

The background of the slide is a night-time photograph of the Balflex Portugal Hose Plant. The large industrial building is illuminated with white lights, and its 'Balflex Portugal Hose Plant' logo is visible on the side. A parking lot with several cars is in the foreground, and a road with a guardrail runs along the left side. In the background, there are dark, silhouetted hills and a power line tower under a dark sky.

Balflex Hose & Fittings Introduction

Balflex Hoses

The Balflex Group manufactures a complete hose range and respective fittings and adapters for the vastest applications, under proper specifications and in accordance with the applicable international norms (ISO, SAE, MSHA, EN, DIN, BS, DNV, RMA among others), of which we detach the following ones:

- ✦ Hydraulic Hoses for low, medium, high and very high pressure, in rubber or thermoplastic materials, with textile or steel wire reinforcement, for oil-based fluids or water fluids;
- ✦ Industrial Hoses of high resistance for the most diversified fluids and environmental conditions of use;
- ✦ Stainless Steel Hoses, for diversified levels of pressure, with enormous resistance to corrosion and a vast range of chemical and industrial fluids;
- ✦ Polytetrafluoroethylene (PTFE) Hoses for the most diverse uses, of great resistance to high and low temperature and chemical products, of low abrasion for fluids conveying, non-toxic, fire resistant and of great durability;

Some of the standards, by which our range of hoses are manufactured:

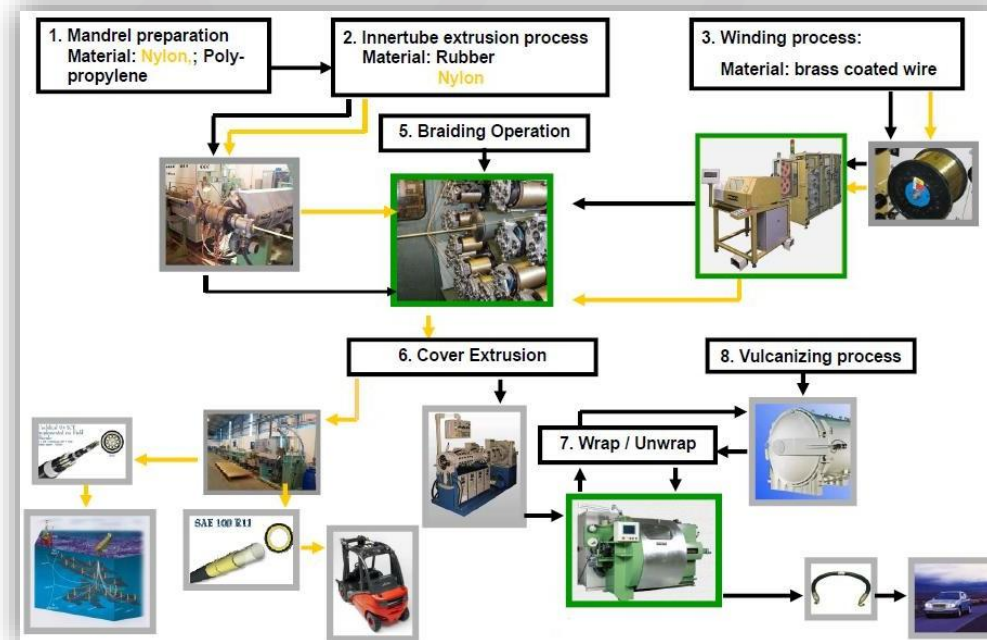
- ✦ EN 853 – Hydraulic Hoses with steel braided reinforcement;
- ✦ EN 854 - Hydraulic Hoses with textile braided reinforcement;
- ✦ EN 855 - Thermoplastic Hoses with braided reinforcement;
- ✦ EN 856 - Hydraulic Hoses with steel spiral reinforcement;
- ✦ EN 857 - Hydraulic Compact Hoses with steel braided reinforcement;
- ✦ SAE J517 – Hydraulic Hoses;
- ✦ ISO 11237 - Hydraulic Compact Hoses with steel braided reinforcement
- ✦ ISO 18752 - Hydraulic Isobaric Hoses with steel braided reinforcement



Manufacturing, Composition and Classification of Hoses

The hoses for hydraulic systems, for hydraulic fluid conduction based of oil, synthetic, emulsions, water and air, are regulated by international standards, most usual they are EN 853 for hoses with steel reinforcement of medium and high pressure, EN 854 for hoses with textile reinforcement of medium pressure, EN 855 for thermoplastic hose, EN 856 for spiral hoses with steel reinforcement of very high pressure and American standards from SAE J517 of the series 100R.

