DNV·GL

Certificate No:
TAP00000N6

TYPE APPROVAL CERTIFICATE

This is to certify:

That the High Velocity Pressure Relief Valve

with type designation(s)
SUPER-ISO and VAC-ISO

Issued to
Topsafe Co., Ltd.
Gimhae-si Gyeongsangnam-do, Republic of Korea

is found to comply with
Det Norske Veritas' Rules for Classification of Ships Pt.5, Ch.3 "Oil Carriers"
Det Norske Veritas' Rules for Classification of Ships Pt.5, Ch.4 "Chemical Carriers"

Application :

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

Design: **Weight loaded high velocity pressure/vacuum relief valve with gas free screen**
Sizes: **DN 65 to DN 300**

This Certificate is valid until **2020-12-31**.

Issued at **Høvik** on **2016-11-08**

for **DNV GL**

DNV GL local station: **GYE**

Approval Engineer: **Adel Samiei**

Marianne Spæren Marveng
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.

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Job Id: **262.1-024108-1**
Certificate No: **TAP00000N6**

Product description

Integrated weight loaded high velocity and vacuum relief valve with flame screen complying with following standards for design, testing and performance:

- ISO15364:2007 – Standard for ships and marine technology – Pressure/vacuum valves for cargo tanks
- IMO MSC/Circ. 677 (as amended by MSC/Circ.1009 and MSC.1/Circ.1324) - Revised Standards for The Design, Testing and Locating of Devices to Prevent the Passage of Flame into Cargo Tanks in Tankers
- EN ISO 16852:2010: Flame arresters - Performance requirements, test methods and limits for use

Pressure side:

Part	**DN65/80/100/125**			**DN150/200/250/300**		
	Material					
	Spec. 1	Spec. 2	Spec. 3	Spec. 1	Spec. 2	Spec. 3
Pressure housing	SUS316	SUS316	SUS316L	SECC	SUS316	SUS316L
Pressure stem	Monel 400	Monel 400	Monel 400	SUS316	SUS316	SUS316L
Pressure disc	SUS316	SUS316	SUS316L	SUS316	SUS316	SUS316L
Pressure seat	SUS316	SUS316	SUS316L	SUS316	SUS316	SUS316L
Pressure body	SC480	SCS14A	SCS16A	SC480	SCS14A	SCS16A
	For all sizes					
Vacuum body	FCD450/A216-WCB	SCS14A	SCS16A			
Vacuum disc	SUS316	SUS316	SUS316L			
Vacuum seat	SUS316/SCS14A	SUS316	SUS316L			
Vacuum seat housing	FCD450/A216-WCB	SCS14A	SCS16A			
Flame screen	SUS316	SUS316	SUS316			

Application/Limitation

Maximum standpipe length and set pressure:

Type	Maximum equivalent pipe length	Set point [mmAq]	
		Pressure	Vacuum
ISO-65	32.5m	1400, 2100	-350
ISO-80	32.5m	1400, 2100	-350
ISO-100	32.5m	1400, 2100	-350
ISO-125	30.5m	1400, 2100	-350
ISO-150	15.0m	1400	-350
ISO-200	15.0m	1400	-350
ISO-250	3.5m	1400	-350
ISO-300	3.5m	1400	-350

The length of standpipe between cargo tank and valve is restricted with regard to hammering. The maximum allowable dynamic pressure drop in the standpipe between the cargo tank and the valve is not to exceed the equivalent (steel-) pipe length as indicated.

May be fitted on tanks containing products with Maximum Experimental Safe Gap (MESG):

- DN 65 – DN 125: 0.65mm or above
- DN 150 – DN 300: 0.9mm or above

Maximum loading rate to be established according to the latest revision of MSC/Circ. 731

Sizing and location to be in accordance with the latest revision of MSC/Circ. 731.

Installation on board is to comply with the Rules Pt.5 Ch.3 Sec.5B.

Each finished device to be leakage tested, ref. ISO15364 Pt. 8.3.

A copy of the instruction manual shall be kept on board, and is to include:

- Copy of the laboratory report
- Flow test data, incl. flow rates under both positive and negative pressures, operating pressures, operating sensitivity, flow resistance and velocity

Type Approval documentation

- Manufacturer's instruction manual, dated 2006-05-17
- Type approval test program procedure and results for high velocity vent (rev. 1), dated 2005-12-12
- Type approval test results of high velocity vent and vacuum relief valve 1-1 & 2-1, dated 2006-09-26
- KIMM test report no.: 2006294823 (-0 to -7), dated 2006-09-26
- Type approval test result (Endurance burning test), dated 2008-04-24
- Leakage test dated 2010-01-22
- Freezing test dated 2010-01-22

