TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MERB00002S1
Revision No:
0

This Certificate is issued by DNV UK Limited based on authorisation of the Maritime & Coast Guard Agency (MCA) as an UK Approved Body to undertake conformity assessments on marine equipment in accordance with the requirements of the Merchant Shipping (Marine Equipment) Regulations 2016 as amended.

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)
“VID Fire-Kill K6 Pacific Fine Water Spray” (ceiling), “VID Fire-Kill K6 North Sea Fine Water Spray” (ceiling),...

Issued to
Vid Fire-Kill ApS
Svendborg, **Denmark**

is found to comply with the requirements in the following Regulations/Standards:
Regulation **MSN 1874 Amendment 7,**
item No. UK/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 **2027-10-30**.

Issued at **London** on **2023-04-14**

for **DNV UK Ltd.**

DNV local unit:
Denmark CMC

Approval Engineer:
Tessa Biever

Approved Body No.: **0097**

Christine Mydlak-Roeder
MER Service Responsible

Maritime & Coastguard Agency
UK Approved Body Authorised by the MCA

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-control phase module (D, E or F) of Schedule 2 of the Merchant Shipping (Marine Equipment) Regulations 2016, as amended is fully complied with and controlled by a written inspection agreement with an approved body. The product liability rests with the manufacturer or his representative in accordance with the Merchant Shipping (Marine Equipment) Regulations 2016.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV UK Ltd. of any changes to the approved equipment. 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. This certificate remains valid unless suspended, withdrawn, re-called, or cancelled.

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

"VID Fire-Kill K6 Pacific Fine Water Spray" (ceiling), "VID Fire-Kill K6 North Sea Fine Water Spray" (ceiling), "VID Fire-Kill K6 Mediterranean Fine Water Spray" (ceiling), "VID Fire-Kill K1 Biscay Water Mist" (bilge), "VID Fire-Kill F1 Tampa Fine Water Spray" (bilge), "VID Fire-Kill B1 Hudson" (bilge) and "VID Fire-Kill B1 Bengal (bilge)",
Is a dry pipe water mist system, composed of nozzles, stainless steel piping, section valves, strainers and electrically driven pumps.

The system is to be designed in accordance with the "Principal Requirements for the System" in IMO MSC/Circ.1165.

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

Application/Limitation

Approved for use as fixed fire extinguishing system for machinery spaces and cargo pump rooms.

The nozzles are to be installed to the following specifications with one layer of ceiling mounted nozzles (including nozzles under every platform) and a bilge system:

Volume and height of protected spaces (K6 Pacific)	
Maximum ceiling height of protected space [1]:	10.0 m
Maximum volume of protected space [2]:	3842 m^3
Notes: 1) Standard casings need in general not to be considered when assessing this height limitation. 2) This will in general be accepted as the maximum net volume for any protected space (corresponding to a typical gross volume of 4520 m^3). This volume shall include bilges, casings, etc.	

Volume and height of protected spaces (K6 North Sea)	
Maximum ceiling height of protected space [1]:	10.0 m
Maximum volume of protected space [2]:	2862 m^3
Notes: 1) Standard casings need in general not to be considered when assessing this height limitation. 2) Net volume can be increased to 5024 m^3 based on IMO MSC.1/Circ.1385 as average time to extinguishment for the three fires with the longest extinguishing times is less than 11:13 minutes. This volume shall include bilges, casings, etc.	

Volume and height of protected spaces (K6 Mediterranean)	
Maximum ceiling height of protected space [1]:	5.0 m
Maximum volume of protected space [2]:	500 m^3
Notes: 1) Standard casings need in general not to be considered when assessing this height limitation. 2) Net volume can be increased to 1000 m^3 based on IMO MSC.1/Circ.1385 as average time to extinguishment for the three fires with the longest extinguishing times is less than 10 minutes. This volume shall include bilges, casings, etc.	

Ceiling mounted nozzles (K6 Pacific)	
Maximum horizontal spacing:	3.0 x 3.0 m
Maximum distance to bulkhead:	1.5 m
Maximum coverage area per nozzle (average):	9.0 m^2
Maximum ceiling height of nozzles:	10.0 m
Minimum pressure at nozzles:	8.0 bar
Nozzle type:	VID F-K K6
Nozzle orientation:	Downwards
Nozzles shall normally be installed approximately 0.1 - 0.2 m below deck. Where the nozzles are located less than 3 m above the protected object, a narrower nozzle spacing than 3 x 3 m or the use of nozzles intended for lower installation height should be considered. Arrangement to be approved case-by-case.	
A separate system for the bilges, approved according to IMO MSC/Circ.1165, is to be provided.	
Casings and areas under platforms and other similar obstruction shall be protected by additional nozzles.	
Nozzles are to be uniformly distributed throughout the space.	