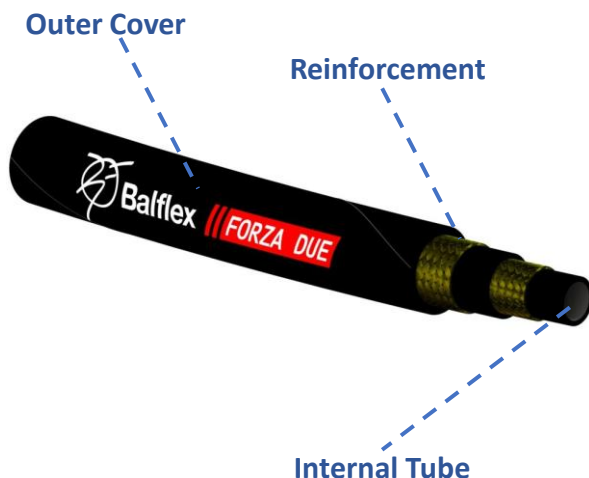
Manufacturing Process



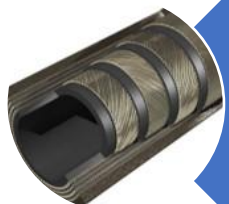
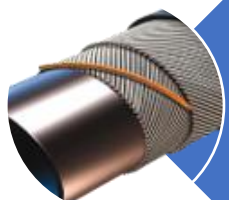
Hose Construction

Typically, a rubber hose is constructed of an extruded inside synthetic rubber tube that has the sole purpose to keep the conveyed fluid in the hose. The elastomeric nature of rubber requires that a reinforcement layer be wound or braided around the tube in order to hold the internal pressure. The reinforcement layer(s) are either textile or steel (or both). To protect these inner layers of the hose from the ambient conditions, an outer synthetic rubber cover is extruded around the reinforcement.

Balflex hydraulic hoses are composed by 3 basic elements:



1. **Internal tube**: it has the purpose to lead the fluid, transmitting the pressure to the components of the reinforcements. The internal tube is made up of rubber compound that possesses characteristics that allows it to resist to chemical and physical attacks of fluids. It also can be of thermoplastic material.
2. **Reinforcement**: it has the purpose to give to the hose physical and mechanical resistance, having the purpose to resist the internal forces, external forces or combination of the two. The reinforcement can be textile or metallic. The reinforcement must withstand the pressure that is build up in the hose. The reinforcement should also be able to absorb external forces, such as buckling, compression and elongation forces, that are likely to occur. For example, if the hose is bent or in it's free state. The reinforcement in the hose should not be damaged inside by materials or in the vicinity of the hose (pressure; thermal and chemical resistance of reinforcement material).
3. **Outer Cover**: it has the purpose to protect the reinforcement of physical damages and to resist the attacks of the external environment, such as abrasion and ozone, etc. The covering can be composed of rubber, impregnated textile wires with rubber, or still stainless-steel wires.

**Wire Braid Hose****Spiral Braid Hose****Textile Braid Hose**

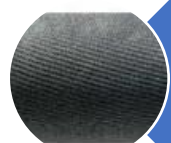
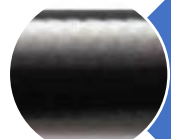
Hose Classification according to Reinforcement

Hydraulic hoses are classified according to working pressure they can achieve: Hydraulic Hoses for low, medium, high and very high pressure, in rubber or thermoplastic materials, with textile or steel wire reinforcement, for oil-based fluids or water fluids;

- ✦ Hydraulic Hoses for low, medium, high and very high pressure, in rubber or thermoplastic materials, with textile or steel wire reinforcement, for oil-based fluids or water fluids;
- ✦ Very high-pressure hose – R12; R13; R15; 4SP; 4SH;
- ✦ High pressure hose – 2SN/R2AT; 2SC/R16
- ✦ Medium pressure hose – 1SN/R1AT; 1SC/R17; R5; R7; R8
- ✦ Low pressure hose – R3/3TE; R6/1TE; 2TE.

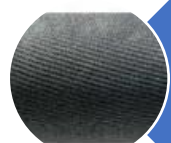
Materials of Reinforcement

- ✦ Polyester (Low pressure hose and thermoplastic)
- ✦ Steel (Medium and high pressure) (brass plated for better adhesion)
- ✦ Stainless Steel (special applications)

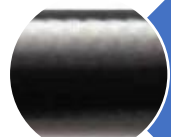
**Wrapped Elastomer Cover****Smooth Elastomer Cover****Textile Braided Cover****Steel or Stainless-Steel Cover**

Materials of Inner Tube and Outer Cover

- ✎ Polyester (Low pressure hose and thermoplastic);
- ✎ NBR (nitrile) -Excellent resistance to oils including with biodegradable oils;
- ✎ NBR/SBR - Good ratio for price/quality but resistance more limited to hydraulic oils compared to NBR,
- ✎ EPDM (ethylene-propylene) - resistance to phosphate-ester fluids, not compatible with mineral oils, good resistance to hot water, detergents and certain solvents;
- ✎ CR (chloroprene) - excellent resistance to ozone, atmospheric agents and abrasion, often used for the hose cover;
- ✎ PVC/NBR - good resistance to ozone, atmospheric agents and abrasion;
- ✎ CPE (chlorinated polyethene) - good resistance to temperature and dry air;



Wrapped Elastomer Cover



Smooth Elastomer Cover



Textile Braided Cover



Steel or Stainless-Steel Cover

Main Characteristics of the components

Inner Tube

- ✎ Direct contact with the fluid, with which must be compatible chemically;
- ✎ Temperature of use is a factor significant to consider;
- ✎ Should not be porous;
- ✎ Must allow a correct fixing and sealing of the fittings;

