



## TECH BULLETIN 201119DD

### BMT VirusGuard PPE Mask Fabrics & Safety Barrier Screen

*Engineered with BMT NanoScreen™ Technology*

BMT NanoScreen™ PPE Safety Mask fabrics are functional, high performing filtration fabrics on rolls used to produce reusable / washable personal protective safety masks that balance genuine filtration efficiency with comfortable breathability.

Our heavy-duty institutional Safety Barrier NanoScreen™ fabric on rolls is a heavy-duty screen product designed for production of finished safety barrier screen panels in frames. VirusGuard Safety Barrier NanoScreen™ Panels are engineered to protect people & employees in the workplace with highly functional **see-through / talk-through workplace ergonomics**, that delivers a more comfortable & productive human interaction experience as compared to solid acrylic plexiglass barrier alternatives.

BMT delivers our high-performance PPE filtration products on industrial rolls for processing by our clients. We also coordinate manufacturing of finished PPE masks and Safety Barrier NanoScreen™ Panels in frames with certified & authorized **BMT Strategic Production Partners**.

*ASTM F2100 test data for VFE, BFE and PFE is available 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, washable & reusable mask
- 3-layer / 70 +/- 5 gsm / NanoScreen™ functional core laminated between 100% polyester fabric
- Suitable for ultrasonic welding / heat molding / print sublimation up to 250 F = 121 C
- When covered with most fabrics, finished mask is hand-washable with mild soap & warm water / hand rinse / air dry / do not squeeze or scrub
- Finished mask or removable filter is suitable for extended use with proper care
- Available in White & 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
- 5-layer / 335 +/- 10 gsm / Ultrasonically welded & durable 100% polyester exterior fabric
- Suitable for ultrasonic welding / heat molding / print sublimation up to 250 F = 121 C
- Finished mask is hand-washable with mild soap & warm water / hand rinse / air dry / do not squeeze or scrub. Finished mask is suitable for extended use with proper care
- Available in Black, White and White/Black inside / outside combination

## **BMT VirusGuard NanoMask Fabric**

### **Type 9004 Advanced Grade**

- *ASTM F2100 Tested 99.9% Viral & Bacterial Filtration Efficiency + PFE 97.8%*
- Engineered with *BMT NanoScreen™* Technology
- Our highest performing filtration efficiency mask fabric designed to meet the most rigid standards
- Roll-ready for production of finished REUSABLE & WASHABLE PPE safety masks
- Designed for use where ASTM formal certification is not mandatory but where highest ASTM tested filtration efficiency standards are preferred, including:
  - Non-Front-Line Hospital/Medical/Healthcare support staff
  - Nursing Homes, clinics, and other health care facilities
  - Consumer Personal Choice safety masks
  - Institutional / academic & educational / government / military / law enforcement / correctional & emergency services
  - Home / lifestyle / office / industrial / aviation / transportation & maritime
- 4-layer / 210 +/- 5 gsm / Advanced Grade *NanoScreen™* functional filtration core bonded between durable exterior polyester & interior comfort nylon / ready for direct mask fabrication
- Suitable for ultrasonic welding / heat molding / print sublimation up to 250 F = 121 C
- Finished mask is hand-washable with mild soap & warm water / hand rinse / air dry / do not squeeze or scrub. Finished mask is suitable for extended use with proper care



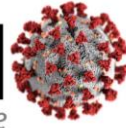
## **BMT VirusGuard Safety Barrier Screen**

### **Type 9003 Standard Grade**

- Engineered with ASTM-Tested BMT *NanoScreen™* Technology
- A heavy-duty / highly durable / puncture resistant *NanoScreen™* product designed for safety barrier screen applications to promote safety and mitigate the transfer of harmful airborne droplets carrying virus & bacteria where people work and socialize
- Engineered to be mounted in contemporary, architectural lightweight frames for use in corporate workspace / institutional / retail / hospitality / leisure / clubs & social gathering venues
- Presents the pleasant appearance of a window screen with excellent air flow
- *See-Through / Talk-Through Functional Workplace Ergonomics* to promote team & social cohesion
  
- 3-layer / 165 +/-5 gsm / Inner *NanoScreen™* Standard Grade 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 metal window screen (114 Newtons)
- Lightweight design of frame-mounted units delivers max flexibility for ceiling-hung / tabletop / freestanding / or mobile Safety Barrier Screen designs for rapid deployment, setup & breakdown.
- Can be packed on rolls for rapid delivery to any field operation for rapid response cut & mount
  
- Can also be hung in 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
- Multiple shipboard maritime & industrial applications to segregate work areas while permitting excellent air flow & ventilation
- Rolls can be emergency-deployed & mounted by employee work teams using heavy-duty duct tape / Gorilla tape / or other improvised field attachment means
- Special orders include 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.

