

# TYPE APPROVAL CERTIFICATE

**This is to certify:**

**That the Diaphragm Valve**

with type designation(s)  
**400E, 400Y, 700E**

Issued to

**Bermad CS Ltd.**  
**Israel, Israel**

is found to comply with

**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018**  
**DNV GL class programme DNVGL-CP-0186 – Type approval – Valves**

**Application :**

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

Type:	Temperature range:	Max. working press.:	Sizes:
400E	0 to max 90 °C (See page 2)	20 bar	DN40 to DN250 (1.5" to 10")
400Y	0 to max 90 °C (See page 2)	25 bar	DN40 to DN250 (1.5" to 10")
700E	0 to max 90 °C (See page 2)	25 bar	DN40 to DN250 (1.5" to 10")

Issued at **Høvik** on **2019-08-27**

for **DNV GL**

This Certificate is valid until **2024-06-30**.

DNV GL local station: **Haifa**

Approval Engineer: **Maheshraja Venkatesan**

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**Zeinab Sharifi**  
**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: **262.1-016084-10**  
 Certificate No: **TAP000009N**  
 Revision No: **2**

## Product description

Hydraulically operated diaphragm valves with flanged connections designed to EN 12516-3.

Valve type	Sizes covered	Design pressure	Max. fluid working temperature
400E	DN40 to DN250	20 bar	EPDM: 90 °C
400Y	(1½", 2", 2½", 3", 4", 6", 8" & 10")	25 bar	NBR: 80 °C
700E		25 bar	NR: 60 °C

Body and Cover Optional Materials		Seal/Diaphragm Optional Materials
Ductile iron	ASTM A536 Grade 65-45-12	EPDM NBR Natural Rubber
Cast steel	ASTM A216 Grade WCB	
Cast steel (low temp)	ASTM A352-03 Grade LCC	
Cast Stainless Steel 316	ASTM A351 CF8M	
Ni Al Bronze	ASTM B 148 C95800	
Duplex steel	ASTM A890/955 Grade 4A and 5A	
254 SMO	A351 Grade CK-3MCuN CN-3MN	
Hastelloy C276	ASTM ASTM A494 Gr. CW12MW Grade C276	
Titanium	ASTM B367 Grade C2 or higher	

Manufacturing location : Bermad CS Ltd,  
Kibbutz Evron, 22808 Israel

## Application/Limitation

Diaphragm valves covered by this certificate are approved for use in:

- fresh water and foam fire protection systems,
- pneumatic lines.

The valves have not been fire tested as part of this type approval and as such are not approved for use in fire mains, hydrants or for use in systems or spaces where fire resistance is required.

Functionality of the valves are not covered under the scope of approval.

### Blast Resistance

The valves have been subject to blast modelling following the principles outlined in DNVGL-RP-D101 section 3.11 and the following inputs:

- The analysis applied a static pressure of 2.5 MPa both the top and side of each valve. The load directions were applied and evaluated independently.
- The material properties considered were those for ASTM A536 Grade 65-45-12.
- Design parameters used:-
  - Blast or DAL over pressure : 4 bar
  - Pulse duration : 1 sec
  - Blast or dynamic drag pressure : 2.05 bar
  - Equivalent wind speed : 579 m/s

The explosion design accidental loads DAL (i.e., blast loads) and blast drag pressure as specified above are considered in line with DNVGL-OS-A101 Ch.2 Sec.1 Table 1 [3.5.8] and DNVGL-RP-D101 Sec.3 [3.11.2.1]

The blast modelling demonstrates that the valve bodies are capable of withstanding such loading. It should be noted that the blast modelling did not include pipework.

## Production Testing

Each valve body shall be subjected to a hydrostatic pressure test at:

- 1.5 times the allowable pressure at room temperature

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In addition each valve shall be subject to seat leakage testing as follows:

- 1.1 times the design pressure in the valve flow direction.

Testing shall follow procedures and acceptance criteria in EN 12266-1 (leakage rate A).

### Certification

For ship installations (DNV GL-RU-SHIP Pt.4 Ch.6):

- Valve bodies shall be delivered with material certificates in accordance with DNV GL Ship Pt.4 Ch.6 Sec.2 Table 3.
- The Society's product certificates are required for valves with DN > 100 mm having a design pressure, p > 16 bar and for ship side valves with DN > 100 mm regardless of pressure rating. For other valves, works certificate will be accepted.

