

System: E.Protect+ Application: Walls		Former System Name: S	Former System Name: System III-CWB	
		System Thickness: 180 mils		
	1st Layer	2nd Layer	3rd Layer	
Product Name Former Name	e.spray 80 mils Ecoline-S	e.shield 110b Ecoshield-EB	e.drain 6000 Ecodrain-S 6000	

DESCRIPTION

E.Protect+ Wall is a redundant field-installed composite waterproofing, methane gas, and vapor intrusion barrier for below-grade post applied vertical wall. Designed to provide the most redundant and highest level of below grade building protection of the E.Series systems, E.Protect+ Wall provides un-paralleled protection with a fully bonded system to the substrate and utilizes all three types of waterproofing: spray applied polymer modified asphalt, bentonite, and a polyolefin sheet. E.Protect+ Wall is designed for projects that require the highest level of performance.

E.Protect+ Wall is compatible with all different types of over excavated wall construction, two-sided formed, one-sided shotcrete, precast concrete, insulated concrete forms (ICF), and concrete masonry units (CMU).

BENEFITS

- Chemically Resistant. Provides chemical resistance to a wide range contaminants commonly found in soil and groundwater.
- Seamless. Composite field-installed membranes do not contain a continuous seam.
- Fully Bonded: Fully bonds with vertical foundation wall.
- Fast Installation: Less weather sensitivity compared to comparable competitive systems.
- Continuous Active Protection: The bentonite layer creates a uniform self-sealing membrane.

LIMITATIONS

- Sites with brackish water and/or contamination will require compatibility testing to determine the appropriate use of bentonite.
- Extreme weather conditions can impact installation methodology.

SPECIFICATIONS, DRAWINGS, AND TECHNICAL ASSISTANCE

The most current specifications and drawings can be found on www.eproinc.com. For project specific details contact EPRO directly, or the local EPRO representative.

Site conditions, performance goals, and budget determine which system is more appropriate for a given project. For more information regarding product performance, testing, plan review, or general technical assistance, please contact EPRO.

WARRANTY

EPRO provides a wide range of warranty options for E.Series systems. For a project to be eligible for any warranty option beyond a 1-year material warranty, an EPRO Authorized Applicator must be used and the project must be registered and approved by EPRO prior to the commencement of any product application.

Warranty options available for this system include:

- Material warranty
- E.Series Labor and Material Warranty
- E.Assurance No-Dollar-Limit Warranty

For information relating to EPRO's E.Assurance warranty program, contact EPRO. All E.Assurance no-dollar-limit labor and material warranties are approved on a project by project basis. E.Asssurance warranties are available for deck applications when E.Series systems are used on the below-grade envelope.

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	196 psi
Elongation	ASTM D412	351%
Adhesion to Concrete	ASTM D903	20.0 lbf/in
Puncture Resistance	ASTM D1709	65.5 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.0374 perms



e.stop hpl



Product Description

Basic Use: e.stop hpl is designed to self seal joints or penetrations in concrete when exposed to moisture, and specified when a bentonite based waterstop is not effective due to contamination, or high salinity.

Composition: e.stop hpl is a rubber based product that has been formulated with special hydrophilic compounds that are intended to expand in a controlled fashion when exposed to moisture.

Benefits

- Does not over expand which can cause self deterioration
- · Does not over stress adjoining substrate material
- Excellent resistance in tidal areas (hydration/dehydration)
- Ideal for groundwater conditions that limit the effectiveness of bentonite based products

Limitations

- Not a self-adhering product and requires the use of e.stop primer prior to securing waterstop to concrete, metal, or PVC (Pipe) surfaces
- Not designed, nor intended to function as an expansion joint sealant
- Not resistant to pre-hydration, store in dry area.

Technical Data

Properties: See physical properties table

Coverages: 16.8' linear feet

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Surfaces should be clean and dry. Remove all dirt, rocks, rust or other construction debris. Do not install e.stop hpl in standing water or on an iced substrate. Apply a continuous layer of e.stop primer along the substrate where e.stop hpl will be installed. Assure proper 3" (75 mm) concrete coverage will be maintained.

Installation: Firmly press the entire length of e.stop hpl onto the adhesive. For best results apply e.stop hpl within 30 minutes of adhesive installation. e.stop primer may be applied to damp surfaces, but not in standing water.

At structural and pipe penetrations, cut into strips to fit around the penetration. Apply to adhesive and abut coil ends together. On irregular surfaces such as stone or rough concrete, make sure waterstop remains in direct contact with the substrate along the entire installation. There should not be any air gap between the waterstop and the substrate

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Roll: $16.8' \times 3/4" \times 1" \times per roll$, six rolls per case

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

No special equipment is needed.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Eprostop-HPL.



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e.stop hpl

Typical Physical Properties

Physical Property	Test Method	Value
Specific Gravity	ASTM D71	1.35+5
Hydrocarbon Content	ASTM D4	47% min.
Volatile Matter	ASTM D6	1% max.
Penetration, cone 77°F, 150 gm 5 sec	ASTM D217	40+5

Dimensions: 16.8' x 3/4" x 1"





e.roll



Product Description

Basic Use: e.roll is a key component to EPRO's redundant field installed composite design concept and is a roller applied version of e.spray. It is designed to be used for system detailing, repairs, and in areas where the required clearance for e.spray cannot be achieved. e.roll is most commonly used in conjunction with e.poly to reinforce system penetrations, terminations, seams, cracks, and membrane transitions. e.roll is used on decks, overexcavated walls, blindside vertical walls, and underslab E.Series assemblies. e.roll can be applied to a wide range of materials/ substrates, high density polyethylene (HDPE), polyolefin sheets, geotextile fabric, wood, metal, foam insulation, and concrete based surfaces (green concrete, shotcrete and concrete masonry units (CMU)).

Composition: e-roll is a medium viscosity water-based, polymer-modified anionic asphalt emulsion, which exhibits exceptional bonding, elongation and waterproofing characteristics.

Benefits

- e.roll is a single component material, no additional blending is required
- Provides the ability to easily detail and repair assemblies without the use of a spray pump
- Non-toxic, non-hazardous, non-flammable, and VOC free
- Forms both a mechanical and ionic bond directly to concrete
- Application to damp substrates is acceptable

Limitations

- Surfaces shall be free of dirt and debris
- Material should be stored above 40°F and not allowed to freeze

- Not a traffic bearing surface, additional protection required
- Must not be applied to ponded water
- · Cold temperatures will prolong cure time

Technical Data

Shelf life: 1 year. The ability to apply the product beyond its estimated shelf life is dependent on storage conditions and homogeneity of the product. Storing material in an enclosed temperature controlled environment that maintains a minimum ambient temperature of 65° Fahrenheit will likely extend the shelf life beyond 1 year.

Properties: See physical properties table

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. In general, this means all surfaces shall be uniform, free of loose materials, and surface contaminants. Contaminant and loose debris shall be removed prior to application by suitable methods. A test should always be done prior to application using the same cleaning preparation and application procedures to be used on the project.

Application: Please refer to manufacturer's specifications. e.roll shall be spray applied to the specified nominal mil thickness. e.roll may be applied by roller or brush.

Cleaning: Clean all tools, hoses, spray guns, and tips with kerosene and/or equivalent.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

e.roll is available in 5 gallon or 1 gallon containers.

Warranty

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Equipment

No special equipment is necessary.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Ecoline-R.

Typical Physical Properties

Physical Property	Test Method	Value
Color		Drawn to Dlavel
Solvent Content		No Solvents
Shelf Life		1 year
Tensile Strength	ASTM 412	32 psi
Elongation	ASTM 412	3860%
Resistance to Decay	ASTM E 154 SECTION 13	9% Perm Loss
	ASTM G 23	
Moisture Vapor Transmission	ASTM E 96	0.071 g/sq. ft./hr.
Hydrostatic Water Pressure	ASTM D 751	28 psi
Perm Rating	ASTM E 96 (US Perms)	0.17
Methane Transmission Rate	ASTM D 14334	0
Adhesion to Concrete & Masonry	ASTM C 836	7 lbf/inch
Hardness	ASTM C 836	85
Crack Bridging	ASTM C 836	No Cracking
Low Temp. Flexibility	ASTM C 836-00	No Cracking at -20°C

Packaging: 5 gallon bucket





e.base 316



Product Description

Basic Use: e.base 316 is a superior base course option for E.Series pre-applied underslab and pre-applied shoring assemblies for buildings that require the highest level of protection. Using EPRO's redundant field installed composite design concept, e.base 316 augments E.Series system assemblies by adding a thermoplastic membrane with heat welded seams to increase chemical resistance, waterproofing capabilities, and overall system robustness. Used as a key component in E.Protect+ assemblies, e.base 316 is also used as a redundant layer in horizontal podium deck applications.

