

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Ball Valve

with type designation(s)

KHBF-25, 32, 32/38, 40/45, 50-PN375-3312-18X-S083, KHBF-50-PN375-3312-18X-S083-E

Issued to

HYDAC Accessories GmbH
Sulzbach, Germany

is found to comply with

DNV GL rules for classification – Ships

DNV GL class programme DNVGL-CP-0186 – Type approval – Valves

Application :

May be used in following systems: fresh- and sea-water cooling, fuel- and lube oil, compressed air, hydraulic oil, steam, sanitary and compressed air- see page 2 for limitations.

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

Type:	Temperature range:	Max. working press.:	Sizes:
KHBF-25, 32, 32/38, 40/45, 50-PN375-3312-18X-S083	-40°C to +100°C	375 bar	DN25-32-38-40-45-50
KHBF-50-PN375-3312-18X-S083-E	-40°C to +100°C	375 bar	DN50

This Certificate is valid until **2021-12-30**.

Issued at **Hamburg** on **2016-12-31**

DNV GL local station: **Essen Business Support**

for **DNV GL**

Approval Engineer: **Guido Friederich**

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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.

Product description

BALL VALVES, type KHBF block type with square type flange end connections.
Body material: Stainless steel 1.4462 / 1.4418

Application/Limitation

Max. pressure to be de-rated dependant on temperature.

Temperature (°C)	Pressure reduction factor
20	1.00
50	0.95
100	0.85

The valve may not be used for services where "fire safe" applications are required. See below table

System	Closing valves	Regulation valves
Flammable fluids (Flash point ≤60° C)		
1 Cargo oil	No	Yes
2 Crude oil washing	Yes	Yes
3 Vent	Yes	Yes
Flammable fluids (Flash point >60° C)		
4 Cargo oil lines	No	Yes
5 Fuel oil	No	Yes
6 Lubrication oil	No	Yes
7 Hydraulic oil	No	Yes
8 Thermal oil	No	Yes
Inert gas		
9 Water seal effluent lines	Yes	Yes
10 Scrubber effluent lines	Yes	Yes
11 Main lines	Yes	Yes
12 Distribution lines	Yes	Yes
Sea water		
13 Bilge lines	No	Yes
14 Fire main and water spray	No	No
15 Foam	No	No
16 Sprinkler	No	No
17 Ballast	No	Yes
18 Cooling water	No	Yes
19 Tank cleaning	Yes	Yes
20 Non-essential	Yes	Yes
Fresh water		
21 Cooling water	No	Yes
22 Condensate return	No	Yes
23 Non-essential	Yes	Yes
LNG		
24 Liquefied gas, working temperature $t < -55^{\circ} \text{C}$	No	No
25 Liquefied gas, working temperature $t \geq -55^{\circ} \text{C}$	No	No
26 LPG	No	No
Miscellaneous		
27 Starting/control air	Yes	Yes
28 Service air (Non-essential)	Yes	Yes
29 Brine	No	Yes
30 CO_2	Yes	Yes
31 Steam	Yes	Yes
32 Sanitary	Yes	Yes
33 Refrigerants	Yes	Yes

The approval does not cover oxygen systems.
The valve may not be used as shut-off valves for hydrocarbon services or sea water cooling systems.
The approval does not include any operating gear for remote control of the valves.

Each valve is to be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure.

Holding time: 2 minutes for all sizes

No leakage is permitted.

Each valve assembly shall be subjected to a hydrostatic seat leakage test at minimum 1.1 times the design pressure. The test shall be performed with closed valve with the other end open to atmosphere.

Holding time: 5 minutes for all sizes

Acceptable leakage: Drop tight

Type Approval documentation

Tests carried out

Burst Test

Marking of product

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

- Manufacturer's trade mark:
- Type designation
- Size
- Max. design pressure or pressure class

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