

**TYPE APPROVAL CERTIFICATE**

**This is to certify:**

**That the Ball Valve**

with type designation(s)

**Z (DIN), Z (ANSI/ASME) class 150, Z (ANSI/ASME) class 300, ZRB (ANSI/ASME) class 150, ZRB (ANSI/ASME) class 300, K/KRB (ANSI/ASME) class 600, K/KRB (ANSI/ASME) class 800**

Issued to

**PEKOS FABRICACION**  
**Artea VIZCAYA, Spain**

is found to comply with

**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNV GL class programme DNVGL-CP-0186 – Type approval – Valves**

**Application :**

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

Type:	Temperature range:	Max. working press.:	Sizes:
Z (DIN)	See certificate	PN 10/16/25/40 (see certificate)	DN 15, 20, 25, 32 40, 50, 65, 80, 100, 125, 150 & 200
Z (ANSI/ASME) class 150	See certificate	Class 150	1/2", 3/4", 1", 1-1/2", 2", 2-1/2", 3", 4", 6" & 8"
Z (ANSI/ASME) class 300	See certificate	Class 300	1/2", 3/4", 1", 1-1/2", 2", 2-1/2", 3" & 4"
ZRB (ANSI/ASME) class 150	See certificate	Class 150	1/2" x 3/8", 3/4" x 1/2", 1" x 3/4", 1-1/2" x 1-1/4", 2" x 1-1/2", 3" x 2-1/2", 4" x 3", 6" x 5", 8" x 6", 10" x 8" & 12" x 10"
ZRB (ANSI/ASME) class 300	See certificate	Class 300	1/2" x 3/8", 3/4" x 1/2", 1" x 3/4", 1-1/2" x 1-1/4", 2" x 1-1/2", 3" x 2-1/2", 4" x 3" & 6" x 5"
K/KRB (ANSI/ASME) class 600	See certificate	Class 600	2" & 2-1/2"
K/KRB (ANSI/ASME) class 800	See certificate	Class 800	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2" & 2"

This Certificate is valid until **2022-05-11**.

Issued at **Høvik** on **2017-05-12**

DNV GL local station: **Bilbao**

Approval Engineer: **Maheshraja Venkatesan**

for **DNV GL**



Digitally Signed By: Marveng, Marianne Spæren

Location: DNV GL Høvik, Norway

Signing Date: 12.05.2017

**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.

Job Id: **262.1-023910-1**  
 Certificate No: **TAP00000T2**

## Product description

Floating ball valves, 2/ 3-piece, full/ reduced bore with flanged/ threaded/ welded ends

Minimum wall thickness & pressure-temperature ratings are according to ASME B16.34/ EN 12516-1.

### Materials:

Valve type	Body & valve ends	Ball	Stem	Sealing materials
Z (DIN)	1.0619, 1.6220, 1.4408	1.4408/ 1.4401	1.4404/ 1.4401	- Ball seat: PTFE/ PTFE+FG/ PTFE+CG
Z (ANSI/ ASME)	ASTM A216 Gr. WCC, ASTM A352 Gr. LCC, ASTM A351 Gr. CF8M	ASTM A351 Gr. CF8M/ ASTM A182 F316	AISI 316/ AISI 316L	- Body seal: PTFE/ PTFE+FG/ PTFE+CG/ Graphite - Stem seal & packing: PTFE+FG, PTFE+CG , PTFE, FKM, Graphite
ZRB (ANSI/ ASME)	ASTM A216 Gr. WCC, ASTM A352 Gr. LCC, ASTM A351 Gr. CF8M	ASTM A351 Gr. CF8M/ ASTM A182 F316	AISI 316/ AISI 316L	- Ball seat: PTFE/ PTFE+FG/ PTFE+CG - Body seal: PTFE/ PTFE+FG/ PTFE+CG/ Graphite/ FKM - Stem seal & packing: PTFE+FG, PTFE+CG , PTFE, FKM, Graphite
K/ KRB (ANSI/ ASME)	ASTM A182 F316/ 316L, ASTM A105, ASTM A350 Gr. LF2	ASTM A182 F316/ 316L	AISI 316/ AISI 316L/ ASTM A182 Gr. F51	- Ball seat & stem seal: PTFE/ PTFE+FG/ PTFE+CG - Body seal: PTFE/ PTFE+FG/ PTFE+CG/ Graphite - Stem seal & packing: PTFE+CG, FKM, Graphite

