DNV·GL

Certificate No:
TAP00001W5

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Safety Valve

with type designation(s)
352, 355, 400, 410, 412, 413, 420, 451, 452, 455, 460, 461, 492, 492GOX, 642, 645, 652, 810, 812, 813, 851, 852, 861, 2400, 2480, 4000, 6420, 6450

Issued to
Goetze KG Armaturen
Ludwigsburg, Baden-Württemberg, Germany

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Type:	**K. factor:**
352, 355, 400, 410, 412, 413, 420, 451, 452, 455, 460, 461, 492, 492GOX **642, 645, 652, 810, 812, 813, 851, 852, 861, 2400, 2480, 4000, 6420, 6450**	**see manufacturer's data sheets**

Issued at **Hamburg** on **2019-10-30**

This Certificate is valid until **2024-10-29**.

for **DNV GL**

DNV GL local station: **Augsburg**

Approval Engineer: **Ana Cristina Do Carmo Insfran**

Olaf Drews
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

Safety valve type series to be used for discharge of vapors and gases. [1, 2]

Design standards DIN / EN; ASME

Nominal sizes and Materials

Safety valve type	Nominal sizes DN	Valve body materials [1]	DIN EN	ASME
642, 6420	1/2" – 2 1/2" DN 25–DN 65	red brass	CC499K	CC499K
645, 6450	1/2" – 2" DN 25–DN 50			
652, 851	1/2" – 2"			
2480	1/4" – 1"			
861	1/4" – 1/2"			
852	DN 40-DN 50			
352	DN 40-DN 50	spheroidal graphite	0.7043	G.60-40-18
355	DN 15-DN 100	cast iron		
492 GOX	1/4" - 3/4"	monel/stellite	2.4360/ Stellite	UNS No 4400/ Stellite
810	1/4" - 2"	brass	CW617N	CW617N
812, 813	1/2" - 2"			
452	DN 40-DN 50	stainless steel	1.4408	CF8M
455	DN 15-DN 100			
460	3/8" - 1"			
451	1/2" – 2"			
461	1/4" – 1/2"			
2400	1/4" – 1 1/2"			
410	1/4" – 1"	stainless steel	1.4404	316 L
412, 413	1/2" - 2"			
420	1/4" – 3/8"			
492	1/4" – 3/4"			
4000	DN 25-DN 100			
400	DN 20-DN 32	stainless steel	1.4435	316 L

Selection of materials

Note 1
It shall be noted that the selection of the materials considers the applicable service condition with respect to type of media, flow velocity, media temperature and installation area of the piping system or pressure vessel.
In particular, the resistance to corrosion, erosion, oxidation and other deterioration during projected service life are to be taken into account.

Reference is made to DNVGL Rules Pt.4, Ch.6 – Section 2 – Materials.

Design pressures and temperatures

Safety valve type	Pressure (bar)	Temperature (°C)	Gaskets
642,645, 6420, 6450	0,5-16	-50 to +205	PTFE, EPDM, FKM
455	0,2-40	-270 to +400	PTFE, EPDM, FKM, FFKM, MD
355	0,2-40	-60 to +350	PTFE, EPDM, FKM, FFKM, MD
492 GOX	50-420	-40 to + 60	MD
492	50-630	-60 to +180	MD/PAI
400, 4000	0,4-16	-40 to +200	EPDM, FKM
2400, 2480	0,2-70	-200 to +200	PTFE, PTFE + Kohle (C)
852	0,5-25	-60 to +225	NBR, PTFE, EPDM, FKM, FFKM, MD
460	0,2-25	-60 to +225	NBR, PTFE, EPDM, FKM
851, 861	0,5-50	-60 to +225	NBR, PTFE, PTFE + Kohle (C), EPDM, FKM, FFKM, MD
652	1,0-16	-50 to +200	NBR, EPDM, FKM
452	0,5-25	-60 to +400	NBR, PTFE, EPDM, FKM, FFKM, MD
461	0,5-70	-60 to +225	PTFE, PTFE + Kohle (C)
451	0,5-70	-60 to +400	NBR, PTFE, PTFE + Kohle (C), EPDM, FKM, FFKM, MD
420	0,5-50	-40 to +260	EPDM, FKM, FFKM, PTFE
352	0,5-16	-10 to +350	NBR, PTFE, EPDM, FKM, FFKM, MD
413, 813	0,2-6	-60 to +225	PTFE, FKM
410, 412, 810, 812	0,2-50	-60 to +225	NBR, PTFE, EPDM, FKM

