

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Fire-extinguishing system for protection of galley deep-fat cooking equipment**

with type designation(s)

Vesuvius N-pipe Type 2V-BM1, Etna N-Pipe Type I-K1

Issued to

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

is found to comply with

DNV GL offshore standards**DNV GL rules for classification – Ships****DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations****Application :****Approved for use as a fire extinguishing system for galley extract ducts and galley deep-fat cooking equipment.****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**This Certificate is valid until **2021-08-10**.Issued at **Høvik** on **2016-08-11**DNV GL local station: **Fredericia**Approval Engineer: **Tomasz Werchowicz**for **DNV GL**

**Petter Langnes
Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

" Vesuvius N-pipe Type 2V-BM1, Etna N-Pipe Type I-K1"

is a low pressure water mist system, composed of spray heads, stainless steel piping, section valves and supply component(s).

The galley protection system should be designed according to new SOLAS Ch. II-2, Reg.10, 6.4.1-5. This certificate addresses only item 6.4.1.

The spray heads are manufactured by the VID Fire-Kill ApS, Svendborg, Denmark.

Application/Limitation

The spray heads are to be installed in according to the following specifications:

Fat fryer protection	
Distance above fryer:	1 m – 1.5 m
Number of spray heads:	Six per 1.8 m pipe (3 pairs each 600 mm)
Position of spray head (pairs):	Two centrally over the protected area with approx. spreading angel of 60 degrees between nozzles and distance of 50 mm nozzle to nozzle
Maximum size of vats:	0.45 x 0.48 (W x H)
Maximum volume of vats:	30 l
Operating pressure:	7 bar – 9 bar
Spray heads type:	Vesuvius N-pipe Type 2V-BM1

Duct protection	
Maximum protection length of each spray head:	0.5 m
Number of spray heads:	Twelve per 6 m pipe (nozzle spacing every 0.5 m)
Position of spray head:	Upper corner for square ducts (nozzle pointing 64° downwards, from vertical duct side) and upper side in round ducts (nozzle pointing downwards)
Maximum size of square ducts: ¹⁾	0.6 x 0.3 m (W x H)
Maximum size of round ducts: ¹⁾	Ø 0.57 m
Normal operating pressure:	6 bar
Spray heads type:	Etna N-Pipe Type I-K1
Notes:	
1) Larger ducts can be accepted case by case (reduced nozzle spacing)	

Spray head information			
Spray head	k-factor ($Q = k \times p^{1/2}$)	Flow rate	Drawing no.
Vesuvius N-pipe Type 2V-BM1 (per 1.8 m N-pipe) ²⁾	16.8 lpm/bar ^{1/2}	44.45 lpm at 7 bar	80704-557A
Vesuvius N-pipe Type 2V-BM1 (per micro nozzle) ²⁾	2.8 lpm/bar ^{1/2}	7.41 lpm at 7 bar	80704-557A
Etna N-Pipe Type I-K1 (per 6 m N-pipe) ³⁾	10.8 lpm/bar ^{1/2}	26.45 lpm at 6 bar	100303-807A
Etna N-Pipe Type I-K1 (per micro nozzle) ³⁾	0.9 lpm/bar ^{1/2}	2.2 lpm at 6 bar	100303-807A
Notes:			
2) Spray heads are to be made of stainless steel "SS AISI 316" and have a maximum rated pressure of 9 bar.			
3) Spray heads are to be made of stainless steel "SS AISI 303" and have a normal operating pressure of 6 bar.			

System components are to be certified or inspected in accordance with DNV GL Rules.

For all applications:

- A. The pumps or pump unit and the pressure tank are to be delivered with DNV GL product certificate. Other system components are to be certified or inspected in accordance with DNV GL Rules.
- B. Pipes, couplings and other components are regarded as "Class III" piping.
- C. The pump unit and section valves shall be installed in a room having ambient temperature between +4 °C and +45 °C.
- D. Only stainless steel piping, or equivalent corrosion resistant pipes, is to be applied (to avoid clogging of sprinklers). Primary water supply shall be fresh water of potable quality.

The following items are to be submitted for approval for each project:

- System arrangement plans including location of spray heads, section valves, release stations and cylinders.
- Capacity of pressure vessel system.
- Specification of pipes, pump, and associated components;
- Shut down of function defined by SOLAS 2000 II-2/10.6.4.2-5.
- Manual containing operating and maintenance instructions.

Installation testing:

- Pressure testing of water pipe system to at least 1,5 times maximum working pressure;
- Other tests according to makers manual.

Periodical testing:

- Periodical control and inspection to be in accordance with maker's manual.

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, October 2015.

Component Test Report No. 110914-6 and 111004-7, both dated 28 October 2011 from Danish Fire Laboratories.

Fire Test Report No. 120321-66, dated 5 July 2012 from Danish Fire Laboratories.

Fire Test Report No. 120323-67, dated 2 August 2012 from Danish Fire Laboratories.

Drawings No. 80704-557A, 100303-807A from manufacturer.

Design, Installation and Service Manual No. 120829-01-01, dated 29 August 2012 from manufacturer.

Tests carried out

Fire tested according to ISO 15371:2009, component test of spray heads according to IMO MSC/Circ.1165.

Marking of product

The spray and sprinkler heads are to be marked with type designation whereas the pump and pressure units are also to be marked with name of manufacturer.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Class Programme DNVGL-CP-0338, Section 4.