Composition: e.base 316 is a 16 mil geomembrane comprised of high density polyethylene (HDPE). While e.base 316 is always installed as a component of EPRO's E.Series assemblies, it alone exceeds all Class A, B, and C vapor barrier requirements.

Benefits

- Excellent chemical resistance
- Large roll size drastically minimizes seams
- High puncture resistance protects waterproofing from a wide variety of substrates
- Impermeable to water when installed as part of the composite system

Limitations

- Should not be used as the sole means of building protection
- Additional weight should be used during application in windy conditions
- Excessive moisture must be removed prior to welding seams

Technical Data

Properties: See physical properties table

Coverages: One roll covers 1800 square feet, not including overlaps or waste

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Rolls should be inspected for cosmetic damage prior to application. Calibrate hot air welder settings to create a continuous uniform weld that is free from deficiencies.

Application: Please refer to manufacturer's specifications. Overlap the seams of e.base 316 a minimum of 6" and then create uniform 1.5" hot air welded along the length of the seam.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Roll Size: 12' x 150' unfolded rolls, 137 lbs

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

Welding Equipment: Leister Technologies GHIBLI-AW hot air hand welder or an automated hot air welder similar to Leister Technologies VARIMAT V2 or equivalent

Tools: Heat resistant silicone seam roller, blunted point seam probe

Smoke Testing: EPRO Smoke Test Machine for underslab applications

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Ecoshield-H16.





e.base 316

Typical Physical Properties

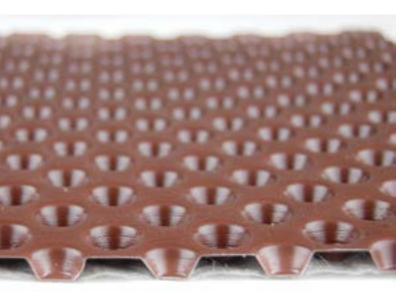
Physical Property	Test Method	Value
Material		HDPE
Color		Green
Thickness		16 mil
Classification	ASTM E 1745	Exceeds Class A, B & C
Water Vapor Permeance	ASTM E 96	029 perms
Tensile Strength	ASTM E 154 (ATSM D 882)	63 lbf/in
Puncture Resistance	ASTM D 1709	2,750 grams Method B
Life Expectancy	ASTM E 154	Indefinite
Chemical Resistance	ASTM E 154	Unaffected

Dimensions: 12' x 150' Weight: 137 pounds





e.drain



Product Description

Basic Use: e.drain has been specifically designed to meet the drainage and protection requirements of below grade waterproofing applications. E.Series utilizes e.drain in applications for over excavated below grade foundation walls to effectively eliminate the buildup of nuisance water, provide another layer of waterproofing redundancy, and provide protection during backfill. e.drain is also applied to shoring as a base course for e.spray. When concrete is applied, the e.drain and e.spray become integrated into the below grade foundation walls, forming a uniform composite system that directs water away and provides a seamless waterproofing membrane.

Composition: e.drain features a lightweight three-dimensional, highly flexible high density polyethylene (HDPE) core and a polypropylene geotextile filter fabric. The filter fabric is bonded to the dimples of the HDPE core.

Benefits

- High density polyethylene core provides a high level of chemical resistance and performs as a waterproofing barrier
- Unique shallow dimple design allows for a uniform application of e.spray
- For shoring applications, e.drain allows waterproofing to become fully integrated into and bonded to the building foundation wall
- Variable widths (6' and 8') provide minimal overlapping of seams and increase installation efficiency
- Suitable for both cast in place concrete and shotcrete

Limitations

- High risk projects may require more redundancy
- Not ideal in backfill applications greater than 20 feet

Technical Data

Properties: See physical properties table

Coverages: 6' and 8' wide rolls cover 394 and 527 square feet, respectively, not including overlaps or waste

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Rolls should be inspected for cosmetic damage prior to application. Substrate must be inspected prior to application to make certain it is in accordance with manufacturer's requirements.

Application: Please refer to manufacturer's specifications. Drainage panels may run horizontally or vertically and must be secured to the wall using manufacturer's approved fasteners and subsequent detailing methods.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Roll: 6' x 65.7', 60 lbs. or 8' x 65.7', 73 lbs.

Warranty

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Equipment

Secure with shot pins using power-actuated fastener or by hand.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Ecodrain-E.





Typical Physical Properties

	Physical Property	Test Method	Value
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Dimpled Core

Core		HDPE
Core Material Thickness		30 mil
Color		Brown
Dimple Height	ASTM D1777-96	
Compressive Strength	ASTM D6364-06	5,200 lbs./ft²
Flow rate	ASTM D4716	5.1 gal./min./ft.

Filter Fabric

Grab Tensile	ASTM D4632-91	130 lbs.
CBR Puncture Resistance	ASTM D6241	40 lbs.
Apparent Operating Size	ASTM D4751-99	70 sieve size (.0212 mm)
Water Flow Rate	ASTM D4491-99	55 gpm/ft²
UV Resistance	ASTM D4355-92	70% (500 hrs)

Dimensions: 6' x 65.7', 8' x 65.7'

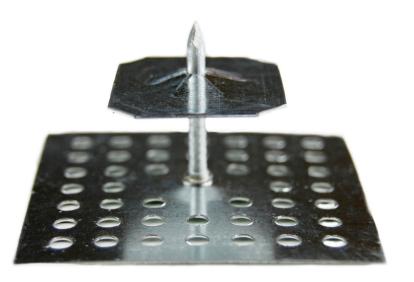
Weight: 6' rolls = 60 lbs., 8' rolls = 73 lbs.



EPRO Services Inc.



e.hanger



Product Description

Basic Use: e.hanger is designed to properly secure an E.Series membrane assembly in place on shoring walls or below grade to vertical wall transitions on over excavated walls. Secure using galvanized steel shot pins to shoring walls after the application of the specified base sheet or directly to over excavated concrete. e.hanger allows for proper securement of heavy and robust membrane assemblies without additional system penetrations.

Composition: $2'' \times 2''$ galvanized steel base with 1'' steel pin. Stainless steal e.hangers are also available.

Benefits

- Ensures proper detailing of fasteners used to hold vertical membrane assemblies in place
- Eliminates the need for additional penetrations after system assembly
- Holds systems in place during shotcrete application

Limitations

Proper spacing and detailing must be followed to not compromise system

Technical Data

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Determine fastening pattern prior to installation.

Application: Install after the application of base layer using 1 galvanized shot pin at opposing corners of the e.hanger. Detailing of each e.hanger should be done in accordance with the system specification.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

1000 hangers with washers per case

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

Secure with shot pins using power-actuated fastener or by hand.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Epro Hanger.





PM Sealant

Product Description

Basic Use: PM Sealant is a Silyl Terminated Polyether (STPE) non-isocyanate, non-solvent detailing sealant that combines the strength of polyurethanes with the weathering resistance of silicones. PM Sealant can withstand the most stringent requirements for high performance bonding and elasticity under severe aging and UV weathering conditions without cracking or yellowing when subjected to extended UV-light exposure.

PM Sealant is used for penetration detailing, as a seam edge and patching detailing sealant, along the transition construction joint between two pours, and for sealing applied termination bar.

Compliances: Conforms to ASTM C920, Type S, Grade NS, Class 25, and AAMA 802.3 Type II Back Bedding Compound. USDA accepted.

Composition: PM Sealant is a gray, single-component, 100% solids, moisture-cured, elastomeric STPE sealant.

