



**FIRE TEST &
RESEARCH LABORATORY**

ISO 17025:2017 ACCREDITED & BIS RECOGNISED

Test Report 00000154

Standard: UL 162:2024

- Foam Equipment and Liquid Concentrates

Flame Armor For Industry



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TEST REPORT

UL 162:2024 — Foam Equipment and Liquid Concentrates

ULR No.: TC565926000000154F

REPORT No.: 00000154

DATE: 18/06/2026

1. Introduction

This report has been prepared by FTRL and relates to the testing described below, conducted in accordance with UL-162:2024 — Foam Equipment and Liquid Concentrates.

ULR Number	:	TC565926000000154F
Report Number	:	00000154
Issue Date	:	18-06-2026
Test Standard	:	UL 162:2024
Type of Sample	:	AR-AFFF 3% × 3%
Testing Period	:	12-06-2026 to 17-06-2026

CLIENT DETAILS

Client : Flame Armor For Industry

Address : Riyadh Al Misfat Dist. Abdul Rahman Bin Salem 14545, Kingdom of Saudi Arabia.

Country : Saudi Arabia

This report shall not be reproduced in part without prior written approval of FTRL. The test results reported herein relate only to the sample(s) tested. This report does not constitute a certification of the product.



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2. Details of Samples Received

The following sample was received by FTRL for testing under the scope of UL 162:2024

Part – A : Sample Identification

Type of Sample	:	Foam Liquid Concentrate AR-AFFF – 3% × 3%
Referred Specification / Standard	:	UL 162:2024
Quantity Received	:	40 Litres
Packing & Sealing Details	:	Sample was packed in HDPE Jerrycans
Seal Intact / Not Intact	:	Seal Intact
Condition of Sample	:	Good
FTRL Code of Sample	:	2606-102-6039

Part – B : Sample Receipt Details

Date of Receipt of Sample	:	12-06-2026
Testing Started On	:	12-06-2026
Testing Completed On	:	17-06-2026
Name of the Client	:	Flame Armor For Industry
Supplementary Information	:	NA



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3. Conditions of Issue

Condition	Statement
Scope of Results	The results contained herein apply only to the particular sample(s) tested and to the specific tests carried out as detailed in this report.
Reproduction	This report shall not be reproduced in part, abridged or abstracted without the written consent of FTRL. It shall not be used for advertisement or legal purposes.
Liability	Total liability of this laboratory is limited to the invoiced amount only. Results are based on tested samples as received.
Remnant Samples	Remnant samples (if any) will be disposed of within 10 days after completing 90 days from the test report issue date, unless a prior written request is received.
Confidentiality	This report is prepared exclusively for the client named herein. FTRL accepts no responsibility to third parties for the content of this report.
Customer Data	Any information or data provided by the customer is clearly identified and remains the responsibility of the customer.
Sampling	The Laboratory did not participate in sampling. The above test results are based on the tested sample(s) as received.
Statement of Conformity	Decision rule based on IEC Guide 115:2023, Clause 4.3.3 Simple Acceptance. Measurement uncertainty not applied per IEC Guide 115:2023, Cl. 4.3.3.



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4. Objectives & Report Summary

Test Objective

Standard	:	UL 162:2024 — Foam Equipment and Liquid Concentrates
Purpose	:	To perform testing against performance requirements of UL 162:2024.
Scope	:	All clauses listed in Section 6 were assessed unless marked N/A.

Report Summary

The sample was submitted by the client and testing commenced on 12-06-2026. All testing was conducted at FTRL, 9th Milestone, Sonipat-Gohana Road, VPO Rattangarh, NH-352A, Sonipat, Haryana – 131001, India, using calibrated laboratory equipment traceable to national standards.

Testing was performed on samples received directly from the client. Test methods, environmental conditioning, instrumentation and acceptance criteria followed the requirements of UL 162:2024 and relevant referenced annexes.

Deviations & Limitations

NOTE: No deviations from UL 162:2024 were recorded during testing unless explicitly stated in the individual clause results in Section 7.



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5. Glossary of Terms

Result codes used throughout this report.

