



TECH BULLETIN 200605 DD

BMT VirusGuard Mask & Safety Barrier Filtration Products

Engineered with BMT NanoScreen™ Technology

To support nationwide emergency programs, BMT is maximizing production of our BMT VirusGuard *NanoScreen™* filtration media products. BMT's line of *NanoScreen™* products are critical filtration fabrics on rolls used to produce reusable / washable personal protective safety masks.

And our heavy-duty institutional safety barrier curtain screen is engineered to protect people & employees in the workplace with highly functional *see-through / talk-through* ergonomics, offering a more comfortable & productive human interaction experience as compared to solid plexiglass barrier alternatives.

BMT delivers our PPE filtration fabrics on industrial rolls and we do not manufacture the finished masks and workplace safety barrier screens in frames or mountings. We do receive many inquiries for finished products made with *NanoScreen™* filtration technology and we are happy to connect interested buyers of finished products with authorized BMT partner manufacturers.

ASTM F2100 certification for VFE, BFE and PFE is either noted below or pending.

BMT VirusGuard NanoScreen™ Fabric Type 9001 Standard Grade

- Engineered with *BMT NanoScreen™* Technology
- Multi-use *NanoScreen™* *filtration core fabric* for production of:
 - DISPOSABLE PPE MASKS / For heat-molding or filtration insert layers in nonwoven masks
 - REUSABLE PPE MASKS / For use as the filtration insert layer to upgrade any local fabric mask to a highly functional, reusable mask
- 3-layer / 70 gsm / *NanoScreen™* functional core laminated between 100% polyester fabric
- Suitable for sonic welding / heat molding and print sublimation up to 250 degrees F
- When covered with most fabrics, finished mask is hand-washable with mild soap & warm water / hand rinse / air dry / no machine washing or drying / do not squeeze or scrub
- Finished mask or removable filter is suitable for extended use with proper care
- Standard color = White for fastest lead time / Also available in Black



BMT VirusGuard NanoMask Fabric

Type 9002 Standard Grade

- Engineered with *BMT NanoScreen™* Technology
- Roll-ready for production of finished REUSABLE & WASHABLE PPE safety masks
- For general use / best breathability safety masks for home & lifestyle / office workplace / industrial workplace / aviation / transportation & maritime
- Designed for clients who have cut & fabrication equipment seeking rapid mask production ramp-up
- 5-layer / 335 gsm / Ultrasonically welded & durable 100% polyester exterior fabric
- Suitable for sonic welding / heat molding and print sublimation up to 250 degrees F
- Finished mask is hand-washable with mild soap & warm water / hand rinse / air dry / no machine washing or drying / do not squeeze or scrub
- Finished mask is suitable for extended use with proper care
- Example SKU photo of Type 9002 5-layer fabric in a reusable mask application below
- Color = White/White for fastest delivery / White/Black combos also available +5-7 days

BMT VirusGuard NanoMask Fabric

Type 9004 Advanced Grade

- *ASTM F2101 Certified VFE Viral Filtration Efficiency 99.9%*
- Engineered with *BMT NanoScreen™* Technology
- Our highest performing Viral Filtration Efficiency mask fabric designed to meet the most rigid ASTM VFE compliance standards
- Roll-ready for production of finished REUSABLE & WASHABLE PPE safety masks
- For hospital / healthcare / institutional / academic & educational / government / military / law enforcement / correctional & emergency medical
- Equally suitable for home & lifestyle mask applications / office workplace / industrial workplace / aviation / transportation & maritime
- Designed for clients who have cut & fabrication equipment seeking rapid mask production ramp-up
- 3-layer / 220 gsm / Advanced Grade *NanoScreen™* functional filtration core bonded between 2 exterior fabric layers of durable 100% polyester / ready for final mask fabrication
- Suitable for sonic welding / heat molding and print sublimation up to 250 degrees F
- Finished mask is hand-washable with mild soap & warm water / hand rinse / air dry / no machine washing or drying / do not squeeze or scrub
- Finished mask is suitable for extended use with proper care
- Color = White / Black / or any White + Black combination