Benefits

- Replaces Silicone and Urethane sealants.
- Does not require a primer.
- Cures rapidly, even at low temperatures, and retains its properties to -75°F (-59°C).
- Non-reactive, PM Sealant will not oxidize or corrode metals.
- PM Sealant does not contain VOC's.
- Provides a continuous smooth surface.

Limitations

- Surfaces must be clean and dry for application.
- Surfaces must be free from frost or ice.

Technical Data

Properties: See physical properties table.

Coverages: Coverage is dependent on the size of application bead. Minimum Bead Size & Estimated Linear Coverage:

- 3/8" x 3/8" (10 mm x 10 mm): Penetrations, seam edges, corner & patch detailing.
 - Sausage: 21' (6.4 m)
- 3/4" x 3/4" with 1" cant (19 mm x 19 mm with 25 mm cant): Horizontal to vertical footing or brick ledge transition joint, wall vertical inside corner.
 - Sausage: 11' (3.4 m)

Storage and Handling: Store raised off the floor, away from moisture and sun, between 55-80°F (13-27°C).

Shelf Life: Sausage = 12 months.

Specification Writer: Contact EPRO before writing specifications on this product. EPRO System selection should be reviewed in order to meet project specific site conditions.

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Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Buckets and Sausages should be inspected for cosmetic damage prior to application.

Application: Please refer to manufacturer's specifications.

Substrate Preparation: Use with adequate ventilation. Wipe substrates to receive PM Sealant clean to remove any dirt, dust, or moisture. Clean the surface of penetrations or protrusions with a wire brush to remove dirt, dust, rust, and loose particles. Surface must be free of frost or ice. No priming is necessary.

Installation: Determine minimum bead thickness and tool into surface

Horizontal to vertical transition joints shall be applied like a caulk into a 1" (25 mm) cant, making sure product is injected into the joint with as well as applied to the surface.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Sausage Size: 20 oz (591 ml), 2.5 lbs (1.13 kg) Case Size: 20 sausages, 50 lbs (22.7 kg)

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

Caulking gun (20 oz. sausage capactiy), knife, box cutter.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Primetak Detail Sealant by Kingfield Construction Products.





Physical Property	Test Method	Value
Material	ASTM C 679	STPE Gray Non-corrosive Up to 300°F for short periods Properties retained to -75°F (-59°C) < 30 minutes @ 77°F & 50% RH < 60 minutes @ 77°F & 50% RH Non-sagging Non-staining 225 PSI 275 PSI 275%
Hardness	ASTM C 661	45-50

Dimensions: Sausage: 20 oz (591 ml) Weight: Sausage: 2.5 lbs (1.13 kg)





e.roll



Product Description

Basic Use: e.roll is a key component to EPRO's redundant field installed composite design concept and is a roller applied version of e.spray. It is designed to be used for system detailing, repairs, and in areas where the required clearance for e.spray cannot be achieved. e.roll is most commonly used in conjunction with e.poly to reinforce system penetrations, terminations, seams, cracks, and membrane transitions. e.roll is used on decks, overexcavated walls, blindside vertical walls, and underslab E.Series assemblies. e.roll can be applied to a wide range of materials/ substrates, high density polyethylene (HDPE), polyolefin sheets, geotextile fabric, wood, metal, foam insulation, and concrete based surfaces (green concrete, shotcrete and concrete masonry units (CMU)).

Composition: e-roll is a medium viscosity water-based, polymermodified anionic asphalt emulsion, which exhibits exceptional bonding, elongation and waterproofing characteristics.

Benefits

- e.roll is a single component material, no additional blending is required
- Provides the ability to easily detail and repair assemblies without the use of a spray pump
- Non-toxic, non-hazardous, non-flammable, and VOC free
- Forms both a mechanical and ionic bond directly to
- Application to damp substrates is acceptable

Limitations

- Surfaces shall be free of dirt and debris
- Material should be stored above 40°F and not allowed to freeze

- Not a traffic bearing surface, additional protection required
- Must not be applied to ponded water
- Cold temperatures will prolong cure time

Technical Data

Shelf life: 1 year. The ability to apply the product beyond its estimated shelf life is dependent on storage conditions and homogeneity of the product. Storing material in an enclosed temperature controlled environment that maintains a minimum ambient temperature of 65° Fahrenheit will likely extend the shelf life beyond 1 year.

Properties: See physical properties table

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. In general, this means all surfaces shall be uniform, free of loose materials, and surface contaminants. Contaminant and loose debris shall be removed prior to application by suitable methods. A test should always be done prior to application using the same cleaning preparation and application procedures to be used on the project.

Application: Please refer to manufacturer's specifications. e.roll shall be spray applied to the specified nominal mil thickness. e.roll may be applied by roller or brush.

Cleaning: Clean all tools, hoses, spray guns, and tips with kerosene and/or equivalent.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

e.roll is available in 5 gallon or 1 gallon containers.

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.





Equipment

No special equipment is necessary.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Ecoline-R.

Typical Physical Properties

Physical Property	Test Method	Value
Color		Brown to Black
Solvent Content		No Solvents
Shelf Life		1 year
Tensile Strength	ASTM 412	32 psi
Elongation	ASTM 412	3860%
Resistance to Decay	ASTM E 154 SECTION 13	9% Perm Loss
Accelerated Aging	ASTM G 23	No Effect
Moisture Vapor Transmission	ASTM E 96	0.071 g/sq. ft./hr.
Hydrostatic Water Pressure	ASTM D 751	28 psi
Perm Rating	ASTM E 96 (US Perms)	0.17
Methane Transmission Rate	ASTM D 14334	0
Adhesion to Concrete & Masonry	ASTM C 836	7 lbf/inch
Hardness	ASTM C 836	85
Crack Bridging	ASTM C 836	No Cracking
Low Temp. Flexibility	ASTM C 836-00	No Cracking at -20°C

Packaging: 5 gallon bucket





e.term hd



Product Description

Basic Use: e.term hd is made from flexible, high strength PVC. It provides an excellent solution for top terminations with belowgrade waterproofing membranes and drainage boards systems. e.term hd protects the waterproofing top edge and will secure drain panels and protection boards.

Composition: High strength PVC.

Benefits

- Unique design prevents penetration of the membrane
- Performs as a termination bar and flashing
- Flashing prevents debris from getting behind the prefabricated drainage composite

Limitations

A sealant bead is required on the top edge of the termination bar

Technical Data

Properties: See physical properties table

Coverages: 8 lineal feet

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. Substrate shall be smooth and uniform to allow for consistent fastening and then e.term hd termination bar is achieved.

Application: Install e.term hd at the top edge of material or through waterproofing membrane using 1-1/4" galvanized shot pins and counter flash with drain board. Attach every 1 ft. on center with appropriate mechanical or power actuated fasteners.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Bar: 8 feet in length and available individually or in bundles of 50

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

Secure 1-1/4" shot pins using power-actuated fastener or by

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Term Bar HD.





e.fastener



Product Description

Basic Use: e.fastener is used to properly secure e.drain in place on blindside shoring wall applications. e.fastener is a five pronged fastener specifically designed to fit into the e.drain shallow dimple when secured by a galvanized steel shot pin.

Composition: Five-pronged orange fastener is made of high density polyethylene (HDPE).

Benefits

- Ensures proper securement of e.drain with proprietary fastener
- Creates uniform and consistent detailing of fasteners
- Secures systems on a wide variety of substrates

Limitations

 Proper spacing and detailing must be followed in order to not compromise system

Technical Data

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Determine fastening pattern prior to installation.

Application: Please refer to manufacturer's specifications. Drainage panels may run horizontally or vertically. Secure seam overlaps using e.fasteners 12 inches on center, and vertical field areas shall be secured with e.fasteners every 3 feet in an alternating manner.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

500 fasteners per box

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

Secure with shot pins using power-actuated fastener or by hand.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Delta Fastener.





e.spray



Product Description

Basic Use: e.spray is a key component to EPRO's redundant field installed composite design concept. e.spray is a polymer modified asphalt (PMA) applied to nominal dry thicknesses of 60, 80, and 100 mils depending on the E.Series system configuration. For robust horizontal deck applications, a 120 mil reinforced option should be specified. Spray applied to form a seamless barrier, e.spray is an integral component to all E.Series systems due to its ability to further enhance and bond to a variety of materials; these material include, high density polyethylene (HDPE), polyolefin sheets, geotextile fabric, wood, metal, foam insulation, and concrete based surfaces (green concrete, shotcrete and concrete masonry units (CMU)). e.spray is applied with a proprietary self-contained sprayer designed to produce high build, monolithic, and rapidly curing membranes.