Ceiling mounted nozzles (K6 North Sea)	
Maximum horizontal spacing:	3.0 x 3.0 m
Maximum distance to bulkhead:	1.5 m
Maximum coverage area per nozzle (average):	9.0 m^2

Maximum ceiling height of nozzles:	10.0 m
Minimum pressure at nozzles:	9.0 bar
Nozzle type:	VID F-K K6
Nozzle orientation:	Downwards
Nozzles shall normally be installed approximately 0.1 - 0.2 m below deck. Where the nozzles are located less than 3 m above the protected object, a narrower nozzle spacing than 3 x 3 m or the use of nozzles intended for lower installation height should be considered. Arrangement to be approved case-by-case.	
A separate system for the bilges, approved according to IMO MSC/Circ.1165, is to be provided.	
Casings and areas under platforms and other similar obstruction shall be protected by additional nozzles.	
Nozzles are to be uniformly distributed throughout the space.	

Ceiling mounted nozzles (K6 Mediterranean)	
Maximum horizontal spacing:	4.0 x 4.0 m
Maximum distance to bulkhead:	2.0 m
Maximum coverage area per nozzle (average):	16.0 m^2
Maximum ceiling height of nozzles:	5.0 m
Minimum pressure at nozzles:	8.0 bar
Nozzle type:	VID F-K K6
Nozzle orientation:	Downwards
Nozzles shall normally be installed approximately 0.1 - 0.2 m below deck. Where the nozzles are located less than 3 m above the protected object, a narrower nozzle spacing than 4 x 4 m or the use of nozzles intended for lower installation height should be considered. Arrangement to be approved case-by-case.	
A separate system for the bilges, approved according to IMO MSC/Circ.1165, is to be provided.	
Casings and areas under platforms and other similar obstruction shall be protected by additional nozzles.	
Nozzles are to be uniformly distributed throughout the space.	

Bilge nozzles (K1 Biscay)	
Maximum horizontal spacing:	1.7 x 0.5 m
Maximum distance to bulkhead:	0.85 m
Maximum coverage area per nozzle (average):	0.43 m^2
Height of nozzle above tank top/floor level:	0.37 - 0.45 m [1)]
Minimum operation pressure at nozzles:	11.0 bar
Nozzle type:	VID F-K K1
Nozzle orientation:	Horizontal [2)]

Notes:

1) The bilge plate was located at 0.75 m in the fire test. Installations on vessels with bilges and nozzle higher or lower than these figures will be considered case by case.
2) Spacing between nozzles pointing the same direction is 0.5 m along the distribution pipe and 1.7 m between distribution pipes. Nozzles of two adjacent rows shall be installed pointing against each other. The nozzles along a row (distribution pipe) are installed with alternating pointing directions, thus with half spacing between them (0.25 m). The manufacturer's prefabricated N-pipe should be used as distribution pipe (consisting of a PN16 Stainless Steel pipe with prefabricated holes and threading for mounting of the K1 nozzles).

Bilge nozzles (F1 Tampa)	
Maximum horizontal spacing:	1.75 x 0.75 m
Maximum distance to bulkhead:	0.85 m
Maximum coverage area per nozzle (average):	0.66 m^2
Height of nozzle above tank top/floor level:	0.35 - 0.37 m [1)]
Minimum operation pressure at nozzles:	11.0 bar
Nozzle type:	VID F-K F1
Nozzle orientation:	Horizontal [2)]

Notes:

1) The bilge plate was located at 1.1 m in the fire test. Installations on vessels with bilges and nozzle higher or lower than these figures will be considered case by case.
2) Spacing between nozzles pointing the same direction is 0.75 m along the distribution pipe and 1.75 m between distribution pipes. Nozzles of two adjacent rows shall be installed pointing against each other. The nozzles along a row (distribution pipe) are installed with alternating pointing directions, thus with half spacing between them (0.375 m). The manufacturer's prefabricated N-pipe should be used as distribution pipe (consisting of a PN16 Stainless Steel pipe with prefabricated holes and threading for mounting of the F1 nozzles).

Bilge nozzles (B1 Hudson)	
Maximum horizontal spacing:	1.5 x 4.0 m
Maximum coverage area per nozzle (average):	6.0 m^2
Height of nozzle above tank top/floor level:	0.30 - 0.60 m 1)
Minimum operation pressure at nozzles:	10.5 bar
Nozzle type:	VID F-K B1
Nozzle orientation:	Horizontal 2)

Notes:
1) The bilge plate was located at 1.0 m in the fire test. Installations on vessels with bilges and nozzle higher or lower than these figures will be considered case by case.
2) Spacing between nozzles pointing the same direction is 1.5 m along the distribution pipe and 4.0 m between distribution pipes. Nozzles of two adjacent rows shall be installed pointing against each other.
3) Approved STHAMEX AFFF foam concentrate (or equivalent) is to be applied with 1% admixture to water after 7 minutes of activating the system.

