

## Test Report

### No. 2013-F-1877/Bio 08

**Applicant:** BIO-EX S.A.S.  
Z.I. La Petite Olivière  
69770 Montrottier  
FRANCE

**Manufacturer:** BIO-EX S.A.S.  
Z.I. La Petite Olivière  
69770 Montrottier  
France

**Application date:** 2013-04-25

**Application:** Test of a foam concentrate for compliance with  
EN 1568-2 : 2008

**Type designation:** BIO FOAM

**Foam concentrate grade according to Annex A of EN 1568:** Synthetic foam concentrate (S)

**Receipt of sample:** 2013-05-06

**Test laboratory:** MPA Dresden GmbH  
Official laboratory for fire extinguishing media and  
fire extinguishers  
Fuchsmühlenweg 6F  
09599 Freiberg  
GERMANY

This report comprises 10 pages inclusive 1 annex.



**General information:**

Only equipment and materials detailed in this report have been subjected to the tests. Test results apply to the tested samples only.

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Publications of test reports and information on tests for publicity purposes require the written approval of the laboratory in every isolated case.

Every page of this report is stamped with the seal of the laboratory.

**Summary:**

The synthetic foam concentrate BIO FOAM has been tested in accordance with the standard EN 1568

- part 2 (high expansion foam for application to water immiscible liquids)

The tested foam concentrate with designation BIO FOAM meets the requirements of the standard EN 1568-2, issue 2008.

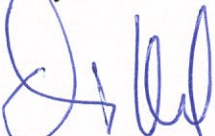
*Extinguishing performance class and burnback resistance level:*

EN 1568 part	By use of	
	potable water	simulated sea water
2	<b>Requirements for high expansion foam are fulfilled</b> (no classification according to EN 1568-2)	<b>Please note the special information no. 1 below</b>

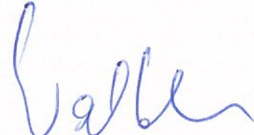
**Information:**

1. The tests with simulated sea water were not carried out.
2. The information according to clause 11 of EN 1568 for container marking shall be stated on the packaging or transport container.

8<sup>th</sup> July 2013

  
Grad. Eng. Dittrich  
Laboratory Manager



  
Grad. Eng. Walter  
Official

## 1. General

Tests have been carried out in accordance with the requirements of the standard EN 1568-2 (high expansion foam / application to water – immiscible liquids).

## 2. Chemical composition

The chemical composition of the foam concentrate has not been submitted by the manufacturer to the laboratory.

## 3. Submitted documents

- /1/ Product Data sheet, dated 2013-04-10
- /2/ Material Safety Data sheet dated 2013-04-10, 4 pages



#### 4. Results of tests

##### 4.1 Laboratory tests - characteristics

##### 4.1.1 General characteristics of the foam concentrate (clauses 4 to 6 of EN 1568)

Characteristic	Requirement EN 1568	Declaration of manufacturer	Reference dimension of laboratory	Requirement met (yes/no)
pH Value (20°C)	6,0 – 9,5	7,0 ± 1,0	7,19	Yes
Density g/cm <sup>3</sup> (20°C)	–	1,02 ± 0,02	1,017	<sup>1)</sup>
Kin. Viscosity mm <sup>2</sup> /s (20°C) (0°C)	– –	– –	2,91 4,54	<sup>1)</sup>
Refraction index n <sup>D</sup> <sub>20</sub>	–	–	1,3509	<sup>1)</sup>
Freezing point °C	–	- 5	- 4,5	<sup>1)</sup>
Sediment Vol % before ageing after ageing	≤ 0,25 ≤ 1,0	< 0,1 –	0 0	Yes Yes
Sample through a 180 µm - sieve dispersible (yes/no)	Yes	–	Yes	Yes
Infrared spectrogram	–	–	Annex 1	<sup>1)</sup>

##### 4.1.2 Temperature conditioning (annex E of EN 1568)

Is the foam concentrate adversely affected by storage at -30°C (declaration of manufacturer)	(yes/no)	No
Low temperature conditioning according to annex E.2	(yes/no)	Yes
High temperature conditioning according to annex E.3	(yes/no)	Yes
Storage of temperature conditioned samples at 20 ± 5°C minimum 48 h and maximum 72 h after conditioning According to annex E.2 / E.3	(yes/no)	Yes
Actual storage duration in days		3
Division of temperature conditioned samples according to annex E.4	(yes/no)	Yes



<sup>1)</sup> No assessment because of no requirements for these characteristics in the standard

#### 4.1.3 Surface tension and spreading coefficient of the 3 per cent foam concentrate solution (clauses 7 and 8 of EN 1568)