BMT VirusGuard Safety Barrier Screen

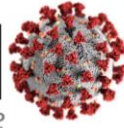
Type 9003 Standard Grade

- Engineered with BMT **NanoScreen™** Technology
 - A heavy-duty / highly durable / puncture resistant **NanoScreen™** product designed for window / door / industrial / institutional / retail & hospitality protection curtains and space separators
 - Has the appearance of a window screen / see-through / talk-through / partial privacy
 - 3-layer / 160 gsm / Inner **NanoScreen™** functional core laminated between heavy-duty exterior screen face fabrics
 - Delivers extremely high puncture resistance of 487 Newtons
 - More than 4 times stronger than conventional aluminum window screen (114 Newtons)
 - Packed on rolls for rapid delivery to any field operation for rapid response cut & mount
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- Can be hung over cubicles or open floorplan workspaces and industrial production line spaces to reduce spread of bacteria, allergens and many airborne droplets that carry a range of virus matter
 - Designed to segment work groups in a grid pattern to control movement of airborne droplets
 - Can be hung from overhead across the center of conference room or office / workspace to segregate space into 2 or more see-through / talk-through safety zones
 - Multiple shipboard maritime applications to segregate work areas while permitting air flow
 - Example: Open workspace = 200 feet x 200 feet; BMT Type 9003 rolls can be field- assembled to required height and mounted in 200-foot assembled lengths to divide the full length of a workspace.
 - Screen can be hung or mounted by employee work teams using heavy-duty duct tape / Gorilla tape / or other improvised field attachment means / doorway entry flaps cut using a box knife
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- BMT VirusGuard **NanoScreen™** Safety Barrier Screen helps protect workspace teams against the spread of many airborne droplets from other workspace teams.
 - Each workspace grid can be numbered & managed to reduce cross-contamination.
 - If any member of a workspace grid team shows symptoms of infection, the entire grid team can be easily quarantined while the other grid teams remain protected, operational & effective
 - BMT can supply pre-assembled custom large / extra-large / jumbo / mega size finished Safety Barrier Curtain in any dimensions per buyer specification / example 300' x 30' gymnasium safety barrier curtain dividers and many other uses.

Even properly fitting masks and the best PPE filtration fabrics do not eliminate the risk of illness or death. BMT VirusGuard NanoScreen™ PPE filtration fabrics are engineered with a patented filtration core designed to defend against respiratory airborne droplets defined as high risk in the range of 5,000-10,000 nanometers by the World Health Organization (WHO) and Centers for Disease Control (CDC). ASTM 2100 barrier testing & certification including VFE Viral Efficiency (ASTM F2101), BFE Bacterial Efficiency (ASTM F2101) and Particulate Efficiency (ASTM F2299 and F2100) as well as breathability (Differential Pressure, Delta P) are either pending or certified as noted above. It is always the responsibility of the end user of BMT VirusGuard NanoScreen™ filtration products to conduct their own testing and certification to ensure compliance with federal, state, and local safety requirements that apply to the final manufactured products.

