ULR-TC578721000014485P
Test Report No. GGN/T(A)/21/014120
Dated: 2021-04-28

South Asia

Applicant	:	**HD PLAST JOINT STOCK COMPANY** Hoang Dieu Industrial Cluster, Hoang Dieu Commune, Gia Loc District, Hai Duong province, Vietnam
Attention	:	Ms. Chi/Ms. Duyen
Test Sample	:	Received on 2021-04-21 11:02 AM
Test Period	:	From 2021-04-21 to 2021-04-28
Sample Description	:	Sample A: Norco 4-Ply Disposable Face Mask
Color	:	Blue
Mfg./Exp. Date	:	/
Sample Quantity	:	/
Lot No./Batch No.	:	/
Country Of Origin	:	Vietnam
Name of the Buyer / Destination	:	**/USA, Europe**
Testing Standard Followed	:	**As per ASTM F2100-19** **The test specification is followed as per ASTM F2100 – 19, Level 2 Barrier**

Note: 1. the submitted samples are Not Drawn by the Laboratory
2. Requested tests are performed

Sample Photo

Laboratory:
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Summary of Results

Sl. No.	Tests	Sample	Test Method	Specification	Observation	Level Achieved	Conclusion
1.	Bacterial filtration efficiency (BFE)	A	ASTM F2101-19	≥ 98%	98.4%	Level 2	Pass
2.	Differential pressure (Breathability)	A	ASTM F2100-19 / EN 14683:2019+AC: 2019(E) Annex C	<6 mmH_2O/cm^2	5.06 mmH_2O/cm^2	Level 2	Pass
3.	Synthetic blood penetration (Splash resistance test)	A	ASTM F1862/F1862M − 17 (120 mm/Hg)	No visible penetration of synthetic blood at the end of test period. 29 masks out of 32 masks should pass the test to quality this parameter.	32 Specimens are Passing out of 32 Specimens	Level 2	Pass
4.	Sub-micron Particulate Filtration Efficiency: (ASTM F2299/F2299M − 03 (Reapproved 2017)	A	ASTM F2299 (Average particle size (0.1 µ)	≥98%	98.2%	Level 2	Pass
5.	Flammability	A	16 CFR Part 1610	Burning time should be ≥3.5 seconds to categorized as Class 1	Class1	Level 2	Pass

Authorized By

Venu Gopala Krishna Rayudu
(Authorised Signatory)

Authorized By

Rashmi Gupta
(Authorised Signatory)

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Test Result(s):

Bacterial Filtration Efficiency (BFE) Test

1. Purpose
For evaluating the bacterial filtration efficiency (BFE) of mask.

2. Sample description was given by client
Sample description: Norco 4-Ply Disposable Face Mask
Specification: As per ASTM F2100-19
Lot Number: /
Sample Receiving Date: 2021-04-21

3. Test Method
ASTM F 2101-19

4. Apparatus and materials
4.1 *Staphylococcus aureus* ATCC 6538.
4.2 Peptone water.
4.3 Tryptic Soy Broth (TSB).
4.4 Tryptic Soy Agar (TSA).
4.5 Bacterial filtration efficiency test apparatus.
4.6 Six-stage viable particle Anderson sampler.
4.7 Flow meters.

5. Test specimen
5.1 Total 5 test specimens are taken for testing.
5.2 Prior to testing, condition all test specimens for a minimum of 4h at (21±5)°C and (85±5)% relative humidity. For Test conditions is being followed during the study i.e. (19 to 23)℃ Temp. and (61 to 69)% relative humidity.
5.3 Testing has been performed with the submitted sample with good laboratory practices.

