DNV·GL

Certificate No:
TAF000008K

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Fixed Dry Chemical Fire Extinguishing System

with type designation(s)
Minimax P-BC 250-5 marine with hose, Minimax P-BC 250-5 marine, Minimax P-BC 600-8 marine, Minimax P-BC 1000-10 marine, Minimax P-BC 1500-13 marine

Issued to
Minimax GmbH & Co. KG
BAD OLDESLOE, Germany

is found to comply with
DNV GL rules for classification – Ships

Application :

The products approved by this certificate are accepted for installation on all vessels classed by DNV GL (details indicated under 'Application/Limitation').

This Certificate is valid until **2021-07-20**.

Issued at **Hamburg** on **2016-07-21**

for **DNV GL**

DNV GL local station: **Hamburg**

Approval Engineer: **Michael Kämpf**

Antje Fleischhauer
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.

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Product description

The Minimax fixed dry chemical powder fire extinguishing system is designed for fighting fires in the on-deck cargo areas of ships carrying liquefied gases in bulk (gas carriers) and in the area of gas fuel bunkering stations on board ships using gases or other low-flashpoint fuels.

The system mainly consists of nitrogen cylinder(s) as propellant gas, piping, valves, pressure regulator, safety valves, gauges, pressure tank for the powder and discharge devices (monitors or hoses with nozzles).

The system is manufactured by Minimax, Bad Oldesloe, Germany.

The system has the following main specifications:

Dry chemical powder used in the system: Potassium sulphate of type BC Karate, Rühl, Germany

Powder monitor type: Minimax MX-2000, PN 16, DN 65

MINIMAX Dry Powder Unit of Type P-BC 250-5 Marine with Hose	
Propellant gas	One bottle of nitrogen 67 ltr / 150 bar
Powder tank	255 ltr
Filling volume, dry powder	Max. 250 kg
Max. operating pressure	14 bar
Max. length of pipings and fittings	33 m hose (25 mm internal diameter) with powder pistol acc. to dwg. S8-05-03
Min. discharge duration	45 s
Discharge rate achieved in testing	3.7 kg/s
Minimum ambient storage temperature	- 35.8 °C
Minimax user manual	S8-80-81

MINIMAX Dry Powder Unit of Type P-BC 250-5 Marine	
Propellant gas	One bottle of nitrogen 67 ltr / 150 bar
Powder tank	255 ltr
Filling volume, dry powder	Max. 250 kg
Max. operating pressure	14 bar
Max. length of pipings and fittings	117.5 m DN 32, and nozzle with 20 mm orifice
Min. discharge duration	45 s
Discharge rate achieved in testing	4.0 kg/s
Minimum ambient storage temperature	- 35.8 °C
Minimax user manual	S8-80-82

MINIMAX Dry Powder Unit of Type P-BC 250-5 Marine (for bunker station)	
Propellant gas	One bottle of nitrogen 67 ltr / 150 bar
Powder tank	255 ltr
Filling volume, dry powder	Max. 250 kg
Max. operating pressure	14 bar
Max. length of pipings and fittings	80 m DN 32, and nozzles with 2x16.5 mm orifice
Min. discharge duration	45 s
Discharge rate achieved in testing	5.7 kg/s
Minimum ambient storage temperature	- 35.8 °C
Minimax user manual	S8-80-82

MINIMAX Dry Powder Unit of Type P-BC 600-8 Marine	
Propellant gas	Two bottles of nitrogen, each 67 ltr / 150 bar
Powder tank	600 ltr
Filling volume, dry powder	Max. 600 kg
Max. operating pressure	14 bar
Max. length of pipings and fittings	227 m DN 65, and DN 65 monitor with powder pipe and orifice (28 mm)
Min. discharge duration	45 s
Discharge rate achieved in testing	14.8 kg/s
Discharge range achieved in testing	> 10 m
Minimum ambient storage temperature	- 35.8 °C
Minimax user manual	S8-80-83