Drawing No.	Rev./Date	Drawing No.	Rev./Date	Drawing No.	Rev./Date
S-ISO-P65-00	16.07.2015	S-ISO-P80-00	16.07.2015	S-ISO-P125-00	16.07.2015
S-ISO-P65-01	05.12.2015	S-ISO-P80-01	05.12.2015	S-ISO-P125-01	05.12.2015
S-ISO-P65-02	05.12.2015	S-ISO-P80-02	05.12.2015	S-ISO-P125-02	05.12.2015
S-ISO-P65-03	05.12.2015	S-ISO-P80-03	05.12.2015	S-ISO-P125-03	05.12.2015
S-ISO-P65-04	05.12.2015	S-ISO-P80-04	05.12.2015	S-ISO-P125-04	05.12.2015
S-ISO-P65-05	05.12.2015	S-ISO-P80-05	05.12.2015	S-ISO-P125-05	05.12.2015
S-ISO-P65-06	05.12.2015	S-ISO-P80-06	05.12.2015	S-ISO-P125-06	05.12.2015
S-ISO-P65-07	05.12.2015	S-ISO-P80-07	05.12.2015	S-ISO-P125-07	05.12.2015
S-ISO-P65-08	05.12.2015	S-ISO-P80-08	05.12.2015	S-ISO-P125-08	05.12.2015
S-ISO-P65-09	16.07.2015	S-ISO-P80-09	16.07.2015	S-ISO-P125-09	16.07.2015
S-ISO-P65-10	05.12.2015	S-ISO-P80-10	05.12.2015	S-ISO-P125-10	05.12.2015
S-ISO-P100-00	16.07.2015	S-ISO-P150-00	16.07.2015	S-ISO-P200-00	16.07.2015
S-ISO-P100-01	05.12.2015	S-ISO-P150-01	05.12.2015	S-ISO-P200-01	05.12.2015
S-ISO-P100-02	05.12.2015	S-ISO-P150-02	05.12.2015	S-ISO-P200-02	05.12.2015
S-ISO-P100-03	05.12.2015	S-ISO-P150-03	05.12.2015	S-ISO-P200-03	05.12.2015
S-ISO-P100-04	05.12.2015	S-ISO-P150-04	05.12.2015	S-ISO-P200-04	05.12.2015
S-ISO-P100-05	05.12.2015	S-ISO-P150-05	05.12.2015	S-ISO-P200-05	05.12.2015
S-ISO-P100-06	05.12.2015	S-ISO-P150-06	05.12.2015	S-ISO-P200-06	05.12.2015
S-ISO-P100-07	05.12.2015	S-ISO-P150-07	05.12.2015	S-ISO-P200-10	05.12.2015
S-ISO-P100-08	05.12.2015	S-ISO-P150-08	05.12.2015	S-ISO-P200-11	16.07.2015
S-ISO-P100-09	16.07.2015	S-ISO-P150-09	05.12.2015	S-ISO-P300-00	16.07.2015
S-ISO-P250-00	16.07.2015	S-ISO-P150-10	05.12.2015	S-ISO-P300-01	05.12.2015
S-ISO-P250-01	05.12.2015	S-ISO-P150-11	16.07.2015	S-ISO-P300-02	05.12.2015
S-ISO-P250-02	05.12.2015	S-ISO-P250-09	05.12.2015	S-ISO-P300-07	05.12.2015
S-ISO-P250-03	05.12.2015	S-ISO-P250-10	05.12.2015	S-ISO-P300-08	05.12.2015
S-ISO-P250-04	05.12.2015	S-ISO-P250-11	16.07.2015	S-ISO-P300-09	05.12.2015
S-ISO-P250-05	05.12.2015	S-ISO-P300-03	05.12.2015	S-ISO-P300-10	05.12.2015
S-ISO-P250-06	05.12.2015	S-ISO-P300-04	05.12.2015	S-ISO-P300-11	16.07.2015
S-ISO-P250-07	05.12.2015	S-ISO-P300-05	05.12.2015		
S-ISO-P250-08	05.12.2015	S-ISO-P300-06	05.12.2015		
S-ISO-V65-00	16.07.2015	S-ISO-V100-00	16.07.2015	S-ISO-V150-00	16.07.2015
S-ISO-V65-01	16.07.2015	S-ISO-V100-01	16.07.2015	S-ISO-V150-01	16.07.2015
S-ISO-V65-02	05.12.2015	S-ISO-V100-02	05.12.2015	S-ISO-V150-02	05.12.2015
S-ISO-V65-03	05.12.2015	S-ISO-V100-03	05.12.2015	S-ISO-V150-03	05.12.2015
S-ISO-V65-04	16.07.2015	S-ISO-V100-04	16.07.2015	S-ISO-V150-04	16.07.2015
S-ISO-V65-05	05.12.2015	S-ISO-V100-05	05.12.2015	S-ISO-V150-05	05.12.2015

