TESTING CERT # 1136.03

Chemitox

TEST REPORT

Report Number: 190662
Date of Issue: August 2, 2019

Report to:

HAKKO CORPORATION

591-2 Fujikubo, Miyoshimachi, Iruma-Gun, Saitama 354-0041, JAPAN

Prepared by:

Chemitox, Inc., Yamanashi Testing Center

18349, Egusa, Sutama-cho, Hokuto-shi, Yamanashi-ken 408-0103, Japan

Responsible Officer
Mitsuya Mochizuki
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Authorized
Hitoshi Watanabe
Implementation
Project Manager

(1) Chemitox is accredited by the following agency to ISO/IEC 17025.
American Association for Laboratory Accreditation (A2LA) — Certificated No: 1136.03

(2) This TEST REPORT refers only to the sample tested, unless stated otherwise.

Chemitox

Date of Issue: August 2, 2019

HAKKO CORPORATION
591-2 Fujikubo, Miyoshimachi, Iruma-Gun, Saitama 354-0041, JAPAN

UL94 HB Flame Test Report

1. Objective

We conducted Horizontal Burning Test in accordance with UL 94 6th Ed. (2018-05-30) "STANDARD FOR SAFETY –Tests for Flammability of Plastic Materials for Parts in Devices and Appliances"..

2. Test Date

June 6, 2019

3. Test Specimen(s)

The description of the specimens given in Table 1 has been prepared from information provided by HAKKO CORPORATION. This information has not been independently verified by Chemitox. All values quoted are nominal, unless specified.:

Table 1 Description of test specimens

Material Composition	Product Name	Nominal Dimension (mm)	Received on
Polyurethane	Flexible Fluorine (PVDF) Resin Tubing	125 × 13	2019-06-03

4. Test Method and Conditioning

Test Method and Conditioning is indicated in Table 2.

Table 2 Test Method and Conditioning

Test name	Horizontal Burning Test
Test and Classification method	UL94 Horizontal Burning Test (Refer to the Appendix)
Test Flame	20 mm Blue Flame
Sample conditioning	23±2°C and 50±10 % relative humidity for a minimum of 24 hours.

5. Test Results

The following Table 3 shows the summary of obtained test results.

Table 3: Test Results

Material	Sample Name	Lot No.	Thickness (mm)	Desired Flame Class	Test Result*	Result
Polyurethane	Flexible Fluorine (PVDF) Resin Tubing	81214A	1.00	HB	HB	PASS
		81026A	1.50	HB	HB	PASS

*: According to instruction from HAKKO CORPORATION, this test was conducted with the transparent side of the sample facing the burner (lower side) and a whitish thin layer upward.

6. Test Location

Chemitox, Inc., Yamanashi Testing Center
18349 Egusa, Sutama-cho, Hokuto-shi, Yamanashi-ken 408-0103

7. Performed by

Shotaro Saito, Engineer (Level 1)

Masaru Sakamoto

Witnessed by Masaru Sakamoto, Engineer (Level 2)

8. Reviewed by

Hitoshi Watanabe, Implementation Project Manager (Level 3)

Appendix

(2 Pages)

- UL94 HB Flame test data
- UL94 HB Flame test method

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Tested by: Shotaro Saito Date 2019-06-06

Printed Name Signature

Ref. NO. 190662

Chemitox

HORIZONTAL BURNING TEST; HB

UL 94, §7
CSA C22.2 No.0.17-00, §4.2.3
(ASTM D635, IEC 60695-11-10)

Specimen Review: [✓] Radius < 1.3 mm, Width = 13±0.5 mm, Length = 125±5 mm and edges are smooth.

Preparation of Test Flame:

Gas Flow Rate: 105 mL/min (105±5 mL/min)

Back Pressure: 2 mm water (<10 mm water)

