

Glossary of Terms

(PFE) PARTICLE FILTRATION EFFICIENCY

Measures the filtration efficiency of a face mask against small particles, usually 0.1 micron. Latex particles are aerosolized, dried, and passed through the test samples. Control counts are performed, without a test sample in the system. The filtration efficiency is calculated by comparing the results of the test samples to the results of the control counts. Reference ASTM F 2299-03. A face mask is considered to be sub-micron filtering if PFE is greater than or equal to 98% as referenced in ASTM F 2100-03a.³

(BFE IN VITRO) BACTERIAL FILTRATION EFFICIENCY

Used to determine the bacterial filtration efficiency (BFE) of various filtration materials. This test employs a ratio of the bacterial challenge counts to sample effluent counts to determine the percent bacterial filtration efficiency (%BFE). The test procedure allows a reproducible bacterial challenge to be delivered to test materials. This test is based on ASTM F 2101-01, and provides a standard procedure for comparison of filtration materials.

(BFE IN VIVO) MODIFIED GREENE AND VESLEY BACTERIAL FILTRATION EFFICIENCY

Provides a practical method of in vivo (wearing) testing of surgical face masks while maintaining a controlled environment. This technique evaluates the bacterial filtration efficiency of face masks. The method employs a quantitative measurement using an Andersen Sampler to determine the effectiveness of the mask at containing microorganisms.

(ΔP) DIFFERENTIAL PRESSURE

Determines the air exchange differential of porous materials. This technique employs a water manometer differential upstream and downstream of the test material at a constant flow rate.

(ASTM F 1862-00a) FACE MASK FLUID RESISTANCE TESTING

Developed to simulate a challenge to the fluid splash resistance of a face mask under conditions similar to actual use. During this test, face masks are insulted with synthetic blood, and graded as a pass or fail. The masks are evaluated at three pressures, 80, 120, and 160. The higher the pressure at which a mask passes, the greater the fluid splash resistance.

N95 FILTER CERTIFICATION TEST

NIOSH required test for N95 respirators that measures filter efficiency and penetration of a 0.3 μ m sodium chloride particle aerosolized at a flow rate of 85 liters per minute at 95% filtration efficiency. OSHA requires that all respirators be properly fit tested using a quantitative or qualitative fit test when initially assigned to a user, and periodically thereafter.

¹ Modified Greene & Vesley.

² These products meet the NIOSH required sodium chloride test with 0.3 μ m particles at 95% filtration efficiency.

³ ASTM F2100-03a p.2 Table 1

Note: The preceding results for PFE, BFE and ΔP are averages based upon testing of representative samples selected randomly from production. ASTM 1862-00a results are based on the highest pressure for which the samples demonstrate an acceptable quality level (AQL) of 4.0.

Fluid Resistance Testing of Medical Face Masks (ASTM F 1862-00a)

In 1998, ASTM published the first standard test method specifically addressing the protection provided by a face mask against a blood splash to the wearer's face. The current title of this standard is: Standard Test Method for Resistance of Medical Face Masks to Penetration by Synthetic Blood (Horizontal Protection of Fixed Volume at a Known Velocity), ASTM F 1862-00a. This procedure was developed to simulate a challenge to the fluid splash resistance of a face mask under conditions similar to actual use.

In this test, a mask is first conditioned at high humidity (85% RH) for four hours, and then placed on a convex fixture simulating a human face. A 2mL spray of synthetic blood reagent is then projected horizontally at a controlled velocity from 12 inches away to strike the outer surface of the face mask at a normal (90°) angle. The velocity is set to simulate a discharge from a punctured blood vessel under a given blood pressure.⁴ If any blood is visible on the inside of the mask after the spray is delivered, then that mask sample has failed the test at that blood pressure.

Masks are evaluated at three pressures: 80, 120, and 160 mm Hg⁵. The goal of the test is to determine the highest blood pressure at which confidence can be established that the face mask will provide fluid resistance. Masks are evaluated in sample sets of 32. At least 29 of 32 samples must pass the test for the mask to pass at the given blood pressure⁶.

The result of this test will be a blood pressure rating in millimeters of mercury which is the highest blood pressure at which the face mask has demonstrated reliable fluid resistance. This information can then be used to determine which mask is appropriate for a given procedure based on the expected threat of blood splash to a wearer's face.

This test method is incorporated into ASTM F 2100-03a, *Performance of Materials Used in Medical Face Masks*, where the Fluid Resistant category (the highest level of performance in this standard) has a 120 mm Hg requirement.