Reinforcement

- ✎ Makes the hose resistant to the internal pressure of the fluid;
- ✎ Allows the fixing of the hose ends, by bite of the ferrule;
- ✎ Provides hose flexibility;

Outer Cover

- ✎ Protection from external risks, such as UV, Ozone, rain;
- ✎ Can be Flame Resistant;
- ✎ Must be Abrasion Resistant;

**ISO 1402**

Hydrostatic tests

ISO 1436

Hoses with 1 and 2 steel braids

ISO 3862

Hoses with 4 and 6 steel spirals

ISO 4406

Cleanliness classes - depollution

ISO 6945

Resistance test to abrasion

ISO 7751

Reports/ratios of the pressures

ISO 11237-1

Compact hoses 1 and 2 steel braids

ISO 12151-1 to 6

Definition of the fittings ends

ISO 18752

Constant pressure class hoses

**EN 853**

Hoses with 1 and 2 steel braids

EN 854

Hoses with textile braids (1TE, 2TE, 3TE)

EN 855

Thermoplastic hoses

EN 856

Hoses with 4 and 6 steel spirals

EN 857

Compact hoses with 1 and 2 steel braids

EN 982

General standard of safety

**SAE100R1** 1 steel braid hose**SAE100R2** 2 steel braids hose**SAE100R3** Hose with textile braids**SAE100R4** Suction hose**SAE100R5** 1 steel braid hose with textile cover**SAE100R6** Hose with textile braid**SAE 100R7 and 100R8** Thermoplastic hoses**SAE100R12** 4 steel spiral hose**SAE100R13** Constant pressure hose 4 or 6 spiral**SAE100R14** PTFE hose with stainless steel braid**SAE100R15** 6 steel spiral hose**SAE100R16** 2 steel braids hose**SAE100R17** Constant pressure rubber hose 21,0 MPa**SAE100R18** Constant pressure thermoplastic hose 21.0 Mpa**SAE100R19** Constant pressure rubber hose 28,0 MPa

Type of Test on Hose Production

Table 4 - SAE J517 qualification test requirements

Type of Test	100R1	100R2	100R3	100R4	100R5	100R6	100R7	100R8
Dimensional Check	X	X	X	X	X	X	X	X
Proof	X	X	X	X	X	X	X	X
Change in Length (%)	+2/-4	+2/-4	+2/-4	NA	+2/-4	+2/-4	+3/-3	+3/-3
Burst	X	X	X	X	X	X	X	X
Leakage	X	X	X	X	X	X	X	X
Cold Bend (°C)	-40	-40	-40	-40	-40	-40	-40	-40
Volume Change @ +100 °C Tube & Cover 0/100%	X	X	X	X	X	X		
Volume Change @ +100 °C Tube & Cover -15/35%							X	X
Ozone Resistance 70 hours @ +40 °C	X	X	X	X		X	X	X
Impulse Test Temperature (°C)	+100	+100	+100		+100		+93	+93
Impulse Test	See 100R1	133	133		See 100R5		125	133
% of Working Pressure	100R1				100R5			
Impulse Test	See 100R1	200	200		See 100R5		150	200
Minimum Cycles (X1000)	100R1				100R5			
Vacuum Resistance @ Absolute Pressure (kPa)				17				
Electrical Conductivity in accordance with SAE J343 (For Thermoplastic Only)							See 100R7	See 100R8
Visual Examination	X	X	X	X	X	X	X	X

Type of Test	100R12	100R13	100R14	100R15	100R16	100R17	100R18	100R19
Dimensional Check	X	X	X	X	X	X	X	X
Proof	X	X	X	X	X	X	X	X
Change in Length (%)	+2/-2	+2/-2	+2/-4	+2/-2	+2/-4	+2/-4	+3/-3	+2/-4
Burst	X	X	X	X	X	X	X	X
Leakage	X	X	X	X	X	X	X	X
Cold Bend (°C)	-40	-40	-40	-40	-40	-40	-40	-40
Volume Change @ +100 °C Tube & Cover 0/100%					X	X		X
Volume Change @ +100 °C Tube & Cover -15/35%							X	
Volume Change @ +121 °C Tube 0/100%	X	X		X				
Volume Change @ +121 °C Cover 0/125%	X	X		X				
Ozone Resistance 70 hours @ +40 °C	X	X		X	X	X	X	X
Impulse Test Temperature (°C)	+120	+120	+204	+120	+100	+100	+93	+100
Impulse Test	133	120	See 100R14	120	133	133	133	133
% of Working Pressure								
Impulse Test	500	500	150	500	200	200	200	200
Minimum Cycles (X1,000)								
Vacuum Resistance @ Absolute Pressure (kPa)								
Electrical Conductivity in accordance with SAE J343 (For Thermoplastic Only)							See 100R18	

