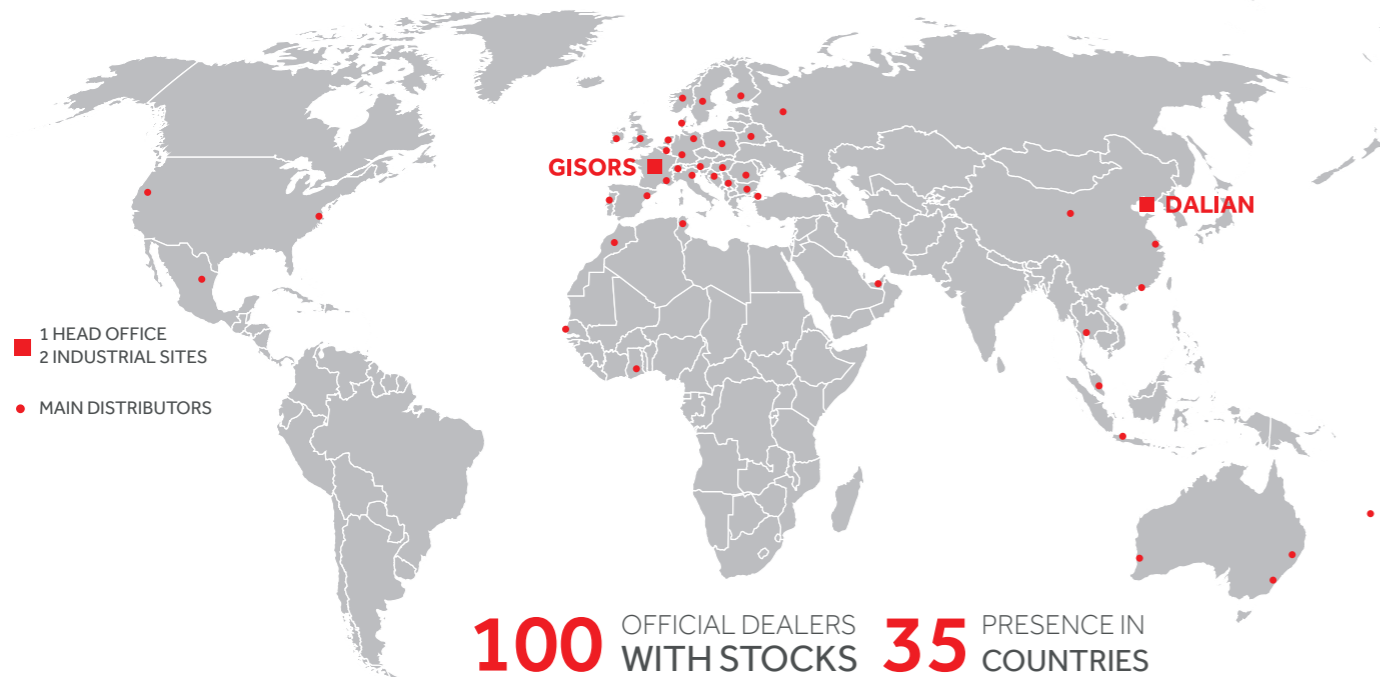


Meca-inox

BALL VALVES

HIGH QUALITY BALL VALVES
BORN IN FRANCE, WORLDWIDE AVAILABLE



Since 1967, MECA-INOX has manufactured ball valves and is a European leading signature for high quality ball valves dedicated to Chemistry, Pharma & Cosmetic, Cryogenic fluids, Food & Beverage and Industry with more than 3 million valves installed all over the world and 150 000 ball valves yearly production.

Expert in stainless steel and carbon steel ball valves technology, we have developed over the years a complete products offer internationally recognized for its reliability, performance, and flexibility of use. Combining high quality materials and our specific knowhow of design and manufacturing, our products meet the most stringent requirements.

From our industrial sites of Gisors (France) and Dalian (China), our teams can support you anywhere in the world. Our network of distributors provide an optimal availability of our valves and equipment for your international projects.

meca-inox.com

MECA-INOX

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A BRAND OF GROUP
Meca-inox
SINCE 1955



LNG MARINE SOLUTIONS



EN-2018

Meca-inox

BALL VALVES

MECA-INOX entered LNG Marine valves market in **2011** with DNV Certified 2 ways ball valves and progressively extended its range of products with **3 ways ball valves complex modules**.