Requirements depending on pipe classes and application

The requirements on the safety relief valve design, material grades and certificates of pressurised parts as well as the scope and requirements of production testing depends on the application and pipe class. For the range of application specified on page 1 of this certificate the following DNVGL Rules are to be observed:

DNV GL Pt. 2, Ch. 1, Sec. 2 Approval of material manufacturers
Ch.2, Sec. 8 – 5 Castings for boilers, pressure vessels and piping systems
Sec. 8 – 6 Ferritic steel castings for low temperature service
Sec. 8 – 7 Stainless steel castings
DNV GL Pt. 4, Ch. 6, Sec. 1 – Table 1 (pipe classes)
Sec. 1 – Table 4 (certification requirements)
Sec. 2 - Table 3 (material certificates acc. to pipe classes)

In addition, for steam and pressure vessels application
DNV GL Pt.4, Ch. 7, Sec.1 - General Requirements
Sec.2 - Materials
Sec.3 - Thermal-oil installations
Sec.5 – 2 Safety Valves (steam boilers)
Sec.7 – Manufacture, workmanship and testing

Application

The safety valve type series are type approved for application in piping systems and on pressure vessels as specified in the Rules Pt.4 Ch.6 - Piping Systems and Pt.4 Ch.7 - Pressure equipment.
Operating media: Steam, water, air, gases and vapors.

Note [1]
The selection of the safety valves for the corresponding service and the right installation under consideration of the materials and media used shall be in compliance with the instructions of manufacturer.

Note [2]
The installation of safety valves in pressurized systems has to be observed under consideration of the specific operating conditions, type of flowing media and observation of the applicable DNV GL Rules as well as Pipe Classes and Pressure Vessel Classes.

Limitation

Safety valves to be fabricated of copper and copper alloys shall not be used for media having temperature above the following limits:

See DNV GL Rules Pt. 4 Ch.6 – Piping systems, Section 2 – Materials:
- copper and aluminum brass: 200°C
- copper nickel: 300°C.

Safety valves to be fabricated of copper and copper alloys are NOT permitted for installation within LNG fuel systems on board of liquefied gas tankers and ship's LNG fuel systems.

Safety valves with threaded connections are NOT permitted for installation in LNG/LPG systems on board of DNV GL classed liquefied gas tankers and in ship's LNG and gas fuel systems.

For valves to be installed on board of ships the following limitations apply:

Valves for installation in systems operating with flammable gases are to be classed within Pipe Class I, see DNV GL Rules Pt. 4 Ch. 6 - Piping systems.

Threaded joints may be used for outside diameters as stated below except for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.
- Threaded joints in CO2 systems shall be allowed only inside protected spaces and in CO2 cylinder rooms
- Threaded joints with tapered thread shall be allowed for pipe class I, outside diameter not more than 33,7 mm.
- Pipe Class II and Class III outside diameter not more than 60,3 mm.
- Threaded joints with parallel thread shall be allowed for Pipe class III, outside diameter not more than 60.3 mm.

For safety valves fabricated of grey cast iron and nodular cast iron the requirements provided in DNV GL Rules Pt. 4 Ch.6 – Piping systems, Section 2 – Materials are to be observed.

Tests carried out

Production testing

Each relief valve is subject to production testing according to applicable DNVGL Rules as follows:
- Machinery piping systems: Pt.4, Ch 6, Section 9 [3] - Valves
- Steam boilers, steam generators, pressure vessels: Pt.4, Ch.7, Section 7 [4.6] - Hydraulic test

Appropriate DNV GL Product Certificate (PC) to be issued, if required by DNV GL Rules.

Marking of product

For traceability to this type approval certificate each valve is to be provided with a name plate with at least the following data:

	Example
Manufacturer's name or trade mark	Goetze
Type designation	852
Nominal pressure rating Inlet	PN
Size inlet / outlet	DN 40 / DN 40
Diameter d_0 [mm]	37
Set pressure [bar]	10
Coefficient of discharge K_D / Media	0,37

Type Approval documentation

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with. Refer to DNVGL-CP-0338, Sec.4.

The main scope of the periodical assessment will normally include:
- Verification of the TA applicant's production and quality system w.r.t ensuring continued consistent production of the type approved products at the TA applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the TA documentation and that this is still used as a basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking

END OF CERTIFICATE