The design & construction of valve ends are in accordance with the following standards:

- Flanged ends : ASME B16.5/ EN 1092-1
- Threaded ends : ASME B1.20.1
- Buttwelding ends : ASME B16.25
- Socket welding ends : ASME B16.11

## Application/Limitation

Valves covered by this certificate are approved to be used in ship piping, machinery piping and cargo piping systems.

This certificate does not cover valves to be installed in LNG/LPG applications.

Valve type	Size	Pressure rating
Z (DIN) Floating, full bore, 2-piece, split body, flanged end according to EN 1092-1	DN15, 20, 25, 32, 40 & 50	PN10/16/40
	DN65, 80 & 100	PN10/16
	DN65, 80 & 100	PN25/40
	DN125 & 150	PN10/16
	DN125	PN25/40
	DN200	PN10/16
Z (ANSI/ ASME) Floating, full bore, 2-piece, split body, flanged end according to ASME B16.5	1/2", 3/4" & 1"	class 150
	1-1/2", 2", 2-1/2", 3" & 4"	class 150
	6" & 8"	class 150
	1/2", 3/4" & 1"	class 300

Job Id: **262.1-023910-1**  
 Certificate No: **TAP00000T2**

	1-1/2", 2", 2-1/2", 3" & 4"	class 300
ZRB (ANSI/ ASME) Floating, reduced bore, 2-piece, end entry, flanged end according to ASME B16.5	1/2" x 3/8" & 3/4" x 1/2"	class 150
	1" x 3/4" & 1-1/2" x 1-1/4"	class 150
	2" x 1-1/2", 3" x 2-1/2" & 4" x 3"	class 150
	6" x 5", 8" x 6", 10" x 8" & 12" x 10"	class 150
	1/2" x 3/8" & 3/4" x 1/2"	class 300
	1" x 3/4" & 1-1/2" x 1-1/4"	class 300
	2" x 1-1/2", 3" x 2-1/2" & 4" x 3"	class 300
	6" x 5"	class 300
K/ KRB (ANSI/ ASME) Floating, full bore, 3-piece, split body, NPT/BSPP/BW/SW ends	1/4", 3/8", 1/2", 3/4", 1", 1-1/4", 1-1/2" & 2"	class 800
	2" & 2 1/2"	class 600

**Temperature range:**

PTFE/ PTFE+FG/ PTFE+CG : -50°C to +240 °C  
 FKM : -46°C to +220 °C  
 Graphite : -50°C to +220 °C

Carbon steels and austenitic stainless steel grades covered by this certificate are not permitted for use in sea water systems.

Carbon steels in contact with seawater shall be properly protected. Surface preparation and coating shall be approved by society.

The approval does not include any operating gear for remote control and actuator part of the valve.

The breakaway torque shall fulfil the requirements set forth in the product standard or specification as applicable, considering the stem material grade & dimensions.

The valve shall be installed according to the manufacturer's instructions.

Valves with threaded joints shall not be used for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.

Valves with threaded ends for direct connectors of pipe lengths with tapered thread shall be allowed for:

- class I, outside diameter not more than 33.7 mm
- class II and class III, outside diameter not more than 60.3 mm.

Valves with parallel thread ends shall be allowed only for class III applications with outside diameter not more than 60.3 mm.