Term	Definition
PASS	Complies. Tested at FTRL using calibrated equipment.
PASS*	Complies — compliance more probable than non-compliance within measurement uncertainty.
FAIL	Non-compliance. Product does not meet clause requirements.
FAIL*	Non-compliance more probable than compliance (within uncertainty band).
N/A	Not applicable to the design under consideration.
N/T	Not tested. Refer to previously tested item or referenced report.
[value]*	Measured result within specification limit by a margin less than measurement uncertainty.



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6. Summary of Test Results

Detailed results for each clause are in Section 7. The table below gives an at-a-glance overview of all tested clauses.

Item	Clause	Title	Applicable	Conformity
1.	7	Film Forming Test	Yes	PASS
2.	10.2	25% Drainage Time with Potable Water with 2 gpm nozzle	Yes	PASS
2a.	10.2	25% Drainage Time with Synthetic Sea Water with 2 gpm nozzle	Yes	PASS
3.	10.3	Expansion Test with Potable Water with 2 gpm nozzle	Not Specified	NA
3a.	10.3	Expansion Test with Synthetic Sea Water with 2 gpm nozzle	Not Specified	NA
4.	12	Class 'B' Fire Test with Potable Water - For top side discharge devices i.e. Type-III application	Yes	PASS
4a.	12.2	Temperature of n-Heptane	Yes	PASS
4b.	4.3 & 12.5	Fire Control period	Not Specified	NA
4c.	Sl. No.2 of Table 12.1	Complete Extinction period	Yes	PASS
4d.	12.5.4	Sealability checking by 1st Torch Test	Yes	PASS
4e.	12.5.4	Sealability checking by 2nd Torch Test	Yes	PASS
4f.	12.5.5 & 12.5.6	Burn Back Resistance Test & Burn Back Area	Yes	PASS
5.	12	Class 'B' Fire Test with Synthetic Sea Water - For top side discharge devices i.e. Type-III application	Yes	PASS
5a.	12.2	Temperature of n-Heptane	Yes	PASS
5b.	4.3 & 12.5	Fire Control period	Not Specified	NA
5c.	Sl. No.2 of Table 12.1	Complete Extinction period	Yes	PASS
5d.	12.5.4	Sealability checking by 1 st Torch Test	Yes	PASS
5e.	12.5.4	Sealability checking by 2 nd Torch Test	Yes	PASS
5f.	12.5.5 & 12.5.6	Burn Back Resistance Test & Burn Back Area	Yes	PASS



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Item	Clause	Title	Applicable	Conformity
6.	10.2	25% Drainage Time with Potable Water with 3 gpm nozzle	Yes	PASS
6a.	10.2	25% Drainage Time with Synthetic Sea Water with 3 gpm nozzle	Yes	PASS
7.	10.3	Expansion Test with Potable Water with 3 gpm nozzle	Not Specified	NA
7a.	10.3	Expansion Test with Synthetic Sea Water with 3 gpm nozzle	Not Specified	NA
8.	12	Class 'B' Fire Test with Potable Water - For top side discharge devices i.e. Type-III application	Yes	PASS
8a.	12.2	Temperature of n-Heptane	Yes	PASS
8b.	4.3 & 12.5	Fire Control period	Not Specified	NA
8c.	Sl. No.2 of Table 12.1	Complete Extinction period	Yes	PASS
8d.	12.5.4	Sealability checking by 1st Torch Test	Yes	PASS
8e.	12.5.4	Sealability checking by 2nd Torch Test	Yes	PASS
8f.	12.5.5 & 12.5.6	Burn Back Resistance Test & Burn Back Area	Yes	PASS
9.	12	Class 'B' Fire Test with Synthetic Sea Water - For top side discharge devices i.e. Type-III application	Yes	PASS
9a.	12.2	Temperature of n-Heptane	Yes	PASS
9b.	4.3 & 12.5	Fire Control period	Not Specified	NA
9c.	Sl. No.2 of Table 12.1	Complete Extinction period	Yes	PASS
9d.	12.5.4	Sealability checking by 1 st Torch Test	Yes	PASS
9e.	12.5.4	Sealability checking by 2 nd Torch Test	Yes	PASS
9f.	12.5.5 & 12.5.6	Burn Back Resistance Test & Burn Back Area	Yes	PASS



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7. Detailed Test Results

PART-C – TEST RESULTS

Following Test Results have been obtained on the sample.