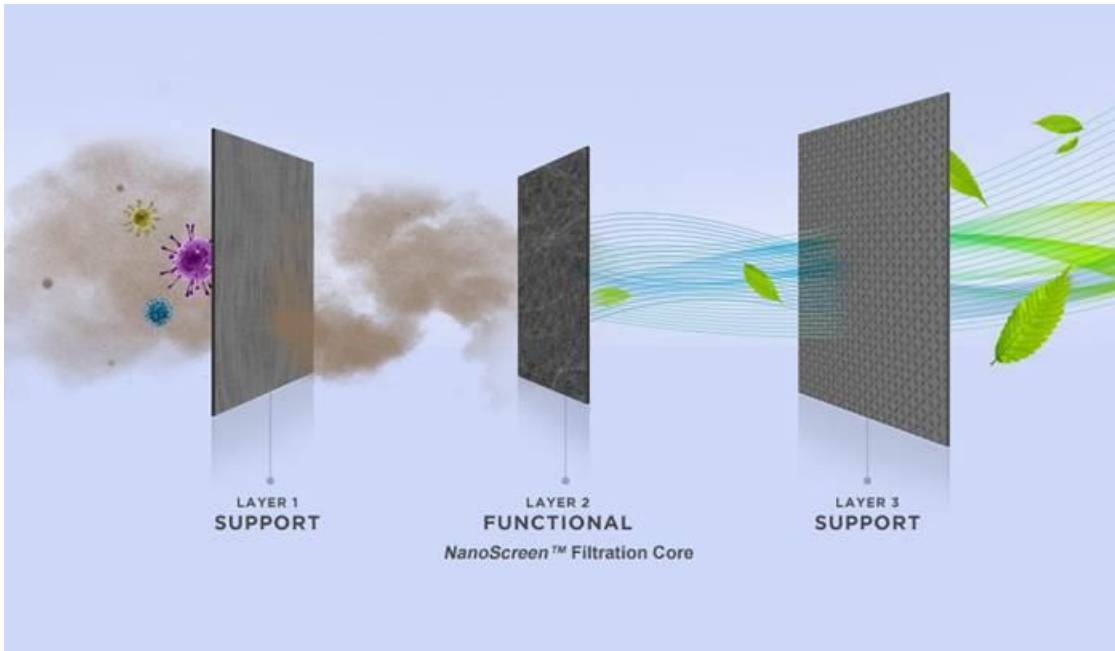
# BMT VirusGuard

NanoScreen™ Defense



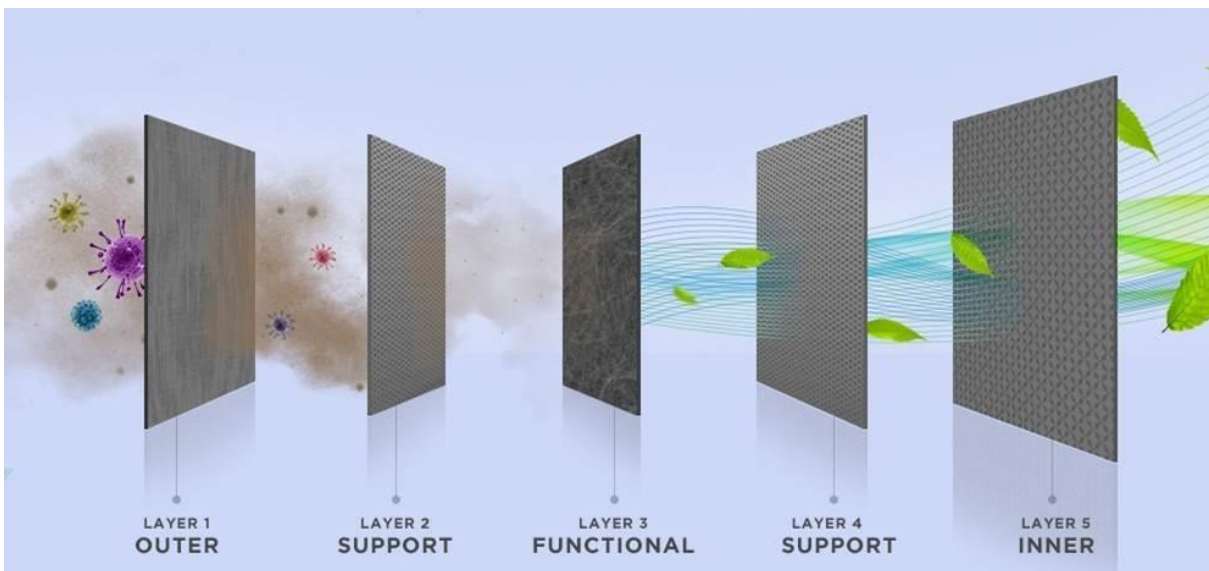
## Type 9001 & 9003 3-Layer Construction

*NanoScreen™ Functional Filtration Core at Center*



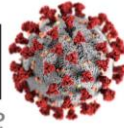
## Type 9002 5-Layer Flex-Fabric Construction

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



# BMT VirusGuard

NanoScreen™ Defense



## 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™ Filtration 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.
- 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
- Engineered with BMT **NanoScreen™** Technology
- ASTM F2100 Tested or Pending Testing in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211, and 820.

