MATERIAL SAFETY DATA SHEET (MSDS)

Material Safety Data Sheet (MSDS)
Fortivene® AquaMesh–PX™
Prepared in accordance with 29 CFR 1910.1200 (OSHA HCS), EU REACH Regulation (EC) No. 1907/2006, and GHS Revision 9

Revision Date: 07/01/2025
Version: 1.0
Product Code: GSSG-FA-PX-001

SECTION 1 – IDENTIFICATION

Product Name: Fortivene® AquaMesh–PX™
Product Type: Engineered Electrospun Nanocomposite Filtration Membrane
Intended Use: High-efficiency water purification, nanofiltration, and ion-selective membrane for military, humanitarian, commercial, and industrial filtration systems.
Manufacturer:
Graphene Solid State Group (GSSG)
30 N Gould St STE R, Sheridan, WY 82801
Production Facility: 1349 Lynn Ave, Bethlehem, PA 18015
Telephone Number: +1 (610) 883-8243
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SECTION 2 – HAZARD IDENTIFICATION

GHS Classification (Final Article Form):

Category	Classification	Statement
Physical Hazards	Not classified	Solid polymer composite
Health Hazards	Eye Irritation (Category 2B, dust only)	H320
Environmental	Not classified	Inert, non-soluble

Signal Word: ***Warning***
Hazard Statements:

- H320: Causes eye irritation (only if dust is generated from cutting or grinding).
- H335: May cause respiratory irritation (if fine particles are inhaled).

Precautionary Statements:

- P261: Avoid breathing dust.
- P280: Wear protective gloves/eye protection.
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes.

Other Hazards:

- Thermal decomposition at ≥400°C may release volatile degradation byproducts.
- Dust particles (if generated) may behave as inert nuisance dust.

SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Nature: Proprietary synthetic electrospun matrix containing functionalized carbon nanostructures (graphenic) and a proprietary polymer support structure infused with amphiphilic surface functionalization.

Component	CAS Number	Concentration (%)	Classification
Functionalized Carbon Nanostructures (Graphene-based)	Trade Secret	10–30%	Non-hazardous, non-respirable in composite form
Crosslinked Amphiphilic Copolymer Matrix (e.g. PAN, PU, or sulfonated polysulfone blend)	Trade Secret	60–80%	Not classified
Electrospinning Stabilizers & Dopants	Proprietary	<5%	Not classified

Component	CAS Number	Concentration (%)	Classification
Surface Modifier (Hydrophilic ionic complex)	Proprietary	<5%	Non-hazardous, REACH-exempt

Note: All components are non-toxic, non-carcinogenic, and fully encapsulated in a crosslinked matrix. Product is a fixed-form electrospun web and does not contain respirable nanoparticles in final use.

SECTION 4 – FIRST AID MEASURES

Inhalation:
Move person to fresh air. If symptoms (coughing, throat irritation) occur due to particulates, seek medical advice. Use appropriate respiratory PPE during material modification.

Skin Contact:
Wash with soap and water. Product is not known to cause skin irritation or sensitization.

Eye Contact:
Rinse thoroughly with water for at least 15 minutes if particulate matter enters the eye. Seek medical attention if irritation persists.

Ingestion:
Non-toxic if ingested in small quantities, but not intended for internal use. Rinse mouth and drink water. Seek medical evaluation if symptoms occur.

Symptoms/Effects, Acute and Delayed:

- Mechanical eye or respiratory irritation from fibers/dust.
- No known systemic effects from composite materials.

SECTION 5 – FIRE-FIGHTING MEASURES

Flammability Class: Not readily flammable. Self-extinguishing under standard testing conditions.

Extinguishing Media:

- Suitable: Water spray, dry chemical, CO_2, foam
- Unsuitable: High-pressure water jet (may spread fibers if exposed)

Hazardous Combustion Products:

- Carbon monoxide (CO)
- Carbon dioxide (CO_2)

- Volatile organic degradation products (e.g., benzene traces, phenolic vapors)

Special Equipment:
Use full firefighting turnout gear with self-contained breathing apparatus (SCBA).

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Avoid contact with airborne dust. Use standard PPE (goggles, gloves, N95 mask).

Environmental Precautions:
Avoid uncontrolled release into waterways. Material is inert but non-biodegradable.

Clean-up Methods:
Vacuum with HEPA filters or wet mop. Do not dry sweep electrospun membranes.