Characteristic		Requirement EN 1568	Reference dimension of laboratory
Surface tension (mN/m) (procedure: with ring)	Untreated sample	–	24,41
	Sample conditioned according to annex E.2 and E.3 of EN 1568		
	Top sample	0,95 bis 1,05 times	24,13
	Bottom sample	0,95 bis 1,05 times	24,50
Requirement according to clause 7 of EN 1568 met		(yes/no)	Yes
Interface tension (mN/m)	Untreated sample	–	3,75
	Sample conditioned according to annex E.2 and E.3 of EN 1568		
	Top sample	–	3,57
	Bottom sample	–	3,93
Spreading coefficient <sup>1)</sup> (mN/m)	Untreated sample	<sup>2)</sup>	- 2,62
	Sample conditioned according to annex E.2 and E.3 of EN 1568		
	Top sample	<sup>2)</sup>	- 2,16
	Bottom sample	<sup>2)</sup>	- 2,89
Requirement according to clause 8 of EN 1568 met		(yes/no)	Yes

<sup>1)</sup> Surface tension – cyclohexane  $T_C = 25,54$  mN/m

<sup>2)</sup> The foam concentrate isn't declared as "film-forming". No requirement.



#### 4.1.4 Expansion and drainage of foam (clause 9 of EN 1568-2)

By the manufacturer recommended usage concentration: 3%

Usage concentration of foam concentrate for the test: 3%

##### 4.1.4.1 High expansion foam

###### Expansion values by using of potable water

Characteristic		Reference dimension
Expansion value	Untreated sample	607,53
Sample conditioned in accordance with annex E.2 and E.3 of EN 1568-2		
Expansion value	Top sample	715,31
	Bottom sample	559,91
Requirement according to clause 9.2 a) EN 1568-2 met <sup>1)</sup> (yes/no)		Yes

###### Expansion values by using of simulated sea water

Characteristic		Reference dimension
Expansion value	Untreated sample	
Sample conditioned in accordance with annex E.2 and E.3 of EN 1568-2		
Expansion value	Top sample	
	Bottom sample	
Requirement according to clause 9.2 c) EN 1568-2 met <sup>1)</sup> (yes/no)		



<sup>1)</sup> Expansion values and 25% drainage time of temperature conditioned samples are not allowed to differ more than 20% of the value obtained with the untreated sample from each other or from the value obtained with the untreated sample.

**25 %- drainage time by using of potable water**

Characteristic		Reference dimension
25%- drainage time	(min:s) Untreated sample	5:30
Sample conditioned in accordance with annex E.2 and E.3 of EN 1568-2		
25%- drainage time	(min:s) Top sample	5:39
	Bottom sample	4:30
Requirement according to clause 9.2 b) EN 1568-2 met <sup>1)</sup> (yes/no)		Yes

**25 %- drainage time by using of simulated sea water**

Characteristic		Reference dimension
25%- drainage time	(min:s) Untreated sample	
Sample conditioned in accordance with annex E.2 and E.3 of EN 1568-2		
25%- drainage time	(min:s) Top sample	
	Bottom sample	
Requirement according to clause 9.2 d) EN 1568-2 met <sup>1)</sup> (yes/no)		

<sup>1)</sup> The 25% drainage time of temperature conditioned samples are not allowed to differ more than 20% of the value obtained with the untreated sample from each other or from the value obtained with the untreated sample.



**50%- drainage time** (without assessment according to the standard)

Characteristic		Reference dimension
50%- drainage time <i>Potable water</i>	(min:s) Untreated sample	8:42
Sample conditioned in accordance with annex E.2 and E.3 of EN 1568-2		
50%- drainage time <i>Potable water</i>	(min:s) Top sample	8:48
	Bottom sample	7:48
50%- drainage time <i>Simulated sea water</i>	(min:s) Untreated sample	
Sample conditioned in accordance with annex E.2 and E.3 of EN 1568-2		
50%- drainage time <i>Simulated sea water</i>	(min:s) Top sample	
	Bottom sample	





#### 4.2 Test fire performance of high expansion foam (clause 10 of EN 1568-2)

Characteristic	Reference dimension		
Usage concentration	3 %		
Air temperature	18 °C		
Test object size	1,73 m <sup>2</sup>		
Fuel / quantity	55 l Heptane		
Fuel temperature	15 °C		
Water temperature	15 °C		
Foam solution temperature	18 °C		
Wind speed	2 m/s		
Preburning time	60 s		
	Test 1	Test 2	Test 3
	Potable water	Potable water	
90 % control time (min:s)	0:48	1:05	
99 % control time (min:s)	0:49	1:16	
Extinction time (min:s)	0:51	1:30	
Foam application time (s)	120	120	
Extinction time in accordance with clause 10 of EN 1568-2 reached <sup>1)</sup> (yes/no)	Yes	Yes	

#### 5. Requirements to marking (clause 11 of EN 1568)

The label for container marking has not been submitted. Note the information on page 2.



<sup>1)</sup> Maximum of extinction time  $\leq 150$  s

Annex 1: Infrared spectrogram of foam concentrate BIO FOAM