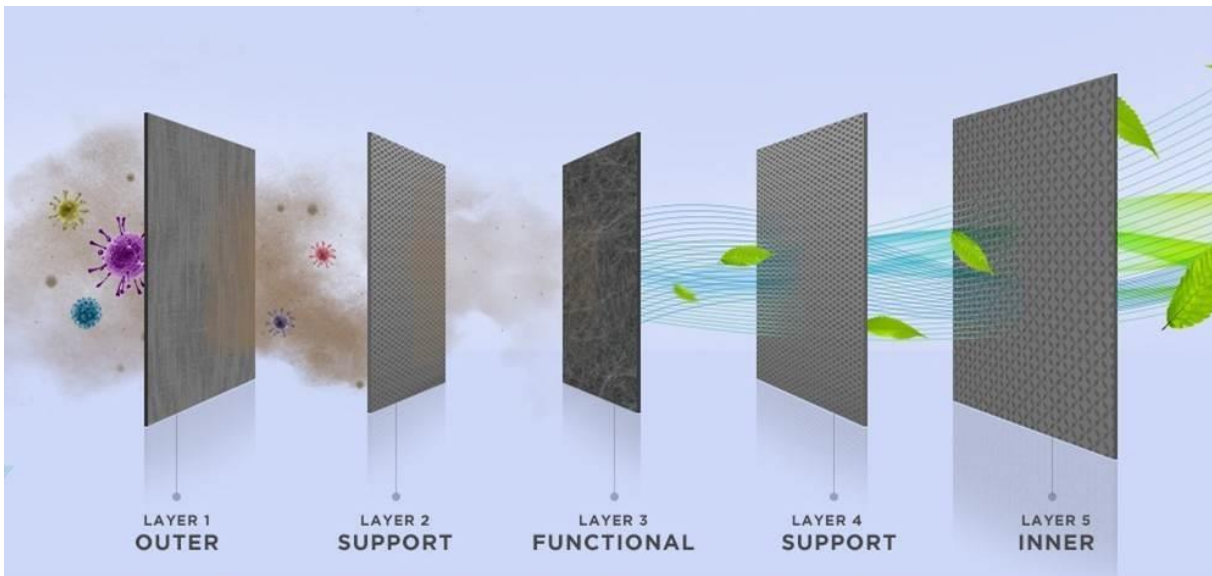
BMT VirusGuard

NanoScreen™ Defense



Type 9002 5-Layer Flex-Fabric Construction

Made with Type 9001 3-Layer NanoScreen™ Functional Core at Center



Sample BMT VirusGuard Reusable Masks & Filter Inserts

Masks Made with 5-Layer Type 9002 NanoMask Fabric

Filter Inserts Made with 3-Layer Type 9001 NanoScreen™ Fabric

NanoScreen™ Functional Core Technology Inside



**Sample Reusable Mask
Type 9002 NanoMask Black**



**Sample Reusable Mask
Type 9002 NanoMask White**



**Sample Changeable Filter Set
Type 9001 NanoScreen™**

TECHNICAL DATA

Coronavirus / COVID-19 is known to spread via touching or airborne droplets that are produced during sneezing or coughing by an infected individual. The critical element that must be blocked is the AIRBORNE DROPLET that carries a virus.

BMT **VirusGuard** filtration products are engineered with BMT **NanoScreen™** technology using advanced nanotechnology filtration design. BMT **VirusGuard** products are high-performing functional filtration fabrics on rolls that are used to produce personal protective safety masks in a range of reusable and disposable styles. And our BMT **VirusGuard** Safety Barrier Screen on rolls delivers safety & protection to personnel in both interior workspace areas and outdoor field operations with the benefit of **see-through / talk-through work team functionality** so critical staff can get the job done while reducing risk of cross-infection from airborne droplets.

- BMT **VirusGuard** blocks or restricts a wide range of airborne droplets carrying virus and bacteria as well as pollen, allergens, fly ash, agricultural & coal dust.
- CDC and WHO define the high risk airborne respiratory droplets that transport most viruses including COVID-19 in a size range of 5,000-10,000 nanometers (*Note 1*) and most are unable to pass through the BMT **VirusGuard** filtration mesh range.
- CDC & public research now suggests that some micro virus nuclei airborne particles can be smaller (*Note 2*) and can pass through most personal protective products, so social distancing remains the most important part of any personal protection strategy (see references).
- High strength 3-layer and 5-layer constructions deliver superior durability and maximum usable life while reducing risk of infection.
- Excellent breathability designed for all-day use and active work and lifestyles
- Multiple functional filtration options designed for a range of reusable & washable safety masks that offer extended use with proper care.
- Suitable for sonic welding as well as heat molding and print sublimation up to 250 degrees F
- Hand-washable with mild soap & warm water / hand rinse / air dry / no machine washing or drying / do not squeeze or scrub to avoid damage to filtration media
- Available in white or any combination of white and black fabric faces
- Made with BMT **NanoScreen™** Technology
- BMT Type 9004 is *ASTM F2101 Certified with VFE Viral Filtration Efficiency 99.9%*. Viral Filtration Efficiency (VFE) testing is conducted in compliance with ASTM F2101 and is executed under Standard Test Protocol STP0007 Rev 16. Testing is performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211, and 820.
- Other BMT Product Types are ASTM 2100 Pending