Type and routine testing of production hoses

Property	Type tests Frequency (for each hose type and size): at initial product qualification, in the event of product changes after initial qualification and after 5 years	Routine tests Performed on each length of finished hose prior to warehousing or sale
Dimensions		
Measurement of inside diameter	X	X
Measurement of outside diameter	X	X
Measurement of outer cover thickness (if applicable – see Table 1)	X	N/A
Measurement of concentricity	X	N/A
Hose tests		
Proof test	X	X
Burst test	X	N/A
Minimum bend radius test	X	N/A
Change in length test (see 6.2)	X	X
Impulse test	X	N/A
Leakage test (hose assemblies)	X	N/A
Cold flexibility test	X	N/A
Adhesion (cover)	X	N/A
Adhesion (lining)	X	N/A
Vacuum resistance test	X	N/A
Fluid resistance test for cover	X	N/A
Fluid resistance test for lining	X	N/A
Ozone resistance test	X	N/A
Visual examination	X	X
X Test shall be carried out.		
N/A Test not applicable		

Relevant facts of Balflex Hoses on Qualification Tests

Abrasion Resistance

Balflex has developed outer cover compound with excellent abrasion resistant when tested according to modified ISO 6945 method, and according to ISO 20444 new abrasion test methods.

We have 2 Types of outer Cover:

Standard Cover

When tested according to ISO 6945, has average abrasion loss of 0.02g

UHA (Ultra High Abrasion)

When tested according to ISO 6945, has average abrasion loss of 0.00g. It is called **ARMOURGUARD**.



Abrasion Resistance Test Report

Test Nr. : 2-2024
Date : 12-01-2024
Page : 1 of 1

1. Identification of Product

Hose Designation:	BALPAC PREMIUM DIN EN 857 2SC / SAE R16 - DN25 - 1" - SMOOTH	Outside Diameter (Average):	35.54 mm
Reference (Balflex):	10.1S19.16	Over Wire Diameter (Average):	32.85 mm
Batch:	00 TO 1854/23	Nr. of Tested Samples:	3
Sample's Length:	150mm		

2. Test Standard

ISO 6945 Rubber Hoses Determination of abrasion resistance of the outer cover

3. Test Specifications

The samples must be tested according to ISO6945

- Temperature: **21°C**
- Nr. of Cycles: **2 000** (one cycle equals 200mm of travel)
- Frequency: 1,25hz
- rpm: **75**
- Moving the abrading toll: **100mm** (back and forth)
- Vertical Static force: **25N**
- Max permissible loss of mass: **0,5g**



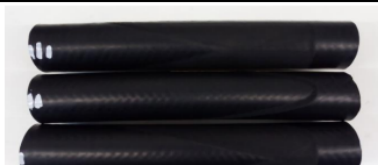
4. Equipment Used

Gibitre Hose Abrasion Check SN: ABT2022051

5. Results obtained :

Sample Nr.	Vertical Static force [N]	Frequency [hz]	Cycles Performed	Initial mass (g)	Final mass (g)	Loss in mass (g) ±0.01g	Status
1	25N	1.25	2 000	165.18	165.17	0.01	Pass
2	25N	1.25	2 000	162.58	162.55	0.03	Pass
3	25N	1.25	2 000	166.68	166.66	0.02	Pass
Mean loss in mass						0.02	Pass

6. Samples after 2 000cycles :



 Balflex®

Abrasion Resistance Test Report

Test Nr. : 33-2024
Date : 04-01-2024
Page : 1 of 1

1. Identification of Product

Hose Designation:	FORZA DUE DIN EN 853 2SN / SAE R2AT - DN12 - 1/2"	Outside Diameter (Average):	21.69 mm
Reference (Balflex):	10.1004.08	Over Wire Diameter (Average):	19.60 mm
Batch:	0	Nr. of Tested Samples:	3
Sample's Length:	150mm		

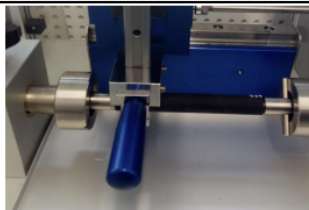
2. Test Standard

ISO 6945 Rubber Hoses Determination of abrasion resistance of the outer cover

3. Test Specifications

The samples must be tested according to ISO6945

- Temperature: **21°C**
- Nr. of Cycles: **2 000** (one cycle equals 200mm of travel)
- Frequency: 1,25hz
- rpm: **75**
- Moving the abrading toll: **100mm** (back and forth)
- Vertical Static force: **25N**
- Max permissible loss of mass: **0,5g**

A blue rubber hose is shown being tested in a machine. The hose is clamped at both ends and is being moved back and forth by a mechanical arm. The machine is blue and silver.

4. Equipment Used

Gibitre Hose Abrasion Check SN: ABT2022051

5. Results obtained :

Sample Nr.	Vertical Static force [N]	Frequency [Hz]	Cycles Performed	Initial mass (g)	Final mass (g)	Loss in mass (g)	Status
1	25N	1.25	2 000	88.36	88.36	0.00	Pass
2	25N	1.25	2 000	87.78	87.78	0.00	Pass
3	25N	1.25	2 000	87.14	87.14	0.00	Pass
Mean loss in mass						0.00	Pass

6. Samples after 2 000cycles :

Three black rubber hoses are shown, stacked vertically. They appear to be in good condition, with no visible wear or damage after 2000 cycles of testing.

