



Marine & Offshore

Attestation number: P19-286-ATT

BV Project references: P19-286

*This attestation is not valid when presented without the full attached schedule composed of 5 sections*

## DESIGN REVIEW ATTESTATION

*This attestation is issued to*

**Mutsubishi Rubber Co., Ltd.**

Osaka - JAPAN

*For the product*

**Isolation Balloon Type II**

Reference requirements:

- Res. IMO MSC.370(93) – IGC CODE - § 8.2.9
- IMO MSC.1/Circ.1559 – UNIFIED INTERPRETATION OF THE IGC CODE [...] - § 5

This document attests that BUREAU VERITAS reviewed the technical documentation submitted for the equipment identified above, with regards to reference requirements mentioned above. Details of this review are to be found in the “Schedule of Review” in the subsequent pages of this attestation.

**For BUREAU VERITAS**

At BV Paris, on 29 April 2021

Didier BELLON

Head of Section - DA SAFE



This attestation will not be valid if the applicant makes any changes or modifications to the product. This attestation is issued within the scope of the General Conditions of BUREAU VERITAS Marine & Offshore Division available on the internet site [www.veristar.com](http://www.veristar.com). Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgment, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

This attestation consists of 2 pages

## Schedule of Review

### 1. PRODUCT DESCRIPTION:

The **Isolation Balloon type II** is a portable equipment intended for use as a mean of emergency isolation of a cargo tank vent in case of failure of a Pressure Relief Valve (PRV).

It consists of a synthetic inflatable balloon and its associated handling mechanism which makes possible:

- to insert the balloon in the venting pipe of the tank and inflate it in position before removal of the PRV,
- and accordingly deflate it and remove it after return to service of the PRV

Object of the review is solely the above described portable equipment, as defined in submitted manufacturer's drawing (ref. 2.1), items 1 to 20, 23. In particular following items have not been included in the review's scope:

- Regulator unit and hoses used for the purpose of inflating the balloon (items 21 and 22 in manufacturer's drawing, ref. 2.1)
- Design of the cargo vent line in the vicinity of the PRV (which need to be adapted to allow for the use of the **Isolation Balloon type II**)

### 2. DOCUMENTS AND DRAWINGS:

2.1 – Manufacturer's drawing:

- "Isolation Balloon For 300", ref. 19-55-0052-1, rev. C, issued on 22 Oct. 2020

2.2 – Failure Modes and Effects Analysis (FMEA):

- "fmea-worksheet 20201225.xls" as submitted on 25 Dec. 2020

2.3 – Handling manual:

- "Isolation Balloon Type II Handling Manual", ref. E2020034-3, rev. F, issued on 23 Dec. 2020

### 3. TEST SPECIFICATIONS & REPORTS:

3.1 – "Isolation balloon Type II – Test Specification", ref. E2020034-1-4, rev. B, issued 28 Sept. 2020.

3.2 – "Isolation balloon Type II – Test results", ref. E2019093-4, rev. B, issued 26 Feb 2021.

3.3 – "Isolation balloon Type II – Observed test results under cryogenic temperature", dated 31 March 2021, report of test made under witnessing of BV surveyor.

### 4. APPLICATION / LIMITATION:

4.1 – This attestation does not constitute a Bureau Veritas type approval of the equipment.

4.2. –**Isolation Balloon type II** is intended to be used onboard gas carriers with temperature of cargo equal or above -163°C. It is to be used on a temporary basis, for isolation of a PRV before maintenance when the tank is loaded (ref. IMO MSC.1/Circ.1559).

4.3 – Suitability of used synthetic materials with regards to cryogenic applications has been evaluated on basis of the results of the "Performance test at cryogenic temperature" and the "Cryogenic temperature splash test", which have been noted satisfactory. It remains however to be confirmed by repeated use for real operations.

4.4. – Resistance to ageing of the synthetic material parts (e.g., silicone balloon) has not been evaluated in the frame of the review.

4.5 – Handling manual (ref. 2.2) has been reviewed and is limited to the handling of the **Isolation Balloon type II**. Conditions of its use onboard a ship are not covered by this manual and have thus not been reviewed. In particular:

- safety instructions for the operator and PPE (personal protective equipment) to be used, and
- specific instructions for the operator, related to intervention in hazardous areas (normally zone 1, in the present case)

have not been reviewed. It is expected that those conditions of use onboard a ship will be defined at a later stage, on a case by case basis, i.e. for each concerned ship.

### 5. OTHERS:

5.1 – It is **Mitsubishi Rubber Co., Ltd.**'s responsibility to inform owner, ship operators or their sub-contractors of the proper methods of fitting, use and general maintenance of the equipment.