[✓] TEST FLAME IS BLUE (YELLOW TIP JUST REMOVED), HEIGHT = 20±1 MM

Specimen No.	Thickness mm	Time, t (s)	Damaged Length, L (mm)	X_1	Burning Rate (mm/min)	Flame Class
Set #: - Material: Flexible Fluorine (PVDF) Resin Tubing (Lot No.:81214A) Color: Natural						HB*
Test Date: 2019-06-06 Start Time: 15:10 End Time: 15:18						☒ Yes
1	1.04	-	-	(2)	-	☐ No
2	1.04	-	-	(2)	-	
3	1.07	115	23	(1)	12	
Set #: - Material: Flexible Fluorine (PVDF) Resin Tubing (Lot No.:81026A) Color: Natural						HB*
Test Date: 2019-06-06 Start Time: 15:19 End Time: 15:35						☒ Yes
1	1.55	-	-	(2)	-	☐ No
2	1.54	-	-	(2)	-	
3	1.55	144	28	(1)	12	
Set #: Material: Color:						HB
Test Date: Start Time: End Time:						☐ Yes
1				( )		☐ No
2				( )		
3				( )		
Set #: Material: Color:						HB
Test Date: Start Time: End Time:						☐ Yes
1				( )		☐ No
2				( )		
3				( )		

2019-06-06 SS

*: According to instruction from HAKKO CORPORATION, this test was conducted with the transparent side of the sample facing the burner (lower side) and a whitish thin layer upward.

Note Damaged Length (L) equals distance beyond 25 mm reference mark
Linear Burning Rate = 60L/t (Not calculated if 25 mm mark not passed)

Observation (X_1):
(1) Ceased to burn before the 100 mm reference mark. Materials is HB
(2) Ceased to burn before the 25 mm reference mark. Materials is HB
(3) Misc:

Micrometer: M-299 Timer: M-14-38 Hood: A-8-7

Lab Ambient: 23 °C (25±10°C) and 53 %RH (≤75%RH)

APPENDIX

Horizontal Burning Test

Referenced Standard: ☑ UL94 (6th Ed. Sec.7)
☐ CSA C22.2-92 No. 0.17-00 (Sec. 4.2.3)
☐ GB 5169.16-2008 (IEC 60695-11-10 2003-08 Edition 1.1)

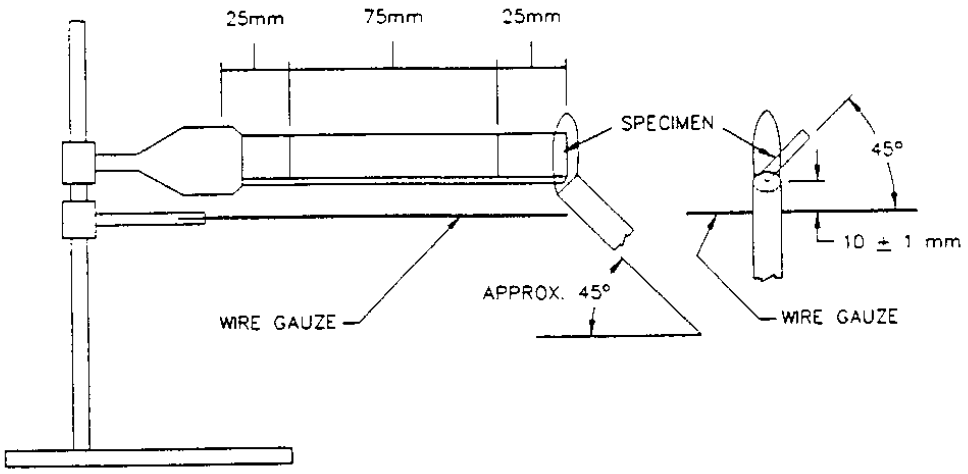
1. Sample size : 125±5 × 13.0±0.5 mm × thickness

2. Procedure (See figure) :

   1) Three specimens are to be tested.

   2) A blue flame of 20±1 mm is inclined toward the end of the specimen at an angle of 45 ±2° to the horizontal. Apply the flame for 30±1 seconds or until the combustion reaches the 25 mm mark.

   3) Record the time for the combustion front to travel from 25 mm mark up to the 100 mm mark.



FT120C

Test Criteria

1. Not have a burning rate exceeding 40 mm per minute over a 75 mm span for specimens having a thickness of 3.0 to 13 mm, or

2. Not have a burning rate exceeding 75 mm per minute over a 75 mm span for specimens having a thickness less than 3.0 mm, or

3. Cease to burn before the 100 mm reference mark.

4. If only one specimen from a set of three specimens does not comply with the requirements, another set of three specimens is to be tested. All specimens from this second set shall comply with the requirements in order for the material in that thickness to be classified HB.