Relevant facts of Balflex Hoses on Qualification Tests

Ozone Resistance

Balflex has developed outer cover compound with excellent ozone resistance, when tested in accordance with EN ISO 7326, Method 1 or 2, depending on the nominal bore of the hose. There shall be no cracking and no deterioration of the cover visible under x2 magnification during a period of 72 hours.

Balflex does not show any cracks during a period of 600 hours.

Rua dos Plátanos, 197 – 4100-414 Porto – Portugal
Tel: 226 159 000 Fax: 226 159 035

TESTING LABORATORY

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TEST REPORT Nº 20234001377/10en

Date: 2023-11-30

2.2 TEST PARAMETERS

- **Conditioning in the strained state:** 48 h stored in the dark at 23 ± 2 °C;
 - **Ozone concentration:** 50 ± 5 ppm;
 - **Source of ozonized air:** Ultra Violet lamp;
 - **Test temperature:** 40 ± 2 °C;
 - **Relative Humidity:** < 65 %;
 - **Ozonized air velocity:** 0,020 m/s;
 - **Ozonized air flow rate:** 0,005 m³/s;
 - **Duration of exposure:** In Ozone chamber – 600h*
 - **Bend radius, r_b :** In accordance with Table 1.
- * 404h straight following by 19 days without ozone exposure and another set of 196h straight with ozone exposure. Procedure in accordance with customer request.

Note: Test performed at the same time with the specimens tested in process 20234001377/20en, and 20234001377/30en

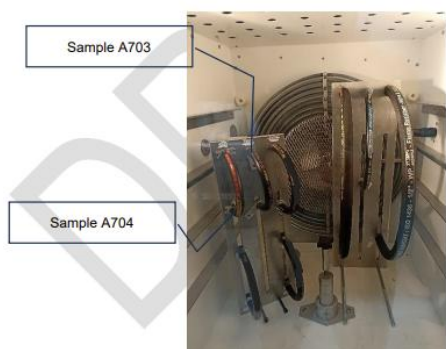


Fig. 4 – Specimen position inside the Ozone chamber

Rua dos Plátanos, 197 – 4100-414 Porto – Portugal
Tel: 226 159 000 Fax: 226 159 035

TESTING LABORATORY

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TEST REPORT Nº 20234001377/10en

Date: 2023-11-30

3. RESULTS

DATE OF THE BEGINNING THE TEST: 2023-09-27.

DATE AFTER 404H: 2023-11-14.

DATE OF INITIATE THE SECOND PERIOD OF EXPOSURE: 2023-11-02

DATE OF END THE TEST: 2023-11-10

- **Preview mode:** Naked eye up to 48 h. Under x2 from 72 h

Test Hours (Ozone exposure)	Cracking after ozone exposure?
2	NO
4	NO
24	NO
48	NO
72	NO
96 to 384 (each 24h)	NO
404	NO
428 to 572 (each 24h)	NO
600	NO

NOTE: No cracks were detected in specimen after a 600 h.



Fig. 5 – Photo of the sample A 703 after 600h on ozone chamber



Fig. 6 – Photo of the sample A 704 after 600h on ozone chamber

Factors for selection of Hydraulic Hoses

Working pressure

When selecting a hose, it should be considered that its working pressure should be higher than the maximum operating pressure of the system. For determination of the maximum operating pressure the system engineer should always consider possible pressure peaks during start up and inversion. Pressure peaks may be so short that they are only measurable with electronic devices. In suction applications, the capacity of the hose to withstand negative pressure is a decisive factor. Working pressures are given for working temperature of + 20°C (+ 68°F). For increased temperatures, a de-rating factor should be considered. The rated working pressures of Balflex® hydraulic hoses can be checked on the catalogues.

Temperature

Excessive temperature is one of the main limitations of rubber and induces accelerated aging. Fluid temperature, either in motion or with the equipment stopped, should not exceed the maximum working temperature recommended for each hose. Likewise, surrounding temperature should be considered, specially when resulting from heat sources in the proximity of the hose assembly.

The rubber of Balflex hydraulic hoses are adjusted in way that the hoses, depending on the model, can work of a temperature of - 40° until máx. 100 °C (and for short space of the 125 time °C). The very low temperatures of work, the rubber mixtures reach the call glass point. The glass point describes a temperature, in which the elastic behavior of the material reaches the zero, that is, the material is porous and has left, on mechanical loads, as glass. The typical signals of a hose damaged had to a glass rupture are small radial fictions in the surface of the exterior and interior layer of the hose. The hose use the raised temperatures, equally reduces the high durability of the same ones, since the rubber materials age faster, when displayed to temperatures. Moreover, it is important to know that the superior layer of a rubber hose is sufficiently sensible to the ambient influences as, for example, to ozone and the strong rays ultraviolet. Ozone and the rays ultraviolet can, in circumstances undesirable, to provoke the rupture of molecules of chain of the material. This, in turn, makes with that the material loses its elasticity, is hard and porous and breaks. The signals of ruptures are small fictions that if spread until the braid.

