AMERICAN BUREAU OF SHIPPING

Customer Name	**FLEXOMARINE S.A.**	Purchase Order No.	
Attending Office	**Sao Paulo**	Report Number	**SP2189116**
First Visit Date	**08-Oct-2012**	Last Visit Date	**07-Jun-2013**

Certification Of: Flexible Hose
Manufacturer: FLEXOMARINE S.A.
Quantity: One(1)

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

Equipment Data

Manufacturer Number(S. No.)	10.12.12830
Model Number	"FLEXOMARINE" 1000 SERIES - SINGLE 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.

Manufacture and test of the following prototype hose, nominal diameter 300 mm (12 in), in accordance with GMPHOM 2009 (Guide manufacturing and Purchasing Hoses for Offshore Moorings - 2009).

Prototype Characteristics:
Hose Model: "Flexomarine" 1000 Series - Single Carcass Hose.
Rated Working Pressure: 21 bar.
Hose size: 300 mm (12 in) Nominal Bore x 10.7 m (35 ft) long.
Hose Serial Number 10.12.12830
Flange ASME B16.5 class 150#
Beginning of manufacture (W) 08 Oct 2012
End of manufacture (W) 15 Oct 2012
Beginning of tests (W) 14 Dec 2011
End of tests (W) 28 May 2013
Manufacture specification: "Prototype Manufacturing Hose Specification" - 1000 S/3 rev. 00
Drawing of Flexomarine 1000 series Prototype: DDT-2513-1235 sht 1/4 to 4/4 rev. 0.

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Main Characteristics	**Prototype**	**Range of Qualified Hoses**
Nominal Diameter:	300 mm (12 in)	300 mm (12 in) and all smaller size ranges;
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 nº SC 1212830 rev. 0 and listed as follows :

1. Material Tests (GMPHOM section 3.4.1): Flexomarine's certificate nº 2172/2012.
2. Adhesion Tests
2.1. Nipple (GMPHOM section 3.4.2): Flexomarine's certificate nº 2166/2012.
2.2. Body and Cover (GMPHOM sections 3.4.3 & 2.1.3):
2.2.1 On Dry Sample: Flexomarine's certificate nº 2167/2012.
2.2.2 On Sample Filled with Hydrocarbon Fluid (IRM 902 oil)/soaked for 30 days: Flexomarine's certificate nº 2170/2012.
2.3. Buoyancy material (GMPHOM section 3.4.4): Flexomarine's certificate nº 2169/2012.
3. Buoyancy Recovery Test (GMPHOM sections 3.4.5 & 1.7.4): Flexomarine's certificate nº 2171/2012.
4. Weight Test (GMPHOM sections 3.4.6, 2.1.5 & 1.6.3): Flexomarine's certificate nº 2164/2012.
5. Collar Test (GMPHOM section 3.4.7): Flexomarine's certificate nº 3138/2013.
6. Torsion Test (GMPHOM sections 3.4.8 & 2.1.8): Flexomarine's certificate nº 2125/2012.
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 nº 2173/2012.
7.2. On Pressurised Hose (GMPHOM section 3.4.9.2): Flexomarine's certificate nº 2174/2012.
8. Dynamic Tests (GMPHOM section 3.4.10):
8.1. Bending Load (GMPHOM section 3.4.10.1): Flexomarine's certificate nº 2175/2012.
8.2. Tensile Load (GMPHOM section 3.4.10.2): Flexomarine's certificate nº 2200/2013.
8.3. Torsion Load (GMPHOM section 3.4.10.3): Flexomarine's certificate nº 2936/2013.
9. Minimum Bend Radius Test (GMPHOM sections 3.4.11, 1.4.1 & 2.1.6): Flexomarine's certificate nº 2940/2013.
10. Bending Stiffness Tests (GMPHOM sections 3.4.12 & 2.1.7):
10.1. Bending Stiffness Test Before Dynamic Tests: Flexomarine's certificate nº 2160/2012.
10.2. Bending Stiffness Test After Dynamic Tests: Flexomarine's certificate nº 2941/2013.
11. Hydrostatic Pressure Tests (GMPHOM sections 3.4.13 & 2.1.10):
11.1. Hydrostatic Pressure Test Before Dynamic Tests: Flexomarine's certificate nº 2163/2012.
11.2. Hydrostatic Pressure Test After Dynamic Tests: Flexomarine's certificate nº 2942/2013.
12. Kerosene Tests (GMPHOM sections 3.4.14 & 2.1.11):
12.1. Kerosene Test Before Dynamic Tests: Flexomarine's certificate nº 2165/2012.
12.2. Kerosene Test After Dynamic Tests: Flexomarine's certificate nº 2944/2013.
13. Vacuum Tests (GMPHOM sections 3.4.15 & 2.1.12):
13.1 Vacuum Test Before Dynamic Tests: Flexomarine's certificate nº 2162/2012.
13.2 Vacuum Test After Dynamic Tests: Flexomarine's certificate nº 2945/2013.
14. Electrical Tests (GMPHOM section 3.4.16 & 2.1.13):
14.1. Electrical Test Before Dynamic Tests: Flexomarine's certificate nº 2161/2012.
14.2. Electrical Test After Dynamic Tests: Flexomarine's certificate nº 2943/2013.
15. Carcass Burst Test (GMPHOM section 3.4.17) (*): Flexomarine's certificate nº 3137/2013
16.Crush test (GMPHOM section 3.4.20) Flexomarine's certificate nº 3140/2013
17.Lifting Lug Test (GMPHOM section 3.4.21, 2.1.15 and 1.8.5) Flexomarine's certificate nº 2123/2012

ABS SÃO PAULO

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(*) Burst tests details:

	Specified requirement	**Obtained value**
burst pressure	> 105 bar	144,9 bar
Mode of failure	The burst occurred in an angular direction, at 1,12 m from end B.	

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 obove tests, the prototype hose is consigned to be in compliance with GMPHOM 2009 requirememts.

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

Bernardes Gil Luiz Gonzaga

Rossi Carlos R.

Reviewed By