Composition: e.spray is a non-hazardous, low-viscosity, water-based, anionic asphalt emulsion modified with a blend of synthetic polymerized rubbers and proprietary additives. e.spray is highly stable during transit and proper storage, but becomes highly reactive during the spray application to form a rapidly cured membrane with exceptional bonding, elongation, and hydrophobic characteristics.

Benefits

- Provides a layer of seamless protection and redundancy in all E.Series system assemblies
- Hydrophobic and resistant to methane gas
- Non-toxic, non-hazardous, non-flammable, and VOC free
- Forms a tenacious bond directly to concrete
- Application to damp substrates is acceptable
- Can be applied in below freezing temperatures with proper equipment

Limitations

- Surfaces shall be free of dirt and debris
- Material should be stored above 40°F and not allowed to freeze
- Not a traffic bearing surface, additional protection required
- Must not be applied to ponded water
- Direct foot traffic should be limited when ambient air temperatures are greater than 100°F
- Green concrete may require a primer coat prior to application

Technical Data

Shelf life: 6 months. The ability to apply the product beyond its estimated shelf life is dependent on storage conditions and homogeneity of the product. Storing material in an enclosed temperature controlled environment that maintains a minimum ambient temperature of 65° Fahrenheit will likely extend the shelf life beyond 6 months.

Properties: See physical properties table

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Additional test information available upon request.

Installation

EPRO Authorized Applicators must be approved in writing by EPRO prior to receiving a contract in order to qualify for a warranty for this product and system assembly.

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. Surfaces shall be uniform, free of loose materials, and surface contaminants. Contaminant and loose debris shall be removed prior to application by suitable methods.

Application: Please refer to manufacturer's specifications. e.spray shall be spray applied to the specified nominal mil thickness. When properly applied, e.spray will set up immediately on the surface and promptly start the curing process. Light foot traffic is acceptable, but must be limited to the authorized EPRO applicator. The initial cure is complete when e.spray is no longer ejecting moisture, 12 to 48 hours depending on ambient air conditions.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

e.spray is available in the following packaging options:

55 gallon drum 275 gallon tote 330 gallon tote





Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

Spray System: AD-55 Sprayer is available through EPRO. To discuss alternative spray machine options, please contact EPRO directly.

Smoke Testing: EPRO Smoke Test Machine for underslab applications

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Ecoline-S.

Typical Physical Properties

Physical Property	Test Method	Value
Color		Brown to Black
•	ASTM 412	•
Elongation	ASTM 412	4140%
Resistance to Decay	ASTM E 154 Section 13	4% Perm Loss
Accelerated Aging	ASTM G 23	No Effect
Moisture Vapor Transmission	ASTM E 96	0.026 g./sq. ft./hr.
Hydrostatic Water Pressure	ASTM D 751	26 psi
Perm Rating	ASTM E 96 (US Perms)	0.21
Methane Transmission Rate	ASTM D 1434	0
Adhesion to Concrete & Masonry	ASTM C 836 & C 704	11 lbf./inch
Adhesion to HDPE	ASTM C 836	28.363 lbf./inch
Adhesion to Polypropylene Fabric	ASTM C 836	31.19 lbf./inch
Hardness	ASTM C 836	80
Crack Bridging	ASTM C 836-00	No Cracking
Low Temp. Flexibility		No Cracking at -20° C

Packaging: 55 gallon drum, 275 gallon tote, 330 gallon tote





e.shield 110b



Product Description

Basic Use: e.shield 110b is designed to provide maximum protection and redundancy to E.Series systems requiring high performance building protection. Installed on over excavated walls, e.shield 110b embodies the redundant field installed composite design concept by leveraging the waterproofing and protection benefits of a high density polyethylene (HDPE) backing with the self-healing characteristics of a continuous bentonite layer. When combined in a E.Series system assembly, e.shield 110b provides system unparalleled protection and redundancy.

Composition: e.shield 110b is a black and gray redundant geocomposite bentonite membrane comprised of two distinct layers. The membrane consists of an HDPE film chemically bonded to a layer of sodium montmorillonite bentonite.

Benefits

- Confines bentonite within membrane assembly to provide a redundant self-sealing layer
- High puncture resistance protects waterproofing from subsequent construction damage
- When sealed properly, pre-activation prior to concrete placement will not occur

Limitations

- Should not be stored in the rain
- Contaminated groundwater may inhibit performance and compatibility testing is required on all sites where contamination might be of concern.

Technical Data

Properties: See physical properties table

Coverages: One roll covers 120 square feet, not including overlaps or waste.

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Rolls should be inspected for cosmetic damage prior to application. E.Shield 110b may be applied over a nominally cured e.spray membrane.

Application: Please refer to manufacturer's specifications. Install e.shield 110b protection course vertically with the bentonite layer facing the e.spray and the smooth HDPE side facing away from the wall. Overlap all seams a minimum of 3" with seam overlap detail per project specification while taking into account anticipated weather conditions.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Roll Size: 4' x 30' rolls, 75 lbs.

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

No equipment is necessary. Secure e.shield 110b protection course seams with e.tape 106.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Ecoshield-EB.





e.shield 110b

Typical Physical Properties

Physical Property	Test Method	Value
Film Material		HDPE
Film Color		Black
Bentonite		Wyoming Sodium Montmorillonite
Weight		0.6 lb. per. Sq. ft. (4.89 kg/m²)
Puncture Resistance	ASTM E154-88 Section 10	170 lbs. (77.3 kg)
Tensile Strength	ASTM D882	6100 psi
% Elongation at Break	ASTM D882	100%
Crack Bridging		1/8" (.032cm) crack
Resistance to Hydrostatic Head	ASTM D 751 Procedure A	174 ft. (52.9m) of water
Water Vapor Permeability	ASTM E96-80	0.53x10 ⁻³ cm/sec
Resistance to Microorganisms	ASTM E154-88 Section 13	Unaffected
Freeze/thaw Cycles		Unaffected
Installation temperatures	ASTM D746, ASTM D1238	40°F to 150°F (-40°C to 65.5°C)

Dimensions: 4' x 30' Weight: 75 pounds





e.stop gu

Product Description

Basic Use: e.stop gu is a self-adhering gunnable expanding waterstop paste designed to stop water infiltration through cast-in-place concrete at construction joints and penetrations. It expands upon contact with water to form a positive seal against the concrete. The key to e.stop gu's effectiveness is that it is highly expansive, which seals and fills voids in cracks and concrete, and is easy to apply using caulking equipment.

e.stop gu can be applied over rough and smooth concrete, steel piles, dowels and Nelson Studs, and on iron or PVC pipes.

For shotcrete applications, e.stop gu requires a double layer application with a minimum 1-inch separation.

Composition: e.stop gu is a gray hydrophilic expanding urethane waterstop sealant.

Benefits

- Active swelling waterstop is fully encased in concrete to seal off water ingress.
- Self-adhering over concrete, iron, steel, and PVC.
- Fast and easy installation.
- Conforms to irregular surfaces.
- Seals around pipe penetrations.
- Ideal when pouring against existing concrete.
- · High resistance to hydrostatic pressure.

Limitations

- Not an expansion joint sealant.
- It is designed for structural concrete with a minimum of 2,600 psi compressive strength.
- Requires a minimum of 3-inch (75 mm) of concrete coverage depending on the size of the bead used.
- Must be fully cured before concrete pour.
- Not resistant to pre-hydration.

Technical Data

Properties: See physical properties table.

Coverages: Coverage is dependent on the size of application bead. Applied material skins over after two hours and moisture cures in ten hours.

Minimum bead size and estimated linear coverage:

- 1/2" x 1/2": 6'-6" (2 m)
 3/8" x 3/4": 5'-11" (1.8 m)

Storage and Handling: Store raised off the floor, away from moisture and sun, between $55-80\,^{\circ}F$ ($13-27\,^{\circ}C$).

