

Test Report 8887038.

SFE-AFFF/AR3-3%.


Jiangsu Suolong Fire Science
and Technology Co.,Ltd.

Introduction.

This report has been prepared by Mzota Chintu and relates to the activity detailed below:

Job/Registration Details	Client Details
Job number: 8887038 Job type: Testing Start Date: 16/02/2018 Test type: Type Sample ID: Registration: KM 688132 Scheme: BS EN 615 & BS EN 1568 Protocol: PP436 Scheme Mgr: Antony Field	Jiangsu Suolong Fire Science and Technology Co.,Ltd. Technological Industrial Park Xinghua Economic Development Zone Kangmin West Road ,LinCheng Town Xinhua Jiangsu 225753 China

The report has been approved for issue by Mark Goodchild – Team Manager

Approved For Issue	
	Issue Date: 27 February 2019

Objectives.

This is an independent type test evaluation of the test item, to determine conformity with the entirety of the specified Standard or Standards, carried out in accordance with the relevant scheme requirements.

Type test for product certification

Product Scope.

SFE -AFFF/AR3-3%

Report Summary.

The samples submitted complied with the requirements of the test work conducted.

Results only:

All measured results indicated with an * are below/above the specification limit by a margin less than the measurement uncertainty.

Test Requirements.

BS EN 1568-4:2008 Fire extinguishing media — Foam concentrates — Part 4: Specification for low expansion foam concentrates for surface application to water-miscible liquids

Section	Clause	Requirements	Result
1	4-6	General characteristics of the foam concentrate	PASS1
2	(Annex E)	Temperature conditioning	Results only
3	(7&8)	Surface tension and spreading coefficient	PASS2
4	9	Expansion and drainage of foam	PASS2
4.1	9	Low expansion foam	PASS2
5	10	Test Fire Performance of low expansion foam	
5.2	10	Gentle application	PASS1
6	11	Container Marking	PASS
Annex			

Summary of Test Comments.

Clause	Comments
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Glossary of Terms.

PASS: Complies. Tested by BSI engineers at BSI laboratories.

PASS1: Complies. Witnessed by BSI engineers in manufacturers laboratory.

PASS2: Complies. Tests carried out by third party lab; results accepted by BSI.

PASS*: Report resulted in uncertainty and states that Compliance is more probable than non-compliance.

FAIL: Non compliance – Product does not meet the requirements of this clause.

FAIL*: Report resulted in uncertainty and states that Non-compliance is more probable than compliance.

N/A: Not applicable to design under consideration.

N/T: Not tested due to similarity to previously tested item; reference earlier test report.

Conditions of Issue.

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BSI
Kitemark House
Maylands Avenue
Hemel Hempstead
Hertfordshire
HP2 4SQ

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**TESTING, EXAMINATION AND ASSESSMENT OF FOAM CONCENTRATE
SUBMITTED AS A TYPE TEST SAMPLE****INTRODUCTION**

For the purposes of product certification the aqueous film-forming foam concentrate detailed below, submitted on behalf of Jiangsu Suolong Fire Science Ltd., was tested and assessed against the requirements of BS EN 1568-4:2008 as indicated on the following pages of this Report. This request was made on a BSI Service Management Order.

Clauses 7, 8 and 9 contained in this Test Report were undertaken by MPA Dresden, results for these clauses have been taken from MPA Dresden Test report No 20181388-3 dated 10 January 2019.

All other clauses were witnessed by a member of the BSI Fire Suppression Laboratory at the client's premises.

IDENTIFICATION OF EXTINGUISHING MEDIUM

Name of Extinguishing medium:	SFE – AFFF/AR3-3%
Usage concentration:	3%

CONCLUSION OF THE TESTS

The aqueous film-forming foam met the requirements of those clauses, or parts thereof, of the Specification against which assessments were made.

Additional information;

The aqueous film-forming foam should not be stored at a temperature lower than 0°C.

1. General characteristics of the foam concentrate (Clauses 4 to 6 of EN 1568)

Characteristic	Requirement EN 1568	Manufacturer's Specification	Sample Measurement	Within Specification (yes/no)
PH Value (20°C)	6.0 – 9.5		7.77	Yes
Density g/cm ³	-		1.005	(1)
Kin. Viscosity mm ² /s (20°C)	-		1295.5	(1)
	-			(1)
	-	-	1452.7	(1)
Refraction index n _D ²⁰	-	-	N/T	(1)
Freezing point	-	-5	N/T	(1)
Sediment (Vol %)	-			
Before ageing	≤ 0.25	-	0%	Yes
After ageing	≤ 1.0	-	0%	Yes
Sample through a 180 µm – sieve dispersible (Yes/No)	Yes	-	Yes	Yes
Infrared spectrogram	-	-	N/T	(1)
Conformity according to Manufacturer's specification (yes / no):				Yes

⁽¹⁾ Standard does not specify a limit for this requirement..