For offshore marine and machinery systems and equipment (DNV GL-OS-D101):

- Valve bodies shall be delivered with material certificates in accordance with DNV GL-OS-D101 Ch.2 Sec.2 Table 5.
- The Society's product certificates are required for valves with DN > 100 mm having a design pressure, p > 16 bar and for ship side valves with DN > 100 mm regardless of pressure rating. For other valves, works certificate will be accepted.

### Type Approval documentation

Application File for DNV Certification of Bermad Valves, dated 2013-08-04 containing:

<u>Drawing no.</u>	<u>Title</u>	Status
-	Valve data sheets/catalogues for 400E, 400Y, 700E.	For information
RAM\015-003	1 1/2" – 40 mm 400E Deluge Valve	Type approved
RAM\020-003 Rev.1	2" – 50 mm 400E Deluge Valve	Type approved
RAM\025-033	2.5" – 3"R (Flanged Body) 400E Series Deluge Type	Type approved
RAM\030-003	3" – 80 mm 400E Deluge Valve	Type approved
RAM\040-003 Rev.1	4" – 100 mm 400E Deluge Valve	Type approved
RAM\060-003	6" – 150 mm 400E Deluge Valve	Type approved
RAM\080-003 Rev.2	8" – 200 mm 400E Deluge Valve	Type approved
RAM\100-003 Rev.2	10" – 250 mm 400E Deluge Valve	Type approved
RAM\120-00B	12" – 300 mm 400E Deluge Valve Type B	Type approved
RAM\140-00B	14" – 350 mm 400E Deluge Valve Type B	Type approved
Torrent\030-A	3" DN80 400Y (Torrent Valve)	Type approved
Torrent\040-A	4" DN100 400Y (Torrent Valve)	Type approved
Torrent\060-A	6" DN150 400Y (Torrent Valve)	Type approved
Torrent\080-A	8" DN200 400Y (Torrent Valve)	Type approved
Torrent\100-A	10" DN250 400Y (Torrent Valve)	Type approved
S55\015-A	1 1/2" – 40 mm Deluge Body 700 Series	Type approved
S55\020-A	2" – 50 mm 700 Series	Type approved
S55\025-A	2 1/2" – 65" Control Valve 700 Series	Type approved
S56\030-A	3" – 80 mm 700 Series Standard Pressure Deluge Control Valve	Type approved
S53\040-A	4" – 100 mm 700 Series Standard Pressure Deluge Control	Type approved

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S53\060-A	Valve 6" – 150 mm 700 Series Standard Pressure Deluge Control Valve	Type approved
S53\080-A	8" – 200 mm 700 Series Standard Pressure Deluge Control Valve	Type approved
S53\100-A	10" – 250 mm 700 Series Standard Pressure Deluge Control Valve	Type approved
S53\120-A	12" – 300 mm Control Valve 700 Series Standard Pressure	Type approved
S53\160-A	16" – 400 mm Control Valve 700 Series Standard Pressure	Type approved
S53\200-A	20" – 500 mm Control Valve 700 Series Standard Pressure	Type approved
29072013/1	400E 20 bar Test Report On Diaphragm Valve, dated 2013-07-29	For information
30072013/1	400Y 25 bar Test Report On Diaphragm Valve, dated 2013-07-30	For information
01082013/1	700E 25 bar Test Report On Diaphragm Valve, dated 2013-08-01	For information
-	Approval Report – Automatic Water Control Valves for use in Deluge, Preaction	For information
-	Refrigerated Area and Dry Pipe Sprinkler Systems. Class: 1011/1012/1013, 1020, 1021. FM Approvals, USA. Dated 2013-01-11.	For information
-	Ex5092 Report on Special System Water Control Valves – Deluge Type Underwriters Laboratories Inc., USA. Dated 1999-10-26.	For information
-	Blast Simulation Report for valve series: 400E, 400Y and 700E, dated 24-03-2014	For information

## Tests carried out

Burst testing

## Marking of product

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

- manufacturer's 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

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 approval are complied with. Reference is made to DNVGL-CP-0338.