6. Procedure
6.1 Preparation of the bacterial challenge: Dilute the culture in peptone water to achieve a concentration of approximately 5×10^5 CFU/ml
6.2 Adjust the flow rate through the Anderson sampler to 28.3 L/min.
6.3 Deliver the challenge to the nebulizer using a syringe pump. Purge tubing and nebulizer of air bubbles.
6.4 Perform a positive control run without a test specimen to determine the number of viable aerosol particles being generated. The mean particle size (MPS) of the aerosol will also be calculated from the results of these positive control plates.
6.4.1 Initiate the aerosol challenge by turning on the air pressure and pump connected to the nebulizer. Immediately begin sampling the aerosol using the Anderson sampler.
6.4.2 Time the challenge suspension to be delivered to the nebulizer for 1 min.
6.4.3 Time the air pressure and Anderson sampler to run for 2 min.
6.4.4 At the conclusion of the positive control ran, remove plates from the Anderson sampler.
6.5 Place new agar plates into Anderson sampler and clamp the test specimen into the top of the Anderson sampler, with the inside of the specimen facing towards the bacterial challenge (test area: 63.6cm^2).
6.6 Repeat the challenge procedure for each test specimen.
6.7 Repeat a positive control after completion of the sample set.
6.8 Perform a negative control run by collecting a 2 min sample of air from the aerosol chamber. No bacterial challenge should be pumped into the nebulizer during the collection of the negative control.
6.9 Incubate agar plates at (37±2)°C for (48±4) h.
6.10 Count each of the six-stage plates of the Anderson sampler.

7. Calculation

Total the count from each of the six plates for the test specimens and positive controls, as specified by the manufacture of Anderson sampler. The filtration efficiency percentages are calculated as follows:

BFE=(C-T) / C × 100

T is the total plate count for the test specimen.

C is the mean of the total plate counts for the two positive controls.

Apparatus Photo:

1. Bacterial Filtration Efficiency: (ASTM F 2101 - 19)

Test Condition: The pre conditioned atmosphere maintained before the testing i.e. (16 to 26)°C Temp. and (60 to 80)% relative humidity. Test conditions is being followed during the study i.e. (19 to 23)°C Temp. and (61 to 69)% relative humidity.
Test Organism Used: Staphylococcus aureus ATCC 6538, Inoculum Size: 5 × 10^5 CFU/ml, Media Used: Tryptic soya agar, Dilution Medium Used: Peptone water, Incubation Period: 37 ± 2°C for 48 hrs, test area of mask: 63.6cm^2, Sample Exposure Side: Face Side, Flow Rate: 28.3 L/min, Mean particle size of challenge aerosol: 3.0 ± 0.3 micron, Testing performed with the inside of the medical face mask in contact with the bacterial challenge.

Sample A

Observations:

Plate No. / Stage No.	Positive control before CFU/Plate	Positive control After CFU/Plate	Negative Control CFU/Plate	Mask 1 CFU/Plate	Mask 2 CFU/Plate	Mask 3 CFU/Plate	Mask 4CFU/Plate	Mask 5 CFU/Plate
1	129	120	0	0	0	0	0	0
2	245	239	0	1	2	3	5	4
3	392	298	0	2	4	6	3	2
4	475	551	0	6	1	4	4	4
5	697	697	0	19	16	13	10	15
6	921	832	0	20	24	16	19	20
Total of 6 Plate	2859	2732	0	48	47	42	41	45
Average CFU	2798		-					
% Bacterial filtration efficiency test result				98.28	98.32	98.49	98.53	98.39
Mean of % Bacterial filtration efficiently test results				98.4				
Requirement				>=98%				
Conclusion				PASS				

Note: The test requirement is taken as per ASTM F2100 – 19, Level 2 Barrier

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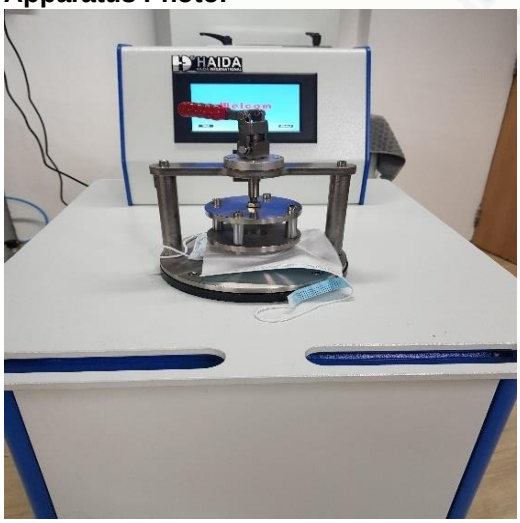
Differential pressure Test

1. Purpose
The purpose of the test was to measure the differential pressure of masks.
2.Sample description was given by client
Sample description: Norco 4-Ply Disposable Face Mask
Specification: ASTM F2100-19 / EN 14683:2019+AC:2019(E) Annex C
Lot Number: /
Sample Receiving Date: 2021-04-21
3.Test Method
ASTM F2100-19 / EN 14683:2019+AC:2019(E) Annex C
4. Apparatus and materials
Differential pressure testing instrument
5.Test specimen
5.1 Test specimens are complete masks or shall be cut from masks. Each specimen shall be able to provide 5 different circular test areas of 2.5 cm in diameter.
5.2 Prior to testing, condition all test specimens for a minimum of 4 h at (21±5)0C and (85±5)% relative humidity. For Test conditions is being followed during the study i.e. (19 to 23)℃ Temp. and (61 to 69)% relative humidity.
5.3 Testing has been performed with the submitted sample with good laboratory practices.
6. Procedure
6.1 Without a specimen in place, the holder is closed, and the differential manometer is zeroed. The pump is started, and the flow of air adjusted to 8 L/min.
6.2 The pretreated specimen is placed across the orifice (total area 4.9cm2, test area diameter 25mm) and clamped into place to minimize air leaks. The testing performed with the airflow direction from the inside of the mask to the outside of the mask.
6.3 Due to the presence of an alignment system the tested area of the specimen should be perfectly in line and across the flow of air.
6.4 The differential pressure is read directly.
6.5 The procedure described in steps 6.1-6.4 is carried out on 5 different areas of the mask and readings averaged.
Apparatus Photo:



2. Differential Pressure (Breathability): ASTM F2100-19 / EN 14683:2019+AC:2019(E) Annex C						
Test Condition: The pre conditioned atmosphere maintained before the testing i.e. (16 to 26)°C Temp. and (80 to 90)% relative humidity. Test conditions is being followed during the study i.e. (19 to 23)°C Temp. and (61 to 69)% relative humidity. Specimen Size: Diameter 25 mm (Area: 4.9 cm^2), Sample Exposure Side: Face Side, Flow Rate: 8 L/min, Airflow Direction: From the Inside of the Mask to the Outside of the Mask, The testing performed with the airflow direction from the inside of the mask to the outside of the mask.						
Sample A						
Observations:						
Specimens	:	1	2	3	4	5
Test Results (mmH_2O/cm^2)	:	5.07	4.83	4.69	5.77	4.96
Average Test Results ($mmH2O/cm^2$)	:	5.06				
Requirement	:	<6 mmH_2O/cm^2				
Conclusion	:	PASS				
Note: The test requirement is taken as per ASTM F2100 – 19, Level 2 Barrier						

Synthetic Blood Penetration Test

1. Purpose
For evaluation of resistance of masks to penetration by a fixed volume of synthetic blood at a high velocity.

2.Sample description was given by client
Sample description: Norco 4-Ply Disposable Face Mask
Specification: As per ASTM F2100-19
Lot Number: /
Sample Receiving Date: 2021-04-21

3.Test Method
ASTM F1862 /ASTM F1862M-2017

4. Apparatus and materials
4.1 Synthetic blood
4.2 Tensiometer
4.3 Synthetic blood penetration test apparatus
4.4 Targeting plate
4.5 Air pressure source
4.6 Ruler
4.7 Balance
4.8 Controlled temperature and humidity chamber.

5.Test specimen
5.1 Total 32 test specimens are taken for testing.
5.2 Prior to testing, condition all test specimens for a minimum of 4h at (21±5)°C and (85±5) % relative humidity. Test specimens within 1 min of removal from the conditioning chamber, or alternatively keep conditioned specimens in a portable, closed container with an atmosphere representative of the specified conditioning environment prior to testing. For Test conditions is being followed during the study i.e. (19 to 23)°C Temp. and (61 to 69)% relative humidity.
5.3 Testing has been performed with the submitted sample with good laboratory practices.

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6.Procedure

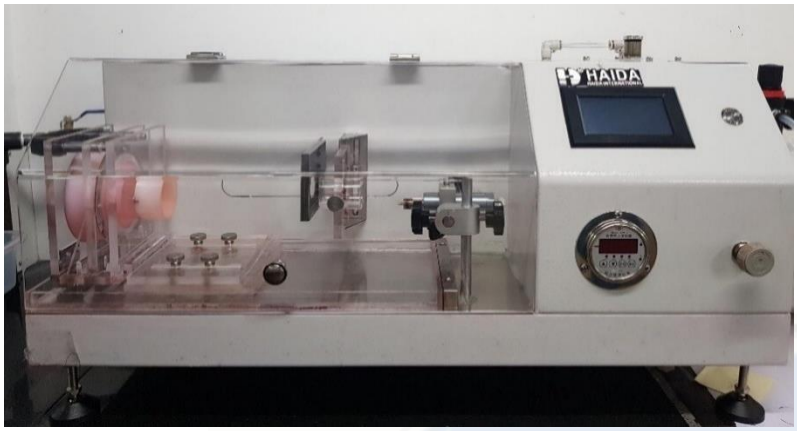
6.1 Prepare the synthetic blood of surface tension measuring(40 ± 5 dyn/cm) for the test.
6.2 Determine the density of the synthetic blood.
6.3 Fill the reservoir with new synthetic blood.
6.4 Position the test specimen 30.5 cm (12 in.) from the exit of the canula.
6.5 Set the reservoir pressure to the approximate pressure.
6.6 Place the targeting plate approximately 1 cm away from the mask.
6.7 Set the valve timer to 0.5 s. Collect and weigh the amount of fluid delivered (before the targeting hole).
6.8 Set the valve timer to 1.5 s. Collect and weigh the amount of fluid delivered (before the targeting hole).
6.9 Calculate the difference in weight of the two spurts. For a test fluid with a specific gravity of 1.005, Table 1 gives the target difference in weight plus lower and upper limits for a velocity range within 2% of the target.

Table 1 Target weight difference

Fluid Pressure (mmHg)	Weight difference for 1s difference in spurt duration (g)		
	Min.	Target	Max.
80	2.456	2.506	2.556
120	**3.002**	**3.063**	**3.124**
160	3.466	3.537	3.607

6.10 Adjust the reservoir pressure and repeat steps 6.7 to 6.9 until the weight difference is within the target range.
6.11 Record the weight difference for the spurts exiting the nozzle.
6.12 Record the pressure in the reservoir.
6.13 Set the valve time to 0.5 s. Collect and weigh the amount of fluid passing through the targeting hole.
6.14 Set the valve time to 1.5 s. Collect and weigh the amount of fluid passing through the targeting hole.
6.15 The difference in weight between the 0.5 s and 1.5 s spurts through the targeting plate shall be within +2% ~ -5% of the difference in weight from the nozzle.
6.16 If the differential weight is less than 95 % of the weight difference exiting the nozzle, check the aim of the stream to make sure it is passing cleanly through the targeting hole.
6.17 If the differential weight is more than 102 % of the weight difference exiting the nozzle, repeat the weight measurements exiting the nozzle (steps 6.7 to 6.11).
6.18 For standard synthetic blood, the timer duration can be estimated using the formula:
(p is the density of the test fluid.) t = 0.5 + (2× p - g at 0.5 s) / (g at 1.5 s - g at 0.5 s). Adjust the timer duration until 2 mL of fluid passes through the hole for three spurts in a row. For a test fluid with a density of 1.005 g/cm3, the output shall weigh 2.01 ± 0.04 g for each individual spurt.
6.19 Record the timer setting to use as the starting point for subsequent testing.
6.20 Mount a test specimen on the specimen holding fixture. If the mask contains pleats, spread the pleats out when mounting the mask onto the fixture to present a single layer of material as the target area.
6.21 Squirt the synthetic blood onto the test specimen for the calculated time. Ensure that the synthetic blood hits the target area of mask.
6.22 Inspect the inside surface for synthetic blood penetration within 10 s of squirting the synthetic blood against the target area. After every 16 specimens, ensure that the test apparatus is delivering 2 mL of synthetic blood by collecting and weighing the output passing through the targeting hole. If the delivered output has shifted by more than 0.04 g (2 %), repeat the calibration procedure.
6.23 Report the results (none / penetration) for each test specimen at the test pressure.

Apparatus photo:



3. Synthetic blood penetration (Splash resistance test): (ASTM F1862/F1862M − 17)

Test Condition: The pre conditioned atmosphere maintained before the testing i.e. (16 to 26)°C Temp. and 80 to 90)% relative humidity. Test specimens within 1 min of removal from the conditioning chamber, or alternatively keep conditioned specimens in a portable, closed container with an atmosphere representative of the specified conditioning environment prior to testing. For Test conditions is being followed during the study i.e. (19 to 23)°C Temp. and (61 to 69)% relative humidity.
Fluid Pressure: 120 mmHg

Observations:

Specimens	:	1	2	3	4	5	6	7	8
Test Results	:	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Specimens		9	10	11	12	13	14	15	16
Test Results		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Specimens		17	18	19	20	21	22	23	24
Test Results		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Specimens		25	26	27	28	29	30	31	32
Test Results		Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Final Test Result	:	32 Specimens are Passing out of 32 Specimens							
Requirement	:	Minimum 29 specimens pass out of 32 specimens tested							
Conclusion	:	PASS							

Note:1. The test requirement is taken as per ASTM F2100 – 19, Level 2 Barrier
2. No deviation is done in test procedure.

South Asia

Submicron Particulate Filtration Efficiency Test

1. Purpose
This test method establishes procedures for measuring the initial particle filtration efficiency of materials used in medical facemasks using monodispersed aerosols.

2. Sample description was given by client
Sample description: Norco 4-Ply Disposable Face Mask
Specification: As per ASTM F2100-19
Lot Number: /
Sample Receiving Date: 2021-04-21

3. Test Method
According to ASTM F2299/ASTM F2299M − 03 (Reapproved 2017)

4. Apparatus and materials
4.1 Clean, dry compressed air supply,
4.2 HEPA filters (2),
4.3 Aerosol generator,
4.4 Charge neutralizer,
4.5 Humidifier,
4.6 Test filter holder and duct assembly,
4.7 Pressure drop measuring device,
4.8 Air flow rate measuring device,
4.9 Temperature and relative humidity detectors,
4.10 Air blower (optional for negative pressure system),
4.11 Optical particle counters.

5. Test Specimen
5.1 Total 5 mask samples are taken for testing.
5.2 Mask samples for testing are provided in the original primary packaging.
5.3 The pre conditioned atmosphere maintained before the testing i.e. (18 to 24)℃ Temp. and (30 to 50)% relative humidity. For Test conditions is being followed during the study i.e. (19 to 23)℃ Temp. and (61 to 69)% relative humidity
5.4 Testing has been performed with the submitted sample with good laboratory practices.

6. Procedure
6.1 Set main airflow, dilution airflow, and aerosol generator airflow to test conditions, Purge main airflow for 10 to 15 min,Warm up optical particle counter (OPC) for 15 to 30 min,
6.2 Switch the OPC into the main airflow and balance OPC airflow against the main airflow. Observe OPC count data.
6.3 Aerosol Drying Verification:
6.3.1 Set up the aerosol generator with a nominal volume of the distilled water to be used in the latex dilutions.
6.3.2 Without a material specimen in the test system, establish the main system airflow and the OPC sampling airflow for the upstream sampling probe. Usable Tested Area = 63.62 cm2, Flow Rate = 100 cm3/sec (6 L/min), Face Velocity = 1.57 cm/sec.
6.3.3 Sample the upstream and downstream airflow for 1 min each particles used were neutralized prior to test..
6.3.4 Verify complete drying of the aerosol droplets by comparing these counts to counts
6.3.5 Record the relative humidity and the temperature of the airflow.
6.3.6 Run this drying test for approximately 1 h, sampling every 15 min for upstream and downstream counting and record aerosol stability and system relative humidity. Measure the water consumption of the aerosol generator.
6.3.7 Record any dilution airflow and the required air pressure for the aerosol generator.
6.4 Aerosol Stability and Zero Efficiency Check:
6.4.1 Fill the aerosol generator with the desired dilution of latex suspension, Without a filter media sample in the test system, close the system and establish the required system airflows.

6.4.2 Stabilize the system airflow with the aerosol suspension for approximately 5 min, then begin successive 1-min upstream and downstream counts for 15 min or until reproducible counts are established
6.4.3 Verify that counting is within a 10 % coincidence of the OPC.
6.5 Efficiency Test:
6.5.1 Install the material specimen in the test system and re-establish the required airflows.
6.5.2 Monitor the OPC airflow and adjust for the added material specimen P on the sample flow.
6.5.3 Record the temperature, the relative humidity of the test airflow, and the P of the filter media.
6.5.4 Sample and record the upstream and downstream aerosol counts for a minimum of five counts at each position using a 1-min sampling time.