Factors for selection of Hydraulic Hoses

Fluid compatibility

Fluid compatibility with the hose and the coupling should be verified. Fluids that chemically attack the hose can lead to the contamination and obstruction of the hydraulic system and to premature failure of the hose. Handling gases requires special attention. As an orientation, the Balflex® Hydraulic Hose Fluid Compatibility Chart gives a classification of compatibility with some fluids. Consult Balflex® for compatibility of other fluids and rubber compounds. Whenever in doubt test before application.

Dimensioning

Dimensioning of all components should guarantee that pressure loss is kept at a minimum, in order not to reduce power transmission and to avoid overheating or turbulence of the fluid that might lead to deterioration of the lining.

Assembly geometry

Installation should guarantee that the minimum bend radius of the hose is respected and that bending occurs only in one plane. Hose length may suffer a variation between – 4% and + 2%, when submitted to pressure. The assembly length should provide enough margin for this change in length. Torsion and traction of the assembly must be avoided and protection and restraint of the assembly should be considered if there are obstacles to avoid. Mechanical loads acting on the assembly, including vibration, should be kept at a minimum. Free swiveling connectors should be used whenever torsion is present. Whenever hose failure may result in whipping (for example in gas applications) restraint through a steel cable to the connecting parts should be considered. When connecting a moving part, the free movement of the assembly without touching any surface should be assured. Positioning of the assembly should consider that risks of bodily injury and equipment damage through spillage or fluid ejection are minimized.

Factors for selection of Hydraulic Hoses

Environmental compatibility

The hose and couplings compatibility with the working environment factors, as temperature, fire hazard, UV light, ozone, chemicals and electrical charges should be considered. External protection sleeves require an adequate assembly.

Air and Gaseous applications

Hose assemblies that are to be used in air and other gaseous applications should be pin-pricked, through the cover, prior to use. These micro perforations allow gas that has permeated the inner tube of the hose to escape into the atmosphere. This prevents gases from accumulating and blistering the hose cover.

Electrical conductivity

Electrical conductivity, to avoid static electricity build up, or non-conductivity, to avoid electrical discharge through the assembly, may be decisive requirement to avoid explosion or electrical shocks. Whenever the hose is not unequivocally branded either non-conductive or anti-static, its electrical characteristics should always be considered as not controlled.

Permeability

All hoses present a certain degree of permeability, especially with gases and highly volatile liquids. The designer should consider the possibility that this permeability results in system or environment contamination.

Abrasion

Accelerated external abrasion, through contact in motion or exposure to projected particles reduces drastically hose life and leads to premature failure through exposure of the reinforcement. For special applications Balflex® recommends hoses with special abrasion resistant rubber compounds or protection through adequate sleeves.

**Balflon Hoses****Balinox Hoses****Thermoplastic Hoses****Industrial Hoses****Balwash hoses**

Balflon

Balflex® Balflon hoses are produced to Balflex® specifications and meet and exceed SAE J517 R14 standard. They cover a wide variety of medium pressure applications, in PTFE, smooth and convoluted with stainless steel reinforcement, for a very large variety of chemical fluids, as well as traditional hydraulic fluids and steam.

Balinox

Balinox stainless steel hoses are produced to Balflex® specifications and to ISO 10380 type 2. It covers a wide variety of low to very high-pressure applications.

Thermoplastic

Balflex® Thermoplastic hoses are produced to Balflex® specifications and according to ISO 3949, SAE J517 and EN 855 standards. They cover a wide variety of medium to high pressure applications, in thermoplastic, textile and steel reinforcement, for petroleum and water base hydraulic fluids.

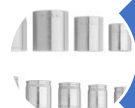
Industrial

Balflex® Industrial Hoses are produced to Balflex® specifications and according to international standards, covering a wide variety of applications, with best-chosen high-quality grade polymers, with synthetic fibers or steel wire reinforcements.

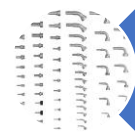
Balwash

Balflex® Balwash steel wire braided hoses are produced to Balflex® specifications and with Isobaric range, with WP of 280 / 420 / 500d 400 bar, for jetwash applications.

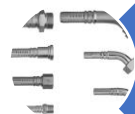
Hydraulic Fittings range



2-Piece Fitting – Ferrules
(Serie 20)



2-Piece Fitting – Standard Tail
(Serie 23)



2-Piece Fitting – Interlock Tail
(Serie 26)



1-Piece Fittings – BW23



1-Piece Fittings – BF21

The range of hydraulic fittings - Balfit - is produced according to specifications of Balflex and standards ISO, SAE, DIN, JIS, BSP, UNF and others. Balflex optimized the production of these terminals and its compatibility with the great hydraulic hose range, in order to assure the highest performance and to cover most extensive range of applications.

2-Piece Fitting Standard Tail

Complete range of combination of ferrule with standard tail that allows the perfect match with Balflex Hose range, of 1 and 2 steel wire braid, 4 steel spirals, textile braid and thermoplastic hoses with skive and non skive options.