Sr No	Test Parameter (Clause Ref. No. of UL-162:2024)	Requirements as per UL-162:2024	Test Observations
1	Film Forming Test (Clause No. 7)	In the Film Forming Test only the value of Spreading Co-efficient is required to be determined as per procedure given in ASTM D1331-89. As per Clause 7.1 the value of Spreading Co-efficient shall be greater than zero at 21±3°C when determined as per ASTM D1331-89.	i) (+) 3.46 dynes/cm at 19.6°C with distilled water ii) (+) 3.20 dynes/cm at 20.2°C with synthetic sea water
2.	25% Drainage Time with Potable Water (with 2 gpm Nozzle) (Clause No. 10.2)	Quarter drainage period shall be more than 30 seconds. Temperature of Foam solution shall be 10°C to 32°C	4 minutes 44 seconds at 26.2°C
2a.	25% Drainage Time with Synthetic Sea Water Water (with 2 gpm Nozzle) (Clause No. 10.2)	Quarter drainage period shall be more than 30 seconds. Temperature of Foam solution shall be 10°C to 32°C	4 minutes 21 seconds at 26.5°C
3.	Expansion Test with Potable Water Water (with 2 gpm Nozzle) (Clause No. 10.3)	Limits of Expansion Ratio are not specified in UL-162.	9.58 at 26.2°C
3a.	Expansion Test with Synthetic Sea Water Water (with 2 gpm Nozzle) (Clause No. 10.3)	Limits of Expansion Ratio are not specified in UL-162.	9.47 at 26.5°C
4.	Class 'B' Fire Test with Potable Water - For top side discharge devices i.e. Type-III application, (Cl. Ref. no.:- 12) Nozzle used = 2 gpm, Shape of Fire Pan = square, Fire Area = 50 square feet, Fuel = commercial n-Heptane, depth of fuel = 2 inch, Premix Solution Temperature 26.2°C, Preburn period = 1 minute. Total period of application of foam = 3 minutes.		
4a.	Temperature of n-Heptane (Cl 12.2)	10°C to 32°C.	25.6°C
4b.	Fire Control period (Cl 4.3 & 12.5)	Not Specified	01 min 04 seconds
4c.	Complete Extinction period (Sl. No.2 of Table 12.1)	Foam shall extinguish fire in 3 minutes (maximum)	1 min 32 seconds



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Sr No	Test Parameter (Clause Ref. No. of UL-162:2024)	Requirements as per UL-162:2024	Test Observations
4d.	Sealability checking by 1 st Torch Test (Cl 12.5.4)	During passing of burning torch allover the surface of fuel covered with foam including corners of the Fire Pan; the fuel shall not reignite, flame or flash over. However, candling, flaming or flash over that self extinguishes is acceptable provided that the phenomenon does not remain in one area for more than 30 seconds.	Pass the test
4e.	Sealability checking by 2 nd Torch Test (Cl 12.5.4)	During passing of burning torch allover the surface of fuel covered with foam including corners of the Fire Pan; the fuel shall not reignite, flame or flash over. However, candling, flaming or flash over that self extinguishes is acceptable provided that the phenomenon does not remain in one area for more than 30 seconds.	Pass the test
4f.	Burn Back Resistance Test & Burn Back Area (Cl 12.5.5 & 12.5.6)	As a consequence of removal of foam blanket enclosed by the stove pipe followed by igniting the exposed fuel & letting it burn for 1 minute followed by gently removal of the stove pipe the burning area shall reclose to extinguish fire or if the burning area keeps increasing; then at the end of 5 minute duration the burning area shall not exceed 10 square feet.	Pass the test.
5.	Class 'B' Fire Test with Synthetic Sea Water - For top side discharge devices i.e. Type-III application, (Cl. Ref. no.: 12) Nozzle used = 2 gpm, Shape of Fire Pan = square, Fire Area = 50 square feet, Fuel = commercial n-Heptane, depth of fuel = 2 inch, Premix Solution Temperature 26.5°C, Preburn period = 1 minute. Total period of application of foam = 3 minutes		
5a.	Temperature of n-Heptane (Cl 12.2)	10°C to 32°C.	25.8°C
5b.	Fire Control period (Cl 4.3 & 12.5)	Not Specified	01 min 12 seconds
5c.	Complete Extinction period (Sl. No.2 of Table 12.1)	Foam shall extinguish fire in 3 minutes (maximum)	1 min 38 seconds



