



Project: -

Client: Shibata Industrial Co., Ltd.

Office Kobe

Client's Order Number: -

Date: 24 May 2014

Order Status: Complete

Inspection Dates

First: 19 May 2014

Final: 23 May 2014

This certificate is issued to Shibata Industrial Co., Ltd. to certify that the undersigned Surveyor to Lloyd's Register did, at their request, attend their Akashi Works, Akashi, Hyogo-pref., Japan on and between the above dates for the purpose of inspecting the undernoted material.

### Prototype Test of Floating Pneumatic Rubber Fender

#### Particulars

- |                              |                                                                                        |
|------------------------------|----------------------------------------------------------------------------------------|
| 1) Fender Type               | : Type II (Sling Type)                                                                 |
| 2) Size                      | : 1,000 mmΦ x 1,500 mmL (internal pressure at 80 kPa)<br>200 mmΦ x 300 mmL (miniature) |
| 3) Drawing No.               | : APA-1252, APA-1258 (miniature)                                                       |
| 4) Construction              | : Outer rubber, Tire-cord layers, Inner rubber                                         |
| 5) Initial internal pressure | : 80 kPa.                                                                              |

#### Applicable Standard

ISO 17357-1 (First edition 2014-01-15)

Ships and marine technology - Floating pneumatic rubber fenders - Part 1 : High pressure

#### Procedure

Operating Procedure for Witness Inspection on Pneumatic Rubber Fenders :

Doc. No.AP-S-0731-1, dated : 2014-05-12

空気式防舷材検査実施要領書 文書番号: AP-S-0731-1 日付: 平成 26 年 5 月 12 日  
(シバタ工業株式会社)

#### Scope of Inspection

The following scope of inspection was carried out against the above standard and specification requirements in accordance with the above procedure, and found all satisfactory :-

1. Carried out visual, dimensional and weight inspection on the above two rubber fenders under the pneumatic internal pressure at 80 kPa.

( - Continue - )

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2. Witnessed air leakage test on the above two rubber fenders under the pneumatic internal pressure at 80 kPa.
3. Witnessed performance test, parallel compression test to determine energy absorption and reaction force on the above 1,000 mmΦ × 1,500 mmL rubber fender under the pneumatic pressure at 80 kPa.
4. Witnessed angular compression test on the above miniature size of the fender to determine fender deformation property.
5. Witnessed durability test starting on the above miniature size of the fender, total 3,000 repetitive cycles of parallel compression from 0% deflection to 60% deflection, and after this test, verified a counter had been indicated 3,000 times and confirmed no cracks, other harmful defects on the fender surface and no reduction of energy absorption.
6. Witnessed compression recovery test on the above 1,000 mmΦ × 1,500 mmL rubber fender and verified fender diameter had been recovered over 97% of the original size.
7. Reviewed and endorsed puncture-resistance test report of the five test specimens and confirmed the all test specimens had sufficient puncture-resistance strength.
8. Carried out marking check and verified all information was in accordance with the standard.
9. Reviewed and endorsed the manufacturer's inspection, test records and a certificate of synthetic tire cord.

Remarks:

The manufacturer's measuring and testing equipment used was correctly calibrated.

  
Y. Morita  
Surveyor to Lloyd's Register Group Limited

A subsidiary of Lloyd's Register Group Limited



Project: -

Client: Shibata Industrial Co., Ltd.

Office: Kobe

Client's Order Number: -

Date: 24 May 2014

Order Status: Complete

Inspection Dates

First: 16 May 2014

Final: 23 May 2014

This certificate is issued to Shibata Industrial Co., Ltd. to certify that the undersigned Surveyor to Lloyd's Register did, at their request, attend their Akashi Works, Akashi, Hyogo-pref., Japan on and between the above dates for the purpose of inspecting the undernoted material.

### Commercial Test of Floating Pneumatic Rubber Fender

#### Particulars

- |                              |                                                       |
|------------------------------|-------------------------------------------------------|
| 1) Fender Type               | : Type II (Sling Type)                                |
| 2) Size                      | : 2,000 mmΦ x 3,000 mmL (internal pressure at 80 kPa) |
| 3) Drawing No.               | : APA-1253                                            |
| 4) Construction              | : Outer rubber, Tire-cord layers, Inner rubber        |
| 5) Initial internal pressure | : 80 kPa.                                             |

#### Applicable Standard

ISO 17357-1 (First edition 2014-01-15)

Ships and marine technology – Floating pneumatic rubber fenders – Part 1 : High pressure

#### Procedure

Operating Procedure for Witness Inspection on Pneumatic Rubber Fenders :

Doc. No.AP-S-0731-1, dated : 2014-05-12

空気式防舷材検査実施要領書 文書番号: AP-S-0731-1 日付: 平成26年5月12日  
(シバタ工業株式会社)

#### Scope of Inspection

The following scope of inspection was carried out against the above standard and specification requirements in accordance with the above procedure and found all satisfactory :-

1. Carried out visual, dimensional and weight inspection under the pneumatic internal pressure at 80 kPa.

( - Continue - )

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2. Witnessed air leakage test under the pneumatic internal pressure at 80 kPa.
3. Witnessed hydrostatic pressure test at the pressure of 10 and 250 kPa, and measured circumferential and longitudinal temporary elongation during hydrostatic pressure test.
4. Witnessed material test on the inner and outer rubber material specimens before and after aging.
5. Carried out marking check and verified all information was in accordance with the standard.
6. Reviewed and endorsed the manufacturer's inspection, test records and a certificate of synthetic tire cord.

Remarks:

The manufacturer's measuring and testing equipment used was correctly calibrated.



Y. Morita  
Surveyor to Lloyd's Register Group Limited

A subsidiary of Lloyd's Register Group Limited