Marine & Offshore

Certificate number: 36053/B0 BV
File number: ACM 135/2727/01
Product code: 2104I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

BALFLEX PORTUGAL SA

PORTO - PORTUGAL

for the type of product

NON-METALLIC HOSES (FLEXIBLE PIPES) ASSEMBLIES

BALFLEX FORZA (DIN EN 853: 1SN, 2SN; SAE J517 100R1AT, 100R2AT),
BALFLEX BALPAC (DIN EN 857: 1SC, 2SC; SAE J517: 100R17, 100R16) &
BALFLEX BRAKEMASTER (SAE J517 100R5)

Requirements:
- BUREAU VERITAS Rules for the Classification of Steel Ships

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 23 Apr 2024

For Bureau Veritas Marine & Offshore,
At BV LISBON, on 23 Apr 2019,
Miguel MORGADO





This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site 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 Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, 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.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

BALFLEX Rubber Hoses FORZA (1SN / R1AT, 2SN / R2AT) , BALPAC (1SC / R17, 2SC / R16) & BRAKEMASTER (R5)

1.1 BALFLEX FORZA Hose acc. to DIN EN 853 1SN / SAE J517 100R1AT

Nominal Size (inch)	3/16"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
Internal Diameter (mm)	4,8	6,3	8,0	9,5	12,7	16,0	19,0	25,4	32,0	38,0	50,8	63,5	76,2
Max. Working Pressure (MPa)	25.0	22.5	21.5	18.0	16.0	13.0	10.5	8.8	6.3	5.0	4.0	3.0	2.0

Temperature range (°C): - 40 to +100

End connections: Balflex®2-piece fittings serie 23 with 20 serie ferrules. Balflex® Multicrimp fittings serie BW23/BF21/P23

The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.2 BALFLEX FORZA Hose acc. to DIN EN 853 2SN / SAE J517 100R2AT

Nominal Size (inch)	3/16"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
Internal Diameter (mm)	4,8	6,3	8,0	9,5	12,7	16,0	19,0	25,4	32,0	38,0	50,8	63,5	76,2
Max. Working Pressure (MPa)	41.5	40.0	35.0	33.0	27.5	25.0	21.5	16.5	12.5	9.0	8.0	7.0	5.5

Temperature range (°C): - 40 to +100

End connections: Balflex®2-piece fittings serie 23 with 20 serie ferrules. Balflex® Multicrimp fittings serie BW23/BF21/P23

The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.3 BALFLEX BALPAC Hose acc. to DIN EN 857 1SC / SAE J517 100R17

Nominal Size (inch)	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
Internal Diameter (mm)	6,3	8,0	9,5	12,7	16,0	19,0	25,4
Max. Working Pressure (MPa)	22.5	21.0	21.0	21.0	25.0	21.5	20.7

Temperature range (°C): - 40 to +100

End connections: Balflex®2-piece fittings serie 23 with 20 serie ferrules. Balflex® Multicrimp fittings serie BW23/BF21/P23

The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.4 BALFLEX BALPAC Hose acc. to DIN EN 857 2SC / SAE J517 100R16

Nominal Size (inch)	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
Internal Diameter (mm)	6,3	8,0	9,5	12,7	15,9	19,0	25,4
Max. Working Pressure (MPa)	40.0	35.0	33.0	27.6	25.0	21.5	16.5

Temperature range (°C): - 40 to +100

End connections: Balflex®2-piece fittings serie 23 with 20 serie ferrules. Balflex® Multicrimp fittings serie BW23/BF21/P23

The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.5 BALFLEX BRAKEMASTER Hose acc. to SAE J517 100R5

Nominal Size (inch)	3/16"	1/4"	5/16"	13/32"	1/2"	5/8"	7/8"	1-1/8"	1-3/8"	1-13/16"	2-3/8"	3"
Internal Diameter (mm)	4,8	6,3	8,0	10,4	12,7	16,0	22,2	28,6	34,9	46,0	60,3	76,2
Max. Working Pressure (MPa)	20.7	20.7	15.5	13.8	12.1	10.3	5.5	4.3	3.4	2.4	2.4	1.4

Temperature range (°C): - 40 to +100

End connections: Balflex® Multicrimp fittings serie P25

The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.6 Material Specification

Inner tube	Seamless oil resistant synthetic rubber
Reinforcement	1 high tensile steel wire braid (1SN / R1AT, 1SC / R17) 2 high tensile steel wire braids (2SN / R2AT, 2SC / R16) 2 high resistance synthetic textiles braids with 1 intermediate high tensile steel wire braid (R5)
Outer tube	Black, oil, abrasion and weather resistant synthetic rubber (1SN / R1AT, 1SC / R2AT, 2SN / R2AT, 2SC / R16) Impregnation of outer textile braid with black, oil, abrasion and weather resistant synthetic rubber (R5)
Fittings	Carbon steel, zinc plated