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Sr No	Test Parameter (Clause Ref. No. of UL-162:2024)	Requirements as per UL-162:2024	Test Observations
5d.	Sealability checking by 1 st Torch Test (Cl 12.5.4)	During passing of burning torch allover the surface of fuel covered with foam including corners of the Fire Pan; the fuel shall not reignite, flame or flash over. However, candling, flaming or flash over that self extinguishes is acceptable provided that the phenomenon does not remain in one area for more that 30 seconds.	Pass the test
5e.	Sealability checking by 2 nd Torch Test (Cl 12.5.4)	During passing of burning torch allover the surface of fuel covered with foam including corners of the Fire Pan; the fuel shall not reignite, flame or flash over. However, candling, flaming or flash over that self extinguishes is acceptable provided that the phenomenon does not remain in one area for more that 30 seconds.	Pass the test
5f.	Burn Back Resistance Test & Burn Back Area (Cl 12.5.5 & 12.5.6)	As a consequence of removal of foam blanket enclosed by the stove pipe followed by igniting the exposed fuel & letting it burn for 1 minute followed by gently removal of the stove pipe the burning area shall reclose to extinguish fire or if the burning area keeps increasing; then at the end of 5 minute duration the burning area shall not exceed 10 square feet.	Pass the test
6.	25% Drainage Time with Potable Water (with 3 gpm Nozzle) (Clause No. 10.2)	Quarter drainage period shall be more than 30 seconds. Temperature of Foam solution shall be 10°C to 32°C	5 minutes 42 seconds at 28.2°C
6a.	25% Drainage Time with Synthetic Sea Water (with 3 gpm Nozzle) (Clause No. 10.2)	Quarter drainage period shall be more than 30 seconds. Temperature of Foam solution shall be 10°C to 32°C	5 minutes 14 seconds at 29.5°C
7.	Expansion Test with Potable Water (with 3 gpm Nozzle) (Clause No. 10.3)	Limits of Expansion Ratio are not specified in UL-162.	8.08 at 28.2°C
7a.	Expansion Test with Synthetic Sea Water (with 3 gpm Nozzle) (Clause No. 10.3)	Limits of Expansion Ratio are not specified in UL-162.	7.84 at 29.5°C



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Sr No	Test Parameter (Clause Ref. No. of UL-162:2024)	Requirements as per UL-162:2024	Test Observations
8.	Class 'B' Fire Test with Potable Water - For top side discharge devices i.e. Type-II application, (Cl. Ref. no:- 12) Nozzle used = 3 gpm, Shape of Fire Pan = square, Fire Area = 50 square feet, Fuel = Iso Propyl Alcohol, depth of fuel = 2 inch, Premix Solution Temperature 28.2°C, Preburn period = 1 minute. Total period of application of foam = 5 minutes.		
8a.	Temperature of Iso Propyl Alcohol (Cl 12.2)	10°C to 32°C.	27.6°C
8b.	Fire Control period (Cl 4.3 & 12.5)	Not Specified	42 seconds
8c.	Complete Extinction period (Sl. No.2 of Table 12.1)	Foam shall extinguish fire in 5 minutes (maximum)	58 seconds
8d.	Sealability checking by 1st Torch Test (Cl 12.5.4)	During passing of burning torch all over the surface of fuel covered with foam including corners of the Fire Pan; the fuel shall not reignite, flame or flash over. However, candling, flaming or flash over that self extinguishes is acceptable provided that the phenomenon does not remain in one area for more than 30 seconds.	Pass the test
8e.	Sealability checking by 2nd Torch Test (Cl 12.5.4)	During passing of burning torch all over the surface of fuel covered with foam including corners of the Fire Pan; the fuel shall not reignite, flame or flash over. However, candling, flaming or flash over that self extinguishes is acceptable provided that the phenomenon does not remain in one area for more than 30 seconds.	Pass the test
8f.	Burn Back Resistance Test & Burn Back Area (Cl 12.5.5 & 12.5.6)	As a consequence of removal of foam blanket enclosed by the stove pipe followed by igniting the exposed fuel & letting it burn for 1 minute followed by gently removal of the stove pipe the burning area shall reclose to extinguish fire or if the burning area keeps increasing; then at the end of 5 minute duration the burning area shall not exceed 10 square feet.	Pass the test