SECTION 7 – HANDLING AND STORAGE

Safe Handling Guidelines:

- Avoid mechanical abrasion (e.g., cutting, sanding).
- Do not expose to open flame or direct thermal stress.
- Avoid breathing airborne particles.

Storage Conditions:

- Store at 10–30°C
- Relative humidity: <60%
- UV-resistant packaging preferred
- Stable under inert atmosphere; avoid ozone exposure

Shelf Life: 10 years under controlled environment.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits:

Component	Type	Limit	Reference
Nuisance Particulates	OSHA PEL	15 mg/m³ (total); 5 mg/m³ (respirable)	29 CFR 1910.1000
Graphene/Carbon	NIOSH REL	1.0 µg/m³ (inhalable), advisory	NIOSH 2013-145

Component	Type	Limit	Reference
Nanofibers	(dust)	only	

Engineering Controls:

- Ventilation required when mechanically altering the material.
- Use enclosed handling or extraction systems if dust is expected.

PPE Recommendations:

- Eyes: ANSI-approved goggles
- Skin: Nitrile or neoprene gloves
- Respiratory: NIOSH-approved particulate respirator (e.g., N95)
- Clothing: Laboratory coat or coveralls

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Property	Value
Appearance	Flexible mesh membrane, matte gray-blue
Odor	Odorless
pH (suspension in water)	~7.0
Melting Point	>300°C (polymer dependent)
Boiling Point	Not applicable
Flash Point	>480°C
Flammability	Non-flammable solid
Vapor Pressure	Not applicable
Density	1.45–1.65 g/cm³
Water Solubility	Insoluble (hydrophilic functional groups enable selective permeability)
Partition Coefficient (Kow)	Not measurable
Decomposition Temperature	~390–430°C
Viscosity	Not applicable

SECTION 10 – STABILITY AND REACTIVITY

Reactivity: Non-reactive under ambient conditions
Stability: Chemically stable
Incompatibilities: Strong acids, fluorine, oxidizers

Hazardous Decomposition: CO, CO_2, aromatic VOCs under pyrolysis
Polymerization: Will not occur

SECTION 11 – TOXICOLOGICAL INFORMATION

Endpoint	Result
Acute Oral Toxicity (Rat)	LD_{50} > 5,000 mg/kg
Acute Dermal Toxicity	LD_{50} > 2,000 mg/kg
Inhalation (dust, rat)	LC_{50} > 10 mg/L
Skin Corrosion/Irritation	Non-irritating
Eye Irritation	Slight mechanical irritation
Sensitization	Not a sensitizer
Mutagenicity	Negative (Ames Test)
Carcinogenicity	Not listed (IARC, NTP, OSHA)
Reproductive Toxicity	No known effects
STOT (Single/Repeated)	No target organ toxicity observed
Aspiration Hazard	Not applicable

SECTION 12 – ECOLOGICAL INFORMATION

Endpoint	Value
Acute Toxicity to Fish (OECD 203)	LC_{50} > 1,000 mg/L
Daphnia magna (48h EC_{50})	>1,000 mg/L
Persistence	Inert, non-biodegradable
Bioaccumulation	Low (log Kow < 1 assumed)
Mobility in Soil	Non-mobile in final form
Other Effects	Does not disrupt aquatic microbiota

SECTION 13 – DISPOSAL CONSIDERATIONS

- Dispose in accordance with local, national, and international regulations.
- Not regulated as hazardous waste under RCRA.
- Do not incinerate in open environments.
- Preferred disposal: industrial solid waste landfill or high-temperature incineration.

Waste Code (RCRA): None assigned

SECTION 14 – TRANSPORT INFORMATION

Regulation	Description
DOT (US)	Not regulated
IATA (Air)	Not regulated
IMDG (Sea)	Not regulated
UN Number	Not applicable
Transport Hazard Class	Not applicable
Packing Group	Not applicable
Marine Pollutant	No

SECTION 15 – REGULATORY INFORMATION

United States:

- TSCA Inventory: All components listed
- SARA 302/304/311/312/313: Not applicable
- California Prop 65: No listed chemicals
- OSHA: Non-hazardous article under standard use

Canada:

- DSL/NDSL: Compliant
- WHMIS: Non-controlled product

EU (REACH):

- All monomers/components REACH registered or exempt
- Product not classified as hazardous

SECTION 16 – OTHER INFORMATION

HMIS Rating:

- Health: 1
- Flammability: 0

- Reactivity: 0
- PPE: B (gloves and safety glasses)

NFPA Rating:

- Health: 1
- Fire: 0
- Reactivity: 0

Disclaimer:
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