Valves with socket welded ends in accordance with DNV GL Pt.4 Ch.6 Sec.9 [6.1]:

- shall not be used in overboard pipes where substantial thickness is required.
- may be used for class I & II pipes with an OD of 88.9 mm and less
- shall be subject to the Society's consideration in each case for stainless steel pipes

**Type Approval documentation**

**Drawings:**

0-36-040300---GV-DNV, rev. 2	0-07-015150-GGVV-DNV, rev. 2	0-36-040010---G-DNV, rev. 2
001B03600040300I, rev. 02	001B00700015150, rev. 00	001B03600040040, rev. 02
002B00200040300I, rev. 01	002000700015150, rev. 2	002B001F4040040, rev. 00
005003600040000, rev. 04	005-07-015-C, rev. 2	002B001F1040040, rev. 00
011B03600040000, rev. 03	011-07-015 rev. 0	005003600040000, rev. 04
001B03600050300, rev. 01	001B00700020150, rev. 00	011B03600040000, rev. 03
002B00200050300I, rev. 00	002000700020000 rev. 0	001B03600050040, rev. 01
001A03600065300, rev. 00	0-07-015300-GGVV-DNV rev. 2	002B001F4050040, rev. 01

Job Id: **262.1-023910-1**  
Certificate No: **TAP00000T2**

002A00100065300, rev. 00	0010007RE015300, rev. 00	002B001F1050040, rev. 01
001B03600080300, rev. 00	002000700015300, rev. 00	001B03600065016, rev. 1
002B00200080300, rev. 00	005-07-015-C, rev. 2	002B001F4065016, rev. 01
005003600080000, rev. 02	011-07-015, rev. 1	002B001F1065016, rev. 01
011B03600080000, rev. 04	001A00700020300, rev. 00	001B03600065040, rev. 00
001B03600100300I, rev. 01	002000700020000 rev. 0	002B001F4065040, rev. 00
002B00200100300, rev. 1	0-07-025150-GVV-DNV, rev. 2	002B001F1065040, rev. 00
0-36-125010---G-DNV, rev. 2	001B0R700025150, rev. 01	001B03600080016, rev. 02
001B03600125016I, rev. 00	002000700025150, rev. 03	002B001F4080016I, rev. 04
002B00100125016, rev. 00	005003600015000, rev. 02	002B001F1080016I, rev. 02
005003600125000, rev. 02	011B03600015000, rev. 03	005003600080000, rev. 02
011B03600125000, rev. 02	001A0R700040150, rev. 00	011B03600080000, rev. 04
001B03600125040I, rev. 00	002000700040150, rev. 1	001B03600080040I, rev. 03
002B00100125040, rev. 00	005003600025000, rev. 02	002B001F4080040I, rev. 01
001B03600150016I, rev. 00	011B03600025000, rev. 03	002B001F1080040I, rev. 01
002B00100150016, rev. 00	0-07-025300-GVV-DNV, rev. 02	001B03600100016I, rev. 01
001B03600200010I, rev. 01	001B0R700025300, rev. 00	002B001F4100016I, rev. 02
002B00100200010, rev. 01	002000700025300, rev. 0	002B001F1100016I, rev. 00
005003600200000, rev. 01	005003600015000, rev. 02	001B03600100040I, rev. 00
011B03600200000, rev. 01	011B03600015000, rev. 03	002B001F4100040I, rev. 00
001B03600200016I, rev. 03	001A0R700040300, rev. 01	002B001F1100040, rev. 00
