

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	Mutsubishi Rubber Co., Ltd., Osaka Main Office
Address	Keihin Dojima Bldg, 10F, 2-1-31,, Doujima, Kita-ku, Osaka, 530-0003, Japan
Place of Production	Mutsubishi Rubber Co., Ltd., Headquarter and Plant 2-3-5, Mitsugaoka, Nishi-ku, Kobe, 651-2228, Japan
Type	Isolation Balloon Type II
Description	Isolation balloon assemblies
Trade Name	ISBL(Type II)-300A & 400A
Application	Marine and offshore use, as means of emergency isolation in the event of a failure of a cargo tank-installed pressure relief valve.
Specified Standard	Lloyd's Register's Rules and Regulations for the Construction and Classification of Ships for the Carriage of Liquefied Gases, Chapter 8, Paragraph 8.2.9, July 2020 IMO MSC.1/Circ. 1559 Manufacturer's Test Specification No. E2019093-1 Rev. A including operability and leakage test procedures using air of normal temperature and helium gas of less than minus 164(°C) and nitrogen liquid splash test procedure
Ratings	Nominal diameter of relief valve inlet pipe : 300A Nominal diameter of relief valve outlet pipe : 400A

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Nominal diameter of connection pipe and ball valve : 80A / 150A
Maximum temporary isolating pressure (MPa gauge) : 0.07 / 0.03
Minimum design temperature (°C) : -164
Maximum working internal pressure of balloon (MPa gauge) : 0.20 / 0.15

Other Conditions

Where the isolation balloon assemblies are intended to be used for the purpose of temporary isolation in a ship classed with Lloyd's Register, the following comments are applicable:-

- 1) For each project, the usage of this balloon system is to be indicated on the cargo tank venting system arrangement plan for approval.
- 2) Cargo operation manuals are to include relevant information on this balloon system and be approved as per IGC Code Chapter 18, Paragraph 18.2.
- 3) Personnel training is to be carried out in accordance with IGC Code Chapter 18, Paragraph 18.7.
- 4) The emergency isolation by means of the isolation balloon type II is to be carried out in open space in accordance with the manufacturer's instructions and approved cargo operation manuals; personnel protective equipment and portable gas detectors are used during emergency isolation operations.
- 5) Storage, handling, assembly, usage and replacement are to be in accordance with the manufacturer's instructions.
- 6) Where the two cargo tank relief valves will discharge into a common header leading to a vent mast, the relief valve in emergency situation needs to be safely isolated on both the upstream and downstream sides.
- 7) The approval of the balloon as a safe means of emergency isolation as required by the IGC 8.2.9 for specific projects shall be accepted by the ship's flag administration.
- 8) The balloon material and associated components shall be compatible with

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the cargo.

9) The balloon isolation system should not be used for toxic cargoes unless otherwise proposed and agreed.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register Group Ltd of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: LR2020879TA

The Design Appraisal Document LR2020879TA-01 and its supplementary Type Approval Terms and Conditions form part of this Certificate.