

Determination of test fire performance of FT SLAM / FTJN 1010 extinguishing medium according to Annex H of EN 1568-3:2008

Report no.	2017-Efectis-R000964
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1. SUBJECT

Determination of the test fire performance of liquid concentrate FT SLAM / FT JN 1010.

2. EXAMINATION

Extinguish qualities according to paragraphs of Annex H of EN 1568-3:2008.

3. PRINCIPAL

Fire Terminator International PTE. Ltd
Blk. 3015
Ubi Road 1
Unit 04-266
SINGAPORE 408704

4. PLACE AND DATES FOR THE EXAMINATION

The extinguishing tests according Annex H of EN 1568-3:2008 took place on 29th May 2017 at the facilities of the Brandweer Oefencentrum Kleefse Waard Arnhem.

The test fires were carried out indoors at this facilities under controlled climatological circumstances. The tests were performed by staff and with equipments of Efectis Nederland Bleiswijk, The Netherlands.

The tests were witnessed by Mr. H.J. Mondt, Lead Auditor IMS Marine Branch of Bureau Veritas. Also representatives of Fire Terminator International PTE. Ltd were present.

5. DATE AND NUMBER OF THE REPORT

June 2017; 2017-Efectis-R000964.

6. INTRODUCTION

By order of Fire Terminator International PTE. Ltd, Singapore, the Centre of Fire Research of Efectis Nederland carried out extinguishing tests to determine the extinguishing qualities of liquid concentrate FT SLAM / FT JN1010 supplied by the principal.
Refer to Annex B of this report for the MSDS of the concentrate.

The fire tests were carried out in accordance with Annex H of EN 1568-3:2008 "**Specification for low expansion foam concentrates for surface application to water immiscible liquids**".

6.1 FOAM TYPE AND CONCENTRATIONS

FT SLAM / FT JN1010 is supplied by Fire Terminator International PTE. Ltd, Singapore. The concentrate was sent from Singapore by air mail in six plastic jerry cans with a volume of 5 litres.

During the tests the foam was applied in premixed form after mixing in a 6% concentration with potable water. The concentration is in accordance with manufacturers recommendations.

6.2 FOAM PREMIX

The foam concentrations mentioned in this report are volume concentrations. The concentration is defined as the ratio of concentrate volume to total volume. Before each test, a stainless steel premix tank was filled with approximately 100 l of the foam mixture. In order to reach the correct concentration, the following procedure was adopted:

- A container was filled with the required volume of concentrate;
- The premix tank was placed on the weighing table and the concentrate poured in the tank;
- The tank was then filled with water. The water flow was stopped when the correct weight was reached;
- The tank was fitted with a pressure connection and connected to a nitrogen cylinder with pressure regulator;
- The tank was pressurized up to a pressure which supplies a nozzle pressure of 6.3 bar with the prescribed foam nozzle this gives a foam flow rate of 11.4 l/min;
- After application of the foam, the nozzle was thoroughly cleaned by circulating water through it for at least 1 minute;
- The premix tank was emptied and rinsed with clean water.

6.3 TEST PAN

The circular fire test pan was made out of mild steel sheet with a thickness of 2.5 mm and had an internal diameter of 2400 mm with a rim height of 200 mm. The internal surface area of the tray is 4.52 m². A burn-back pot was present with an internal diameter of 300 mm and a height of 200 mm.

6.4 FUEL

The test fuel of commercial grade N-Heptane was placed directly on the layer of water in the test pan. In both tests, the mean fuel/water depth was 50 mm. Between the fire tests, the tray was emptied and cleaned, in order to ascertain that there could be no influence from residual matter from a previous test.

6.5 NOZZLE TYPE AND POSITIONING

The foam was discharged using the prescribed standard nozzle. The nozzle was positioned for type H3 forceful application (EN 1568-3 §H.3), i.e. above the horizontal and at a distance from the test pan such that the foam strikes the fuel surface at a point 1 meter from the back edge of the tray. At the end of the foam application the nozzle was manually moved (for approximately 5 seconds) beyond the two adjacent side extensions until full control of the fire was reached.

6.6 FOAM APPLICATION

The foam was to be applied at the rate of nominally 11,4 l/min by applying a pressure of 6.3 bar to the nozzle. The actual flow rate in each test was determined by recording the decrease of the premix tank weight with time, and proved to be in the range 2.50 - 2.55 l/min/m² in all tests. The foam was applied for 3 minutes in each case.

7. TEST RESULTS

Date of performance of extinguishing tests: May 29th 2017

Test pan : diameter 2.40 m, $A=4.52 \text{ m}^2$
 Fuel : N-Heptane, Commercial grade
 Nozzle : standard
 Concentrate : FT SLAM / FT JN1010
 Premix : with potable water
 Density liquid concentrate FT SLAM / JN 1010: 1.089 kg/dm^3

Table 1: Test results

	Test 1:	Test 2:
amount of fuel	144 litres N-Heptane	144 litres N-Heptane
premix (100 litres)	6% premix JN 1010	6% premix JN 1010
expansion (l/kg)	9.7	9.7
25% drainage time	3'40"	3'40"
50% drainage time	6'15"	6'15"
premix tank pressure	6.5 bar	6.5 bar
nozzle pressure	6.3 bar	6.3 bar
pre-burn time	60 seconds	60 seconds
nozzle	fixed position	fixed position
application	forceful	forceful
mean wind velocity:	<0.1 m/s	<0.1 m/s
mean ambient temperature (air)	22 °C	24 °C
mean premix temperature	19 °C	18 °C
mean fuel temperature	16 °C	16 °C
extinguishing 90%	60 seconds	45 seconds
extinguishing 99%	100 seconds	90 seconds
extinguishing 100%	180 seconds	180 seconds
25 % burn back time	14 minutes	18 minutes
application rate	11.4 l/min.	11.4 l/min.
application density	2.5 l/min/m^2	2.5 l/min/m^2
extinguishing test	passed	passed

8. CONCLUSIONS

The liquid concentrate FT SLAM / FT JN 1010 with 6% concentration proved to be successful in controlling and extinguishing N-Heptane fires in agreement with the specific paragraphs of EN 1568-3:2008.