2. Temperature conditioning (Annex E of EN 1568)

Is the foam concentrate adversely affected by storage at -30°C (declaration of manufacturer)	Yes
Low temperature conditioning according to annex E.2	No
High temperature conditioning according to annex E.3	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
Actual storage duration in days	3
Division of temperature conditioned samples according to annex E.4	Yes

⁽²⁾ The marking on the container for the foam concentrate stipulates the temperature requirements with regards to storage.

3. Surface tension and spreading coefficient of the 3 per cent foam concentrate solution (Clauses 7 & 8)

Characteristics	Requirement EN 1568	Measured
Surface tension (mN/m) (Procedure: with ring)	Untreated sample Sample conditioned according to annex E.2 and E.3 Top sample Bottom sample	- 16.89 0.95 – 1.05 times 16.86 0.95 – 1.05 times 16.36
Requirement according to clause 7 of EN 1568 met (Yes/No)		Yes
Interface tension	Untreated sample Sample conditioned according to annex E.2 and E.3 Top Sample Bottom Sample	- 4.24 - 4.36 - 4.15
Spreading coefficient	Untreated sample	>0 4.41
	Sample conditioned according to annex E.2 and E.3 Top sample Bottom sample	>0 4.32 >0 5.03
Conformity according to clause 8 of EN 1568 met (Yes/No)		Yes

4. Expansion and drainage of foam (Clause 9 of EN 1568-4)

4.1 Low expansion foam

4.1.1 Expansion values by use of potable water (Clause 9.2 a)

Characteristic	Measured
Expansion Value	Untreated sample 5.61
Sample conditioned in accordance with annex E.2 and E.3	
Expansion value	Top sample 5.45 Bottom sample 5.83
Conformity according to clause 9.2 a) of EN 1568-4 met (Yes/No)	
Yes	

4.1 Low expansion foam (CONTINUED)

4.1.2 Expansion values by use of simulated sea water (Clause 9.2c)

Characteristic		Result
Expansion Value	Untreated sample	8.71
Sample conditioned in accordance with annex E.2 and E.3		
Expansion value	Top sample	8.27
	Bottom sample	7.97
Conformity according to clause 9.2 c) of EN 1568-4 met (Yes/No)		Yes

4.1.3 25% drainage time by using potable water (Clause 9.2b)

Characteristic		Result
25% drainage time (h:min)	Untreated sample	5:47
Sample conditioned in accordance with annex E.2 and E.3		
25% - drainage time (h:min)	Top sample	5:18
	Bottom sample	5:47
Conformity according to clause 9.2 b) of EN 1568-4 met (Yes/No)		Yes

4.1.4 25% drainage time by using simulated sea water (Clause 9.2d)

Characteristic		Result
25% drainage time (h:min)	Untreated sample	7:24
Sample conditioned in accordance with annex E.2 and E.3		
25% - drainage time (h:min)	Top sample	7:03
	Bottom sample	6:16
Conformity according to clause 9.2 d) of EN 1568-4 met (Yes/No)		Yes

4.1.5 50% drainage time (Without assessment according to standard)

Characteristic		Result
50% drainage time potable water (min:s)	Untreated sample	10:53
Sample conditioned in accordance with annex E.2 and E.3		
50% drainage time potable water (min:s)	Top sample	10:12
	Bottom sample	10:33
50% drainage time simulated sea water (min:s)	Untreated sample	12:48
Sample conditioned in accordance with annex E.2 and E.3		
50% drainage time simulated sea water (min:s)	Top sample	12:22
	Bottom sample	11:55

5. Test Fire Performance of low expansion foam (Clause 10 of EN 1568-4)

5.2 Gentle application

Characteristic	Results			
Usage concentration (%)	3			
Air temperature (°C)	14.5			
Test object size (m ²)	1.73			
Fuel/quantity	144 l heptane			
Fuel temperature (°C)	16			
Water temperature (°C)	N/A			
Foam solution temperature (°C)	17.8			
Wind Speed (m/s)	0 (indoor)			
Preburning time (s)	120			
Potable/Seawater	Acetone Potable	Acetone sea water	IPA sea water	IPA potable
	Test 1	Test 2	Test 3	Test 4
90% control time (min:s)	0:50	0:30	0:30	1:00
99% control time (min:s)	1:00	0:55	0:40	1:15
Extinction time (min:s)	1:10	0:58	0:45	1:19
Foam application time (s)	180	180	180	180
25% burnback time (min:s)	12:30	12.01	15:40	17.20
Extinguishing performance class and burnback resistance level in accordance with clause 10 of EN 1568-4 (Yes/No)	Yes (IB)	Yes (IB)	Yes (IA)	Yes (IA)

5.1 Extinguishing performance class and burnback resistance level in accordance with table 1 of EN 1568-4

Test by using of	Acetone		IPA	
	Potable	Sea water	Potable	Sea water
Extinguishing performance	I	I	I	I
Burnback resistance level	B	B	A	A

6. Container Marking (Clause 11 of EN 1568-4)

The marking conformed to the requirements detailed in clause 11 of BS EN 1568-4:2008 and can be found in the appendix of this report.