

**Prepared For:**

**Date:** 4.27.2020  
**Project Number:**

**Product(s) Tested:**

**Evaluation of medical gowns per ANSI/AAMI PB70 (AATCC TM-127-2018) and ASTM D6701.**



**Figure 1. Medical gown materials as received**

**ANSI/AAMI PB70 Requirements:**

American National Standards Institute (ANSI) and the Association of the Advancement of Medical Instrumentation (AAMI): ANSI/AAMI PB70:2003 describes liquid barrier performance and classification of protective apparel and drapes intended for use in health care facilities.

**ASTM F1868** – sweating hotplate approach to measure the thermal resistance, also evaporative resistance (attached) for textiles. This method also considers the wind effect (environmental factors).

**Table 1—Classification of barrier performance of surgical gowns, isolation gowns, other protective apparel, surgical drapes, and drape accessories**

Level	Test	Result	AQL requirement (Alpha=.05)	RQL requirement (Beta = 0.10)
1	AATCC 42	≤ 4.5 g	4 %	20 %
2	AATCC 42: AATCC 127	≤ 1.0 g ≥ 20 cm	4 % 4 %	20 %
3	AATCC 42 AATCC 127	≤ 1.0 g ≥ 50 cm	4 % 4 %	20 %
4	ASTM F1671 (surgical gowns, isolation gowns and other protective apparel) ASTM F1670 (surgical drapes and drape accessories)	Pass Pass	4 % 4 %	20 % 20 %

1. Blotter paper used with the AATCC method must meet the specifications provided in section 5.2.1.2 of this standard.

**Standard Test Method:**

**Water Resistance: Hydrostatic Pressure Test per AATC TM-127-2018**

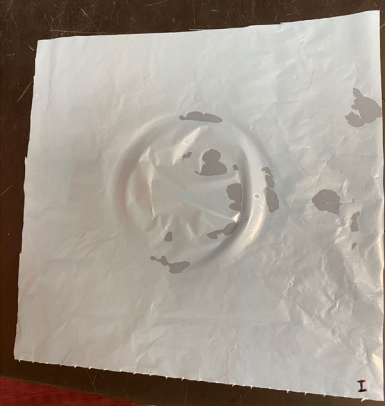
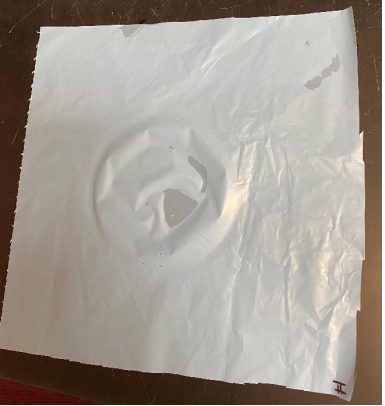

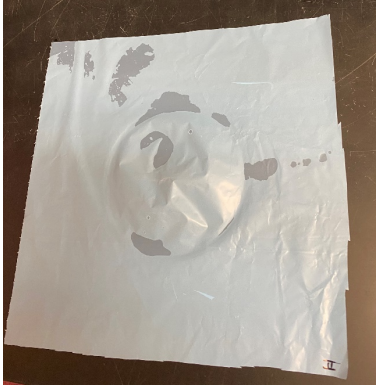
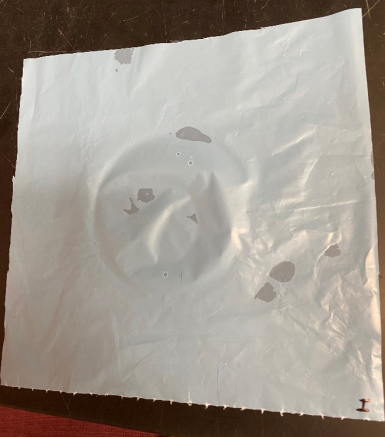

The hydrostatic pressure test was investigated according to AATCC TM-127-2018 (AATCC, 2018), with three specimens per sample evaluated. The test was conducted using the Hydro II® Portable Hydrostatic Pressure Tester, with the pressure of 60 mbar set using a diaphragm. All specimens resisted the pressure applied, not displaying any failure during an evaluation time of one minute for Levels 1, 2, and 3 per Table 2. Table 3 shows the pictures of each specimen after testing.

**Table 2: Results of Hydrostatic Pressure Test**

Sample	Method	Level Threshold	Results	
2.0 mil	AATCC 127/ANSI/AAMI PB 70 Standard	Level 1	Pass	> 60 mbar
2.0 mil	AATCC 127/ANSI/AAMI PB 70 Standard	Level 2	Pass	> 60 mbar
2.0 mil	AATCC 127/ANSI/AAMI PB 70 Standard	Level 3	Pass	> 60 mbar

Sample	Method	Level Threshold	Results	
1.5	AATCC 127/ANSI/AAMI PB 70 Standard	Level 1	Pass	> 60 mbar
1.5	AATCC 127/ANSI/AAMI PB 70 Standard	Level 2	Pass	> 60 mbar
1.5	AATCC 127/ANSI/AAMI PB 70 Standard	Level 3	Pass	> 60 mbar

**Table 3. Specimens after the Hydrostatic Pressure Test**

Specimen / Sample	1.5 mil	2.0 mil
1		
2		
3		

**References:**

AATCC. TM 127-2018, Water Resistance: Hydrostatic Pressure Test. Research Triangle Park, NC: American Association of Textile Chemists and Colorists; 2018.

ASTM D6701-16, Standard Test Method for Determining Water Vapor Transmission Rates Through Nonwoven and Plastic Barriers, ASTM International, West Conshohocken, PA, 2016.

## Standard Test Method:

ASTM F1868-17 Standard Test Method for Thermal and Evaporative Resistance of Clothing Materials Using a Sweating Hot Plate (Part C)

Test Conditions: Sweating guarded hotplate temperature  $35\pm 0.1^{\circ}\text{C}$ , ambient temperature  $25\pm 0.5^{\circ}\text{C}$ , RH  $65\pm 2\%$ , air velocity  $1\pm 0.1\text{m/s}$ .

## Results:

Table 3. Average values of tested and calculated items

Sample	Rct ( $^{\circ}\text{C}\cdot\text{m}^2/\text{W}$ ),	Ret ( $\text{Pa}\cdot\text{m}^2/\text{W}$ )	Rcf ( $^{\circ}\text{C}\cdot\text{m}^2/\text{W}$ )	Ref ( $\text{Pa}\cdot\text{m}^2/\text{W}$ )	THL ( $\text{W}/\text{m}^2$ )
1.5	0.0788	315.40	0.0029	309.90	244.5
2.0	0.0784	321.86	0.0025	316.36	246.6

### Note:

**Rct** ( $^{\circ}\text{C}\cdot\text{m}^2/\text{W}$ ), total thermal insulation of sweating guarded hotplate, material, and boundary air.

**Ret** ( $\text{Pa}\cdot\text{m}^2/\text{W}$ ), total evaporative resistance of sweating guarded hotplate, material, and boundary air.

**Rcf** ( $^{\circ}\text{C}\cdot\text{m}^2/\text{W}$ ), intrinsic thermal insulation of the material only.

**Ref** ( $\text{Pa}\cdot\text{m}^2/\text{W}$ ), intrinsic evaporative resistance of the material only.

**THL** ( $\text{W}/\text{m}^2$ ), the total heat loss (THL) predicted with **Rct** and **Ret** in a  $25^{\circ}\text{C}$ , 65% RH environment.



Figure 3. Samples as tested

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