The Fire extinguishing performance is Class I and the burn-back level is A using potable water.



P.B. Reijman B.Sc.
Project Leader Special Testing



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Manager Testing

APPENDIX A: PICTURES



Photograph A1: pre-burn phase test fire



Photograph A2: extinguishing phase test fire





Photograph A3: 90% extinguished test fire




Photograph A4: burn-back test


APPENDIX B: MSDS FT SLAM / FT JN1010

	www.fireterminator.com		
	Address:	Blk. 3015 Ubi Road 1	
		Unit 04-266	
		Singapore 408 704	
	Tel:	(65) 6748 4396/ (65)6454 5494	
<u>MATERIAL SAFETY DATA SHEET</u>		FIRE TERMINATOR JN 1010 (Class 'A' 'B' & 'C' Fires)	
<i>Page 1 of 4</i>			
SECTION 1: IDENTIFICATION OF THE MATERIAL AND SUPPLIER			
Product Name	Fire-Terminator <i>JN-1010</i> (Class 'A' & 'B' Fires)	Other Names	None
Recommended Use	The intended or recommended use of this preparation is as a fire-extinguishant for Class 'A' & 'B' fires		
Manufacturer's Name	Fire Terminator International Pte Ltd	Address	Blk.-3015, Ubi Road 1 #04-266 Singapore 408704
Telephone No.	(65) 6748 4396	Emergency Telephone No.	(65) 6454 5494
		Date prepared	11 April 2017
SECTION 2: HAZARDS IDENTIFICATION			
Hazard Classification	Not hazardous		
Safety Phrase(s)	Not available	Risk Phrase(s)	Not available
SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS			
Preparation	Mixture		
Main Ingredients	Acacia Sep, Carom seed Sep and Mineral Salts.		
Hazardous contents	No PFOS , No PFOA		
SECTION 4: FIRST AID MEASURES			
Description of Necessary First Aid Measures	Eye Contact	Flush with large amounts of water. Seek medical attention.	
	Skin Contact	Wash with soap and water. Seek medical attention	
	Inhalation	Not expected to be toxic if inhaled.	
	Ingestion	Give large amounts of water. Seek medical attention.	
Medical Attention and Special Treatment	See above		

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		Singapore 408 704	
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		Fax: (65) 6836 0120	
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SECTION 5: FIRE FIGHTING MEASURES			
Suitable Extinguishing Media	Product is an extinguishing agent	Hazardous Combustion Products	None
Special Protective Precautions and Equipment for Fire Fighters	None	Hazchem Code	Not Hazardous
SECTION 6: ACCIDENTAL RELEASE MEASURES			
Emergency Procedures		Prevent skin and eye contact	
Methods and Materials for Containment and Clean Up		Wash spilled area with water.	
SECTION 7: HANDLING & STORAGE			
Precautions for Safe Handling		Avoid direct sunlight & extreme temperatures	
Conditions for Safe Storage, Including any Incompatibles		No special conditions are needed for safe storage. Store in its original packaging. Storage Temperature: 2° - 50° C If frozen can be used after the liquid is Thawed.	
SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION			
National Exposure Standards	Not applicable	Biological Limit Controls	Not available
Engineering Controls	Not available	Personal Protection Equipment	Do not require specific protection
SECTION 9: PHYSICAL & CHEMICAL PROPERTIES			
Appearance	Light Reddish liquid	Odour	Odourless
Freezing Point	Not available	Flash Point	None
Upper and Lower Flammable (explosive) Limits in Air	Not explosive	Ignition Temperature	Does not ignite

SECTION 10: STABILITY AND REACTIVITY			
Chemical Stability	Stable	Conditions to avoid	None
Incompatible Materials	Not applicable	Hazardous Reactions	None
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SECTION 11: TOXICOLOGY INFORMATION			
Health Effects from the Likely Routes of Exposure	Eye Contact	May cause irritation	
	Skin Contact	May cause mild transient irritation	
	Inhalation	May cause mild transient irritation	
	Ingestion	May cause gastrointestinal irritation.	
SECTION 12: ECOLOGICAL INFORMATION			
Biodegradability	Readily biodegradable		
Eco-Toxicity	Not expected to be toxic.		
SECTION 13: DISPOSAL CONSIDERATIONS			
Disposal Methods	Dispose off in compliance with local, state and Commonwealth regulations that may be in force		
Special Precautions for Landfill or Incineration	Not available		
SECTION 14: TRANSPORT INFORMATION			
UN Number	Not applicable	UN Proper Shipping Name	Not applicable
Class and Subsidiary Risk	Not applicable	Packing Group	Not applicable
Special Precautions for User	None	Hazchem Code	Not hazardous
<p>CONTENTS NOT RESTRICTED AND NOT REGULATED AS PER IATA. Tested Toxin-free by TUV SUD PSB (Report No: 7191060875-CHM13-EO). Singapore Green Label product FRAGILE - Avoid scratches, crashes and drops while transporting the products</p>			
SECTION 15: REGULATORY INFORMATION			
Risk / Safety	Not Classified	Symbol(s) on	Not required

Phrases		Label	
Law on Toxic Material	Not applicable	Fire Fighting Law	Not applicable
Labour Health Safety Law on Hazardous Material		Not applicable	

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SECTION 16: OTHER INFORMATION	
Date of preparation	11 April 2017

-END OF MSDS-