance burning). Therefore, the in-line detonation flame arresters must not be used if a burning on the flame arrester element is anticipated due to process conditions.

Flame arresters covered by this certificate are only to be installed on cargo tanks fitted with inert gas system in accordance with SOLAS Regulation II-2/62.

Products covered by this certificate shall not be used as an end-of-line device.

A copy of the instruction manual shall be kept on board which shall include:

- installation instructions;
- operating instructions;
- maintenance requirements, including cleaning;
- copy of the laboratory report;
- flow test data, including flow rates under both positive and negative pressures, operating sensitivity, flow resistance and velocity, should be provided.

Type Approval documentation

Tests carried out

Pressure test, leak test, flow measurement (air), flame transmission test, corrosion test.

Marking of product

For traceability to this type approval, each flame arrester and elements shall be marked in accordance with ISO/IEC 80079-49:2024 [13.2] and MSC/Circ.677 [4.1].

Periodical assessment

This certificate is only valid if required periodical assessments are carried out with satisfactory results.

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.

To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com.

Manufactured by:

Topsafe Co., Ltd.
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