

KR HELLAS LTD.
41, Athinas Av., Vouliagmeni,
GR-16671, Athens, Greece
TEL: +30-210-428-6736
FAX: +30-210-428-6728



Certificate No:
MED- MB-3001-11
MED Item No: **A.1/3.48**
This consists of **5 pages.**
Page 1/5

EC TYPE EXAMINATION CERTIFICATE

as per Module B
of European Council Directive 96/98/EC on Marine Equipment (MED)

THIS IS TO CERTIFY that KR Hellas Ltd., designated by the Hellenic Republic of Greece as Notified Body according to Council Directive 96/98/EC on Marine Equipment as amended, did undertake the EC Type Examination procedures for the product identified below according to the following specific standards and that the product is found to meet the specific standards in compliance with the requirements of Annex A.1, Section 1, item No. A.1/3.48 and Annex B, Module B in the Council Directive 96/98/EC as amended by Commission Directive 2014/93/EU

Manufacturer Name : NK Co.,Ltd.
Address : 502, Gwahaksandan-ro, Gangseo-gu, Busan, Korea
Product Name : Fixed water based local application firefighting systems components
(A.1 item designation) : for use in category "A" machinery spaces
Product Type : NK-MIST (Nozzle type : NKT LKD 4.33)
Specific Standards : SOLAS 1974 as amended, Reg. II-2/10, and X/3,
IMO Res. MSC.36(63)-(1994 HSC code) 7,
IMO Res. MSC.97(73)-(2000 HSC code) 7,
IMO MSC/Circ.1387

This certificate is issued at Athens on 14th April 2016, under the authority of the Hellenic Republic of Greece by KR Hellas Ltd., Notified Body No. 2198.

This certificate is valid until 13th April 2021.



Notified Body No.2198



(KRH Endorse)

Shin Jeong-do

CEO of KR Hellas Ltd.

Any person not a party to the contract pursuant which this document is delivered may not assert a claim against KRH for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgment, fault or negligence committed by personal of KRH in establishment or issuance of this document, and in connection with any activities for which it may provide. In this provision KRH shall mean the KR Hellas Ltd. as well as all its subsidiaries, directors, officers, employees and any other acting on behalf of KR Hellas Ltd.



Certificate No :

MED- MB-3001-11

MED Item No : A.1/3.48

Page 2/5

Attachment to EC Type Examination Certificate (1/4)

Type examination documentation:

Technical file including the drawings of Fixed water based local application fire fighting systems components for use in category "A" machinery spaces was approved by Korean Register of Shipping dated 2010-12-24.

Test reports:

1. Water mist system(Type : NK-MIST) was tested in accordance with IMO MSC/Circ.913 and IMO MSC.1/Circ.1276.
2. Nozzles(Type : NKT LKD 4.33) was tested in accordance with IMO MSC/Circ.1165 amended by IMO MSC.1/Circ.1269.

Report No.	Title of Report	Inspection & Test Institutes	Date
KRH-MED-0448-2015	Report of conformity assessment for Module B	KR Hellas LTD.	12/04/2016
KRH-W-0085-2010	Inspection record for Fixed water based local application firefighting systems components for use in Category A machinery spaces	Korean Register of shipping	18/01/2011
P2010033526	Performance Test of a Fixed Water-Based Local Application Fire Extinguishing System	Korea Institute of Machinery and Materials	22/11/2010
P2011002526	Performance Test of a Fixed Water-Based Local Application Fire Extinguishing System	Korea Institute of Machinery and Materials	10/01/2011

Product particulars:

1. "NK-MIST", is a water mist systems, composed of nozzles, stainless steel piping, manual or automatic section valves, strainers, control systems and electrically driven pumps.
2. The system is to be designed according to principal requirements for the system, IMO.MSC/Circ.913 and SOLAS Ch.II-2, Reg.10.5.6. Only the nozzles are type approved by this certificate. Pumps, pipes, couplings, valves and other systems components are subject to case by case approval.
3. The nozzles are manufactured by NK Co., Ltd., Korea.





Certificate No :

MED- MB-3001-11

MED Item No : A.1/3.48

Page 3/5

Attachment to EC Type Examination Certificate (2/4)

Application/Limitations of Use:

1. The nozzles are to be installed above the protected objects according to the following specifications :

Alternative 1 : Vertically downward position

Maximum horizontal spacing :	4.0 m x 4.0 m
Minimum vertical distance from object :	0.5 m
Maximum vertical distance from object :	14.5 m
Minimum operation pressure :	12 bar
Nozzle type :	NKT LKD 4.33
K-factor of nozzle(using $K = Q / p^{1/2}$) :	4.33

- The outer nozzles are to be located either at the edge of the protected area or outside of the protected area.
- The nozzles are to be installed in a vertically downward position.

