DNV·GL

Certificate No:
TAP00000RH

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Ball Valve

with type designation(s)
BKH, BKHP, MKHP, KH-ISO, KHSAE

Issued to
MHA ZENTGRAF GmbH & Co. KG
Merzig Saarland, Germany

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

Application :

May be used for flammable fluids (LNG/LPG) service, hydraulic oil, fuel oil, lubricating oil, inert gas, fresh water, sea water, sanitary, starting/control air, service air, brine, CO2, steam and refrigerants.

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

Temperature range:	**See certificate**
Max. working press.:	**See certificate**
Sizes:	**DN4 to DN100**

This Certificate is valid until **2022-01-01**.

Issued at **Hamburg** on **2017-01-02**
DNV GL local station: **Essen** for **DNV GL**

Approval Engineer: **Guido Friederich**

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

Valve types	Sizes
BKH	DN 4, 6, 8, 10, 13 and 16, 20 and 25
BKHP	DN 20 and 25
MKHP	DN 32, 40 and 50
KH-ISO250	DN13, 19, 25, 32, 38, 51, 56 and 63
KH-ISO320	DN 15, 20, 25, 32, 40, 50, 65, 80 and 100
KH-ISO400	DN 13, 19, 25, 32, 38, 51, 56, 63 and 80
KH-SAE210/420	DN 15, 20, 25, 32, 40, 50, 65 and 80
KH-SAE210	DN 15, 20, 25, 32, 40, 50, 65, 80 and 100
KH-SAE420	DN 15, 20, 25, 32, 40, 50, 65 and 80

End connections

Valve types	End connections/rating
BKH and BHKP and MHKP	DIN ISO 228 Female thread ANSI B1.20.1 NPT Female thread ISO 8434 (DIN2353) Light series ISO 8434 (DIN2353) Heavy series SAE J 514 UN/UNF Female thread ISO6162-1 3000 psi SAE-split flange adapter ISO6162-1 6000 psi SAE-split flange adapter ISO6162-1 3000 psi SAE-adapter ISO6162-1 6000 psi SAE-adapter DIN3202-F1 F10/40-F63/160-F250-F320
KH-ISO250	3600 psi, ISO6164
KH-ISO320	DN15-50 : 5075 psi, not part of ISO 6164 DN 65-100: 5075 psi, not part of ISO 6164
KH-ISO400	5800 psi, ISO 6164
KH-SAE210/420	3000 and 6000 psi, ISO 6162-1 and -2
KH-SAE210	3000 psi, ISO 6162-1
KH-SAE420	6000 psi, ISO 6162-2

Application/Limitation

Valves may be used for flammable fluids (LNG/LPG) service, hydraulic oil, fuel oil, lubricating oil, inert gas, fresh water, sea water, sanitary, starting/control air, service air, brine, CO2, steam and refrigerants.

Material description	Material no.	Temperature range, °C
Free cutting steel 11SMn30	1.0715	-20°C to +120°C
Carbon steel S355J2+N Fine grained steel with Re≥355N/mm²	1.0577 All steels in according to AD-2000-code, data sheet W10	 according to AD-2000-code, data sheet W10
Stainless steel X6CrNiMoTi17-12-2 X2CrNiMoN22-5-3 X5CrNiMo17-12-2 X2CrNiMo17-13-2	 1.4571 1.4462 1.4401 1.4404	 -273°C to +250°C -40°C to +250°C -200°C to +250°C -200°C to +250°C

Pressure reduction factors for elevated temperatures :

Temperature (°C)	Carbon steel unalloyed	Low alloyed steels	Stainless steels

20	1	1	1
50	1	1	0,95
100	1	1	0,85
150	0,89	0,93	0,77
200	0,81	0,87	0,71
250	0,72	0,81	0,67

Max temperature range for standard seal material:

Ball seats	Stem and adater sealing	Temperature range
Polyacetal, POM	-	-40°C to +100°C
Polytetrafluorethylene, PTFE	-	-200°C to +220°C
Polyvinylidenefluorid, PVDF	-	-40°C to +150°C
Polyetheretherketone, PEEK	-	-40°C to +250°C
Cast iron, GG25	-	-40°C to +250°C
-	Acrylonitrile-butadiene-rubber, NBR	-30°C to +100°C
-	Fluor-rubber, FPM	-20°C to +200°C
-	Fluor-rubber FPM special compound	- 46°C to +225°C
-	Ethylen-Propylene-Dien-rubber, EPDM	-50°C to + 130°C
-	Polytetrafluorethylene, PTFE	-200°C to +220°C
-	Perfluorelastomere, FFKM	-20°C to + 275°C
-	Tetrafluorethylene/Propylene, FEPM	-25°C to + 250°C

Limitation / Certification

- Design, fabrication and certification of valves for installations in LPG / LNG systems on board of liquefied gas tankers to be carried out in accordance with DNV GL Rules Pt. 5 Ch. 7 - "Liquefied gas tankers".

- Design, fabrication and certification of valves for installations in ship's LNG and gas fuel systems to be carried out in accordance with DNV GL Rules Pt. 6 Ch.2, Section 5 -"Gas fuelled ship installations" and DNV GL Rules Pt. 5 Ch. 7 - "Liquefied gas tankers".
- The selection of valve materials for gas fuelled ship installations as well as for LPG/LNG service conditions on board of Liquefied gas tankers has to be carried out with the applicable DNV GL Rules.
- Valves for operation with flammable fluids (LPG/LNG) 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 with parallel thread are not allowed for pipe connections within pipe class I.
- Threaded joints with tapered joints shall be allowed for pipe class I, outside diameter not more than 33,7 mm. Pipe Class II and Class III ouside diameter not more than 60,3 mm.
- Threaded joints in CO2 systems shall be allowed only inside protected spaces and in CO2 cylinder rooms.
- Threaded joints with parallel thread shall be allowed for Class III, outside diameter not more than 60,3 mm.

- Valves not suitable for sour gas and fluids specified as toxic or dangerous fluids.

Type Approval documentation

Tests carried out

According recognized standard: DIN EN 12266-1

Industrial valves – Testing of metallic valves
Pressure tests, test procedures and acceptance criteria –
Mandatory requirements

Marking of product

For traceability to this type approval the products are to be marked with:

- Manufacturers name or trade mark
- Valve type designation
- Size
- Maximum design pressure and temperature
- Arrow to indicate direction of flow on one way flow valves

Periodical assessment

A condition for retention of the Type Approval Certificate in its validity period is that periodical assessments are successfully carried out.

The objective of the periodical assessment is to verify that the conditions for the type approval have not been altered.

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