

## 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.

<b>Manufacturer</b>	<b>Dafo Fomtec AB</b>
<b>Address</b>	P.O Box 683, SE-135 26, Tyresö, Sweden
<b>Type</b>	Foam Concentrate
<b>Description</b>	Fire Extinguishing Protein-based, Alcohol Resistant Low-Expansion Foam Concentrate – Type: "Fomtec P 3% AR" (3% Induction rate), for use on polar solvent and hydrocarbon based fires.
<b>Trade Name</b>	Fomtec P 3% AR
<b>Specified Standard</b>	IMO MSC.1/Circ.1312 IMO MSC.1/Circ.1312/Corr.1.

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 EMEA 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.

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

**Saji Abraham**

Surveyor to Lloyd's Register EMEA  
A member of the Lloyd's Register group

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

**ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR2056646SF**

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions.

This Design Appraisal Document forms part of the Certificate.

**EXAMINED DOCUMENTATION**

LR witnessed reports for fire tests at RISE test lab, Sweden (report ref: GOT 1910150) dated 26 March 2019 and Physical Properties tests dated 15 August 2019

**CONDITIONS OF CERTIFICATION**

1. Type: "Fomtec P 3% AR" is a Type A (multi-purpose), protein-based, alcohol resistant foam concentrate, for use on polar solvent/alcohol based fires and hydrocarbon fires, with the following essential characteristics (determined based on testing with fresh water and simulated seawater, in accordance with IMO MSC.1/Circ.1312, including Corr.1).

<b>Foam concentrate Type</b>	<b>Fomtec P 3% AR</b>
Usage concentration	3%
Expansion ratio (Sea water)	4.7
Drainage time (25%) with sea water (minutes: seconds)	06:20
Alcohol resistance (minutes: seconds)	34:00
Sedimentation (%)	0
Viscosity at 60 rpm/spindle no:4 (mPa.s)	1930
pH value	6.7
Surface Tension (N/m)	26.8
Volumic mass (g/ml)	1.1
Freezing temperature (°C)	-5
Storage temperature range (°C)	Above -5 to 50

2. To be used with separately approved fixed or mobile low expansion foam fire extinguishing systems.
3. It is to be confirmed that the IMO MSC.1/Circ.1312 test standard is acceptable for the project and applications envisaged.
4. This certificate only approves the fire performance and the physical characteristics of the foam concentrate in accordance with IMO MSC.1/Circ.1312 including Corr.1, as listed above. The use of certain foam concentrates may also be subject to additional requirements, including environmental regulations, depending on the geographical locations and projects where they are to be used. Therefore, the suitability of the foam concentrate for each application must be confirmed at the design stage by the Project Plan Approval authority.

**ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR2056646SF**

5. Protein-based (P) Alcohol Resistant (Type A) foam concentrates should be subjected to the following tests by independent laboratories or authorised service suppliers acceptable to the Administration:

5.1 Annual small scale reference fire testing to EN 1568-4 Annex I as specified in Annex 3.14 of IMO MSC.1/Circ.1312 to demonstrate the extinguishment times and burnback time do not exceed the following values obtained in the original small scale fire tests conducted to the above standard at the same time as the full scale fire tests:

Reference Test Criteria	Fomtec P 3% AR
90% Extinguishment time (mm:ss)	01:27
99% Extinguishment time (mm:ss)	01:35
Complete Extinguishment Time (mm:ss)	01:47
Burn back time (mm:ss)	05:20

5.2 A Chemical Stability test in accordance with Annex 4.7 of IMO MSC.1/Circ.1312 prior to delivery to the ship and annually thereafter and

5.3 All other periodical tests in accordance with Annex 4 and 5 of IMO MSC.1/Circ.1312 not more than 3 years after being supplied to the ship and annually thereafter.

6. The storage container should be compatible with the foam concentrates throughout the service life of the foam.
7. Each product is to be supplied with its manual for application, use, transport, storage and maintenance.
8. A Batch Certificate should be provided with each delivery, with a declaration of the main characteristics of Sedimentation, pH Value, Expansion Ratio, Drainage Time and Volumic Mass, by the manufacturer and will be the basis for the periodical testing.
9. Chemical composition of foam is to be maintained in production in accordance with originally tested composition formula.
10. 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.
11. The certificate holder is solely responsible for the products supplied under this Certificate and to ensure that their products, whether manufactured by themselves or their licensee manufacturers, if agreed by Lloyd's Register, are fully compliant with the relevant statutory regulations and Lloyd's Register Class rules as applicable 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.

**ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR2056646SF**

**PLACE OF PRODUCTION**

Dafo Fomtec AB  
Garnisonsgatan 47A  
254 66 Helsingborg  
Sweden



Saji Abraham  
Senior Specialist  
Fire & Safety, Statutory Discipline Team  
UK&I Technical Support Office, 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).*