Shelf Life: 12 months.

Specification Writer: Contact EPRO before writing specifications on this product. EPRO System selection should be reviewed in order to meet project specific site conditions.

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Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Tubes should be inspected for cosmetic damage prior to application.

Application: Please refer to manufacturer's specifications. Substrate Preparation: Wipe substrates to receive e.stop gu clean to remove any dirt, dust, or moisture. Clean the surface of penetrations or protrusions with a wire brush to remove dirt, dust, rust, and loose particles. Surface must be free of frost or ice. No priming is necessary.

Installation: e.stop gu is used as a waterstop for penetrations, piles, dowels, and all concrete construction joints.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Tube Size: 10.8 oz (320 ml), 0.68 lbs (0.31 kg) Case Size: 24 tubes, 16.2 lbs (7.35 kg)

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

Caulking gun (10.8 oz. tube capactiy).

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as SepaSeal SH-100 by Kingfield Construction Products.

Physical Properties	
Hydrostatic Head Resistance	
1/2 x 1/2	100 feet (43 psi / 30.5 m)
3/8 x 3/4	150 feet (65 psi / 46 m)





e.poly



Product Description

Basic Use: e.poly is a polyester fabric that is designed to reinforce membrane terminations, transitions, penetrations, seams, and general repair areas. Used in every E.Series assembly, e.poly is installed between two layers of e.roll or e.spray.

Composition: e.poly is a 100% polyester textile material composed of staple fibers hydraulically entangled.

Benefits

- Excellent conformability and elongation
- Exceptional tear resistance and high tensile strength
- Open weave allows complete saturation and integration

Limitations

Not suitable for expansion joints or areas where movement is desired

Technical Data

Properties: See physical properties table

Coverages: 6", 12" and 40" rolls cover 150, 300, and 1,080 square feet, respectively

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Application of e.poly should be done when weather conditions meet the requirement of e.roll or e.spray.

Installation: Please refer to manufacturer's specifications. Install specified thickness of e.roll or e.spray and immediately embed e.poly into the initial layer of e.roll or e.spray. Once firmly pressed into the uncured membrane, fully saturate with additional layer of e.roll or e.spray to the specified thickness.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Roll: 6" x 300', 12" x 300', and 40" x 324' rolls are available

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

No special equipment is needed.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Polyester.





Typical Physical Properties

Physical Property	Test Method	Value
Weight		3 oz.
Bursting Strength	ASTM D3786	177 lbs.
Tensile Strength	ASTM D1682	57.1 psi
Tear Strength	ASTM D1117	16.1 lbs
Elongation	ASTM D1682	62.0%
Conformability		Excellent
Ease of saturation		Excellent

Dimensions: $6" \times 300'$, $12" \times 300'$, and $40" \times 324'$ rolls are available





e.adhesive

Product Description

Basic Use: e.adhesive is designed as a surface adhesion promotor for wide range of substrates when a fast drying, solvent free, a tacky surface is required. Primarily used as a primer for EPRO waterstops, including e.stop b and e.stop hpl, e.adhesive is applied directly to concrete to provide a tacky substrate to secure e.stop in place prior to fastening of the waterstop.

Composition: e.adhesive is a high tack acrylic emulsion primer available in 1 gallon pails.

Benefits

- Quick drying
- Water based, envionmentaly friendly low VOC
- Tacky film provides strong adhesion to desired substrate
- · Easily applied with brush or roller

Limitations

- Not to be applied over standing water or lose substrates
- Keep from freezing

Technical Data

Physical Properties:

Color: White

Solids Content: 63+/- @5 by weight

Flammability: Wet nonflammable, dry burns

Flash Point: Greater than 212°F Viscosity: 3,000 - 5,000 cps VOC: < 25 grams per liter

Coverages: 100 - 150 sq. ft. per gallon

Specification Writer: For e.stop applications, e.adhesive is required for all waterstop applications. One row of e.stop shall be used above the water table, and two rows are required for application elevations located in the design water table.

Installation

Preparation: All surfaces must be clean and free from debris, lose materials, curing agents, or any material that may interfere with the bond between e.adhesive and the substrate.

Application: Mix material before use to ensure uniformity. When applying with a brush, apply with a wide fiber brush to create a smooth uniform film. When applying with a roller, use a low nap phenolic core roller.

Drying Time: Intial set time is 30 min at 68°F

Application Temperature: 32°F - 110°F, for temperatures below freezing contact EPRO about acceptable surface conditioner.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Pail: 1 gallon, 10 pounds.

Warranty

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Equipment

Brush or phenolic core roller should be used for application.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product replaces e.stop primer.



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e.stop



Product Description

Basic Use: e.stop b is an expanding strip waterstop designed to stop water infiltration through cast-in-place concrete construction joints. It expands upon contact with water to form a positive seal against the concrete. The key to e.stop b's effectiveness is that it is highly expansive, which seals and fills voids in cracks and concrete.

Composition: e.stop b is a moisture activated high sodium bentonite content based waterstop.

Benefits

- Active swelling waterstop is fully encased in concrete to seal off water ingress
- Fast and easy installation
- Seals around pipe penetrations
- Ideal when pouring against existing concrete
- High resistance to hydrostatic pressure

Limitations

- Not a self-adhering product and requires the use of e.stop primer prior to securing waterstop to concrete, metal, or PVC (Pipe) surfaces
- Not designed, nor intended to function as an expansion joint sealant
- It is designed for structural concrete with a minimum of 3,000 psi compressive strength. e.stop b requires a minimum of 3" (75 mm) of concrete coverage.
- Not resistant to pre-hydration

Technical Data

Properties: See physical properties table

Coverages: 16.67" linear feet

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Surfaces should be clean and dry. Remove all dirt, rocks, rust or other construction debris. Do not install e.stop b in standing water or on an iced substrate. Apply a continuous layer of e.stop primer along the substrate where e.stop b will be installed. Assure proper 3" (75 mm) concrete coverage will be maintained.

Installation: Firmly press the entire length of e.stop b onto the adhesive. For best results apply e.stop b within 30 minutes of adhesive installation. e.stop primer may be applied to damp surfaces, but not in standing water.

At structural and pipe penetrations, cut into strips to fit around the penetration. Apply to adhesive and abut coil ends together. On irregular surfaces such as stone or rough concrete, make sure waterstop remains in direct contact with the substrate along the entire installation. There should not be any air gap between the waterstop and the substrate

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Roll: $16.67' \times 3/4" \times 1" \times per roll$, six rolls per case

Warranty

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Equipment

No special equipment is needed.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Eprostop-BP.



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Typical Physical Properties

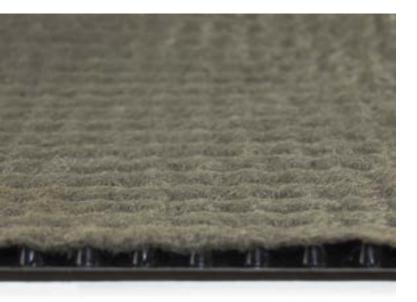
Physical Property	Test Method	Value
Hydrostatic Head	Independent	231 ft
Wet/Dry Cycling (25 cycles)	Independent	No Effect
Adhesion to Concrete	Independent	Excellent

Dimensions: 16.67' x 3/4" x 1"





e.drain 6000



Product Description

Basic Use: e.drain 6000 is applied in negative side applications to blindside shoring walls, in positive side applications to over excavated walls, and over plaza decks. e.drain 6000 prefabricated drainage composite is designed to protect the E.Series system assembly, while effectively eliminating the buildup and ponding of water against the membrane assembly.

Composition: e.drain 6000 features a lightweight threedimensional, high-compressive strength polypropylene core and bonded non-woven geotextile fabric. The bonded filter fabric allows water to pass freely into the molded drain while preventing soil particles from entering and clogging the core structure.

Benefits

- Provides extremely high compressive strength to meet a wide variety of project conditions
- Polypropylene provides greater chemical resistance than traditional polystyrene
- · Maintains flexibility in freezing temperatures

Limitations

Long-term UV exposure is not recommended

Technical Data

Properties: See physical properties table

Coverages: 6' x 50' roll covers 300 square feet; 8' x 50' roll covers 400 square feet, not including overlaps or waste

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Rolls should be inspected for cosmetic damage prior to application. Substrate must be inspected prior to application to make certain it is in accordance with manufacturer's requirements.