002B00100200016, rev. 01	002000700040150, rev. 1	0-36-040150---GV-DNV, rev. 2
0-36-150150---GV-DNV, rev. 2	005003600025000, rev. 02	001B03600040150, rev. 03
001B03600150150, rev. 01	011B03600025000, rev. 03	002B00200040150I, rev. 01
002B00200150150I, rev. 00	0-07-050150-GVV-DNV, rev. 2	005003600040000, rev. 04
005003600125000, rev. 02	001B0R700050150, rev. 01	011B03600040000, rev. 03
011B03600125000, rev. 02	002A00700050000, rev. 01	001B03600050150, rev. 01
001B03600200150I, rev. 03	005003600040000, rev. 04	002B00200050150I, rev. 00
002B00200200150, rev. 01	011B03600040000, rev. 03	001B03600065150, rev. 00
005003600200000, rev. 01	001B0R700080150, rev. 00	002B00200065150, rev. 00
011B03600200000, rev. 01	002000700080150, rev. 1	001B03600080150, rev. 01
0-41-01080-SGSGV-DNV, rev. 2	001A0R700100150, rev. 01	002B00200080150I, rev. 00
00100410010800, rev. 05	002000700100150, rev. 2	005003600080000, rev. 02
002SF410008800, rev. 02	005003600080000, rev. 2	011B03600080000, rev. 04
002BF410008800, rev. 02	011B03600080000, rev. 04	001B03600100150, rev. 01
002NF410008800, rev. 02	0-07-050300-GVV-DNV, rev. 2	002B00200100150I, rev. 02
002WF410006800-80, rev. 01	001B0R700050300, rev. 01	0RB41-01080-SGSGV-DNV, rev. 3
00500410010800, rev. 08	002A00700050000, rev. 01	00100410010800, rev. 05
00100410010800, rev. 05	005003600040000, rev. 04	002SR410015800, rev. 05
002SF410010800, re. 02	011B03600040000, rev. 03	002BR410015800, rev. 02
002BF410010800, rev. 02	001B0R700080300, rev. 01	002NR410015800, rev. 05
002NF410010800, rev. 02	002000700080150, rev. 1	002WR410015800-80, rev. 01
002WF410010800-80, rev. 01	001B0R700100300, rev. 00	00500410010800, rev. 08
00500410010800, rev. 08	002000700100300, rev. 0	00100410015800, rev. 05
00100410015800, rev. 05	005003600080000, rev. 02	002SR410020800, rev. 03
002SF410015800, rev. 03	011B03600080000, rev. 04	002BR410020800, rev. 02
002BF410015800, rev. 02	0-07-150150-GVV-DNV, rev. 2	002NR410020800, rev. 04
002NF410015800, rev. 04	001B0R700150150, rev. 02	002WR410020800-80, rev. 01
002WF410015800-80, rev. 01	002B00700150150, rev. 0	00500410010800, rev. 08
00500410010800, rev. 08	005003600125000, rev. 02	00100410020800, rev. 05
00100410020800, rev. 05	011B03600125000, rev. 02	002SR410025800, rev. 03
002SF410020800, rev. 04	001B0R700200150, rev. 00	002BR410025800, rev. 02
002BF410020800, rev. 02	002B00700200150, rev. 00	002NR410025800, rev. 04
002NF410020800, rev. 04	001A0R700250150, rev. 01	002WR410025800-80, rev. 01
002WF410020800-80, rev. 01	002B00700250150, rev. 00	00500410020800, rev. 07
00500410020800, rev. 07	005003600200000, rev. 01	00100410025800, rev. 03