From DN5 (3/16") up to DN76 (3")

2-Piece Fitting Interlock Tail

Complete range of combination of ferrule with interlock tail that allows the perfect match with Balflex Hose range, 4 and 6 steel spirals hose, with internal and external skive. From DN20 (3/4") up to DN51 (2")

1-Piece Fitting BW23

Complete range of combination of ferrule with BW tail that allows the perfect match with Balflex Hose range, of 1 and 2 steel wire braid, 4 steel spirals, with non skive operation. From DN6 (1/4") up to DN51 (2")

1-Piece Fitting BF21

Complete range of combination of ferrule with BW tail that allows the perfect match with Balflex Hose range, of 1 and 2 steel wire braid, with non skive operation. From DN6 (1/4") up to DN25 (1").

Main Characteristics of Balfit Fittings

- ☞ All fittings according to Balflex drawings;
- ☞ All fittings according to the reference standards;
- ☞ All dimensions according to ISO 2768 m-K, when not referred on the standards;
- ☞ No brazing;
- ☞ All fittings with pressure rating according to the reference standards
- ☞ All fittings have surface treated by galvanic zinc coating with a thick chromate passivation (Cr VI - Free) and sealing (Fe/Zn12/AT2 according to EN ISO 2081).
- ☞ Minimum 216 hours salt spray test, according to ISO 9227, standards demands minimum 72h.

7.3 Finish

The external surface and threads of all carbon steel parts shall be plated or coated with a suitable material that passes a 72 h neutral salt spray test in accordance with ISO 9227, unless otherwise agreed on by the manufacturer and the user. Any appearance of red rust during the salt spray test on any area, except those noted below, shall be considered a failure:

- all internal fluid passages;
- edges, such as hex points, serrations and crest of threads, where there may be mechanical deformation of the plating or coating typical of mass-produced parts or shipping effects;
- areas where there is a mechanical deformation of the plating or coating caused by crimping, flaring, bending and other post-plate metal forming operations;
- areas where the parts are suspended or affixed in the test chamber where condensate can accumulate.

Ref. CATIM	Test Time (hours)	Observations
A555	24 h	Presents black spots on the exposed surface.
	48 h	Presents white corrosion on the exposed surface.
	72 h	Presents white corrosion on the exposed surface.
	144 h	Presents white corrosion on the exposed surface.
	168 h	Presents white corrosion on the exposed surface.
	192 h	Presents white corrosion on the exposed surface.
	216 h	Presents white corrosion on the exposed surface. END OF TEST

10.1.2 PHOTOGRAPHIC REGISTER:



Ref. CATIM	Test Time (hours)	Observations
A564	24 h	Doesn't present corrosion on the exposed surface.
	48 h	Presents black spots on the exposed surface.
	72 h	Presents black spots on the exposed surface.
	144 h	Presents black spots on the exposed surface.
	168 h	Presents black spots on the exposed surface.
	192 h	Presents white corrosion on the exposed surface.
	216 h	Presents white corrosion on the exposed surface. END OF TEST

17.1.2 PHOTOGRAPHIC REGISTER:



Important Information

The reference standard advises the hoses assemblers to use hose and fittings from same source!!!!

Remember that the connection between hose and fittings from same manufacturer it is always being validated on the qualification tests of the hoses.

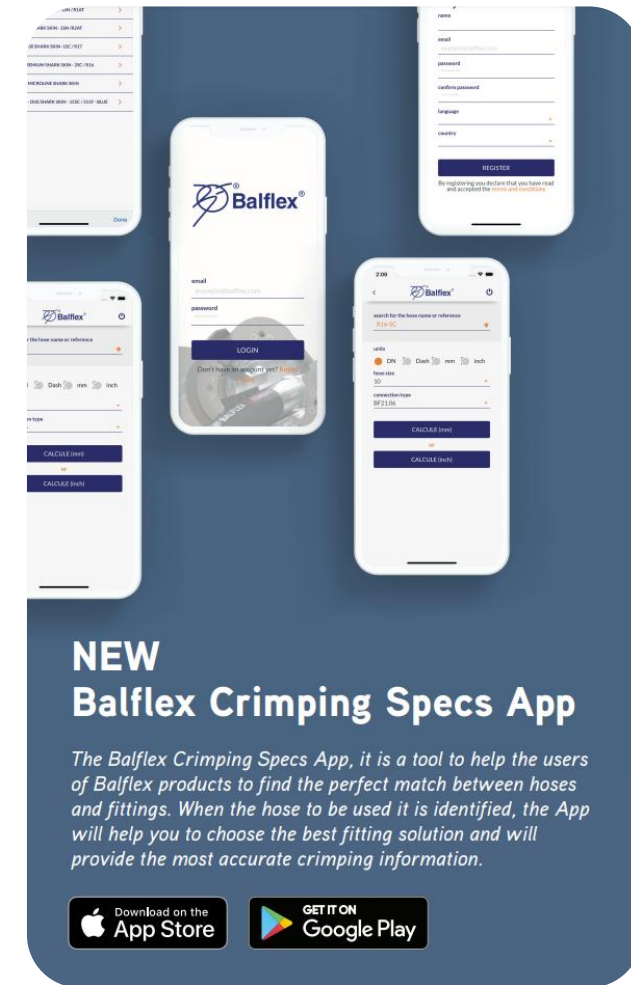
Below image from SAE J517 standard

6. HOSE ASSEMBLIES

Hose assemblies may be fabricated by the manufacturer, an agent for or customer of the manufacturer, or by the user. Fabrication of permanently attached connectors to hydraulic hose requires specialized assembly equipment. Field attachable connectors (screw style and segment clamp style) can usually be assembled without specialized equipment although many manufacturers provide equipment to assist in this operation.