PARTICLES, MICRONS & NANOMETERS

1 meter = 100 centimeters

1 centimeter = 10 millimeters

1 millimeter = 1000 microns (µm) (also called micrometers)

1 micron (µm) = 1000 nanometers

1 nanometer (nm) = 1000 times smaller than a micron (µm)

1 nanometer (nm) = 1 billionth of a meter

BMT VirusGuard

NanoScreen™ Defense



PRODUCT DATA

BMT CERTIFICATION: BMT VirusGuard pricing is being held at or below 2019 pre-COVID-19 USA price levels. BMT will not tolerate abusive pricing at times of national emergency. Subject to changes in raw materials costs and ocean / land / air freight market movements.

BMT VirusGuard NanoScreen™ Fabric

BMT Type 9001 Standard Grade

Construction = 3-Layer dual-application *NanoScreen™* filtration with 100% polyester exterior

Fabric Weight = 70 gsm

Roll Width = 59"

Roll Length = 50 meters = 164 Linear Feet

Roll Weight = 5.25 kg = 11.57 lbs.

Color = Inside White / Outside White

BMT VirusGuard NanoMask Fabric

BMT Type 9002 Standard Grade

Construction = Type 9001 *NanoScreen™* 3-layer functional core fabric ultrasonically welded between 2 outer face fabrics of durable 100% polyester / ready for final mask fabrication

Fabric Weight = 335 gsm

Roll Width = 59"

Roll Length = 30 meters = 98.4 Linear Feet

Roll Weight = 17.6 kg = 38.8 lbs.

Color = Inside White / Outside White

BMT VirusGuard NanoMask Fabric

BMT Type 9004 Advanced Grade

ASTM F2101 Certified VFE Viral Filtration Efficiency 99.9%

Construction = Advanced Grade *NanoScreen™* functional filtration core bonded between 2 exterior fabric layers of durable 100% polyester / ready for final mask fabrication

Fabric Weight = 220 gsm

Roll Width = 59"

Roll Length = 50 meters = 164 Linear Feet

Roll Weight = 16.5 kg = 36.3 lbs.

Color = Inside White / Outside White

For EXPRESS AIR FREIGHT and BLACK COLOR options please see below

BMT VirusGuard

NanoScreen™ Defense



BMT VirusGuard Safety Barrier Screen

BMT Type 9003 Standard Grade

Construction = 3-Layer heavy duty PVC-coated exterior face with integrated BMT *NanoScreen™* functional filtration core

Screen Weight = 170 GSM

2 Roll Width Options = 47" & 59"

Roll Length = 50 meters = 164 Linear Feet

Roll Weight / 47" Width = 12.4 kg = 27.3 lbs.

Roll Weight / 59" Width = 15.5 kg = 34.2 lbs.

Color = Outside Gray / Inside Black

FOB BMT Warehouse LA / Chicago / Dallas / New York / Lincolnton NC

For pickup approximately 45 days from receipt of PO based on most cost-effective ocean transit

Note that we offer alternative express ocean + land logistics options below.

Payment net 30 days from delivery

Subject to final confirmation by BMT

BLACK COLOR UPCHARGES

1. Base pricing is based on Outside White / Inside White color standard production. BMT recommends both sides white for fastest order turnaround for urgent needs.
2. Note that many clients prefer black color inside face to conceal normal wear stains from contact with mouth & face / lipstick / makeup / moisturizer / etc.
3. BMT Type 9001 is available in either full white or full black. White is most common because 9001 is usually an internal component and not visible unless sold as an accessory filter pack with a fabric mask with filter pocket.
4. BMT Type 9002 & 9004 are available in 4 color combinations as noted below.
 - 4.1. For any combination of black color fabric faces inside or outside or both, add approx. 5 days to shipment turnaround time
 - 4.2. For one face black or 2 faces black, **add \$0.15 per linear foot PER EACH FACE**
 - 4.3. Black Options = black outside face only // black inside face only // or black both side faces
 - 4.4. Example: BMT VirusGuard Type 9002 Black both sides = add \$0.15/LF x 2 faces = \$0.30/LF total Black surcharge on base price.
 - 4.5. Same black color upcharge applies to all BMT fabric types

EXPRESS AIR FREIGHT SURCHARGES

For priority express delivery within approximately 10-14 days from receipt of PO or signed BMT sales contract, please inquire with specific order quantity & colors.

