

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate no.:
MEDB00008JU

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 Fixed water-based fire-fighting systems for ro-ro spaces, vehicle spaces and special category spaces: Prescriptive-based systems as per IMO MSC.1/1430 Rev.3

with type designation(s)

Water mist nozzles for deluge system - ZSTWB and ZSTWC

issued to

Ningbo Yonghang Fire Equipment Co., Ltd.
Ningbo, 130, China

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

Regulation (EU) 2023/1667,

item No. MED/3.49a. SOLAS 74 as amended Regulation II-2/19, II-2/20 & X/3, 2000 HSC Code 7 and FSS Code 7, IMO MSC.1/Circ.1430, Rev 3.

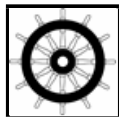
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2029-03-10**.

Issued at **Høvik** on **2024-03-11**

DNV local unit:
Ningbo FIS

Approval Engineer:
Tessa Biever



Notified Body
No.: **0575**

for **DNV AS**

Mydlak-Röder, Christine
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 This certificate remains valid unless suspended, withdrawn, recalled or cancelled.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

'Water mist nozzles for deluge system - ZSTWB and ZSTWC'

are water mist nozzles for a deluge type fire-extinguishing system. The system consists of nozzles and section valves in addition to pump unit(s), stainless steel piping or equivalent corrosion resistant pipes with melting point higher than 925 °C, control system as associated equipment.

The system is to be designed in accordance with the "Principal Requirements" of IMO MSC.1/Circ.1430, Rev.3, for prescriptive-based systems.

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

Only nozzles are type approved by this certificate. Other components are to be approved and/or certified case-by-case.

Application/Limitation

Approved for use as a water-based fixed fire-fighting systems for ro-ro spaces, vehicle spaces and special category spaces (prescriptive-based system)

System design and installation shall be in accordance with principal requirements and prescriptive-based system requirements of IMO MSC.1/Circ.1430 Ch.3 and 4. In addition, uniform distribution of nozzles inside protected space as well as overlap of the spray pattern shall be ensured.

Table 1 Nozzle information:

System type	Nozzle type	k-factor [lpm/bar ^{1/2}]	Flow [lpm]	Pressure at nozzle [bar]	Spray angle, XX [°]	Drawings
Deluge	ZSTWC(16)-XX°	16	19 – 30	1.4 – 3.5	90, 120, 150, 180	ZSTWC(16-54)-XX°
Deluge	ZSTWC(21)-XX°	21	25 – 39	1.4 – 3.5	90, 120, 150, 180	ZSTWC(16-54)-XX°
Deluge	ZSTWC(27)-XX°	27	32 – 51	1.4 – 3.5	90, 120, 150, 180	ZSTWC(16-54)-XX°
Deluge	ZSTWC(32)-XX°	32	38 – 60	1.4 – 3.5	90, 120, 150, 180	ZSTWC(16-54)-XX°
Deluge	ZSTWC(37)-XX°	37	44 – 69	1.4 – 3.5	90, 120, 150, 180	ZSTWC(16-54)-XX°
Deluge	ZSTWC(43)-XX°	43	51 – 80	1.4 – 3.5	90, 120, 150, 180	ZSTWC(16-54)-XX°
Deluge	ZSTWC(54)-XX°	54	64 – 101	1.4 – 3.5	90, 120, 150, 180	ZSTWC(16-54)-XX°
Deluge	ZSTWC(67)-XX°	67	79 – 125	1.4 – 3.5	90, 120, 150, 180	ZSTWC(67-118)-XX°
Deluge	ZSTWC(86)-XX°	86	102 – 161	1.4 – 3.5	90, 120, 150, 180	ZSTWC(67-118)-XX°
Deluge	ZSTWC(118)-XX°	118	140 – 221	1.4 – 3.5	90, 120, 150, 180	ZSTWC(67-118)-XX°
Deluge	ZSTWB(16)-XX°	16	27 – 30	2.8 – 3.5	60, 90, 120	ZSTWB(16-21)-XX°
Deluge	ZSTWB(21)-XX°	21	35 – 39	2.8 – 3.5	60, 90, 120	ZSTWB(16-21)-XX°
Deluge	ZSTWB(27)-XX°	27	45 – 51	2.8 – 3.5	60, 90, 120	ZSTWB(27-54)-XX°
Deluge	ZSTWB(34)-XX°	34	57 – 64	2.8 – 3.5	60, 90, 120	ZSTWB(27-54)-XX°
Deluge	ZSTWB(43)-XX°	43	72 – 80	2.8 – 3.5	60, 90, 120	ZSTWB(27-54)-XX°
Deluge	ZSTWB(54)-XX°	54	90 – 101	2.8 – 3.5	60, 90, 120	ZSTWB(27-54)-XX°
Deluge	ZSTWB(68)-XX°	68	114 – 127	2.8 – 3.5	90	ZSTWB(68-160)-90°
Deluge	ZSTWB(80)-XX°	80	134 – 150	2.8 – 3.5	90	ZSTWB(68-160)-90°
Deluge	ZSTWC(86)-XX°	86	144 – 161	2.8 – 3.5	90	ZSTWB(68-160)-90°
Deluge	ZSTWB(107)-XX°	107	179 – 200	2.8 – 3.5	90	ZSTWB(68-160)-90°
Deluge	ZSTWB(117)-XX°	117	196 – 219	2.8 – 3.5	90	ZSTWB(68-160)-90°
Deluge	ZSTWB(160)-XX°	160	268 – 299	2.8 – 3.5	90	ZSTWB(68-160)-90°