Application: Please refer to manufacturer's specifications. Drainage panels may run horizontally or vertically. In blindside shoring applications, secure e.drain to shoring using 2-inch flat washer fasteners every 24 inches on center on seams and terminations and a minimum of every 48 inches on center in the field.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Roll: 6' x 50', 8' X 50'

Weight: 6' rolls = 64 lbs, 8' rolls = 81 lbs

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

Secure with shot pins using power-actuated fastener or by hand.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Ecodrain-S6000.



eproinc.com



e.drain 6000

Typical Physical Properties

Physical Property Value Test Method

Dimpled Core

Core Material		Polypropylene
Color		Black
Dimple Height	ASTM D1777	0.4" (10.16 mm)
Compressive Strength	ASTM D1621	16,500 psf (790 kN/m²)
Flow rate	ASTM D4716	21 gal/min/ft

Filter Fabric

Grab Tensile	ASTM D4632	100 lbs
CBR Puncture Resistance	ASTM D6241	250 lbs
Apparent Operating Size	ASTM D4751	70 US Sieve (.0212mm)
Water Flow Rate	ASTM D4491	140 gpm/ft² (5704 l/min/m²)
UV Resistance	ASTM D4355	70% (500 hrs)

Dimensions: 6' x 50', 8' X 50'

Weight: 6' rolls = 64 lbs, 8' rolls = 81 lbs





Product Description

Basic Use: e.tape is designed to act as a seam splice when used to seam e.shield geomembrane.

Composition: e.tape is a 7.0 mil polyethylene backed, synthetic rubber adhesive coated heavy-duty adhesive tape.

Benefits

- Permanently tacky adhesive bonds well to most surfaces over a wide temperature range.
- Excellent low-temperature bonding.
- Conforms well to irregular surfaces
- · Maintains a watertight seal in all weather conditions
- Good tear characteristics.

Limitations

 Not to be used when elongation and movement is not desired.

Technical Data

Properties: See physical properties table.

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Application: Please refer to manufacturer's specifications.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

Typical Physical Properties

Physical Property	Value	
Adhesive Thickness	2.5 mils	
Total Thickness	7.0 mils	
Backing Adhesion	35 oz./in.	
Elongation	80%	
Peel Adhesion to Stainless Steel	60 oz./in.	
Tensile Strength (ASTM D1000)	18 lbs./in.	

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.





Product Description

Basic Use: e.catalyst is a premixed, food grade, highly purified concentrate solution that is used to rapidly cure e.spray polymer modified asphalt during application. The premixed solutions are designed to make catalyst creation easy by simplifying the creation of catalyst solution in the field. While calcium chloride flake can take significant time to uniformly mix and can lead to clogging at the spray tips, e.catalyst creates a consistent solution in half the time and drastically reduces spray tip clogging.

Benefits

- Food grade calcium chloride solution provides very low alkali metals, iron, and other impurities commonly found in mass produced calcium chloride flake
- Reduces clogging at spray tips
- Mix time drastically reduced

Limitations

Keep from freezing

Technical Data

Physical Properties:

Color: Blue Odor:

Chemical: Calcium Chloride PH: Slightly Alkaline < 0.01% by weight Impurities:

Coverages: Two, 5-gallon pails per 55 gallon drum of catalyst

Mixing and Safety

Mixing: Using a clean plastic drum, mix one 5 gallon pail of e.catalyst for every 27.5 gallons of room temperature or warmer water. Do not use any reclaimed water when mixing calcium chloride solution. Mix solution with a clean stir stick; no crystallization should be visible.

Safety: Liquid calcium chloride is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective nonleather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended to protect hands. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Pail: 5 gallon pail, bulk quantities also available

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

55 gallon plastic drum, clean stir stick to agitate material

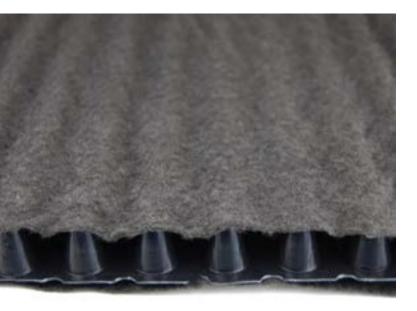
Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.





e.drain 12ds



Product Description

Basic Use: e.drain 12ds has been specifically designed for installation at the base of below grade foundation walls to enhance the removal of water away from the building to the specified discharge points.

Composition: e.drain 12ds features a lightweight threedimensional, highly flexible polypropylene core and a nonwoven geotextile filter fabric. The filter fabric is bonded to the dimples of the polypropylene core to prevent clogging within the drain.

Benefits

- Cost effective alternative to traditional pipe and gravel French drains
- Exceptional flow rates
- Excellent compressive strength
- Installation can occur in any weather condition

Limitations

Not effective when constantly submerged

Technical Data

Properties: See physical properties table

Coverages: One roll covers 165 lineal feet

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Rolls should be inspected for cosmetic damage prior to application. Substrate must be inspected prior to application to make certain it is in accordance with manufacturer's requirements.

Application: Please refer to manufacturer's specifications. Installation of e.drain 12ds shall occur prior to the placement of any additional drainage composite. e.endout, e.sideout, e.splice, and e.corner fittings shall be used in transition with e.drain as required.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Roll: 165'x 12" x 1", 65 lbs.

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

No special equipment is required.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Ecodrain-DS 12.





Typical Physical Properties

Physical Property Value Test Method

Dimpled Core

Core Material		Polypropylene
Color		Black
Compressive strength	ASTM D1621	9,500 PSF (455 kN/m²)
Thickness	ASTM D1777	1"
Flow rate	ASTM D4716	30 gpm/ft of width

Filter Fabric

CBR puncture	ASTM D6241	250 lbs.
Grab tensile strength	ASTM D4632	100 lbs
AOS	ASTM D4751	70 U.S. sieve
Permitivity	ASTM D4491	2.0 sec ⁻ⁱ
Flow rate	ASTM D4491	140 gpm/ft²
UV resistance	ASTM D4355	70% (500 hrs)

Dimensions: 165' x 12" x 1"

Weight: 65 pounds

EPRO Services Inc.







SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.term af, e.term asl Product Description: aluminum term bars

Synonyms: N/A CAS No: N/A

Supplier:

EPRO Services, Inc. PO Box 347 Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US): Not classified

Label Elements

GHS-US Labeling: No labeling applicable

Other Hazards: This product is physiologically inert in its massive form. However, user-generated dust and/or fumes may pose a physiological hazard if inhaled or ingested. Avoid inhalation of metal dusts and fumes. May cause an influenza-like illness. Avoid skin and eye contact with dusts to prevent mechanical irritation. User-generated dust is easily ignited and difficult to extinguish. This product contains components that are environmentally hazardous and small chips, fine turnings, and dust from processing may be toxic to aquatic life.

Unknown Acute Toxicity (GHS-US): No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances: Not applicable

Mixtures

Name	% (w/w)	Classification (GHS-US)	
Aluminum	>89.9	Comb. Dust; Flam. Sol 1, H228	
CAS No 7429-90-5		Water-react. 2, H261	
Zinc	<0.1	Aquatic Acute 1, H400	
CAS No 7440-66-6	0.1 - 1.0,	Aquatic Chronic 1, H410	
	1.0 - 2.5		
Magnesium	<0.1,	Flam. Sol. 1, H228; Self-heat. 2, H252	
CAS No 7439-95-4	0.1 - 1.0	Water-react. 2, H261	
	1.0 - 2.1		
Silicon	<0.1,	Comb. Dust	
CAS No 7440-21-3	0.1 - 1.0,		
	1.0 - 1.8		
Manganese	<0.1,	Comb. Dust	

CAS No 7439-96-5	0.1 – 1.0,	
	1.0 – 1.5	
Copper	<0.1,	Comb. Dust
CAS No 7440-50-8	0.1 - 1.0	Aquatic Acute 1, h400
	1.0 – 1.3	Aquatic Chronic 3, H412
Iron	<0.1,	Comb. Dust
CAS No 7439-86-6	0.1 - 1.0	Flam. Sol. 1, H228
	1.0 - 1.1	Self-heat. 1, H251
Chromium	<0.1,	Comb. Dust
CAS No 7440-47-3	0.1 - 0.5	
Lead	<0.1	Acute Tox. 4 (Oral), H302; Acute Tox. 4 (Inhalation: dust,
CAS No 7439-92-1		Mist), H332; Carc. 1B, H350; Repr. 1A, H360; STOT RE 1, H372;
		Aquatic Acute 1, H400; Aquatic Chronic 1, H410

^{*} More than one of the ranges of concentration prescribed by Controlled Products Regulations has been used where necessary due to varying composition.