⁴ Bernoulli's equation is used to calculate the stream velocity which would occur for a puncture at a given blood pressure. Direct measurement of volume per unit time is used to establish velocity.

⁵ Average normal systolic blood pressure is 120 mm Hg.

⁶ This sampling is based on ANSI/ASQC sampling plans. Other sampling plans may be used when appropriate.



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KIMBERLY-CLARK* Face Masks

TECHNICAL DOCUMENTATION

Standard Masks

Surgical Masks

CODE	DESCRIPTION	PFE (0.1 µm)	BFE (3 µm)	ΔP (mm H ₂ O/cm ²)
47500	SOFT TOUCH* II SURGICAL MASK (Pleat-Style with Horizontal Ties, Blue)	≥ 97%	≥ 96%	< 1.5
48100	THE LITE ONE* SURGICAL MASK (Pleat-Style with Ties, Blue)	≥ 97%	≥ 96%	< 1.5
48105	THE LITE ONE* SURGICAL MASK (Pleat-Style with Ties, Green)	≥ 97%	≥ 96%	< 1.5
62367	THE LITE ONE* SURGICAL MASK (Pleat-Style with Ties, White)	≥ 97%	≥ 96%	< 1.5
48201	CLASSIC* SURGICAL MASK (Pleat-Style with Ties, Blue)	≥ 97%	≥ 96%	< 2.0
62369	CLASSIC* SURGICAL MASK (Pleat-Style with Ties, Green)	≥ 97%	≥ 96%	< 2.0
48210	NURSES' SURGICAL MASK (Pleat-Style with Ties, Blue)	≥ 97%	≥ 96%	< 2.0
48296	TEDDY BEAR SURGICAL MASK (Pleat-Style with Ties, Pink and Blue Teddy Bear Print)	≥ 97%	≥ 96%	< 1.5
48390	SO SOFT* SURGICAL MASK (Pleat-Style with Ties, White)	≥ 97%	≥ 96%	< 1.5
59928	THE FRIENDLY* SURGICAL MASK (Pleat-Style with Ties, White)	≥ 97%	≥ 96%	< 2.0
37505	FILTERMASK* SURGICAL MASK (Pouch-Style with Ties, Blue)	≥ 97%	≥ 96%	< 3.0
37525	FILTERMASK* SURGICAL MASK (Pouch-Style with Ties, Green)	≥ 97%	≥ 96%	< 3.0
48220	DUCKBILL* SURGICAL MASK (Pouch-Style with Ties, Blue)	≥ 97%	≥ 96%	< 1.5
48225	DUCKBILL* SURGICAL MASK (Pouch-Style with Ties, Green)	≥ 97%	≥ 96%	< 1.5

Procedure Masks

47080	PROCEDURE MASK (Pleat-Style with Earloops, Blue)	≥ 97%	≥ 96%	< 3.0
47085	PROCEDURE MASK (Pleat-Style with Earloops, Green)	≥ 97%	≥ 96%	< 3.0
47090	PROCEDURE MASK (Pleat-Style with Earloops, White)	≥ 97%	≥ 96%	< 3.0
47095	PROCEDURE MASK (Pleat-Style with Earloops, Pink)	≥ 97%	≥ 96%	< 3.0
47117	PROCEDURE MASK (Pleat-Style with Earloops, Yellow)	≥ 97%	≥ 96%	< 3.0
47295	TEDDY BEAR PROCEDURE MASK (Pleat-Style with Earloops, Pink and Blue Teddy Bear Print)	≥ 97%	≥ 96%	< 2.0
62356	THE LITE ONE* PROCEDURE MASK (Pleat-Style with Earloops, Blue)	≥ 97%	≥ 96%	< 1.5
62357	THE LITE ONE* PROCEDURE MASK (Pleat-Style with Earloops, Green)	≥ 97%	≥ 96%	< 1.5
62364	THE LITE ONE* FACE MASK (Pleat-Style with Knitted Headbands, Blue)	≥ 97%	≥ 96%	< 1.5

Cone Masks

00152	CONE MASK (Molded Cone-Style with Headband, Blue)	N/A	≥ 95% ¹	< 0.5
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Specialty Masks

