DNV·GL

Certificate No:
TAP000009N

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
Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"
Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment
Det Norske Veritas' Standards for Certification 2.9 No. 5-794.40

Application :

Diaphragm valves approved for use in fire protection water and foam systems.
Blast loads considered according to DNV-OS-A101 (April 2011)Section 2 Table D1 Area 6.
Blast over pressure: 4 bar
Dynamic drag pressure: 2.05 bar

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:
400E	max 90 °C (see cert.)	20 bar	DN40 to DN250 (1.5" to 10")
400Y	max 90 °C (see cert.)	25 bar	DN40 to DN250 (1.5" to 10")
700E	max 90 °C (see cert.)	25 bar	DN40 to DN250 (1.5" to 10")

This Certificate is valid until **2019-06-30**.

Issued at **Høvik** on **2016-03-09**

for **DNV GL**

DNV GL local station: **Houston**

Approval Engineer: **Adel Samiei**

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.

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Job Id: **262.1-016084-4**
Certificate No: **TAP000009N**

Product description

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

Valve type	Size	Design pressure	Max. fluid working temperature
400E	DN40 to DN250 1 ½" to 10"	20 bar	EPDM: 90 °C NBR: 80 °C NR: 60 °C
400Y	DN40 to DN250 1 ½" to 10"	25 bar	
700E	DN40 to DN250 1 ½" to 10"	25 bar	

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	

Authorised place of manufacture:

Bermad CS Ltd
Kibbutz Evron
22808 Israel

Application/Limitation

Blast loads considered according to DNV-OS-A101 (April 2011)Section 2 Table D1 Area 6.

- Blast over pressure: 4 bar
- Dynamic drag pressure: 2.05 bar

Valves are approved for use in:

- fresh water, sea 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.

Blast Resistance

The valves have been subject to blast modelling following the principles outlined in DNV-RP-D101 section 3.11.

- 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.

This was based on the following design parameters from DNV-OS-A101 (April 2011) Section 2 Table D1 Area 6 and DNV-RP-D101 Section 3.11 Table 3-1;

- Blast over pressure: 4 bar
- Pulse duration: 1 sec
- Dynamic drag pressure: 2.05 bar
- Equivalent wind speed: 579 m/s

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 is to be subjected to production testing (hydrostatic testing of valve body plus seat leakage) according to the procedure and requirements of EN12266-1:2012.

Material Certification
Valve bodies and bonnets are to be furnished with material certificates as given in DNV Ship Pt.4 Ch.6 Sec.2 Table A2.

Product Certification
DNV product certificates are required for valves with DN > 100 mm. For valves with DN ≤ 100 mm a manufacturer's certificate is accepted.

Type Approval documentation
Tests carried out
The following testing as required by the DNV Type Approval Programme has been undertaken:

- Burst testing – witnessed by Underwriters Laboratories Inc., USA.
- Burst Testing – witnessed by FM Approvals, USA.

Additional testing not covered by the DNV Type Approval Programme is not listed here.

Marking of product
Each valve shall be clearly marked for identification. The identification marking may be performed on the body or on a plate
of non-corrosive material. When a metallic plate is used, the plate shall be permanently fixed to the body.

Identification marking on the body shall be located to nonstressed areas and shall be clearly legible. The identification marking shall as a minimum include the following:
— manufacturer's name or trade mark
— valve type designation
— size
— MWP (Max. Working Pressure)
— 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 an assessment 2 years after issue of the Type Approval Certificate, according to DNV Standard for Certification No. 2.9 – 5-794.40, "Type Approval of Valves" to verify that the conditions for the type approval are complied with.