

**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Butterfly Valves**

with type designation(s)

**SL (light series), SR (Heavy series)**

Issued to

**DENNIS NAKAKITA S.A.****Alcázar de San Juan Ciudad Real, Spain**

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 July 2015****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.**

<b>Type:</b>	<b>Temperature range:</b>	<b>Max. working press.:</b>	<b>Sizes:</b>
<b>SL (light series)</b>	<b>Depending on the seat material</b>	<b>10 bar</b>	<b>DN40 to DN1000</b>
<b>SR (Heavy series)</b>	<b>Depending on the seat material</b>	<b>25 bar</b>	<b>DN40 to DN1000</b>

Issued at **Høvik** on **2017-11-09**for **DNV GL**This Certificate is valid until **2022-06-30**.DNV GL local station: **Madrid**Approval Engineer: **Adel Samiei**

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**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.



## Product description

One piece body butterfly-valves in SL and SR series  
 Wafer, Wafer-lug, lug and Double flanged  
 Single piece shaft  
 Minimum body thickness: according to ASME B16.34

Sizes:

SL: DN:40,50,65,80,100,125,150,200,250,300,350,400,450,500,550,600,700,800,900,1000

SR: DN:40,50,65,80,100,125,150,200,250,300,350,400,450,500,550,600,650,700,750,800,900,1000

Part	Material Category	Material designation/standard
body and disc	Gray cast iron	ASTM A-126 Class B
	Nodular cast iron (ferritic type)	GGG40 / EN-GJS-400-15
	Carbon steel	ASTM A-216 Grade WCB
	Alloy steel	ASTM A352 Grade LCB, LC2, LC3
	Cast stainless steel	Ni-Resit ASTM A-351 CA-15, CF8, CF8M
	Forged stainless steel	ASTM A182 Grade F6, F316, F304 AISI 431
	Monel	Monel 400
	Stellite	Stellite
	Hastelloy	Hastelloy B Hastelloy C
	Bronze	ASTM B62
	Aluminium bronze	ASTM B-148 9A & 52AL9D
Sealing	Non-metallic	Natural rubber, Ethylene Propylene, Neoprene, Butile, Hypalon, Nitrile, Silicon, Viton fluoride, PTFE (Teflon)
	Metallic	AISI 316, Monel-K500, Monel K-400, Inconel and Hastelloy

## Application/Limitation

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

Temperature range depending on seat material:

Seat	Temperature range	Seat	Temperature range	Seat	Temperature range
Natural rubber	-40°C to 60°C	Butile	-30°C to 100°C	Silicon	0°C to 200°C
Ethylene Propylene *	-40°C to 120°C	Hypalon	-20°C to 130°C	Viton fluoride	0°C to 120°C
Neoprene	-40°C to 110°C	Nitrile	-15°C to 90°C	PTFE (Teflon)	-100°C to 200°C

\*) not allowed to use in systems containing Hydrocarbons.

The approval does not include any operating gear for remote control of the valves.

Austenitic stainless steels (e.g. grades 304, 316, 304L, 316L, CF8 & CF8M) are not seawater resistant and shall not be used in direct contact with seawater.

Valves covered by this certificate are fire safe for sizes equal to DN200 (8") and bigger. Otherwise (sizes smaller than DN200) they shall not be installed in systems where fire safe application is required.

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

Nodular cast iron of the ferritic type, with specified minimum elongation of 12%, may be used in class II and III piping (when the minimum design temperature is not less than 0°C) and in valves located on the ship's side and bottom and valves on the collision bulkhead.

Grey cast iron may be used for class III piping, with the following exceptions:

- Valves fitted on ship sides and bottom and on sea chests
- Valves fitted on collision bulkhead
- Valves under static head fitted on the external wall of fuel tanks, lub. oil tanks and tanks for other flammable oils
- Valves for fluids with temperatures in excess of 120°C.

Minimum body thicknesses (in mm) for each type/size are in accordance with below table:

DN	Heavy series (SR)	Light series (SL)
40	12	12
50	12	12
65	16.5	16.5
80	13	13
100	13	13
125	15	15
150	18	15
200	20	12
250	22	14
300	24	16
350	26	18

DN	Heavy series (SR)	Light series (SL)
400	29	20
450	31	20
500	33	20
550	36	20
600	39	24
650	39	-
700	40	25
750	40	-
800	40	30
900	47	28
1000	46	30

### Type Approval documentation

Drawings:

exp300R + H30-80 dated 27-02-2014 / exp300R + M30 dated 27-02-2014  
 exp300R + AC50 dated 27-02-2014 / exp300R + pal dated 27-02-2014

Detail drawings: (SL)

CU-40R-MHN10 ed.2, CU-50R-W-MHN10 ed.2, CU-65R-W-MHN10 ed.1, CU-80R-SML-MHN10 ed.1, CU-100R-SML-MHN10 ed.0, CU-125R-SML-MHN10 ed.0, CU-150R-SML-MHN10 ed.0, CU-200R-SML-MHN20 ed.0, CU-250R-SML-MHN20 ed.0, CU-300R-SML-MHN20 ed.0, CU-350R-SML-MHN20 ed.0, W.80.01, W.90.01, W100.01, W.105.01, W.120.01, W.140.01, W.160.01, W.180.01/10K, W.200.01

Detail drawings: (SL)

CU-40R-MHN10 ed.2, CU-50R-W-MHN10 ed.2, CU-65R-W-MHN10 ed.1, CU-80R-SML-MHN10 ed.1, CU-100R-SML-MHN10 ed.0, CU-125R-SML-MHN10 ed.0, CU-150R-SML-MHN10 ed.0, CU-200R-SML-MHN20 ed.0, CU-250R-SML-MHN20 ed.0, CU-300R-SML-MHN20 ed.0, CU-350R-SML-MHN30 ed.1, CU-400R-SML-MHN40 ed.0, CU-450R-SML-MHN40 ed.0, CU-500R-SML-MHN50 ed.0, CU-550R-SML-MHN50 ed.0, CU-600R-SML-MHN60 ed.0, CU-650R-SML-MHN60 ed.0, CU-700R-SML-MHN70 ed.2, CU-750R ed.0, CU-800R-SML-MHN80 ed.0, CU-900R-SML-MHN80 ed.0, CU-1000R-SML-MHN60 ed.0

ABS fire test report number HM2488649 / Dr.-Ing.T. Bäumer report number IBB-1102

Calculation reports for SR and SL series (ed3)

### 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). The test pressure need not be more than 70 bar in excess of the nominal pressure.

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 EN12266-1 (Rate A).

Valves fitted on ship's side and bottom are also to be hydrostatically tested at a pressure equal to 5 bar applied independently on each side of the closed disc.

### Certification

Job Id: **262.1-007495-4**  
Certificate No: **TAP000011F**

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.

### **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 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.