S-ISO-V65-06	05.12.2015	S-ISO-V100-06	05.12.2015	S-ISO-V150-06	05.12.2015
S-ISO-V65-07	05.12.2015	S-ISO-V100-07	05.12.2015	S-ISO-V150-07	05.12.2015
S-ISO-V65-08	05.12.2015	S-ISO-V100-08	05.12.2015	S-ISO-V150-08	05.12.2015
S-ISO-V65-09	05.12.2015	S-ISO-V100-09	05.12.2015	S-ISO-V150-09	05.12.2015
S-ISO-V65-10	16.07.2015	S-ISO-V100-10	16.07.2015	S-ISO-V150-10	16.07.2015
S-ISO-V65-11	05.12.2015	S-ISO-V100-11	05.12.2015	S-ISO-V150-11	05.12.2015
S-ISO-V65-12	05.12.2015	S-ISO-V100-12	05.12.2015	S-ISO-V150-12	05.12.2015
S-ISO-V80-00	16.07.2015	S-ISO-V125-00	16.07.2015	S-ISO-V200-00	16.07.2015
S-ISO-V80-01	16.07.2015	S-ISO-V125-01	16.07.2015	S-ISO-V200-01	16.07.2015
S-ISO-V80-02	05.12.2015	S-ISO-V125-02	05.12.2015	S-ISO-V200-02	05.12.2015
S-ISO-V80-03	05.12.2015	S-ISO-V125-03	05.12.2015	S-ISO-V200-03	05.12.2015
S-ISO-V80-04	16.07.2015	S-ISO-V125-04	16.07.2015	S-ISO-V200-04	16.07.2015
S-ISO-V80-05	05.12.2015	S-ISO-V125-05	05.12.2015	S-ISO-V200-05	05.12.2015
S-ISO-V80-06	05.12.2015	S-ISO-V125-06	05.12.2015	S-ISO-V200-06	05.12.2015
S-ISO-V80-07	05.12.2015	S-ISO-V125-07	05.12.2015	S-ISO-V200-07	05.12.2015
S-ISO-V80-08	05.12.2015	S-ISO-V125-08	05.12.2015	S-ISO-V200-08	05.12.2015
S-ISO-V80-09	05.12.2015	S-ISO-V125-09	05.12.2015	S-ISO-V200-09	05.12.2015
S-ISO-V80-10	16.07.2015	S-ISO-V125-10	16.07.2015	S-ISO-V200-10	16.07.2015
S-ISO-V80-11	05.12.2015	S-ISO-V125-11	05.12.2015	S-ISO-V200-11	05.12.2015
S-ISO-V80-12	05.12.2015	S-ISO-V125-12	05.12.2015	S-ISO-V200-12	05.12.2015
S-ISO-V250-00	16.07.2015	S-ISO-V250-08	05.12.2015	S-ISO-V300-03	05.12.2015
S-ISO-V250-01	16.07.2015	S-ISO-V250-09	05.12.2015	S-ISO-V300-04	16.07.2015
S-ISO-V250-02	05.12.2015	S-ISO-V250-10	16.07.2015	S-ISO-V300-05	05.12.2015
S-ISO-V250-03	05.12.2015	S-ISO-V250-11	05.12.2015	S-ISO-V300-06	05.12.2015
S-ISO-V250-04	16.07.2015	S-ISO-V250-12	05.12.2015	S-ISO-V300-07	05.12.2015
S-ISO-V250-05	05.12.2015	S-ISO-V300-00	16.07.2015	S-ISO-V300-08	05.12.2015
S-ISO-V250-06	05.12.2015	S-ISO-V300-01	16.07.2015	S-ISO-V300-09	05.12.2015
S-ISO-V250-07	05.12.2015	S-ISO-V300-02	05.12.2015	S-ISO-V300-10	16.07.2015
				S-ISO-V300-11	05.12.2015
				S-ISO-V300-12	05.12.2015

Tests carried out

Freezing, corrosion, hydraulic pressure, flash back (pressure- and vacuum valve), hammering, endurance burning (pressure valve only) and flow condition test. Velocity is measured and documented

Marking of product

For traceability to this type approval each device is at least to be marked with:

- Manufacturer's name or trade mark.
- Type designation
- Additional marking acc. IMO MSC/Circ. 677 sec. 4.1 and ISO15364:2007 sec.12

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform a survey – every second year and before the expiry date of this certificate - to verify that the conditions for the type approval are complied with.