



AMERICAN BUREAU OF SHIPPING

Customer Name	FLEXOMARINE S.A.	Purchase Order No.	
Attending Office	Sao Paulo	Report Number	SP2103721
First Visit Date	27-Jun-2011	Last Visit Date	08-Jun-2012

Certification Of: PROTOTYPE HOSE ACCORDING TO Quantity: One(1)
GMPHOM 2009
Manufacturer: FLEXOMARINE S.A.

Survey Location: Flexomarine S.A. - São Paulo, SP, Brazil

Equipment Data

Manufacturer Number(S. No.) 06.11.11323
Model Number "FLEXOMARINE" SAFE 7000 SERIES - DOUBLE CARCASS HOSE

This is to Certify that the undersigned surveyor(s) to this Bureau did, at the request of the customer, carry out the following survey and report as follows:

- Traceability of materials used on this project has been verified.
- Welding plans, procedures & welder qualifications have been reviewed as required by Rule/Specifications.
- Examination during manufacturer assembly has been carried out to verify all critical phases of welding, fitting, machining, and non-destructive examination as required by the applicable Rules and/or requirements.
- All testing (pressure/load/operational/etc.) has been carried out as applicable and verified in accordance with the applicable Rules/specifications.
- Testing machines are maintained in a satisfactory condition and records of their recheck or calibration dates confirmed.
- Manufacturer test records and/or mill certificates were confirmed to comply with specification.
- For details of Mechanical Properties and/or Chemical Composition, refer to the mill/manufacturer's records.
- Final markings for identification confirmed.

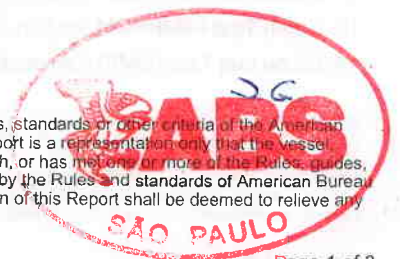
REPORT N° SP - 2103721 REVISED ON 18 JUNE 2012.

Manufacture and tests of the following prototype hose, nominal diameter 600 mm (24 in), in accordance with GMPHOM 2009 (Guide to Manufacturing and Purchasing Hoses for Offshore Moorings - 2009).

Prototype Characteristics:

- Hose Model: "Flexomarine" Safe 7000 Series - Double Carcass Hose.
- Rated Working Pressure: 21 bar.
- Hose size: 600 mm (24 in) Nominal Bore x 10.7 m (35 ft) long.
- Hose Serial Number 06.11.11323
- Flange ASME B16.5 class 150#
- Beginning of manufacture (W) 27 June 2011
- End of manufacture (W) 13 July 2011
- Beginning of tests (W) 01 August 2011
- End of tests (W) 31 May 2012
- Manufacture specification: "Prototype Manufacturing Hose Specification" - 7000 F/1 rev. 00
- Drawing of Flexomarine Safe 7000 series Prototype: DDT-2220-2435 sht 1/4 to 4/4 rev. 0.

NOTE: This report evidences that the survey reported herein was carried out in compliance with one or more of the Rules, guides, standards or other criteria of the American Bureau of Shipping and is issued solely for the use of the Bureau, its committees, its clients or other authorized entities. This Report is a representation only that the vessel, structure, item or material equipment, machinery or any other item covered by this Report has been examined for compliance with, or has met one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping. The validity, applicability and interpretation of this report is governed by the Rules and standards of American Bureau of Shipping who shall remain the sole judge thereof. Nothing contained in this Report or in any notation made in the contemplation of this Report shall be deemed to relieve any designer, builder, owner, manufacturer, seller, supplier, repairer, operator or other entity of any warranty express or implied.



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<u>Main Characteristics</u>	<u>Prototype</u>	<u>Range of Qualified Hoses</u>
Nominal Diameter:	600 mm (24 in)	600 mm (24 in) and down to, but excluding, 300mm;
Nominal Length:	10.7m	10.7 m and +/- 25% of the nominal length;
Rated Working Pressure:	21 bar	21 bar and all lesser RWPs.

The related prototype hose was subject to the following tests and found to comply with the requirements of GMPHOM 2009, as reported on the Flexomarine's Prototype Certificate n° DC 2411323 rev. 0 and listed as follows :