Express air freight delivery is based on cost per kg / not cost per roll carton unit. Cost per kg moves down as total air shipment order weight moves up. Transit time subject to air freight space available.

LAND FREIGHT SURCHARGES

Just-In-Time program door deliveries from nationwide BMT warehouse locations are available under multi-month supply chain contracts. BMT trucking charges subject to delivery destination & program volumes. Close-proximity new warehouse setup is available for major program support.

REFERENCES

- 1, CDC I.B.3.b. Droplet transmission. Ref: Par 2.
<https://www.cdc.gov/infectioncontrol/guidelines/isolation/scientific-review.html>
2. CDC I.B.3.b. Droplet transmission. Ref: Par 2.
<https://www.cdc.gov/infectioncontrol/guidelines/isolation/scientific-review.html>
3. Bourouiba, L. (2020). Turbulent Gas Clouds and Respiratory Pathogen Emissions: Potential Implications for Reducing Transmission of COVID-19. JAMA - Journal of the American Medical Association. American Medical Association.
4. Duguid, J. P. (1946). The size and the duration of air-carriage of respiratory droplets and droplet-nuclei. Journal of Hygiene, 44(6), 471–479.
5. Gralton, J., Tovey, E., McLaws, M. L., & Rawlinson, W. D. (2011, January). The role of particle size in aerosolized pathogen transmission: A review. Journal of Infection.
6. Golberg, D. New York Presbyterian. Assistant Professor of Medicine at Columbia University
https://www.nyp.org/medicalgroups/hudsonvalley/for-patients/healthcare-articles/what-to-know-social-distancing?utm_source=alterian&utm_medium=email&utm_campaign=regional_NYPMG-HV&utm_content=coronavirus-202004&wt.tsrc=email
7. Werner E. Bischoff, Katrina Swett, Iris Leng, Timothy R. Peters, Exposure to Influenza Virus Aerosols During Routine Patient Care, The Journal of Infectious Diseases, Volume 207, Issue 7, 1 April 2013, Pages 1037–1046,
8. van Doremalen, N., Bushmaker, T., Morris, D. H., Holbrook, M. G., Gamble, A., Williamson, B. N., ... Munster, V. J. (2020). Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. New England Journal of Medicine.
9. Gralton, J., & McLaws, M. L. (2010). Protecting healthcare workers from pandemic influenza: N95 or surgical masks? Critical Care Medicine. Lippincott Williams and Wilkins.

REFERENCES, Continued

10. ANNA BAŁAZY, MIKA TOIVOLA, TIINA REPONEN, ALBERT PODGÓRSKI, ANTHONY ZIMMER, SERGEY A. GRINSHPUN, Manikin-Based Performance Evaluation of N95 Filtering-Facepiece Respirators Challenged with Nanoparticles, *The Annals of Occupational Hygiene*, Volume 50, Issue 3, April 2006, Pages 259–269,
11. Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., Tan, W. (2020). A novel coronavirus from patients with pneumonia in China, 2019. *New England Journal of Medicine*, 382(8), 727–733.
12. Langrish, J. P., Mills, N. L., Chan, J. K. K., Leseman, D. L. A. C., Aitken, R. J., Fokkens, P. H. B., ... Jiang, L. (2009). Beneficial cardiovascular effects of reducing exposure to particulate air pollution with a simple facemask. *Particle and Fibre Toxicology*, 6.
13. Nicas, M., Nazaroff, W. W., & Hubbard, A. (2005). Toward understanding the risk of secondary airborne infection: Emission of respirable pathogens. *Journal of Occupational and Environmental Hygiene*, 2(3), 143–154.
14. van der Sande, M., Teunis, P., & Sabel, R. (2008). Professional and home-made face masks reduce exposure to respiratory infections among the general population

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