Alternative 2 : Inclined position at an angle of 15° to a vertical direction

Maximum horizontal spacing :	4.0 m x 4.0 m
Minimum vertical distance from object :	1.0 m
Maximum vertical distance from object :	6.0 m
Minimum operation pressure :	12 bar
Nozzle type :	NKT LKD 4.33
K-factor of nozzle(using $K = Q / p^{1/2}$) :	4.33

Alternative 3 : Inclined position at an angle of 60° to a vertical direction

Maximum horizontal spacing :	4.0 m x 4.0 m
Minimum vertical distance from object :	1.0 m
Maximum vertical distance from object :	6.0 m
Minimum operation pressure :	12 bar
Nozzle type :	NKT LKD 4.33
K-factor of nozzle(using $K = Q / p^{1/2}$) :	4.33

- The outer nozzles are to be located either at the edge of the protected area or outside of the protected area.
- The nozzles are to be installed in a inclined position at an angle of 60 degrees to the vertical direction
- According to vertical distance, the protected area is to be shifted in the direction of the nozzles by below equation ;

$$Y = 0.0004167 \times X^5 - 0.0127083 \times X^4 + 0.1233 \times X^3 - 0.52229167 \times X^2 + 1.22625 \times X + 1.035$$

Y : Shifted distance of protected area

X : Vertical distance from object





Certificate No :

MED- MB-3001-11

MED Item No : A.1/3.48

Page 4/5

Attachment to EC Type Examination Certificate (3/4)

Table - Shifted distance of the protected area in accordance with vertical distance from object

Vertical distance from object	1 m	2 m	3 m	4 m	5 m	6 m
Shifted distance of the protected area at an angle of 15°	0.65 m	0.755 m	0.825 m	0.895 m	0.96 m	1.00 m
Shifted distance of the protected area at an angle of 60°	1.85 m	2.195 m	2.415 m	2.65 m	2.885 m	3.00 m

1. Nozzles are made of stainless steel (STS 316).
2. The detectors are to be approved by the concerned Government or Society, as appropriate.
3. Individual Product Certification for system units is required.
4. The following documents are to be submitted for approval for each actual application.
 - System arrangement plans including location of nozzles, section valves, release station and pump unit (including water supply specifications)
 - Documentation of power supply and control system
 - Specification of pipes, electrical motor, valves, pumps and associated components.
 - Pressure drop calculations and water capacity calculations
 - Arrangement of interface to fire detection and alarm system (where applicable)
 - Manual with operating, test and maintenance instructions
5. The following items are to be tested upon installation
 - Testing of water mist discharge is to be carried out for at least one section.
 - Pressure testing of water piping system to at least 1.5 times maximum working pressure by using test valve.
 - Testing of automatic starting system and alarms in accordance with SOLAS II-2, Reg.10.5.6.4.
 - Testing of automatic start of system (in case of unattended machinery spaces)
 - Other tests according to type approval manual.
 - Other tests considered necessary by the Society.
6. The electric components for the pressure source, etc. for the system should have a minimum rating of IP54.



(KRH Endorse)




Certificate No :
MED- MB-3001-11
MED Item No : A.1/3.48
Page 5/5

Attachment to EC Type Examination Certificate (4/4)

Marking of product:

1. Mark of Conformity

The manufacturer is allowed to affix the Mark of Conformity  according to Article 11 in the Council Directive 96/98/EC on marine equipment and issue a Declaration of Conformity, only when the module D or E or F of Annex B in the directive is fully complied with.

2. Marking of product for identification

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

Conditions of the validity:

1. The products are to be manufactured in accordance with the approved production quality assurance system (Module D) or approved product assurance system (Module E), or are to be subjected to product verification (Module F) of the Council Directive 96/98/EC on Marine Equipment as amended.
2. If the Directive or the applied Standard(s) is amended, the product is to be re-approved in accordance with the amended requirements prior to it being supplied to vessels to which the amended Directive or Standard(s) apply. Any significant changes in design or construction of the product, or amendments to the Directive or Standards referenced above may render this certificate invalid.
3. The Manufacturer must inform the "Notified Body" of all modifications which may affect compliance with the requirements.
4. The Mark of Conformity may only be affixed to the product and a Declaration of Conformity may only be issued when the production/product assessment module referred to in the council directive, is fully complied with.

Remark

1. Reissued on 14th April 2016.
- Renewal of existing certificate issued on 25th January 2011

End of Certificate