Full text of H-phrases: see section 16

4. FIRST-AID MEASURES

Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If medical advice is needed, have product container or label at hand.

Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

Skin Contact: Cool skin rapidly with cold water after contact with molten product. Removal of solidified molten material from skin requires medical assistance.

Eye Contact: Removal of solidified molten material from the eyes requires medical assistance. Immediately rinse with water for a prolonged period (at least 15 minutes) while holding the eyelids wide open. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists.

Ingestion: Do not induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

Most Important Symptoms and Effects Both Acute and Delayed

General: Under normal conditions of use not expected to present a significant hazard. During processing or physical alteration, flakes or powder cause irritation of the respiratory tract, eyes, skin, and are harmful. Molten material may release toxic, and irritating fumes.

Inhalation: During processing, the most significant route of exposure is by the inhalation (breathing) of fumes. If fumes are inhaled, they can cause a condition commonly known as metal fume fever with symptoms which resemble influenza; Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude, and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea, and prostration may also occur.

Skin Contact: Causes severe skin burns. Contact with fumes or metal powder will irritate skin. Contact with hot, molten metal will cause thermal burns. Dust may cause irritation in skin folds or by contact in combination with tight clothing. Mechanical damage via flying particles and chipped slag is possible.

Eye Contact: During metal processing, dusts caused from milling and physical alteration will likely cause eye irritation.

Fumes from thermal decomposition or molten material will likely be irritating to the eyes. Mechanical damage via flying particles and chipped slag is possible.

Ingestion: Ingestion is not considered a potential route of exposure.

Chronic Symptoms: Inhalation of iron oxide fumes undergoing decomposition may cause irritation and flu-like symptoms, otherwise iron oxide is not hazardous. Aluminum: Inhalation of finely divided aluminum powder may cause pulmonary fibrosis. Zinc: Prolonged exposure to high concentrations of zinc fumes may cause "zinc shakes", an involuntary twitching of the muscles.

Otherwise, zinc is non-toxic. Chromium: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Increased incidences of respiratory cancer have been found in chromium (VI) workers. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion. Silicon: Can cause chronic bronchitis and narrowing of the airways. Manganese: Chronic exposure can cause inflammation of the lung tissue, scarring the lungs (pulmonary fibrosis). Anemia. Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, and lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure. Lead: Exposure can result in lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; encephalopathy; kidney disease; hypertension. Indication of Any Immediate Medical Attention and Special Treatment Needed: If you feel unwell, seek medical advice (show the label where possible).

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use water when molten material is involved, may react violently or explosively on contact with water.

Fire Hazard: Dust, chips, or ribbons can be ignited more easily, by an ignition source, by improper machining, or by spontaneous combustion if finely divided and damp.

Explosion Hazard: Product is not explosive.

Reactivity: Stable at ambient temperature and under normal conditions of use.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Under fire conditions, hazardous fumes will be present.

Firefighting Instructions: Do not breathe fumes from fires or vapors from decomposition.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products. **Hazardous Combustion Products:** Oxides of magnesium. Oxides of copper. Oxides of aluminum. Oxides of lead.

Reference to Other Sections

Refer to section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not handle until all safety precautions have been read and understood. Avoid breathing (vapors, dust, fumes).

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Avoid creating or spreading dust.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection. Wear suitable protective clothing, gloves, and eye/face protection.

Emergency Procedures: Eliminate ignition sources. Evacuate unnecessary personnel, isolate, and ventilate area.

Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Contain and collect as any solid. Avoid generation of dust during clean-up of spills.

Methods for Cleaning Up: Use clean non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal

Reference to Other Sections: See Heading 8. Exposure controls and personal protection.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Do not allow water (or moist air) contact with this material. Product dust is combustible. Use care during processing to minimize generation of dust.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and when leaving work. Do not eat, drink, or smoke when using this product. Wash hands and forearms thoroughly after handling. Always wash your hands immediately after handling this product, and once again before leaving the workplace.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Store in original container. Store in dry protected location to prevent any moisture contact. Keep away from heat and flame.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers. Water, humidity. Alkalis. Corrosive substances in contact with metals may produce flammable hydrogen gas.

Special Rules on Packaging: Store in a closed container.

Specific End Use(s): Various extruded aluminum parts and products and cast billet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Aluminum (7429-90-5)	Aluminum (7429-90-5)		
Mexico	OEL TWA (mg/m³)	10 mg/m³ (dust)	
USA ACGIH	ACGIH TWA (mg/m³)	1 mg/m³ (respirable fraction)	
USA OSHA	OSHA PEL (TWA) (mg/m³)	15 mg/m³ (total dust) 5 mg/m³ (respirable fraction)	
USA NIOSH	NIOSH REL (TWA) (mg/m³)	10 mg/m³ (total dust) 5 mg/m³ (respirable dust)	
Alberta	OEL TWA (mg/m³)	10 mg/m³ (dust)	
British Columbia	OEL TWA (mg/m³)	1.0 mg/m³ (respirable)	
Manitoba	OEL TWA (mg/m³)	1 mg/m³ (respirable fraction)	
New Brunswick	OEL TWA (mg/m³)	10 mg/m³ (metal dust)	
Newfoundland & Labrador	OEL TWA (mg/m³)	1 mg/m³ (respirable fraction)	
Nova Scotia	OEL TWA (mg/m³)	1 mg/m³ (respirable fraction)	

