

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB000083U

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV AS under the authority of the Government of Norway.

This is to certify:

That the Helicopter facility foam fire-fighting appliances

with type designation(s)
Micro PUN nozzle

Issued to

Firenor AS
Kristiansand S, Norway

is found to comply with the requirements in the following Regulations/Standards:

Regulation (EU) 2022/1157,
item No. MED/3.67. SOLAS 74 as amended, Regulation II-2/18 and IMO MSC.1/Circ.1431

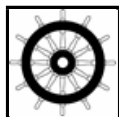
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2028-07-10**.

Issued at **Høvik** on **2023-07-11**

DNV local station:
West Norway CMC

Approval Engineer:
Helge Bjørnara



Notified Body
No.: **0575**

for **DNV AS**

.....
Sverre Olav Bergli
Head of Notified Body



The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

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

"Micro PUN nozzle"

a fixed helicopter deck foam firefighting system composed of non- aspirating pop-up nozzles, pipes, valves, pump(s), strainer, foam proportioner, foam tank with foam 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 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 FSS Code Ch.17.

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)	12–26.1 m
Number of nozzles (n)	4-19
Application rate (q) ¹⁾	6 lpm/m ²
Nozzle spacing:	Ref. layout drawings below
Nozzle working pressure:	4-7 bar
Nozzle orientation:	Pop-up
Foam mixture	1%, 3% or 6%
<u>Notes:</u> 1) The application rate shall be 6 lpm/m ² as it is required by FSS Code Ch.17.3.2. If the flag Administration has specific requirements this will prevail.	

Nozzle information:

k-factor	50-110 lpm/bar ^{1/2}
Working pressure	4-7 bar
Nozzle coverage (diameter)	7 m
Nozzle throw height	6-7 m
Flow (q)	100-249 lpm
The nozzles are made of stainless steel (SS316), Ni Al Bronze, 6MO, Super Duplex or Titanium.	

The following additional applications/limitations apply:

- Approved pressure range is 4-7 bar.
- The pump unit is to be delivered with product certificate and foam proportioner is to be of approved type. Other system components are to be certified or inspected in accordance with relevant rules and regulations.
- The foam concentrate is to be of approved type.
- Pipes, couplings and other components are regarded as "Class III" piping.
- 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:

- System arrangement plans including location of nozzle, release stations and control circuitry/arrangement.
- Documentation of power supply and control system.
- Specification of pipes, pressurised cylinder, generator, pump and associated components.
- Pressure loss and flow calculations.
- Design, installation, operation and maintenance manual.
- 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 relevant class 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, class requirements and maker's maintenance manual.

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

Type Examination documentation

Test reports:

- No. 000033-W-049, Rev.02, Area coverage test procedure, dated 19 August 2022 from manufacturer.
- No. 000033-W-049, Rev.02, Area coverage test procedure, dated 19 October 2022 from manufacturer.
- No. 000033-W-040, Rev.03, K-factor test, dated 01 February 2021 from manufacturer.
- No. 000033-W-141, Rev. 01, K-factor test – After Salt Testing dated 06 June 2023 from manufacturer.

Layout drawings:

- No. 000033-D-9040, Rev.03 dated 12 May 2022 (Layout for deck up to D=12)
- No. 000033-D-9140, Rev.03 dated 12 May 2022 (Layout for deck up to D=13.5)
- No. 000033-D-9340, Rev.03 dated 12 May 2022 (Layout for deck up to D=20.8)
- No. 000033-D-9440, Rev.03 dated 12 May 2022 (Layout for deck up to D=22.2)
- No. 000033-D-9540, Rev.03 dated 12 May 2022 (Layout for deck up to D=24.8)
- No. 000033-D-9640, Rev.03 dated 12 May 2022 (Layout for deck up to D=26.1)

all from manufacturer

Nozzles:

- No. 000033-D-9021, Rev.02 dated 25 March 2020 (AISI 316 K=50)
- No. 000033-D-9521, Rev.02 dated 25 March 2020 (AISI 316 K=70)
- No. 000033-D-9121, Rev.02 dated 13 May 2022 (AISI 316 K=80)
- No. 000033-D-9321, Rev.02 dated 25 March 2020 (AISI 316 K=110)

all from manufacturer

- Doc. No. 000033-W-015, Rev.02, Inspection and Test Plan – Production, dated 1 February 2021 from manufacturer.
- Doc. No. 000033-W-020, Rev.03, Data Sheet - Mechanical, dated 1 February 2021 from manufacturer.
- Doc. No. 000033-W-052, Rev.03, Instruction, Installation, dated 1 February 2021 from manufacturer
- Doc. No. 000033-W-058, Rev.01, Instruction, Maintenance, dated 22 February 2020 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, name and address of manufacturer and MED Mark of Conformity (see page 1).