Certificate no.:
TAP000030J

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Ball Valve

with type designation(s)
LL1

issued to
MECA-Inox Valves Co., Ltd.
Dalian, Liaoning Province, **China**

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNV rules for classification – Ships Pt.6 Ch.2 Sec.14 Gas fuelled ship installations – Gas fuelled ammonia
DNV class programme DNV-CP-0186 – Type approval – Valves

Application:

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

Temperature range:	**-50°C to +100°C**
Max. working press.:	**see certificate**
Sizes:	**see certificate**

Issued at **Hamburg** on **2025-05-22**
This Certificate is valid until **2030-05-21**.
DNV local unit: **Dalian NB & CMC**

for **DNV**

Approval Engineer: **Ana Cristina Do Carmo Insfran**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

Product description

Low leakage marine ball valve type LL1 for application in ammonia (LHN3/NH3) fuel piping and system installations as well as piping systems.

Valve Type	Nominal Pressure [PN]	Size range [DN]	Design Pressure [MPa]	Temperature [°C]
LL1 Marine SF	Class 300	DN10	4,96	-50° ~ +100°
		DN15		
		DN20		
		DN25		
		DN32		
		DN40		
		DN50		
	Class 250	DN65	3,94	
		DN80		
	Class 150	DN100	1,9	
		DN125		
		DN150		

Design conditions:
Flange connection acc. to ASME B.16.5
Design and Testing acc. to ASME B16.34-2020
API607-2016 – Fire Test for quarter-turn valves and valves equipped with non-metallic seats.

Materials:

Valve parts	Material	Standard
Body	CF3M*	ASTM A351
Ball	CF3M*	ASTM A351
Stem	316L*	ASTM A479
Connections	F316L*	ASTM A182
Seat	PTFE (TFM1600)	-

*Heat treatment: solution treatment

Application / Limitation

Stainless steel ball valves type LL1 approved for the use in ammonia (LHN3/NH3) fuel piping and system installations as well as piping systems. Operating media includes flammable gases[1].

1: Valve designs for use and installation in ammonia (LHN3 and NH3) ship fuel systems require additional approval by the flag state administration for each particular ship as these fuels are not covered by the IGF Code at present. The interim Guideline for Safety of Ships using Ammonia as fuels - MSC.1-Cir.1687 published on 2025-02-26 shall be observed.

Type Approval documentation

Production testing and Certification

Production Testing and Certification for the actual intended application shall follow the latest applicable edition of the Rules (as mentioned on the front page of this certificate).

Valve type approval tests carried out

Type of test	Test Standard
Pressure test	ASME B.16.34 and DNV Pt. 4, Ch. 6
Tightness test	EN 12266 – 1 / -2
Fire safe test	API 607 [2022]
Fugitive emission test	ISO 15848 -1 [2025]
Electrostatic test	ISO7121- 2016

Note: The fire test was commissioned by Quality Inspection Center to Pump and Valve Products of Zheijang Province in accordance with API 607 standard.

Marking of product

Minimum marking requirements shall be as outlined in the valve design standard. An example for traceability to this type approval the products are to be marked with:

Meca-inoX BALL VALVES 美嘉诺阀门（大连）有限公司
MECA-Inox Valves Co., Ltd.

产品型号 Type	LL1	产品编号 Product No.	1111
公称压力 Nominal pressure	4,96 MPa	公称通径 Nominal Diameter	DN50
阀体材料 Body material	CF3M ASTMA351	最低使用温度 Min.Temperature	-50°C
制造日期 Manufacture date	2025-04-29	适用介质 Applicable media	Ammonia

Place of Production

Meca-Inox Valves Co.,Ltd.
No.30-1. 2 Huaihe West Road, Dalian Development Area, Liaoning Province, P.R. China.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with.
Refer to DNV CP-0338, Sec.4.
The certificate is only valid if required periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com

END OF CERTIFICATE