Nunavut	OEL STEL (mg/m³)	20 mg/m ³
Nunavut	OEL TWA (mg/m³)	10 mg/m³
Northwest Territories	OEL STEL (mg/m³)	20 mg/m ³
Northwest Territories	OEL TWA (mg/m³)	10 mg/m³
Ontario	OEL TWA (mg/m³)	1 mg/m³ (respirable)
Prince Edward Island	OEL TWA (mg/m³)	1 mg/m³ (respirable) 1 mg/m³ (respirable fraction)
Québec	VEMP (mg/m³)	10 mg/m ³
Saskatchewan	OEL STEL (mg/m³)	20 mg/m³ (dust)
Saskatchewan	OEL TWA (mg/m³)	10 mg/m³ (dust)
Silicon (7440-21-3)	0	206, (44.65)
Mexico	OEL TWA (mg/m³)	10 mg/m³ (inhalable fraction)
Mexico	OEL STEL (mg/m³)	20 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m³)	15 mg/m³ (total dust)
		5 mg/m³ (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m³)	10 mg/m³ (total dust)
	, , , , ,	5 mg/m³ (respirable dust)
British Columbia	OEL TWA (mg/m³)	10 mg/m³ (total dust)
New Brunswick	OEL TWA (mg/m³)	10 mg/m³
	, ,,	<u> </u>
Nunavut	OEL TWA (mg/m³)	5 mg/m³ (respirable mass)
Northwest Territories	OEL TWA (mg/m³)	5 mg/m³ (respirable mass)
Ontario	OEL TWA (mg/m³)	10 mg/m³ (total dust)
Québec	VEMP (mg/m³)	10 mg/m³ (containing no Asbestos and <1%
Cashatahaaaa	OFI CTEL (122 - (123))	Crystalline silica-total dust)
Saskatchewan	OEL STEL (mg/m³)	20 mg/m ³
Saskatchewan	OEL TWA (mg/m³)	10 mg/m ³
Yukon	OEL STEL (mg/m³)	20 mg/m³
Yukon	OEL TWA (mg/m³)	30 mppcf
Copper (7440-50-8)		
Mexico	OEL TWA (mg/m³)	0.2 mg/m³ (fume) 1 mg/m³ (dust and mist)
Mexico	OEL STEL (mg/m³)	2 mg/m³ (fume)
		2 mg/m³ (dust and mist)
USA ACGIH	ACGIH TWA (mg/m³)	0.2 mg/m³ (fume)
USA OSHA	OSHA PEL (TWA) (mg/m³)	0.1 mg/m³ (fume)
		1 mg/m³ (dust and mist)
USA NIOSH	NIOSH REL (TWA) (mg/m³)	1 mg/m³ (dust and mist)
		0.1 mg/m³ (fume)
USA IDLH	US IDLH (mg/m³)	100 mg/m³ (dust, fume, and mist)
Alberta	OEL TWA (mg/m³)	0.2 mg/m³ (fume)
British Columbia		
	OEL TWA (mg/m³)	1 mg/m³ (dust and mist)
Manitoba	OEL TWA (mg/m³)	0.2 mg/m³ (fume)
New Brunswick	OEL TWA (mg/m³) OEL TWA (mg/m³)	0.2 mg/m³ (fume) 0.2 mg/m³ (fume)
New Brunswick Newfoundland & Labrador	OEL TWA (mg/m³) OEL TWA (mg/m³) OEL TWA (mg/m³)	0.2 mg/m³ (fume) 0.2 mg/m³ (fume) 0.2 mg/m³ (fume)
New Brunswick Newfoundland & Labrador Nova Scotia	OEL TWA (mg/m³) OEL TWA (mg/m³) OEL TWA (mg/m³) OEL TWA (mg/m³)	0.2 mg/m³ (fume) 0.2 mg/m³ (fume) 0.2 mg/m³ (fume) 0.2 mg/m³ (fume)
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New Brunswick Newfoundland & Labrador Nova Scotia Nunavut Nunavut	OEL TWA (mg/m³) OEL TWA (mg/m³) OEL TWA (mg/m³) OEL TWA (mg/m³) OEL STEL (mg/m³) OEL STEL (mg/m³)	0.2 mg/m³ (fume) 0.2 mg/m³ (fume) 0.2 mg/m³ (fume) 0.2 mg/m³ (fume) 0.6 mg/m³ (fume) 0.2 mg/m³ (fume)

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Ontario OEL TWA (mg/m³) 0.5 mg/m³	Northwest Territories	· - ·	_
	Ontario	· - ·	
	Prince Edward Island	, . ,	_

Québec	VEMP (mg/m³)	0.5 mg/m³
Saskatchewan	OEL STEL (mg/m³)	1.5 mg/m ³
Saskatchewan	OEL TWA (mg/m³)	0.5 mg/m ³
Yukon	OEL STEL (mg/m³)	3.0 mg/m ³
Yukon	OEL TWA (mg/m³)	0.1 mg/m ³
Lead (7439-92-1)		·
Mexico	OEL TWA (mg/m³)	0.15 mg/m³ (dust and fume)
USA ACGIH	ACGIH TWA (mg/m³)	0.05 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m³)	50 μg/m³
USA NIOSH	NIOSH REL (TWA) (mg/m³)	0.050 mg/m ³
USA IDLH	US IDLH (mg/m³)	100 mg/m ³
Alberta	OEL TWA (mg/m³)	0.05 mg/m ³
British Columbia	OEL TWA (mg/m³)	0.05 mg/m ³
Manitoba	OEL TWA (mg/m³)	0.05 mg/m ³
New Brunswick	OEL TWA (mg/m³)	0.05 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m³)	0.05 mg/m ³
Nova Scotia	OEL TWA (mg/m³)	0.05 mg/m ³
Nunavut	OEL STEL (mg/m³)	0.45 mg/m ³
Nunavut	OEL TWA (mg/m³)	0.15 mg/m ³
Northwest Territories	OEL STEL (mg/m³)	0.45 mg/m ³
Northwest Territories	OEL TWA (mg/m³)	0.15 mg/m ³
Ontario	OEL TWA (mg/m³)	0.05 mg/m³ (designated substances regulation)
Prince Edward Island	OEL TWA (mg/m³)	0.05 mg/m ³
Québec	VEMP (mg/m³)	0.05 mg/m ³
Saskatchewan	OEL STEL (mg/m³)	0.15 mg/m ³
Saskatchewan	OEL TWA (mg/m³)	0.05 mg/m³
Yukon	OEL STEL (mg/m³)	0.45 mg/m³ (dust and fume)
Yukon	OEL TWA (mg/m³)	0.15 mg/m³ (dust and fume)

Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Avoid dust production. Avoid creating or spreading dust. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Personal Protective Equipment: Safety glasses. Gloves. Insufficient ventilation: wear respiratory protection. Protective clothing.









Materials for Protective Clothing: With molten material wear thermally protective clothing.

Hand Protection: Wear chemically resistant protective gloves. If material is hot, wear thermally resistant protective gloves.

Eye Protection: Chemical goggles or face shield. Face shield. **Skin and Body Protection:** Wear suitable protective clothing.

Respiratory Protection: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may

exceed established Occupational Exposure Limits. Wear approved mask.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink, or smoke during use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid **Appearance:** Silvery plate, rod, bar, extrusion, etc.

Odor: NoneOrder Threshold: Not applicablepH: Not applicableEvaporation Rate: Not availableMelting Point: 1030 - 1210°F (554-654°C)Freezing Point: Not available

Boiling Point: Not applicable Flash Point: Not available

Auto-ignition Temperature: Not available

Flammability (solid, gas): Not available

Lower Flammable Limit: Not available

Upper Flammable Limit:Not availableVapor Pressure:Not applicableRelative Vapor Density at 20°C:Not availableRelative Density:Not available

Solubility: Water: None Partition coefficient n-octanol/water: Not applicable

Viscosity: Not available Specific Gravity: Not available

Specific gravity / density: 2.69-2.72 g/cm3 (0.097-0.099 lb/ft3)

Explosion Data - Sensitivity to Mechanical impact: Not expected to present explosion hazard due to

mechanical impact

Explosion Data – Sensitivity to Static Discharge: Not expected to present explosion hazard due to static

discharge

10. STABILITY AND REACTIVITY

Reactivity: Stable at ambient temperature and under normal conditions of use.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Protect from moisture. Incompatible materials.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers. Water, humidity. Alkalis. Corrosive substances in contact with metals may produce flammable bydrogen gas.

substances in contact with metals may produce flammable hydrogen gas.

Hazardous Decomposition Products: Under conditions of fire this material may produce oxides of iron, oxides

of copper, oxides of aluminum, oxides of zinc.

11. TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity: Not classified LD50 and LC50 Data: Not available Skin Corrosion/Irritation: Not classified

pH: Not applicable

Serious Eye Damage/Irritation: Not classified

pH: Not applicable

Respiratory or Skin Sensitization: Not classified Germ Cell Mutagenicity: Not classified Teratogenicity: Not classified

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: During processing, the most significant route of exposure is by the inhalation (breathing) of fumes. If fumes are inhaled, they can cause a condition commonly known as metal fume fever with symptoms which resemble influenza; Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper

respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude, and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea, and prostration may also occur.

Symptoms/Injuries After Skin Contact: Causes severe skin burns. Contact with fumes or metal powder will irritate skin. Contact with hot, molten metal will cause thermal burns. Dust may cause irritation in skin folds or by contact in combination with tight clothing. Mechanical damage via flying particles and chipped slag is possible.

Symptoms/Injuries After Eye Contact: During metal processing, dusts caused from milling and physical alteration will likely cause eye irritation. Fumes from thermal decomposition or molten material will likely be irritating to the eyes. Mechanical damage via flying particles and chipped slag is possible.

Symptoms/Injuries After Ingestion: Ingestion is not considered a potential route of exposure.

Chronic Symptoms: Inhalation of iron oxide fumes undergoing decomposition may cause irritation and flu-like symptoms, otherwise iron oxide is not hazardous. Aluminum: Inhalation of finely divided aluminum powder may cause pulmonary fibrosis. Zinc: Prolonged exposure to high concentrations of zinc fumes may cause "zinc shakes", an involuntary twitching of the muscles. Otherwise, zinc is non-toxic. