Certificate No:
TAF00001HU

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Fire Extinguishing System for Heli-deck (Pop-up system)

with type designation(s)
FP-N-PUN-RMS

Issued to
Fireproducts AS
Kristiansand S, **Norway**

is found to comply with
DNV statutory interpretations DNV-SI-0364 – SOLAS interpretations, Edition July 2021
DNV rules for classification – Ships
DNV offshore standards

Application :

Approved as a fixed fire extinguishing system for helidecks and helicopter landing areas.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2021-11-02**
This Certificate is valid until **2026-11-01**.
DNV local station: **Norway CMC, West**

Approval Engineer: **Helge Bjørnarå**

for **DNV**

Helene David-Andersen
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

"FP-N-PUN-RMS ",
a helicopter deck foam firefighting system composed of pop-up nozzles, pipes, valves, pump(s), strainer, foam proportioner, foam tank with AFFF concentrate and control system.

The nozzles are installed flush with the deck. When the system is released the nozzles will be lifted by the water pressure and make an effective spray distribution of water/foam mixture to the entire landing area.

Only the pop-up nozzles are type approved by this certificate. Pipes, couplings, valves and other systems components are subject to case-by-case approval. The system is to be designed in accordance with the "Principal Requirements for the System" in IMO MSC.1/Circ.1431.

Application/Limitation

Approved as a fixed fire extinguishing system for helidecks and helicopter landing areas.

The nozzles are to be installed to the following specifications:

Helicopter deck area (D-value):	15.0 m
Number of nozzles (n):	8 (4 + 4) (see nozzle layout drawing)
Application rate (q)*):	6.0 lpm/m^2
Nozzle location/spacing:	Perimeter of deck (see nozzle layout drawing)
Nozzle pressure:	3.0 bar
Nozzle orientation:	Fixed side distribution. Cone towards centre.
Foam mixture:	1%, 3% & 6%
Note: *) The application rate shall be minimum 6 lpm/m^2 as it is required by IMO MSC.1/Circ.1431. If the flag Administration has specific requirements this will prevail.	

Nozzle information:

Type:	K100	K125
k-factor:	100 lpm/bar$^{1/2}$	125 lpm/bar$^{1/2}$
Working pressure:	2.0 - 5.0 bar	2.0 - 5.0 bar
Nozzle coverage (120°cone towards centre):	8 m	11 m
Nozzle throw height:	3.5 m	3.5 m
Flow (q):	141 - 224 lpm	177 - 280 lpm
The nozzles are made of SS316 or Titanium. Maximum operating pressure is 5.0 bar.		

The following additional applications/limitations apply:

A. Minimum application pressure is 3.0 bar.
B. The pump unit is to be delivered with DNV product certificate and foam proportioner is to be of approved type. Other system components are to be certified or inspected in accordance with DNV Rules.
C. The foam concentrate is to be of approved type.
D. Pipes, couplings and other components are regarded as "Class III" piping
E. The pump unit should be installed in a room having ambient temperature between 4 °C and 45 °C.

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

a) System arrangement plans including routing of pipes, location of nozzles, sections valves, release stations and water supply.
b) Documentation of power supply and control system.
c) Specification of pipes, pressurised cylinder, generator, pump and associated components.
d) Pressure loss and flow calculations.
e) Design, installation, operation and maintenance manual.
f) Each batch of nozzles shall be flow capacity tested at intended working pressure and part of plan approval documentation.

Installation testing:

- System to be function tested.
- Pipe system to be pressure tested to least 1.5 times maximum working pressure.
- All distribution piping shall be blown through with air to ensure that the piping is free from obstructions.

- Function testing of each foam proportioner shall be performed for each installation. The mixing ratio shall be as specified in each application and within a range of -0% to +30% of this (if the specified mixing ratio is 3.0%, test results between 3.0 and 3.9% will be accepted).
- Other tests as required by DNV Rules (pressure testing of piping, etc.) or a similar standard acceptable to the Flag Administration and according to maker's manual shall be carried out.

Periodical testing:
- The periodical testing shall comply with instructions from flag administration, DNV Statutory Interpretations and maker's maintenance manual.

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

Type Approval documentation
Certification in accordance with Class Programme DNV-CP-0338, September 2021.

Test reports:
No. 000028-W-015/5 "Inspection and Test Plan (ITP) – Type Approval" dated 2020-11-03 from manufacturer.
No. 000028-W-020/2 "Data Sheet, Mechanical – RMS Nozzle" dated 2020-06-15 from manufacturer.
No. 000028-W-041/2 "Procedure, Performance Test - 15 x 15 Helideck" dated 2020-06-16 from manufacturer.
No. 000028-W-126/1 "Report, Performance Test - 15 x 15 Helideck" dated 2020-06-17 from manufacturer.
No. 000028-D-9020/1 "Fuel trays placement" dated 2020-06-16 from manufacturer.
No. 000028-D-9070/1 "Water trays placement" dated 2020-06-16 from manufacturer.
No. 000028-W-040/3 "Procedure, K-factor Test" dated 2020-11-02 from manufacturer.
No. 000028-W-140/1 "Report, K-factor Test" dated 2020-11-11 from manufacturer.
No. 000028-W-047/1 "Material Selection Report RMS Nozzles" dated 2021-04-20 from manufacturer.

Nozzle layout drawing:
No. 000028-D-9040/3 "Nozzle placement drawing - Helideck 15m x 15m" dated 2020-06-16 from manufacturer.

Nozzle drawings:
No. 000028-D-9020/3 "GA Drawing RMS Nozzle" dated 2020-06-16 from manufacturer.
No. 000028-D-9021/2 "Cross section drawing – RMS Nozzle K100" dated 2020-06-10 from manufacturer.
No. 000028-D-9121/1 "Cross section drawing – RMS Nozzle K125" dated 2020-06-10 from manufacturer.

Installation and maintenance:
No. 000028-W-052/3 "Instruction, Installation" dated 2020-11-03 from manufacturer.
No. 000028-W-058/4 "Instruction, Maintenance" dated 2020-11-09 from manufacturer.

Tests carried out
The nozzles are tested as sprayers according to EN 13565-1:2019.

Marking of product
The product or packing is to be marked according to EN 13565-1:2019, Section 7.

Periodical assessment
DNV'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 DNV-CP-0338, Section 4.