



Certificate Of Fire Approval

This is to certify that the product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	Halton Marine Oy
Address	Pulttikatu 2, LAHTI, 15700, Finland
Type	Fire Damper (Standard Fire Test)
Description	Single Blade Circular Fire Damper
Trade Name	FDO
Specified Standard	IMO Res. MSC.307(88) – (2010 FTP Code) Annex 1 Part 3

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register Marine Limited of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document and its supplementary Type Approval Terms and Conditions form part of this Certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

M. Hale.

71 Fenchurch Street, London, EC3M 4BS, United Kingdom

Marta Walk

Fire & Safety - Senior Specialist to Lloyd's Register Marine Limited
A member of the Lloyd's Register group

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**DESIGN APPRAISAL DOCUMENT****ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR25262225SFTC-03**

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions, and this Design Appraisal Document forms part of the Certificate.

This Certificate is an Amendment of Certificate Number LR25262225SFTC-02.

Approval Documentation

FDO Electrical Installation, Operation & Maintenance Manual, Revision 05, dated 28.01.2019

FDO Pneumatic Installation, Operation & Maintenance Manual, Revision 03, dated 21.09.2017

FDO Spring Installation, Operation & Maintenance Manual, Revision 03, dated 21.09.2017

Test Reports

TUV EESTI, Masina 11, 10144 Tallinn, Estonia; Fire Test Reports No. 430-13TD-IMO dated 22nd November 2013 and No. 442-13TD-IMO dated 28th January 2014.

VTT Expert Services Ltd, Espoo, Otaniemi, Kivimiehentie 4, Finland; Fire Test Reports No. VTT-S-07638-13 dated 4th November 2013 and No. VTT-S-08754-13 dated 17th January 2014.

TÜV Eesti, Vana-Narva road 24b, Maardu, Estonia, Test report N° 712-18TD-IMO, dated 29th March 2018.

TÜV Eesti, Vana-Narva road 24b, Maardu, Estonia, Test report N° 718-18TD-IMO dated 29th March 2018.

Conditions of Certification

1. For use in A-15, A-30 and A-60 Class steel bulkheads and decks, with the damper and ducting protected by an approved insulation system suitable for the rating of the division, for a minimum length of 1300mm in bulkheads and 1100mm in decks. An additional layer of approved, suitable fire rated insulation is also to be fitted along the ducting where it penetrates the division for a minimum length of 480mm in bulkheads and 400mm in decks.
2. Damper with diameter 160 mm and 250 mm which is remotely controlled fire damper type without fusible link is approved for use in A-15 Class steel bulkheads with the damper and ducting not protected by insulation system.
3. Damper with diameter 160 mm and 250 mm without fusible link is approved for use in A-0 Class steel bulkheads with the damper and ducting not protected by insulation system.
4. Damper with 500 mm with fusible link is approved for use in A-0 Class steel bulkheads with the damper and ducting not protected by insulation system.
5. Clear opening size of damper tested: 500mm, 250 mm and 160 mm diameter
6. Joint between fire damper and coaming is fitted with 'Pyrocryl' gasket. Damper blades are fitted with 'Thermosil Firex' gaskets.
7. Bulkhead mounted dampers may be fitted with the following as-tested models of actuators, in accordance with Conditions 9 & 10 below:
 - a. 'AT051' pneumatic actuator manufactured by Air Torque
 - b. 'ExMax' actuator manufactured by Schischek
 - c. 'BF230' electrical actuator manufactured by Belimo
 - d. 'CSQP' electrical actuator manufactured by Elodrive
 - e. Pi QT.EX-MFD electrical actuator manufactured by Petz Industries
 - f. InMax-15-SF electrical actuator manufactured by Schischek

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8. Deck mounted dampers may be fitted with the following as-tested models of actuators, in accordance with Conditions 9 & 10 below:
- a. 'AT051 S12B' pneumatic actuator manufactured by Air Torque
 - b. AT051U S8B' pneumatic actuator manufactured by Air Torque
 - c. 'ExMax-5.10-F' actuator manufactured by Schischek
 - d. 'BF230-2 HL' electrical actuator manufactured by Belimo
 - e. 'BLF24 HL' electrical actuator manufactured by Belimo
 - f. 'CSQP-15A1E' electrical actuator manufactured by Elodrive
9. The dampers may also be operated with a spring return mechanism manufactured by Artjarven LaatuJousi Oy
10. All dampers for A-15, A-30 , A-60 application to be fitted with a fusible link closing mechanism with 74°C or 100°C bulb, manufactured by Kausalan Tera Oy
11. All FDO 500 damper for A0 application on exposed side to be fitted with a fusible link closing mechanism with 72°C bulb, manufactured by Petz Industry
12. Actuators and corresponding thermal triggers/fusible link mechanisms are restricted for use with up to the maximum size damper tested and in the tested orientation (bulkheads/decks). Actuators fire tested with the smaller dampers and identified on this certificate may be accepted with larger dampers on a case-by-case basis, subject to satisfactory test evidence provided to the final Project Plan Approval Authority to demonstrate they are able to close the larger damper at least within the same time period as in the actual fire tests. Factory tests performed under Lloyd's Register witness in ambient temperature conditions with 5 seconds applied as a compensation factor (due to factory testing conducted, not under fire conditions) may also be accepted as suitable test evidence; for example, if the closure time for larger damper in the fire test is 30 seconds, actuator tested with smaller dampers must be able to close the larger damper at least within 25 seconds in the factory test
13. Derivations of fire tested actuators, such as in different voltage supplies, different electric connection specifications (European/American etc.) and with higher performance ratings such as IP ratings, Explosive ratings etc. may also be accepted on a case-by-case basis, subject to formal confirmation from the actuator manufacturer provided to the final project authorities that such changes do not adversely affect their functionality and performance or reduce damper closure times. Tested actuators in alternative material options cannot be accepted under this certificate
14. Composition, application and installation of subcomponents, including adhesives, seals and any fire retardants, to be maintained in production and used in accordance with originally tested composition formula and method of application and installation, and manufacturer's instructions.
15. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype.
16. The certificate holder is solely responsible for the products supplied under this Certificate and to ensure that their products are fully compliant with the relevant statutory regulations and designed, manufactured and installed to the same quality and specifications as the prototype tested, including components that are designed and manufactured by third parties.

**DESIGN APPRAISAL DOCUMENT****ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR25262225SFTC-03****Places of Production**

Halton Ventilation (Shanghai) Co., Ltd.
Block 7, No. 55 Feidu Road,
Lingang New City, Pudong New District
201306 Shanghai
People's Republic of China

Halton Marine Oy
Pulttikatu 2
FIN 15700
Lahti
FINLAND

M. Walk.

Marta Walk
Senior Specialist, Fire & Safety
Statutory Discipline Team, Marine & Offshore
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s)



This product has been verified to be fully in accordance with Transport Canada Procedure TP14612E "Procedures for approval of life-saving appliances and fire safety systems, equipment and products and is suitable to be placed on Canadian Flagged vessels.