Nozzles are made of chrome plated brass. Maximum operating pressure is 3.5 bar.

Nozzles are to be installed in a pendant (downward) position.

XX denotes spray angle. For cover area, please see table 2.

Table 2 Nozzle cover area:

Nozzle type	Spray angle, XX [°]	Cover area, radius [m]
ZSTWC(16-118)-XX°	90	2.3
ZSTWC(16-118)-XX°	120	2.6
ZSTWC(16-118)-XX°	150	2.7
ZSTWC(16-118)-XX°	180	2.8
ZSTWB(16-54)-XX°	60	1.7
ZSTWB(16-160)-XX°	90	1.6

ZSTWB(16-54)-XX°	120	2.1
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For all applications

- A. Restrictions apply to use of this system on open ro-ro and open special category spaces (see IMO MSC.1/Circ.1430 Rev.3).
- B. 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).
- C. Redundant pump arrangement is to be approved on a case-by-case basis.
- D. Pipes, couplings and other components are regarded as "Class III" piping.
- E. The pump unit and section valves shall be installed in a room having ambient temperature between 4 °C and 45 °C.
- F. Only stainless-steel piping or equivalent corrosion resistant pipes are to be applied (to avoid clogging of nozzles). Primary water supply shall be a fresh water of potable quality.

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 pump unit.
- b. Documentation of power supply and control system.
- c. Specification of pipes, section valves, pumps, including drivers and associated components.
- d. Pressure drop calculations and water spray capacity calculations.
- e. Design, installation, operation and maintenance manual.

Installation testing:

- The system is to be cleaned in accordance with routines outlined in maker's system description manual.
- In case of deluge systems, at least 2 sections should be tested with full flow through the nozzles. Manual release of all section valves (without water accepted) shall be carried out.
- In case of sprinkler systems, not less than 2 sprinkler heads in each section shall be tested, except that the test program may be limited to 10 sprinkler heads in at least 5 sections.
- Manual start of pumps shall be carried out.
- Alarms at the manned control stations shall be tested.
- Other tests as required by 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, statutory interpretations and maker's maintenance manual.

Type Examination documentation

Component test:

Test report No. Gn202303329 dated 12 September 2023 from Testing Center of Tianjin Fire Research Institute, Tianjin, China.
Test report No. YHSY-20230802 dated 1 February 2024 from manufacturer.

Drawings, deluge:

Drawing No. ZSTWC(16-54)-XX° dated 8 February 2023 from manufacturer.
Drawing No. ZSTWC(67-118)-XX° dated 8 February 2023 from manufacturer.
Drawing No. ZSTWB(16-21)-XX° dated 8 February 2023 from manufacturer.
Drawing No. ZSTWB(27-54)-XX° dated 8 February 2023 from manufacturer.
Drawing No. ZSTWB(68-160)-90° dated 8 February 2023 from manufacturer.

Tests carried out

Component test in accordance with IMO Res. A.800(19) and IMO Res. MSC.265(84), and in compliance with IMO MSC.1/Circ.1430.

Marking of product

The nozzles are to be marked with trademark or manufacturer's name, model identification, manufacturer's factory identification, k-factor and MED Mark of Conformity (see first page).