DNV·GL

Certificate No:
**TAF00000XS**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Fixed Dry Chemical Fire Extinguishing System**

with type designation(s)
**TMS-SP-DPS**

Issued to
## Johnson Controls International Korea, Inc.
**Busan, Republic of Korea**

is found to comply with
**DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations**
**DNV GL rules for classification – Ships**
**DNV GL offshore standards**

## Application :

**Approved for use as a fixed dry chemical powder fire-extinguishing system on gas carriers.**

**Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Issued at **Høvik** on **2020-04-03**
This Certificate is valid until **2025-04-02**.
DNV GL local station: **Busan**

Approval Engineer: **Helge Bjørnarå**

for **DNV GL**

**Mårten Schei-Nilsson**
**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.


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## Product description

"TMS-SP-DPS"
are designed for fighting fires on cargo manifolds and cargo areas on LPG and LNG ships. Each system consists of a nitrogen cylinders (propellant gas), piping, valves, pressure regulator, safety valves, gauges, pressure tank for the powder and discharge devices (monitors and hoses with nozzles).

This certificate does only address the functionality and performance of the entire system. All system components are subject to case by case approval.

The system is to be designed in accordance with the "Principal Requirements for the System" in IMO MSC.1/Circ.1315.

The system is manufactured by Johnson Controls International Korea, Inc., Busan, Korea.

## Application/Limitation

Approved for use as a fixed dry chemical powder fire-extinguishing system on gas carriers.

The system has the following approved main specifications:

| **Dry Chemical Powder System** | |
|---|---|
| Propellant gas | Nitrogen |
| Powder tank | 1530 - 3250 L, working pressure 12 bar |
| Dry powder medium[1)] | Potassium Bicarbonate |
| Discharge device[2)] | Monitor (D-65)<br>Hand hose gun (DPHG-3.5) |
| Minimum operation system temperature | -20° C |
| 1) The dry chemical powder used in the system shall be of approved type (Potassium Bicarbonate only)<br>2) The pipe length between powder tank and the discharge devices shall be as straight as possible. | |

| **Monitor (D-65)** | |
|---|---|
| Material | Stainless steel |
| Weight | 25 kg |
| Pressure at nozzle (average) | 5.5 – 9.5 bar |
| Nozzle orifice for flow rate | Ø28 – Ø45 mm |
| Discharge rate (monitor) | 10 – 25 kg/s |
| Minimum throw length monitor | 10 – 30 m |
| Maximum length of piping / number of fittings | 113.4 m pipe size 80A<br>Fittings:<br>- 45° elbow – 14<br>- 90° elbow – 3<br>- R230 bending (90°) – 2 |

| **Hand hose gun (DPHG-3.5)** | |
|---|---|
| Material | Stainless steel and brass |
| Weight | 3 kg |
| Discharge rate (hand hose gun) | 3.5 kg/s |
| Pressure at nozzle (average) | 6.0 bar |
| Maximum length hose | 33 m |
| Maximum length of piping / number of fittings | 206.2 m pipe size 40A pipe<br>Fittings:<br>- 90° elbow – 1<br>- R150 bending (90°) – 2<br>- R260 bending (90°) – 2<br>- R290 bending (90°) – 6<br>- R355 bending (90°) – 6 |

The powder pressure vessel and pressure gas cylinders are subject for separate approval and shall be delivered with DNV GL product certificates. Arrangement of safety valves is subject to approval in each case. Other system components are to be inspected in accordance with the DNV GL Rules.

The following documentation is to be submitted in each separate case:

- Plans showing the location of powder unit, piping, release controls, hoses and monitors.
- Arrangement of the assembled powder unit, including release lines.
- Capacity calculations (flow rate and total amount of powder).
- Approvals and specification of the fire extinguishing powder.
- Material specification and dimensions for all piping and specifications for all other components.
- Manual containing design, inspection, operation and maintenance procedures.

Testing at installations:

- All tests and inspections defined by maker's manual.
- The pipes, tanks, valves and fittings and assembled systems shall be tested as per DNV GL Rules for Classification of Ships, Pt.4 Ch.6 and Ch.7.
- All distribution piping shall be blown through with air or nitrogen to ensure that the piping is free from obstructions, filters to be checked.
- All valves, release stations and any control systems shall be function tested.
- The pipes, valves, fittings and assembled systems shall be subjected to a tightness test.
- The initial testing shall also include a discharge of sufficient amounts of dry chemical powder to verify that the system is in proper working order.

Testing at periodical surveys:

- All periodic tests and inspections defined by maker's manual
- The system should also be tested and inspected as specified by the DNV GL Rules and DNVGL-SI-0364 – SOLAS Interpretations, reference is made to IMO MSC.1/Circ.1432.

## Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, September 2018.

Test report No. R2013-0803 dated 7 November 2013 from FILK, Gyeonggi-Do, Korea.
Test report No. R2018-0202 dated 16 March 2018 from FILK, Gyeonggi-Do, Korea.
Test report No. R2018-0203 dated 16 March 2018 from FILK, Gyeonggi-Do, Korea.

Type Approval Document for Fixed Dry Chemical Powder Fire Extinguishing System No. TMS-SP-DPS-TA1 from manufacturer.

Operation and Maintenance Manual Doc. No. SS-036 980519 from the manufacturer.

## Tests carried out

The system is tested according to IMO MSC.1/Circ.1315.

## Marking of product

The powder unit is to be marked with name of manufacturer and type designation.

## 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.