Now, MECA-INOX designs and produces **Multifunction Valves Modules** for LNG as fuel ships in operation in ECA regions.



LNG as fuel ships equipped with MI valves

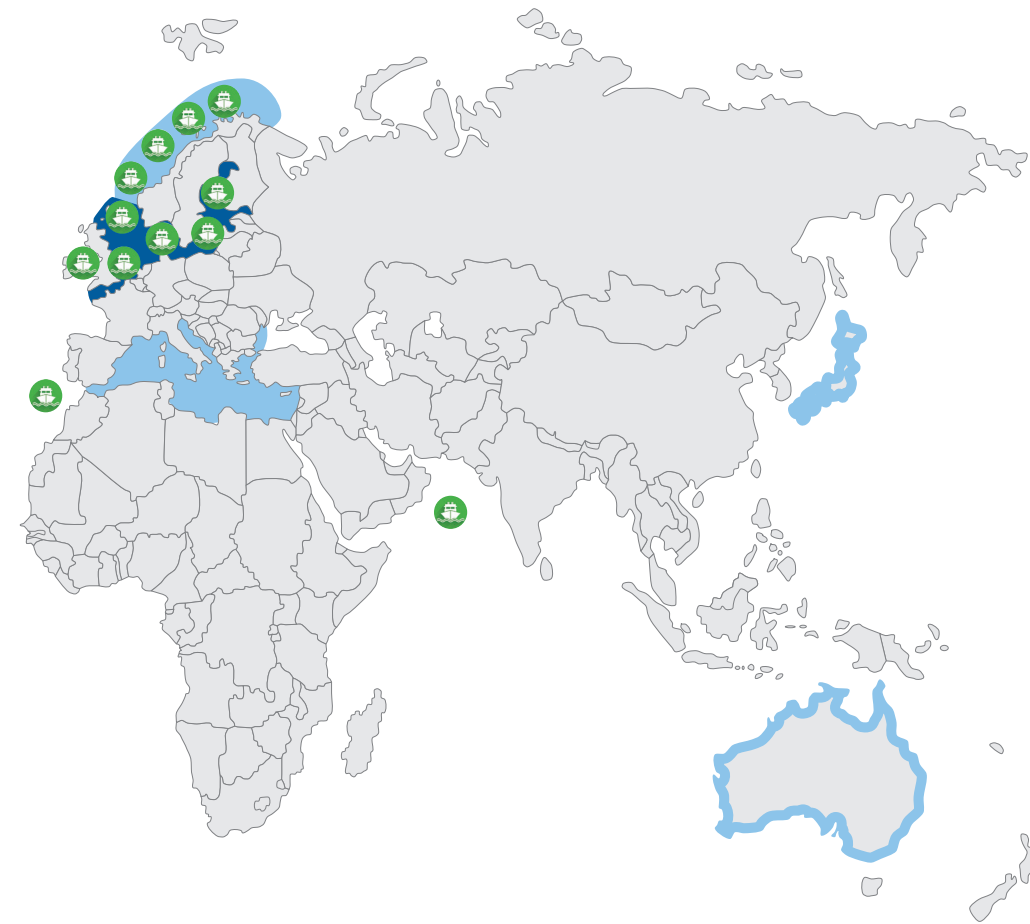


LNG Tug



LNG Cruise Ship

Map of Emission Control Area (ECA)



Existing ECA

Potential future ECA



LNG car/passengers Ferry



LNG RoRo ship



LNG Dredger

More than 20 LNG as fuel ships in operation equipped with MECA-INOX valves in 2018

Based in France, MECA-INOX manages through dedicated project teams the design, production and certification in close collaboration and control of the main IACS certification organisms.

