

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Fire Damper**

with type designation(s)

Single and Multiblade Fire Damper Types FDB2-EL, FDB2-PNL, FDB2-PNR and FDB2-SP

Issued to

Halton Marine Oy
LAHTI, Finland

is found to comply with

DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations**DNV GL offshore standards****DNV GL rules for classification – Ships****Application :****The damper is approved for use in ducts penetrating bulkhead or deck Class A-0 to A-60.****Size of damper: Max 2000 x 1900 mm. Min. 100 x 100 mm.****This certificate is recognized by Transport Canada.****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**This Certificate is valid until **2021-11-13**.Issued at **Høvik** on **2016-11-14**for **DNV GL**DNV GL local station: **Helsinki**Approval Engineer: **Tomasz Werchowicz**

Petter Langnes
Head of Section

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.

Job Id:
Certificate No: **TAF00000CH**

Product description

"Single and Multiblade Fire Damper Types, FDB2-EL, FDB2-PNL, FDB2-PNR and FDB2-SP" composed of actuator or manually operated fire dampers with 1 mm damper blades and 210-300 mm deep casing made from 3 to 10 mm galvanized, painted steel plates or stainless steel (AISI304, 316 or 316L). The coaming and fire dampers are insulated on both exposed and unexposed side with 75 mm thick Paroc Slab 110, Paroc Slab 100, or any other equivalent and approved A-class insulation. Actuator is fitted on exposed side.

For A-0 approved dampers no insulation is required.

The casing to be welded or bolted to the bulkhead/deck by Ø10 mm bolts spaced 150 mm apart. For use of gaskets, if any, see Application/Limitation below.

The Fire damper is also manufactured at the premises of:

- Halton Marine Oy, Lahti, Finland,
- Halton Ventilation (Shanghai) co. Ltd, Lingang New City, Pudong, Shanghai, China,
- Halton Company, Scottsville, USA.

Application/Limitation

The fire dampers of type FDB2-EL, FDB2-PNL, FDB2-PNR and FDB2-SP are approved for use in duct penetrating bulkheads and decks with fire rating as follows:

FIRE DAMPER TYPE	SIZE (W x H)	FIRE RATING, BULKHEAD INSTALLATION:	FIRE RATING, DECK INSTALLATION:
FDB2-EL/ PNL/PNR/ E-D/P-D	2000 x 1900	A-0: No insulation dwg. LH-5219 Rev. A A-15 or A-30: – with insul. dwg. LH-5187 Rev. C A-60: with insul. dwg. LH-5242 Rev. A	A-0: No insulation dwg. LH-5219 Rev. A A-15: with insul. dwg. LH-5187 Rev. C
FDB2-EL/ PNL/PNR	1200 x 1600	A-0: No insulation dwg. LH-5219 Rev. A A-15 or A-30: with insul. dwg. LH-5187 Rev. C A-60: with insul. dwg. LH-5189 Rev. D	A-0: No insulation dwg. LH-5219 Rev. A A-15 or A-30: with insul. dwg. LH-5187 Rev. C. A-60: with insul. dwg. LH-5189 Rev. D
FDB2-EL/ PNL/PNR/ SP	100 x 100	A-0: No insulation dwg. LH-5219 Rev. A A-15 or A-30: with insul. dwg. LH-5187 Rev. C. A-60: with insul. dwg. LH-5189 Rev. D	A-0: No insulation dwg. LH-5219 Rev. A A-15 or A-30: with insul. dwg. LH-5187 Rev. C. A-60: with insul. dwg. LH-5189 Rev. D

DAMPER MODULES,	TWO DAMPERS TOGETHER	FOUR DAMPERS TOGETHER
FDB2 size of one damper:	W is ≤ 1000mm, the H is ≤ 1900mm	W is ≤ 1000mm, the H is ≤ 1600mm
FDB2 size of one damper:	W is 1000mm < W ≤ 1200mm, H is ≤ 1600mm Installation dwgs. See drawings in Statement VTT-S-3542-10	W is 1000mm < W ≤ 1200mm, H is ≤ 1400mm. Installation dwgs. See drawings in Statement VTT-S-3542-10

Blade gaskets other than Silicon LTE and/or Intumex LSK may be used if having equivalent fire technical and functional properties, and approved according to IMO 2010 FTP Code part 1.