7. Aerosol Filtration
7.1 Efficiency% for specific particle size= [1-Average downstream counts/Average upstream counts]x 100
Apparatus photo:

4. Sub-micron Particulate Filtration Efficiency: (ASTM F2299/F2299M − 03 (Reapproved 2017)							
Test Condition: The pre conditioned atmosphere maintained before the testing i.e. (18 to 24)°C Temp. and (30 to 50)% relative humidity. Test conditions is being followed during the study i.e. (19 to 23)°C Temp. and (61 to 69)% relative humidity. Particle used:0.1 micron polystyrene latex, Tested Area = 63.62 cm2, Flow Rate = 100 cm3/sec (6 L/min), Face Velocity = 1.57 cm/sec. particle is neutralized.							
Sample A							
Observations:							
Specimens	:	1	2	3	4	5	Average
Upstream Particle Count (A)	:	294903	309648	318495	289005	280158	298441.8
Background Particle Count (B)	:	2108	2108	2108	2108	2108	2108
% of Background Particle Count, (B/A)*100	:	0.7	0.7	0.7	0.7	0.8	0.7
Downstream Particle Count (C)	:	5247	5614	5457	5273	4853	5289
ΔP (Pressure drop), kPa	:	0.044	0.040	0.041	0.039	0.044	0.042
Particle Filtration Efficiency (%),[(1-C/A)*100]	:	98.2	98.2	98.3	98.2	98.3	98.2
Requirement	:	>=98%					
Conclusion	:	PASS					
Note: The test requirement is taken as per ASTM F2100 – 19, Level 2 Barrier							

Standard for the Flammability of Clothing Textiles-16 CFR Part 1610

1. Purpose
The purpose of this standard is to reduce danger of injury and loss of life by

- standard methods of testing and rating the flammability of textiles and textile products for clothing use
- prohibiting the use of any dangerously flammable clothing textiles.

2. Sample description was given by client
Sample description: Norco 4-Ply Disposable Face Mask
Specification: As per ASTM F2100-19
Lot Number: /
Sample Receiving Date: 2021-04-21

3. Test Method
Standard for the Flammability of Clothing Textiles-16 CFR Part 1610

4. Apparatus and materials

1. Automatic washing machine and dryer
2. Ballast for dry cleaning
3. Ballast for laundering
4. Brushing device
5. Butane, chemically pure
6. Circulating ovens
7. Commercial dry cleaning machine
8. Desiccant
9. Desiccator
10. Dry cleaning solvent and detergent
11. Flame measuring device
12. Flow control device (may be part of test chamber)
13. Gloves, insulated
14. High vacuum grease to seal desiccator
15. Laundering detergent
16. Regulator
17. Scale
18. Specimen holders and clips
19. Specimen holding rack
20. Specimen preparation materials such as scissors, marking pens, and tape
21. Specimen template, 50 by 150 mm (2 by 6 in)
22. Stop thread, No. 50, white, mercerized 100% cotton sewing thread
23. Test chamber (which includes chamber structure, specimen rack, specimen holder, indicator finger, ignition mechanism, timing device, draft ventilator strip, stop weight [30.0 ± 0.5 g], thread guides and door)
24. Thermometer or thermocouple
25. Timer

5. Test specimen

5.1 Test preliminary specimens to determine the fastest burning area and direction of the fabric.
5.2 The specimens should be cut from the most flammable area and direction of the sample. Specimens should be cut in the warp/long direction if there is no difference in the results of the preliminary trials.
Cut five specimens with dimensions 50 by 150 mm (2 by 6 in) with the long dimension in the direction with the fastest burn time as determined during the preliminary trials, take a total of 5 test specimens.
5.3 Prior to testing,105 ± 3 °C (221 ± 5 °F) for 30 ± 2 minutes
5.4Testing has been performed with the submitted sample with good laboratory practices.