2. DOCUMENTS AND DRAWINGS

- BALFLEX Catalogue, 2018- issue
- Instructions IT.PQ.07.02, 04 and 06 Rev.2 dated 01/03/2018; IT.PQ.07.31 Rev.2 dated 30/04/2018

No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

- Tests carried out: dimensional check, assembly test, leakage, hydraulic pressure test, change in length, according to SAE J517, and proof test, and burst test, according to DIN EN ISO 1402:2009 as reviewed on 13/12/2013
- Hydrostatic pressure test reports dated 18/09/2018 (specimen BALFLEX FORZA 1SN R1AT 3/8" & 1")
- Hydrostatic pressure test reports dated 18 & 19/09/2018 (specimen BALFLEX FORZA 2SN R2AT 3/8" & 1")
- Hydrostatic pressure test reports dated 18 & 19/09/2018 (specimen BALFLEX BALPAC 1SC 3/8" & 1")
- Hydrostatic pressure test reports dated 18 & 19/09/2018 (specimen BALFLEX BALPAC 2SC 3/8" & 1")
- Hydrostatic pressure test reports dated 21/09/2018 (specimen BALFLEX BRAKEMASTER R5 13/32" & 1-1/8")
- Impulse resistance test report N° 44-2018 dated 17/05/2018 (specimen 1SC 3/8")
- Impulse resistance test report N° 48-2018 dated 23/05/2018 & N° 66-2018 dated 31/07/2018 (specimen 1SN 1" & 3/8")
- Impulse resistance test report N° 3-2018 dated 04/01/2018 & N° 36-2018 dated 26/04/2018 (specimen 2SC 1" & 3/8")
- Impulse resistance test report N° 34-2018 dated 19/04/2018 & N° 46-2018 dated 21/05/2018 (specimen 2SN 3/8" & 1")
- Impulse resistance test report N° 16-2018 dated 20/02/2018 (specimen BALPAC 3000 R17 1")
- Impulse resistance test report N° 70-2018 dated 07/08/2018 & N° 62-2018 dated 05/07/2018 (specimen R5 1-1/18" & 13/32")
- Impulse resistance test reports N° 32-2018 dated 13/04/2018 (3/4") & N° 2-2018 dated 04/01/2018 (5/16")
- Ozone resistance test performed according to ISO 7326:2016 during 72 hours at 40ºC as per test reports N° 20184000896/10-4en dated 16/07/2018 & N° 20184000896/20-4en dated 16/07/2018

4. APPLICATION / LIMITATION

4.1 May be used on the following services: fresh water and compressed air.

4.2 End fittings as per manufacturer's catalogue. The hoses are to be entirely assembled in the manufacturer's workshop.

4.3 The installation of hose assemblies is to be in accordance with the manufacturer's instructions to take into consideration forces due to vibration. The hoses are not to be used on services when vibration test is required in Bureau Veritas Rules.

4.4 The hoses are to be limited to a length necessary to provide for relative movement between fixed and flexibly mounted items of machine/equipment or systems and are only to be used in lengths up to 2 m. The hoses are to be installed in clearly visible and readily accessible locations at all times.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 The products are to be supplied by **BALFLEX Portugal SA** in compliance with the type and the requirements described in this certificate. This type of product is within the category IBV of Bureau Veritas Rule Note NR320.

5.3 This certificate may be also used by other companies authorised by **BALFLEX Portugal SA** that would fall under the **BALFLEX** Products when same specifications, tolerances, equipment and quality control procedures are used. To this end, the concerned company shall have to apply for agreement by Bureau Veritas in writing.

5.4 BV product certificate is required.

5.5 Each hose with end fittings is to be hydraulically pressure tested to twice the maximum working pressure and provided with the manufacturer's pressure test report and conformity of production.

For information, **BALFLEX Portugal SA** has declared to Bureau Veritas the following production site:
BALFLEX Portugal SA: Rua Bouça dos Estilhadores 226/254, 4445-044 Alfena, Porto, PORTUGAL

6. MARKING OF PRODUCT

Each hose assembly is to be at least clearly and indelibly marked with:

- Manufacturer name or logo (BALFLEX)
- Type designation
- Date of manufacture and lot #
- Society's brand as relevant

7. OTHERS

It is **BALFLEX Portugal SA**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

This certificate supersedes the Type Approval Certificate No. 36053/A0 BV issued by the Society.

***** END OF CERTIFICATE *****