

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

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 GL AS under the authority of the Government of Norway.

This is to certify:

That the Nozzles for equivalent water-mist fire extinguishing systems for machinery spaces and cargo pump rooms

with type designation(s)

Total Water Mist Fire Fighting System: X-MIST

Issued to

Tanktech Co., Ltd.
Busan, Republic of Korea

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

Regulation (EU) 2018/773,

item No. MED/3.39. SOLAS 74, Regulation II-2/10 & X/3, 2000 HSC Code 7, FSS Code 7, IMO MSC.1/Circ.1313, IMO MSC.1/Circ.1458 and IMO MSC/Circ.1165 as amended

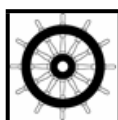
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2023-07-09**.

Issued at **Høvik** on **2018-07-10**

DNV GL local station:
Gimhae Station

Approval Engineer:
Synnøve Bolstad Eri



Notified Body
No.: **0575**

for **DNV GL AS**

Roald Vårheim
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 GL 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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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.



Product description

"X-MIST"

Is a total water mist fire fighting system composed of nozzles, stainless steel or equivalent material piping, section valves pump & motor unit and an electrical panel.

Only nozzles are type approved by this certificate. Pumps, pipes, couplings, valves and other system components are subject to case-by-case approval. The system is to be designed in accordance with IMO MSC/Circ.1165 "Revised Guidelines for the Approval of Equivalent Water-Based Fire-Extinguishing Systems for Machinery Spaces and Cargo Pump-Rooms" as amended by MSC.1/Circ.1237, MSC.1/Circ.1269 and MSC.1/Circ.1386.

The nozzles are manufactured by Tanktech Co., Ltd., Pusan, Korea.

Application/Limitation

The nozzles are to be installed to the following specifications:

Volume and height of protected spaces	
Maximum ceiling height of protected space ¹⁾ :	16.5 m
Maximum volume of protected space ²⁾ :	5300 m ³
The system is to be designed with one layer of ceiling mounted nozzles and one layer of bilge nozzles. Areas under platforms and other similar obstruction shall be protected by additional nozzles. For areas of limited height, nozzles with lower installation height (shorter spacing and less flow) are recommended used.	
Notes: 1) Standard casings need in general not to be considered when assessing this height limitation. 2) Net volume can be increased to 10600 m ³ based on IMO MSC.1/Circ.1385 as extinguishing time is within 10 min. This volume shall include bilges, casings, etc.	

Ceiling mounted nozzles (X-MIST DC 7.1)	
Maximum horizontal nozzle spacing ¹⁾ :	4.0 m x 3.0 m
Maximum distance to bulkhead:	1.5 m
Maximum coverage area per nozzle (average):	12 m ²
Maximum ceiling height of nozzles:	13.5 m
Minimum pressure at nozzles:	10 bar
Nozzles type:	DC 7.1
Nozzle orientation:	Downwards
Notes: 1) Nozzles of two adjacent rows shall be installed in a staggered pattern. The spray nozzles shall be installed at ceiling level, maximum 300 mm below ceiling. Casings and areas under platforms and other similar obstruction shall be protected by additional nozzles. For areas of limited height, nozzles with lower installation height are recommended used.	

Bilge mounted nozzles (X-MIST DB 8.3)	
Maximum horizontal nozzle spacing:	3.5 m x 3.5 m
Maximum distance to bulkhead:	1.75 m
Maximum coverage area per nozzle (average):	12.25 m ²
Height of nozzles above floor level ¹⁾ :	0.6 -2.4 m
Minimum pressure at nozzles:	11 bar
Nozzles type:	DB 8.3
Nozzle orientation:	Downwards
Notes: 1) Nozzles to be installed approximately 0.1 m below bilge plate.	

Job Id: **344.1-003729-2**
Certificate No: **MEDB000044D**

Nozzle information					
Nozzle	Application	k-factor [lpm/bar ^{1/2}]	Flow at operating pressure [lpm]	Operating pressure [bar]	Drawing no.
DC 7.1	Ceiling	7.1	22.5	10 ¹⁾	DC_7.1_PART 1 and 2
DB 8.3	Bilge	8.3	27.5	11 ²⁾	DB_8.3_PART 1 and 2
Notes: 1) The nozzle is made of SUS 316 and have a maximum rated pressure of 16 bar. 2) The nozzle is made of SUS 316 and have a maximum rated pressure of 16 bar.					

For all applications

- A. The pumps shall be delivered with product certificate, whereas other system components are to be inspected in accordance with Class Rules (or equivalent standard as specified by the Flag Administration).
- B. The back-up pump arrangement is to be approved on a case by case basis.
- C. The pump unit and section valves shall be installed in a room having ambient temperature between +4°C and +45°C.
- D. Piping and piping components shall be made of stainless steel or equivalent material and a strainer of adequate size is to be provided downstream of water tank.
- E. Pipes, couplings and other components are regarded as "Class III" piping.
- F. Only fresh water shall be used in the system. This includes testing and flushing operations.

The following items are to be approved and filed by the flag administration 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.

Other documents:

- Documentation for other components (according to EN 3.1B and EN 2.2, as applicable) shall be submitted to the site representative of the Flag Administration.

Installation testing:

- System to be cleaned in accordance with routines outlined in maker's installation manual.
- Water to be sampled from the sprinkler tank, the pump unit and from a representative number of sections and tested for the relevant contaminations identified by maker's specification.
- All sections should be tested with full flow of water through the nozzles.
- 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 Class Rules (pressure testing of piping, etc.) and according to maker's manual shall be carried out.

Periodical testing:

- The periodical testing shall comply with instructions from flag administration, statutory interpretations and maker's maintenance manual.
- At least one section should each year be tested with full flow through the nozzle (not the same section each year).



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Type Examination documentation

Test Report No. R2012-0521 dated August 2012 from Fire Insurers Laboratories of Korea (FILK), Gyeonggi-Do, Korea (fire performance and component tests).

Tests carried out

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

Marking of product

The nozzles and other main component in the system are to be marked with type designation and MED Mark of Conformity.