6. Procedure

6.1 After 30 minutes, remove the specimen holding rack from the oven using insulated gloves.
6.2 Place the specimen holding rack in a desiccator to cool
6. Refurbishment of a sample required if preliminary classification is either Class 1 or 2 in the Original State test.
6.4 Perform dry-cleaning process and one laundering of the sample following the AATCC Test Method 124-2006, Appearance of Fabrics after Repeated Home Laundering.
6.5 Before testing, ensure that the flame impingement timer is set to 1.0 s.
6.6 Turn on gas supply to the test chamber and allow air to be displaced from the supply line. Use the flow control device to set the flow of butane to the igniter. Once gas is supplied to the igniter, light the igniter.
6.6 Once the flow has stabilized adjust the flame length so that the test flame is 16 mm (5/8 in The fume hood should be turned off before testing begins.
6.7 Remove a mounted specimen from the desiccator.
6.8 Place the mounted specimen on the specimen rack in the test chamber.
6.9 Adjust the specimen rack so that the indicator finger just touches the surface of the specimen.
6.10 Pull the stop thread through the guides of the specimen holder and test chamber.
6.11 Attach the stop weight to the thread just below the stop weight thread guide.
6.12 Set the timing device to zero.
6.13 Close the door of the test chamber
6.14 Activate the trigger device so that the flame impinges on the specimen for 1.0 s. The timing device starts automatically.
6.15 At the end of the test, there will be either A burn time or No burn time
6.16 Record the burn time from the timing device as well as any visual observations using the prescribed test result codes, If there is no burn time, record any visual observations using the test codes.
6.17 Test five specimens. Determine the average burn time. For raised surface fabrics, determine the type of burn using the test result codes. Use the appropriate Test Sequence flow chart in section 13 as per method. Test Result Codes and Sequence of this laboratory manual to determine the next step in testing.
6.18 Follow same procedure after Refurbished specimen 6.5 to 6.18.
6.19 TEST CODES AND SEQUENCE: Use the test results (time in seconds) and test observations to determine the test result code from the tables below. Use the appropriate test result code for each specimen in the test report.
For plain surface fabrics, choose between the three codes Note that no time is reported for codes DNI or IBE.
For raised surface fabrics, choose between the eight codes. Note that no time is reported for codes SF uc, SF pw, or SF poi.

7. Calculation

Calculate average burn time and code in original state and refurbishment and classify based on classification:

Table 7. Sample Classifications

Classification	Plain Surface	Raised Fiber Surface[5]
Class 1	Average burn time ≥ 3.5 s	Average burn time > 7.0 s OR Average burn time is 0-7 s with no base burns (SFBB)
Class 2	N/A	Average burn time is 4-7 s with base burn (SFBB)
Class 3	Average burn time < 3.5 s	Average burn time < 4.0 s with base burn (SFBB)

Apparatus photo:

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5.0 FLAMMABILITY*:
16 CFR 1610

Sample A -Upper				
Fabric Surface: Plain				
Preliminary Testing: Original: Lengthwise;				
	Original state		After Refurbishing	
	Flame spread(sec.)	Burn Code	Flame spread(sec.)	Burn Code
(1)	-	IBE	-	-
(2)	-	IBE	-	-
(3)	-	IBE	-	-
(4)	-	IBE	-	-
(5)	-	IBE	-	-
Average	-	-	-	-
(6)	-	-	-	-
(7)	-	-	-	-
(8)	-	-	-	-
(9)	-	-	-	-
(10)	-	-	-	-
Average	-	-	-	-
Flammability Classification: **Class 1**				
Refurbishing	N/A			
Remark:	**Class 1** - Normal Flammability Textiles meeting these requirements are generally accepted by the trade as having no unusual burning characteristics. Class 2 - Intermediate Flammability Textiles meeting these requirements are recognized by the trade as having flammability characteristics between normal and rapid and intense burning. Class 3 - Rapid and intense Burning Such textiles are considered dangerously flammable and recognized by the trade as being unsuitable for clothing because of their rapid and intense burning. IBE=Ignited but extinguished *IBE=Ignited but extinguished, denotes a burn that goes under the cord without breaking the cord - - Sec =Actual Burn Time Measured and Recorded by timing device DNI=Did not ignite BB = Base burns. SFuc = Surface flash under the code but does not break the cord. SFpw = Surface flash, part way SFpoi = Surface flash at point of impingement only. SFonly = Time in second, surface flash only. SFBB = Time in seconds, surface flash base burn. SFBBpoi = Time in seconds, surface flash base burn starting at the point of impingement.			

Note: 1. Test after refurbishing is not applicable as per clause 16CFR 1610.35(a)(2)
2. The test requirement is taken as per ASTM F2100 – 19, Level 2 Barrier
Remarks:
* The test is under the scope of ISO 17025 accreditation.

========== END OF REPORT ==========

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