Thanks to more than **18 years of experience in cryogenic ball valve**, MECA-INOX offers valves in full compliance with Marine Certification Rules :

- Certified stainless steel and components suppliers ✓
- Tested materials (Composition, Impact tests, Tensile tests) ✓
- Internal bench of cryogenic tests according to BS6364 or EN12567 ✓
- Internal hydraulic tests according to EN12266-1 ✓



ECA (Emission Control Area) are sea areas in which **IMO (International Marine Organization)** defined stricter control and are in application to minimize airborne emissions from ships to face the current environmental stakes on both human health and ecosystems.

In these sea areas, the emissions of Sulphur Oxides (SOx), Nitrogen Oxides (NOx) and Particles are strictly controlled and the use of heavy fuels is prohibited.

Driven by the ECA regulation, **LNG as fuel ships** becomes an important stake for the LNG market with more than 100 new ships & ships modifications during the last 5 years.

Indeed, the combustion of LNG reduces from 20% to 40% CO₂ emissions for the same energy production and induce very low sulphur and fine particles.

Meca-Inox is a strategic partner of major actors in LNG as fuel ships manufacturers for Ball Valves Systems but also for maintenance and operations on shipboard.

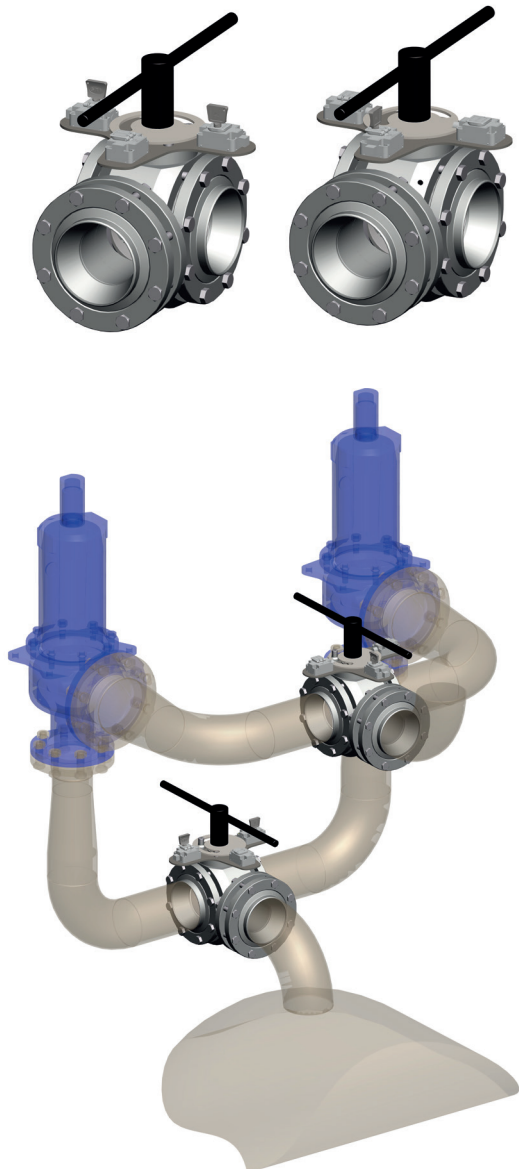


MARINE LNG TANKS SAFETY VALVES COUPLING & MAINTENANCE

DOUBLE LNG TANKS VAPOR VENTING VALVES

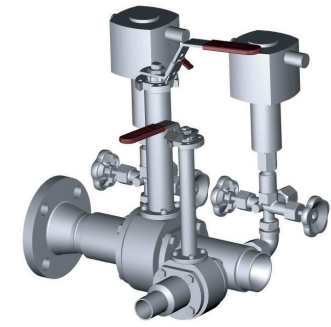
Appaired system of 2 Three-Ways (L or T port) valves for secured safety valves maintenance of LNG Tanks

Size	1" ½ to 6" (DN40 to 150)
Pressure Class	PN16
Temperatures @1bar	-196/190 °C (Gases)
Connections	Large choice of ends available : BW, SW, Flanges, Nipple...
Operation	Lever operated with interlocking key device ⇒ Safe operating during maintenance
Materials	Body, ends, stem, ball : Certified SS 316L with 3.2. Certificates
Tests and Type Approval Certifications	Cryogenic tests according to BS6364, EN12567 Hydrostatic tests according to EN12266-1 TAC from DNV-GL, Lloyd's Register, Bureau Veritas, RINA, ABS
Production experience	27 Systems delivered



