

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Waterbased Fixed Fire Extinguishing System**with type designation(s)
XFlow®

Issued to

Novenco Fire Fighting A/S
Odense SØ, Denmark

is found to comply with

DNV GL rules for classification – Ships**DNV GL offshore standards****DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations****DNV GL class programme DNVGL-CP-0213 – Type approval – Fire safety equipment****Application :****Approved for use as fixed fire extinguishing system for machinery spaces and cargo pump rooms. For further information, see the details under application/limitation on page 2.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2018-05-30**This Certificate is valid until **2023-05-29**.for **DNV GL**DNV GL local station: **Copenhagen**Approval Engineer: **Tessa Bieber**

Mårten Schei-Nilsson
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: **262.1-002850-10**
Certificate No: **TAF00000YK**

Product description

"XFlow®"

is a dry pipe fresh water mist system. The system consists of spray heads, steel piping, manual section valves, strainer, electrical motors and electrically driven pumps. The system is to be designed according to "Principal requirements for the system" in Annex to IMO MSC/Circ. 1165.

This approval cover bilges within engine rooms (as part of a total flooding system). For ceiling mounted spray heads, see the other type approval certificates issued to this maker.

Only the spray heads are type approved by this certificate. Pumps, pipes, couplings and other systems components are subject to case-by-case approval.

The spray heads are manufactured by Novenco Fire Fighting A/S at Odense, Denmark.

Application/Limitation

The spray heads are to be installed in the bilge according to one of the following specifications:

Bilges, NHP4	
Maximum coverage area per spray head:	7 m ² (average) ¹⁾
Height of spray head above tanktop:	0.6 m ²⁾
Height of bilge plate:	0.75 m ²⁾
Minimum operation pressure:	9.0 bar (at spray heads)
Spray head type:	NHP4
K-factor (using $Q = k \times p^{1/2}$):	4.66 lpm/bar ^{1/2}
Spray head orientation:	Horizontal (sideways)
Approved AFFF foam concentrate (or equivalent) is to be applied with 1% admixture to water. A minimum foam capacity for at least 30 minutes discharge shall be provided. Water and foam is to be applied continuously for at least 30 minutes at full pressure.	
Notes.	
1) Example: row with spray heads in both directions. Spacing between spray heads is 2 m along row, 7 m between rows	
2) Installations on vessels with bilge plates higher or lower than 0.75 m will be considered case by case.	

Bilges, NHP2-6B	
Maximum coverage area per spray head:	6 m ² (average) ³⁾
Height of spray head above tanktop:	0.30 – 0.39 m ⁴⁾
Height of bilge plate:	0.75 m ⁴⁾
Minimum operation pressure:	7.0 bar (at spray heads)
Spray head type:	NHP2-6B
K-factor (using $Q = k \times p^{1/2}$):	4.31 lpm/bar ^{1/2}
Spray head orientation:	Horizontal (sideways)
Approved AFFF foam concentrate (or equivalent) is to be applied with 1% admixture to water. A minimum foam capacity for at least 30 minutes discharge shall be provided. Water and foam is to be applied continuously for at least 30 minutes at full pressure.	
Notes.	
3) Example: row with spray heads in both directions. Spacing between spray heads is 3 m along row, 4 m between rows	
4) Installations on vessels with bilge plates higher or lower than 0.75 m will be considered case by case.	

Spray head information			
Spray head	k-factor	Flow	Drawing no.
NHP4	4.66 lpm/bar ^{1/2}	14.0 lpm at 9.0 bar	41014-229
NHP2-6B	4.31 lpm/bar ^{1/2}	11.4 lpm at 7.0 bar	30027348, June 2007

The spray heads are made of Brass coated with SnNi, while some internal parts are made of AISI316 and PTFE. They have a maximum rated pressure of 16 bar.

For all applications

- A. The pump or pump unit shall be delivered with DNVGL product certificate, whereas other system components are to be inspected in accordance with DNVGL Rules (or equivalent standard as specified by the Flag Administration).
- B. Stainless steel piping (or equivalent) and fresh water shall be applied and a strainer of adequate size is to be provided downstream of pump (to avoid clogging of spray heads).
- C. Redundant pump arrangement is to be approved on a case by case basis.
- D. The pump unit and section valves shall be installed in a room having ambient temperature between +4 degree C and +45 degree C.

The following items are to be submitted for approval for each project:

- i. System arrangement plans including routing of pipes, location of nozzles, section valves, release stations, pump unit with back-up capacity and water supply;
- ii. Documentation of power supply and control system;
- iii. Specification of pipes, section valves, electrical motors, pumps and associated components;
- iv. Pressure drop calculations and water mist capacity calculations;
- v. Design, installation, operation and maintenance manual.

Installation testing:

- System to be cleaned in accordance with routines outlined in maker's installation manual;
- All sections should be tested with full flow through the spray heads;
- Manual release of all section valves and start of pumps shall be carried out;
- Alarms inside protected space and at a manned control stations and switchover to emergency power shall be tested;
- Other tests as required by DNV GL rules (pressure testing of piping, etc.) and according to maker's manual shall be carried out.

Periodical testing:

- Periodical flushing, control and inspection to be in accordance with makers maintenance instruction manual
- At least one section should each year be tested with full flow of water through the nozzles (not the same section each year);
- 10 % of the spray heads are to be checked annually to ensure that the deflector pin is in line with the discharge orifice and for clogging of in-built filter.

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, October 2017.

Fire Performance Testing:

- DIFT PE 10024, May 2005
- Letter from DIFT PE 10024, January 2006
- DFL 070625-011, June 2007

Component testing of water mist nozzles:

- FM Approvals, Project 3015383, March 2004
- FM Approvals, Project 3025752, September 2006

Novenco, Clogging Test for NHP-2-6, December 2006 (additional test)

Tests carried out

Tested according to IMO MSC/Circ.1165 (fire tests and component tests).

Marking of product

The spray head is to be marked with type designation whereas pump / control unit is to be marked with name of manufacturer and type designation.

Periodical assessment



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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