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Sr No	Test Parameter (Clause Ref. No. of UL-162:2024)	Requirements as per UL-162:2024	Test Observations
9.	Class 'B' Fire Test with Synthetic Sea Water - For top side discharge devices i.e. Type-II application, (Cl. Ref. no:- 12) Nozzle used = 3 gpm, Shape of Fire Pan = square, Fire Area = 50 square feet, Fuel = Iso Propyl Alcohol, depth of fuel = 2 inch, Premix Solution Temperature 29.5°C, Preburn period = 1 minute. Total period of application of foam = 5 minutes		
9a.	Temperature of Iso Propyl Alcohol (Cl 12.2)	10°C to 32°C.	28.4°C
9b.	Fire Control period (Cl 4.3 & 12.5)	Not Specified	54 seconds
9c.	Complete Extinction period (Sl. No.2 of Table 12.1)	Foam shall extinguish fire in 5 minutes (maximum)	1 min 08 seconds
9d.	Sealability checking by 1 st Torch Test (Cl 12.5.4)	During passing of burning torch allover the surface of fuel covered with foam including corners of the Fire Pan; the fuel shall not reignite, flame or flash over. However, candling, flaming or flash over that self extinguishes is acceptable provided that the phenomenon does not remain in one area for more than 30 seconds.	Pass the test
9e.	Sealability checking by 2 nd Torch Test (Cl 12.5.4)	During passing of burning torch allover the surface of fuel covered with foam including corners of the Fire Pan; the fuel shall not reignite, flame or flash over. However, candling, flaming or flash over that self extinguishes is acceptable provided that the phenomenon does not remain in one area for more than 30 seconds.	Pass the test
9f.	Burn Back Resistance Test & Burn Back Area (Cl 12.5.5 & 12.5.6)	As a consequence of removal of foam blanket enclosed by the stove pipe followed by igniting the exposed fuel & letting it burn for 1 minute followed by gently removal of the stove pipe the burning area shall reclose to extinguish fire or if the burning area keeps increasing; then at the end of 5 minute duration the burning area shall not exceed 10 square feet.	Pass the test



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8. Remarks & Statement of Conformity

STATEMENT OF CONFORMITY

The sample of mechanical foam for firefighting AR-AFFF 3% × 3% type has been found meeting the requirements of the fire performance tests as far as tested as per the UL-162:2024.

General Remarks:

- Decision rule for statement(s) of conformity is based on IEC Guide 115:2023, Clause 4.3.3 Simple Acceptance. Measurement uncertainty is not applied when providing statements of conformity in accordance with IEC Guide 115:2023, Clause 4.3.3.
- The above test results are based on the tested sample(s) as received.
- The Laboratory is responsible for all the information in the test report except for the information provided by the customer. The laboratory did not participate in sampling.
- The Remnant Samples (if any) will be disposed of within 10 days after completing 90 days from the Test Report issuing date, unless a written request is given before testing.
- This Report shall not be reproduced in part and shall not be used for the purpose of advertisements or legal action.
- Total liability of our Laboratory is limited to the invoiced amount only.

9. Approval & Sign-Off

This report has been prepared, reviewed and issued by the personnel identified below for and on behalf of Fire Test & Research Laboratory (FTRL).

Authorized By	Reviewed & Issue By
 Manjita Sr. Scientist	 Rahul Chhillar Director

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