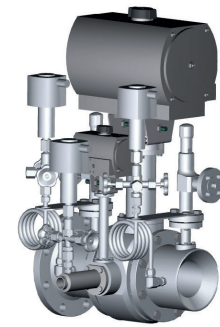
LNG MULTIFUNCTION VALVES SYSTEMS

LNG Vapor Return Module



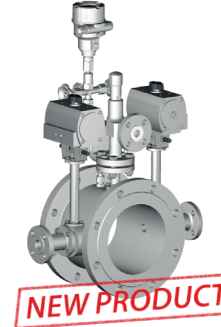
- ✓ Manual LNG Vapors Valve
 - ✓ Pressure Sensors
 - ✓ Manual N₂ Injection Valve
- 2" to 3" lines
12 modules in operation

LNG Bunkering Module



- ✓ Actuated LNG Valve
 - ✓ Pressure Sensors
 - ✓ Safety Valve
 - ✓ Actuated N₂ Injection Valve
- 2" to 6" lines
18 modules in operation

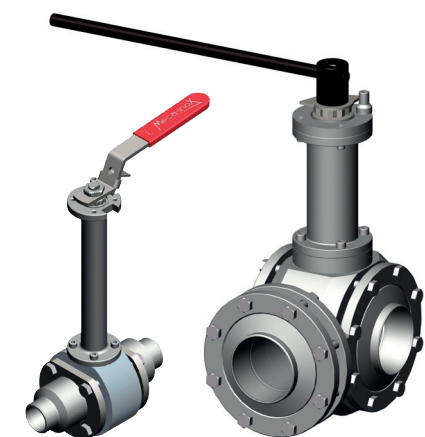
LNG Line N₂ Flushing Module



- NEW PRODUCT**
- ✓ #150 Flange Pipe 2" to 8"
 - ✓ Pressure Sensor
 - ✓ Safety Valve
 - ✓ Actuated N₂ Injection Valve
 - ✓ Actuated Vapors Ejection Valve

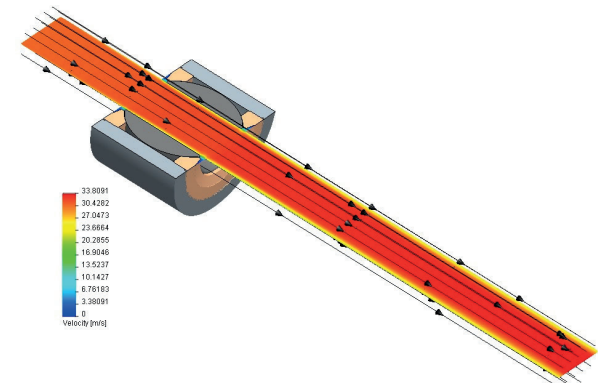
Customized Designs & Equipment On Demand

LNG LINES - 2 & 3 WAYS CRYOGENIC VALVES



- ✓ DN08 to DN150 (1/2" to 6") pipes
- ✓ 100% Machined Components
- ✓ Upstream hole for pressure relief in closed position
- ✓ Large choice of connections : Butt Weld, Socket Weld, Threaded ...
- ✓ Lockable levers, Pneumatic Actuators (Simple or double effect)

EUROPEAN REFERENCE BALL VALVES FOR PERFORMANCE & RELIABILITY



Design

- ✓ Quick actuation
- ✓ Components and accessories delivered with Marine TAC Approval
- ✓ Low Flow Restriction, 2 to 5 times lower than globes valves

Performances

- ✓ High Performance PTFE Modified Gland Packing
- ✓ No internal & external leakage EN12567 or BS6364 tested valves
- ✓ EN12266-1 "Class A"

Reliability

- ✓ All components degreased and cleaned according to EN12300
- ✓ External Static Helium Tightness < 10-5 mbar.L/s
- ✓ Machined bodies, ends, stem extensions

Maintenance

- ✓ Certified materials maintenance
- ✓ Technical Support for installation and maintenance of Valves Systems