SAE J517 hose from one manufacturer is usually not compatible with SAE J516 connectors supplied by another manufacturer. It is the responsibility of the fabricator to consult the manufacturer's written assembly instructions or the manufacturers directly before intermixing hose and connectors from two manufacturers. Similarly, assembly equipment from one manufacturer is usually not interchangeable with that of another manufacturer. It is the responsibility of the fabricator to consult the manufacturer's written instructions or the manufacturer directly for proper assembly equipment. Always follow the manufacturer's instructions for proper preparation and fabrication of hose assemblies.

**Balflex Crimping specifications always
available on our Crimp APP**



**NEW
Balflex Crimping Specs App**

The Balflex Crimping Specs App, it is a tool to help the users of Balflex products to find the perfect match between hoses and fittings. When the hose to be used it is identified, the App will help you to choose the best fitting solution and will provide the most accurate crimping information.

Download on the App Store | GET IT ON Google Play

Balfit Range of Adapters



**Serie 34 - Balfit DIN 2353 / 24°
Compression Ring Hydraulic Pipe
Adapters**



**Serie 35 – Balfit SAE 37°
Adapters**



**Serie 36 – Balfit ORFS (O-Ring
Face Seal) Adapters**



**Serie 52/53 – Balfit BSP
Adapters**

Serie 34

The range of Balfit® 24° Compression Ring pipe fittings is produced according to Balflex® specifications and to ISO 8434-1 and DIN 2353 standards. It covers a very wide variety of applications typical of hydraulic pipe pressure lines, with following threads: metric parallel, BSP parallel and taper, NPTF, UNF;

Serie 35

The range of Balfit® 37° flared hydraulic pipe fittings is produced according to Balflex® specifications and to ISO 8434-2 and SAE J514 standards. It covers a very wide variety of applications typical of hydraulic pipe pressure lines, with following threads: UNF 37° flared, NPT, UNF straight with O-ring, BSP parallel;

Serie 36

The range of Balfit® ORFS O-ring Face Seal Fittings is produced according to Balflex® specifications and to ISO 8434-3 and SAE J1453 standards. It covers a very wide variety of applications typical of hydraulic pressure lines.

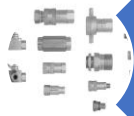
Serie 52/53

The range of Balfit® BSP adapters is produced according to Balflex® specifications and to ISO 8434-6 standards. It covers a very wide variety of applications typical of hydraulic pressure lines, with following threads: BSP parallel, BSP taper, NPT.

Other Products



Serie 05 - Balfit Microtest



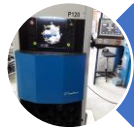
Serie 40 – Balfit Hydraulic Quick-Couplings & Ball valves



Serie 84 – Balfit Pipe Clamps



Serie 11 – Hose Protection



Serie 90 - Machines

Serie 05

Balflex® MicroTest is the range of hoses, couplings and gauges for check lines in hydraulic or refrigeration systems, it is produced according to Balflex® specifications and to ISO, DIN and SAE standards and other relevant industrial specifications;

Serie 40

The range of Balflex® hydraulic valves is produced according to Balflex® specifications and to ISO, DIN and SAE standards and other relevant industrial specifications. Balflex® has optimized the construction of these hydraulic valves in order to assure top rated performance, reliability and economy;

Serie 84

The range of Balflex® clamps is produced according to Balflex® specifications and DIN 3015 standard in order to assure top rated performance, wide range of application, reliability and economy.

Serie 11

The range of Balflex® Protection is composed by 2 lines of product: HPDE Spiral protection and Nylon Sleeve, both products are the best solution to ensure the protection of hoses and operators.

Serie 90

The range of Machines, allows the client to have the best equipment to Cut, Skive and Crimp your hose assemblies. Reliable and low maintenance.

www.balflex.com

Balflex Certificates

Balflex® has earned various certifications for our Management Systems and Products. This reliable and consistent approach has allowed us to achieve our ISO 9001:2015 certification. At Balflex® quality and service always comes first. We are dedicated to continue the development of new products with a strong emphasis on quality.

Member of:





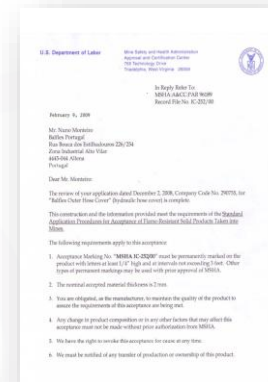
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