Surgical Masks

CODE	DESCRIPTION	PFE (0.1 µm)	BFE (3 µm)	ΔP (mm H ₂ O/cm ²)
48215	FOG-FREE SURGICAL MASK, FOAM BAND (Pleat-Style with Ties, Green)	≥ 97%	≥ 96%	< 1.5
49210	ANTI-FOG SURGICAL MASK W/ DERMA-TOUCH* TAPE, FILM STRIP (Pleat-Style with Ties, Blue)	≥ 97%	≥ 96%	< 1.5
49214	FOG-FREE SURGICAL MASK, FOAM BAND (Pleat-Style with Ties, Blue)	≥ 97%	≥ 96%	< 1.5
49215	ANTI-FOG SURGICAL MASK W/ DERMA-TOUCH* TAPE, FILM STRIP (Pleat-Style with Ties, Green)	≥ 97%	≥ 96%	< 1.5
49216	DUCKBILL* FOG-FREE SURGICAL MASK, FOAM BAND (Pouch-Style with Ties, Blue)	≥ 97%	≥ 96%	< 1.5
49230	ANTI-FOG SURGICAL MASK, FILM STRIP (Pleat-Style with Ties, Blue)	≥ 97%	≥ 96%	< 2.0
49235	ANTI-FOG SURGICAL MASK, FILM STRIP (Pleat-Style with Ties, Green)	≥ 97%	≥ 96%	< 2.0
49310	ULTI-MASK FOG-FREE SURGICAL MASK, FOAM BAND (Pleat-Style with Ties, White)	≥ 97%	≥ 96%	< 2.0

Procedure Masks

62362	FOG-FREE PROCEDURE MASK, FOAM BAND (Pleat-Style with Earloops, Blue)	≥ 97%	≥ 96%	< 2.0
62363	SO SOFT* FOG-FREE PROCEDURE MASK, FOAM BAND (Pleat-Style with Earloops, White)	≥ 97%	≥ 96%	< 2.0

Other Masks

47625	LAZER* SURGICAL MASK (Pleat-Style with Ties, Silver)	≥ 99%	≥ 99%	< 2.5
47650	LAZER* FOG-FREE SURGICAL MASK, FOAM BAND (Pleat-Style with Ties, Silver)	≥ 99%	≥ 99%	< 2.5
47700	PCM2000* MASK, REGULAR SIZE (Pouch-Style with Polyurethane Headbands, Blue)	≥ 99%	≥ 99%	< 2.0
47717	PCM2000* MASK, REGULAR SIZE (Pouch-Style with Polyurethane Headbands, Yellow)	≥ 99%	≥ 99%	< 2.0

Respirator Masks

CODE	DESCRIPTION	PFE (0.1 µm)	BFE (3 µm)	ΔP (mm H ₂ O/cm ²)	ASTM (80, 120, 160 mm Hg)
46727	FLUIDSHIELD* PFR95* N95 PARTICULATE FILTER RESPIRATOR AND SURGICAL MASK, REGULAR SIZE (Pouch-Style with Polyurethane Headbands, Orange)	≥ 99%	≥ 99%	< 5.0	160
46827	FLUIDSHIELD* PFR95* N95 PARTICULATE FILTER RESPIRATOR AND SURGICAL MASK, SMALL SIZE (Pouch-Style with Polyurethane Headbands, Orange)	≥ 99%	≥ 99%	< 5.5	160
46767	FLUIDSHIELD* PFR95* N95 PARTICULATE FILTER RESPIRATOR WITH SAFETY SEAL AND SURGICAL MASK, REGULAR SIZE (Pouch-Style with Polyurethane Headbands, Orange)	≥ 99%	≥ 99%	< 5.0	160
46867	FLUIDSHIELD* PFR95* N95 PARTICULATE FILTER RESPIRATOR WITH SAFETY SEAL AND SURGICAL MASK, SMALL SIZE (Pouch-Style with Polyurethane Headbands, Orange)	≥ 99%	≥ 99%	< 5.5	160
62126	PFR95* N95 PARTICULATE FILTER RESPIRATOR AND SURGICAL MASK, REGULAR SIZE (Pouch-Style with Polyurethane Headbands, White)	≥ 99%	≥ 99%	< 5.0	N/A
62355	PFR95* N95 PARTICULATE FILTER RESPIRATOR AND SURGICAL MASK, SMALL SIZE (Pouch-Style with Polyurethane Headbands, White)	≥ 99%	≥ 99%	< 5.0	N/A