## PARTICLES, MICRONS & NANOMETERS

1 meter = 100 centimeters

1 centimeter = 10 millimeters

1 millimeter = 1000 microns ( $\mu\text{m}$ ) (also called micrometers)

1 micron ( $\mu\text{m}$ ) = 1000 nanometers

**1 nanometer (nm) = 1000 times smaller than a micron ( $\mu\text{m}$ )**

1 nanometer (nm) = 1 billionth of a meter



## PRODUCT DATA

### **BMT VirusGuard NanoScreen™ Fabric**

#### **BMT Type 9001 Standard Grade**

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

Fabric Weight = 70 +/- 5 gsm

Roll Width = 58-60" variable due to elastic properties

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 +/- 10 gsm

Roll Width = 58-60" variable due to elastic properties

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**

Construction = 4-layer Advanced Grade *NanoScreen™* functional filtration core bonded between durable exterior polyester & interior comfort nylon

Fabric Weight = 210 +/- 5 gsm

Roll Width = 59"

Roll Length = 50 meters = 164 Linear Feet

Roll Weight = 15.75 kg = 34.7 lbs.

Color = Inside White / Outside White

# BMT VirusGuard

NanoScreen™ Defense



## **BMT VirusGuard Safety Barrier Screen**

### **BMT Type 9003 Standard Grade**

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

Suitable for mounting in frames to fabricate VirusGuard Safety Barrier *NanoScreen™* Panels

Screen Weight = 165 +/- 5 gsm

2 Roll Width Options = 47" & 59"

Roll Length = 50 meters = 164 Linear Feet

Roll Weight / 47" Width = 9.9 kg = 21.8 lbs.

Roll Weight / 59" Width = 12.38 kg = 27.3 lbs.

Color = Outside Gray / Inside Black

Also available with FR Flame Retardant & Anti-Static Performance Properties

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

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.
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. For one face black or 2 faces black, please inquire.

## **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. Urgent priority delivery is available on request.



## REFERENCES

- [https://english.elpais.com/society/2020-10-28/a-room-a-bar-and-a-class-how-the-coronavirus-is-spread-through-the-air.html?ssm=TW\\_CC](https://english.elpais.com/society/2020-10-28/a-room-a-bar-and-a-class-how-the-coronavirus-is-spread-through-the-air.html?ssm=TW_CC)
- CDC I.B.3.b. Droplet transmission. Ref: Par  
2. <https://www.cdc.gov/infectioncontrol/guidelines/isolation/scientific-review.html>
- [CDC recommends that people wear masks in public settings](https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html)  
<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html>
- <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover-guidance.html#evidence-effectiveness>
- <https://www.cdc.gov/media/releases/2020/p0714-americans-to-wear-masks.html>
- 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.
- 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.
- Galton, 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.
- 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>
- 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.
- 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.
- Galton, J., & McLaws, M. L. (2010). Protecting healthcare workers from pandemic influenza: N95 or surgical masks? Critical Care Medicine. Lippincott Williams and Wilkins.
- 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.

## REFERENCES

### Continued

- 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.
- 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.
- 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.
- van der Sande, M., Teunis, P., & Sabel, R. (2008). Professional and home-made face masks reduce exposure to respiratory infections among the general population

*The global COVID-19 situation is fluid and much remains unknown about this virus and its behavior. New research is emerging constantly by the global scientific community. BMT will continue to make every effort to make the most current reference material available on this website.*

*Even properly fitting masks and the best PPE filtration fabrics do not eliminate the risk of illness or death. BMT VirusGuard NanoScreen™ PPE filtration media 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 available on request or pending.*

*BMT VirusGuard™, and Nanoscreen™ products have not been tested to prevent or reduce clinical infection and are not intended to replace N95 or any other filtration media or medical product that must be specifically approved by the FDA for use as medical device or product.*

*It is always the responsibility of the end user of BMT filtration products to conduct independent testing and certification to ensure compliance with federal, state, and local safety requirements that may apply to the final manufactured products.*

*For more information, please visit <https://www.bmtvirusguard.com>*

*End*