VID Fire-Kill B1 Bengal (bilge)	
Maximum horizontal spacing:	1.5 x 4.0 m
Maximum coverage area per nozzle (average):	6.0 m^2
Height of nozzle above tank top/floor level:	0.30 - 0.50 m 1)
Minimum operation pressure at nozzles:	6 bar
Nozzle type:	VID F-K B1
Nozzle orientation:	Horizontal 2)

Notes:
1) The bilge plate was located at 1.1 m in the fire test. Installations on vessels with bilges and nozzle higher or lower than these figures will be considered case-by-case.
2) Spacing between nozzles pointing the same direction is 1.5 m along the distribution pipe and 4.0 m between distribution pipes. Nozzles of two adjacent rows shall be installed pointing against each other.
3) Approved FOMTEC AFFF foam concentrate (or equivalent) is to be applied with 1% admixture to water after system activation.

Nozzle information:

Nozzle type	Application	k-factor [lpm/bar$^{1/2}$]	Flow [lpm]	Operating pressure [bar]	Drawing no.
VID F-K K6 1)	Ceiling	5.6	15.8	8.0	100714-836
VID F-K K6 1)	Ceiling	5.6	16.8	9.0	100714-836
VID F-K K1 2)	Bilge	0.9	3.0	11.0	100303-807
VID F-K F1 2)	Bilge	1.1	3.6	11.0	120216-1043
VID F-K B1 3)	Bilge	2.8	9.1	10.5	71203-478
VID F-K B1 3)	Bilge	2.8	6.9	6.0	71203-478

1) The nozzle is made of Naval brass + NiSn / AISI 316 and have a maximum rated pressure of 16 bar.
2) The nozzle is made of Naval brass + NiSn / AISI 316 / AISI 303 housing and have a maximum rated pressure of 16 bar.
3) The nozzle is made of Naval brass / AISI 316 and have a maximum rated pressure of 16 bar.

For all applications

A. The pumps (or pump unit) shall be delivered with product certificate, whereas other system components are to be certified or inspected in accordance with Class Rules (or equivalent standard as specified by the Flag Administration).
B. Redundant pump arrangement is to be approved on a case-by-case basis.
C. For nozzles F1 and K1 piping shall be made of stainless steel or equivalent material.
For nozzles K6 and B1 piping can be made of galvanised steel or equivalent material.
For nozzles F1 and K1 only fresh water shall be used in the system.
For nozzles K6 and B1 only water complying with maker's specification shall be used in the system. This includes testing and flushing operations.
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.

The following items are to be approved and filed by the flag administration for each project:

a. System arrangement plans including routing of pipes, location of nozzles, section valves, release stations, pump unit with back-up capacity and water supply.
b. Documentation of power supply and control system.
c. Specification of pipes, section valves, electrical motors, pumps and associated components.

d. Pressure drop calculations and water mist capacity calculations.
e. Design, installation, operation and maintenance manual.

Other documents:
- Gas cylinders, gas pumps, any pipes above DN 50 mm, valves and couplings above DN 100 mm are to be delivered with product certificates (or standards considered by the Flag Administration to be equivalent).
- 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 makers installation manual.
- Water to be sampled from the water supply 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.
- Foam proportioner shall be tested according to approval.
- 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 nozzles (not the same section each year).

Type Examination documentation

Design, installation, operation and maintenance manual No. 141201-01-06 - K6 DIOM 1165 TF, Rev.6, dated 16 October 2021 from manufacturer.

Fire test reports:
Test report No. 110315-52 dated 21 March 2011 from DFL, Svendborg, Denmark.
Test report No. 110630-55 dated 18 August 2012 from DFL, Svendborg, Denmark.
Test report No. 170620-204 dated 30 August 2017 from DFL, Svendborg, Denmark.
Test report No. 111025-59 dated 28 October 2011 from DFL), Svendborg, Denmark.
Test report No. 120308-65 dated 19 March 2012 from DFL Svendborg, Denmark.
Test report No. 140229-136 dated 30 April 2014 from DFL, Svendborg, Denmark.
Test report No. 71205-16 dated 31 March 2008 from DFL, Svendborg, Denmark.

Component test reports:
Test report No. 090109-2 dated 15 April 2011 from DFL, Svendborg, Denmark.
Test report No. 110414-1 dated 15 April 2011 from DFL, Svendborg, Denmark.
Test report No. 110414-2 dated 24 August 2011 from DFL, Svendborg, Denmark.
Test report No. 111004-7 dated 28 October 2011 from DFL, Svendborg, Denmark.
Test report No. 120424-8 dated 30 April 2012 from DFL, Svendborg, Denmark.
Test report No. 141028-148 dated 3 December 2014 from DFL, Svendborg, Denmark.

Drawings, nozzles:
Dwg. No. 100714-836 Rev. C dated 20 April 2012 from manufacturer.
Dwg. No. 100303-807 Rev. B dated 3 March 2010 from manufacturer.
Dwg. No. 120216-1043 dated 3 March 2010 from manufacturer.
Dwg. No. 71203-478 Rev. E dated 3 December 2014 from manufacturer.

Tests carried out

Fire performance test in accordance with IMO MSC/Circ.1165.

Component test in accordance with IMO MSC/Circ.1165 and IMO MSC.1/Circ.1269.

Marking of product

The nozzles are to be marked with type designation and MER Mark of Conformity (see first page) whereas the pump unit is to be marked with name of manufacturer and type designation.