Job Id: **262.1-023910-1**  
Certificate No: **TAP00000T2**

00100410025800, rev. 03	011B03600200000, rev. 01	002SR410032800, rev. 04
002SF410025800, rev. 03	001A0R700300150, rev. 01	002BR410032800, rev. 02
002BF410025800, rev. 02	002A00700300150, rev. 00	002NR410032800, rev. 03
002NF410025800, rev. 04	0-07-150300-GVV-DNV, rev. 2	002WR410032800-80, rev. 01
002WF410025800-80, rev. 01	001B0R700150300, rev. 01	00500410020800, rev. 07
00500410020800, rev. 07	002B00700150150, rev. 0	00100410032800, rev. 04
00100410032800, rev. 04	005003600125000, rev. 2	002SR410040800, rev. 04
002SF410032800, rev. 06	011B03600125000, rev. 2	002BR410040800, rev. 04
002BF410032800, rev. 05	0-36-015040---G-DNV, rev. 2	002NR410040800, rev. 05
002NF410032800, rev. 05	001B03600015040, rev. 01	002WR410040800-80, rev. 01
002WF410032800-80, rev. 01	002B001F1015040, rev. 00	00500410040800, rev. 06
00500410040800, rev. 06	002B001F4015040, rev. 0	00100410040800, rev. 03
00100410040800, rev. 03	005003600015000, rev. 02	002SR410050800, rev. 03
002SF410040800, rev. 05	011B03600015000, rev. 03	002BR410050800, rev. 03
002BF410040800, rev. 03	001B03600020040, rev. 01	002NR410050800, rev. 02
002NF410040800, rev. 04	002B001F1020040, rev. 00	002WR410050800-80, rev. 01
002WF410040800-80, rev. 02	002B001F4020040, rev. 00	00500410040800, rev. 06
00500410040800, rev. 06	001B03600025040, rev. 00	0-36-015300---GV-DNV, rev. 2
0RB41-06580-SGSGV-1-DNV, rev. 3	002B001F1025040, rev. 01	001B03600015300, rev. 02
00100410050600, rev. 03	002B001F4025040, rev. 0	002B00200015300, rev. 00
002SR410065600, rev. 03	005003600025000, rev. 02	005003600015000, rev. 02
002BR410065600, rev. 02	011B03600025000, rev. 03	011B03600015000, rev. 03
002NR410065600, rev. 01	001B03600032040, rev. 0	001B03600020300, rev. 01
002WR410065600-80, rev. 00	002B001F1032040, rev. 00	002B00200020300, rev. 1
00500410040800-1, rev. 00	002B001F4032040, rev. 00	001B03600025300, rev. 02
0-41-05080-SGSGV-1-DNV, rev. 3	0-36-015150---GV-DNV, rev. 2	002B00200025300, rev. 01
00100410050600, rev. 03	001B03600015150, rev. 02	005003600025000, rev. 02
002BF410050600, rev. 02	002B00200015150, rev. 01	011B03600025000, rev. 03
002SF410050600, rev. 04	005003600015000, rev. 02	
002NF410050600, rev. 03	011B03600015000, rev. 03	
002WF410050600-80, rev. 01	001B03600020150, rev. 01	
00500410040800-1, rev. 00	002B00200020150, rev. 01	
0-41-05080-SGSGV-DNV, rev. 3	001B03600025150, rev. 01	
00100410065600, rev. 01	002B00200025150, rev. 01	
002SF410065600, rev. 03	005003600025000, rev. 02	
002BF10065600, rev. 02	011B03600025000, rev. 03	
002NF410065600, rev. 02		
002WF10065600-80, rev. 00		
00500410065600, rev. 04		

Design & Calculation Dossier Pekos Ball Valves, Rev. 0 dated 2015-09-22

Torque table DC-75-02-10-PF rev. 08

Stem calculation rev. 1 dated 2017-03-28

Body 2 calculation – ZRB dated 2017-03-28, rev. 1

Body 2 calculation – Z full bore dated 2016-02-07, rev. 0

Pressure & Functional test – General procedure PR. 75-02 Rev. 15 June 2016

Pressure-temperature chart dated 2017-04-26 for various gasket materials used

Fire test reports from Lloyds: BBO 1000062/1/A1 dated 2009-12-16, BBO 1000062/2/A1 dated 2009-12-16, BBO 1000062/3/A1 dated 2009-12-16, BBO 1000062/4/A1 dated 2009-12-17, BBO 1000062/5/A1 dated 2009-12-17, BBO 1000062/6/A1 dated 2009-12-17, BBO 1000062/7/A1 dated 2007-11-29 & BBO 1000062/8/A1 dated 2007-11-29

Job Id: **262.1-023910-1**  
Certificate No: **TAP00000T2**

### **Certification**

Valve bodies shall be delivered with material certificates in accordance with DNV GL Ship Pt.4 Ch.6 Sec.2 Table 3. Materials with VL and W certificates shall be manufactured in a foundry approved by the society.

DNV GL product certificates are required for valves with DN > 100 mm and design pressure  $\geq$  16 bar, and for ship side valves where DN > 100 mm regardless of pressure. For other valves a manufacturer's product certificate may be accepted.

### **Production Tests**

All valve bodies shall be subjected by the manufacturer to a hydrostatic test at a pressure equal to 1.5 times the nominal pressure (The nominal pressure is the maximum allowable working pressure at room temperature).

All valves assembly shall be subjected to seat leakage test at 1.1 times maximum working pressure at closed position.

Production Testing and acceptance criteria shall be in accordance with API 598.

### **Tests carried out**

Fire test

### **Marking of product**

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

- Manufacturer's name or trade mark
- Type designation
- Maximum working pressure & temperature
- Serial number

### **Periodical assessment**

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