Fluid Resistant Masks

FLUIDSHIELD* Surgical Masks

CODE	DESCRIPTION	PFE (0.1 µm)	BFE (3 µm)	ΔP (mm H ₂ O/cm ²)	ASTM (80, 120, 160 mm Hg)
48207	FLUIDSHIELD* FOG-FREE SURGICAL MASK, FOAM BAND (Pleat-Style with Ties, Orange)	≥ 99%	≥ 99%	< 3.0	160
48208	FLUIDSHIELD* SURGICAL MASK (Pleat-Style with Ties, Orange)	≥ 99%	≥ 99%	< 3.0	160
48237	FLUIDSHIELD* FOG-FREE SURGICAL MASK W/SPLASHGUARD* VISOR (Pleat-Style with Ties, Orange)	≥ 99%	≥ 99%	< 3.0	160
48247	FLUIDSHIELD* FOG-FREE SURGICAL MASK W/ WRAPAROUND SPLASHGUARD* VISOR, FOAM BAND (Pleat-Style with Ties, Orange)	≥ 99%	≥ 99%	< 3.0	160
48248	FLUIDSHIELD* SURGICAL MASK W/ WRAPAROUND SPLASHGUARD* VISOR (Pleat-Style with Ties, Orange)	≥ 99%	≥ 99%	< 3.0	160
48257	FLUIDSHIELD* FOG-FREE SURGICAL MASK W/ WRAPAROUND TOPGUARD* VISOR, FOAM BAND (Pleat-Style with Ties, Orange)	≥ 99%	≥ 99%	< 3.0	160
48227	FLUIDSHIELD* DUCKBILL* SURGICAL MASK (Pouch-Style with Ties, Orange)	≥ 99%	≥ 99%	< 3.0	160
48228	FLUIDSHIELD* DUCKBILL* SURGICAL MASK W/ WRAPAROUND SPLASHGUARD* VISOR (Pouch-Style with Ties, Orange)	≥ 99%	≥ 99%	< 3.0	160
48297	FLUIDSHIELD* TEDDY BEAR SURGICAL MASK (Pleat-Style with Ties, Pink and Blue Teddy Bear Print)	≥ 99%	≥ 99%	< 2.5	160

FLUIDSHIELD* Procedure Masks

47107	FLUIDSHIELD* FOG-FREE PROCEDURE MASK, FOAM BAND (Pleat-Style with Earloops, Orange)	≥ 99%	≥ 99%	< 2.5	160
47108	FLUIDSHIELD* PROCEDURE MASK (Pleat-Style with Earloops, Orange)	≥ 99%	≥ 99%	< 2.5	160
47137	FLUIDSHIELD* FOG-FREE PROCEDURE MASK W/SPLASHGUARD* VISOR, FOAM BAND (Pleat-Style with Earloops, Orange)	≥ 99%	≥ 99%	< 2.5	160
47147	FLUIDSHIELD* FOG-FREE PROCEDURE MASK W/ WRAPAROUND SPLASHGUARD* VISOR (Pleat-Style with Earloops, Orange)	≥ 99%	≥ 99%	< 2.5	160
47148	FLUIDSHIELD* PROCEDURE MASK W/ WRAPAROUND SPLASHGUARD* VISOR (Pleat-Style with Earloops, Orange)	≥ 99%	≥ 99%	< 2.5	160
47297	FLUIDSHIELD* TEDDY BEAR PROCEDURE MASK (Pleat-Style with Earloops, Pink and Blue Teddy Bear Print)	≥ 99%	≥ 99%	< 2.5	160
47298	FLUIDSHIELD* FOG-FREE TEDDY BEAR PROCEDURE MASK W/ WRAPAROUND SPLASHGUARD* VISOR, FOAM BAND (Pleat-Style with Earloops, Pink and Blue Teddy Bear Print)	≥ 99%	≥ 99%	< 2.5	160
47707	FLUIDSHIELD* PCM2000* MASK, REGULAR SIZE (Pouch-Style with Polyurethane Headbands, Orange)	≥ 99%	≥ 99%	< 2.0	160

The PROTECTOR* Surgical Masks

62113	THE PROTECTOR* FOG-FREE SPLASH RESISTANT SURGICAL MASK, FOAM BAND (Pleat-Style with Ties, Blue/Orange Diamond Print)	≥ 99%	≥ 99%	< 2.5	120
62114	THE PROTECTOR* FOG-FREE SPLASH RESISTANT SURGICAL MASK W/ WRAPAROUND SPLASHGUARD* VISOR, FOAM BAND (Pleat-Style with Ties, Blue/Orange Diamond Print)	≥ 99%	≥ 99%	< 2.5	120

The PROTECTOR* Procedure Masks

62115	THE PROTECTOR* SPLASH RESISTANT PROCEDURE MASK (Pleat-Style with Earloops, Blue)	≥ 99%	≥ 99%	< 2.5	120
62116	THE PROTECTOR* FOG-FREE SPLASH RESISTANT PROCEDURE MASK W/ WRAPAROUND SPLASHGUARD* VISOR, FOAM BAND (Pleat-Style with Earloops, Blue)	≥ 99%	≥ 99%	< 2.5	120