1. Material Tests (GMPHOM section 3.4.1): Flexomarine's certificate n° 1231/2012.
2. Adhesion Tests
 - 2.1. Nipple (GMPHOM section 3.4.2): Flexomarine's certificate n° 567/2011.
 - 2.2. Body and Cover (GMPHOM sections 3.4.3 & 2.1.3):
 - 2.2.1 On Dry Sample: Flexomarine's certificate n° 568/2011.
 - 2.2.2 On Sample Filled with Hydrocarbon Fluid (IRM 902 oil)/soaked for 30 days: Flexomarine's certificate n° 576/2011.
 - 2.3. Buoyancy material (GMPHOM section 3.4.4): Flexomarine's certificate n° 579/2011.
3. Buoyancy Recovery Test (GMPHOM sections 3.4.5 & 1.7.4): Flexomarine's certificate n° 703/2012.
4. Weight Test (GMPHOM sections 3.4.6, 2.1.5 & 1.6.3): Flexomarine's certificate n° 573/2011.
5. Collar Test (GMPHOM section 3.4.7): Flexomarine's certificate n° 743/2012.
6. Torsion Test (GMPHOM sections 3.4.8 & 2.1.8): Flexomarine's certificate n° 577/2011.
7. Tensile Tests (GMPHOM section 3.4.9):
 - 7.1. On Empty Hose (GMPHOM sections 3.4.9.1 & 1.2.5): Flexomarine's certificate n° 580/2011.
 - 7.2. On Pressurised Hose (GMPHOM section 3.4.9.2): Flexomarine's certificate n° 581/2011.
8. Dynamic Tests (GMPHOM section 3.4.10):
 - 8.1. Bending Load (GMPHOM section 3.4.10.1): Flexomarine's certificate n° 1172/2011
 - 8.2. Tensile Load (GMPHOM section 3.4.10.2): Flexomarine's certificate n° 1428/2012.
 - 8.3. Torsion Load (GMPHOM section 3.4.10.3): Flexomarine's certificate n° 1429/2012.
9. Minimum Bend Radius Test (GMPHOM sections 3.4.11, 1.4.1 & 2.1.6): Flexomarine's certificate n° 978/2012.
10. Bending Stiffness Tests (GMPHOM sections 3.4.12 & 2.1.7):
 - 10.1. Bending Stiffness Test Before Dynamic Tests: Flexomarine's certificate n° 574/2011.
 - 10.2. Bending Stiffness Test After Dynamic Tests: Flexomarine's certificate n° 977/2012.
11. Hydrostatic Pressure Tests (GMPHOM sections 3.4.13 & 2.1.10):
 - 11.1. Hydrostatic Pressure Test Before Dynamic Tests: Flexomarine's certificate n° 572/2011.
 - 11.2. Hydrostatic Pressure Test After Dynamic Tests: Flexomarine's certificate n° 991/2012.
12. Kerosene Tests (GMPHOM sections 3.4.14 & 2.1.11):
 - 12.1. Kerosene Test Before Dynamic Tests: Flexomarine's certificate n° 575/2011.
 - 12.2. Kerosene Test After Dynamic Tests: Flexomarine's certificate n° 994/2012.
13. Vacuum Tests (GMPHOM sections 3.4.15 & 2.1.12):
 - 13.1 Vacuum Test Before Dynamic Tests: Flexomarine's certificate n° 571/2011.
 - 13.2 Vacuum Test After Dynamic Tests: Flexomarine's certificate n° 993/2012.
14. Electrical Tests (GMPHOM section 3.4.16 & 2.1.13):
 - 14.1. Electrical Test Before Dynamic Tests: Flexomarine's certificate n° 570/2011.
 - 14.2. Electrical Test After Dynamic Tests: Flexomarine's certificate n° 992/2012.
15. Primary Carcass Burst Test (GMPHOM section 3.4.17) (*): Flexomarine's certificate n° 1147/2012
16. Secondary Carcass Burst Test (GMPHOM sections 3.4.18 & 3.4.17) (*): Flexomarine's certificate n° 1148/2012.
17. Double Leak Detector System/Double Carcass Hose (GMPHOM section 3.4.19) (**): Flexomarine's certificate n° 1311/2012.
18. Crush Test (GMPHOM section 3.4.20): Flexomarine's certificate n° 1491/2012.
19. Lifting Lug Test (GMPHOM sections 3.4.21, 2.1.15 & 1.8.5): Flexomarine's certificate n° 1431/2012.



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(*) Burst tests details:

	Specified requirement	Obtained value
Primary carcass burst pressure	> 105 bar	152.6 bar
Secondary carcass burst pressure	> 42 bar	54.2 bar
Mode of failure on primary carcass:	The burst occurred in an angular direction, at 1.8 m from end A.	
Mode of failure on secondary carcass:	The burst occurred in a radial direction, at 1.3 m from end A.	

() Test detail**

Double Leak Detector System, natural expansion of the 2nd carcass and the red spindle, after the burst of the primary carcass, remained operational until failure of the secondary carcass.

All manufacturing activities and performance tests were witnessed by one ABS Surveyor.

All Flexomarine's certificates mentioned above and attached to this report have been reviewed and signed by the undersigned ABS Surveyor

Notes:

1. For particulars of the test results, refer to the attached manufacturer's test certificates.
2. W= Witnessed tests/activities

Based on the satisfactory results of the above tests, the prototype hose is considered to be in compliance with GMPHOM 2009 requirements.

**Surveyor(s) to The American Bureau of Shipping
Attending Surveyors**

 Antunes de Oliveira Luiz Caio

Guimaraes Jose A. B.

Reviewed By



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