MINIMAX Dry Powder Unit of Type P-BC 1000-10 Marine	
Propellant gas	Two bottles of nitrogen, each 67 ltr / 150 bar
Powder tank	1000 ltr
Filling volume, dry powder	Max. 1000 kg
Max. operating pressure	14 bar
Max. length of pipings and fittings	227 m DN 65, and DN 65 monitor with powder pipe and orifice (28/34 mm)
Min. discharge duration	45 s
Discharge rate achieved in testing	20.3 kg/s with 28 mm nozzle 21 kg/s with 34 mm nozzle
Discharge range achieved in testing	> 20 m
Minimum ambient storage temperature	- 35.8 °C
Minimax user manual	S8-80-84

MINIMAX Dry Powder Unit of Type P-BC 1000-10 Marine (with pistol)	
Propellant gas	Two bottles of nitrogen, each 67 ltr / 150 bar
Powder tank	1000 ltr
Filling volume, dry powder	Max. 1000 kg
Max. operating pressure	14 bar
Max. length of pipings and fittings	227 m DN 65, and DN 65 monitor with powder pipe and orifice (34 mm), and 2 x 33 m hose (25 mm internal diameter) with powder pistol acc. to dwg. S8-05-03
Min. discharge duration	45 s
Discharge rate achieved in testing	Pistol: 4.3 kg/s Monitor: 10.2 kg/s
Minimum ambient storage temperature	- 35.8 °C
Minimax user manual	S8-80-84

MINIMAX Dry Powder Unit of Type P-BC 1500-13 Marine	
Propellant gas	Three bottles of nitrogen, each 67 ltr / 150 bar
Powder tank	1600 ltr
Filling volume, dry powder	Max. 1500 kg
Max. operating pressure	14 bar
Max. length of pipings and fittings	227 m DN 65, and DN 65 monitor with powder pipe and orifice (51 mm)
Min. discharge duration	45 s
Discharge rate achieved in testing	25.7 kg/s
Discharge range achieved in testing	> 30 m
Minimum ambient storage temperature	- 35.8 °C
Minimax user manual	S8-80-85

Application/Limitation

The system is approved for use as a dry powder fire extinguishing system for protection of on-deck cargo areas of gas carriers subject to the IGC Code. The system shall be designed according to the principal requirements of IMO MSC.1/Circ.1315.

The system is also suitable for protection of gas fuel bunkering stations subject to the IGF Code (e.g. LNG bunker stations). The system design shall be in accordance with the related requirements.

This certificate does only address the functionality and performance of the entire system. All system components are subject to case by case approval.

The following documentation is to be submitted for approval for each project:

- Arrangement plan showing location of powder units, release controls and discharge devices
- Capacity calculations (flow rate and total amount of powder)
- Material specification and dimensions for all piping
- Specifications for all other system components
- Maker's manual containing design, inspection, operation and maintenance procedures

Testing at installations:

- All tests and inspections defined by the maker's manual
- Pipes, valves, fittings and tanks shall be tested as per DNVGL Rules Pt.4, Ch.6 and Ch.7
- All distribution piping shall be blown through with air or nitrogen to ensure that the piping is free from obstructions
- All valves, release stations and any control systems shall be function tested

Type Approval documentation

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

Test reports:

- Test report on performance testing acc. to MSC.1/Circ.1315 issued by *Efectis Nederland BV*, report no. 2015-Efectis-R001386[Rev.2], March 2016, incl. all relevant product and component data sheets and product/approval certificates
- Test report on salt spray tests issued by Thales Nederland BV, doc. no. 9505 334 219xx 001 dated 2015-09-23

Minimax operating manuals:

- No. S8-80-81 for powder unit P-BC 250-5 marine with hose
- No. S8-80-82 for powder unit P-BC 250-5 marine
- No. S8-80-83 for powder unit P-BC 600-8 marine
- No. S8-80-84 for powder unit P-BC 1000-10 marine
- No. S8-80-85 for powder unit P-BC 1500-13 marine

Tests carried out

The system is tested according to IMO MSC.1/Circ.1315 and class programme no. 474.71 (DNVGL-CP-0213, March 2016).

Marking of product

The powder units are to be marked with the name of the manufacturer and type designation.

Periodical assessment

The DNVGL 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 the procedure described in the Class Programme DNVGL-CP-0338, Section 4.