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When gaskets between frame and coaming are used, they must be approved according to IMO 2010 FTP Code part 1.

The fire dampers to be automatic operated with fusible link by actuators of following type:

For FDB2-EL (electrical):

- Belimo SF24A, BF-24-HL, BLF-230, BF-230-2-HL, SF24 ALON, SR24/120/230. (All min. 12 Nm torque). (*)

The following modulating actuators are also part of this approval: SF24A-SR, SF24A-MF, SF24A-MP and SF24ALON (all min. 15 Nm torque).

- Schischek ExMax 15-SF, RedMax 15-SF / 5.10-SF or InMax 15-F. (*)
- Siemens GGA 326.1E., GGA, GGA126 (*)

For FDB2-PNL (linear pneumatic):

- Roder 245N. (*)

For FDB2-PNR (rotary pneumatic):

- Air Torque AT 100/101 S10 B or EL-O-MATIC ES40. (*)

(*) Actuators of same make but with different size as mentioned above may also be used, provided that they have similar installation arrangement and equivalent fire technical and functional properties.

The fire dampers may also be spring loaded with fusible link or manual operated by handle without fusible link.

The dampers shall be capable of being closed from both sides of the bulkhead or deck.

The arrangement of the fire dampers and necessary insulation of damper casing and ducting in the vicinity of the partition is subject for approval in each case. For further details see test report.

Each product is to be supplied with its manual for installation and use.

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, October 2015.

Fire Test Reports from VTT, Espoo, Finland:

- RTE 679/04 dated 17 May 2004,
- RTE762/04 dated 17 May 2004,
- RTE1083/04 dated 17 May 2004,
- RTE 4422/04(03) dated 17 May 2004,
- RTE 1133/05 dated 24 May 2005,
- RTE 1134/05 dated 24 May 2005,
- VTT-S-10161-07 dated 23 November 2007,
- VTT-S-7445-10 dated 27 September 2010,
- VTT-S-7447-10 dated 27 September 2010,
- VTT-S-8566-10 dated 27 October 2010,
- VTT-S-8567-10 dated 27 October 2010.

Fire Test Reports from Far East Fire Testing Centre, China:

- FT15315 dated 09 October 2015,
- FT15314 dated 09 October 2015.

Drawing from manufacturer:

- LH-5187 Rev. C dated 27 February 2008,
- LH-5189 Rev. D dated 13 December 2007,
- LH-5219 Rev. A dated 01 February 20110,
- LH-5772 Rev. A dated 23 April 2014,
- LH-5223 Rev. C dated 22 October 2009,

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- LH-5768 Rev. A dated 23 April 2014,
- LH-5327 Rev. C dated 29 December 2014,
- LH-5799 Rev. A dated 23 April 2014.

Statements:

- VTT-S-11343-06 dated 29 November 2006 (concerning reduced coaming lengths),
- VVT-S-5668-08 dated 02 July 2008 (concerning modulating actuators),
- VVT-S-3913-09 dated 16 June 2009 (concerning coaming thickness >5 mm up to 10 mm),
- VVT-S-1381-10 dated 16 February 2010 (concerning pneumatic actuators),
- VTT-S-3542-10 dated 28 April 2010 (damper modules),
- VTT-S-9239-10 dated 2 December 2010 (A-0 fire dampers),
- VTT-S-00593-16 dated 5 February 2016 (concerning manual overriding),
- VTT-S-02124-15 dated 13 May 2015 (concerning lengthening of fire damper frame),

all from VTT, Espoo, Finland

Tests carried out

Tested according to IMO FTPC Part 3 and in compliance with IMO 2010 FTP Code Ch. 8.

Marking of product

The product is to be marked with name of manufacturer, type designation and fire-technical rating.

Transport Canada Approval

Based on the procedures laid down in the Transport Canada Publication entitled "Approval Procedures for, Life Saving Equipment and Structural Fire Protection Products (TP 14612)", DNV GL confirms that the product/s listed in this certificate is/are in accordance with Transport Canada's requirements.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Class Programme DNVGL-CP-0338, Section 4.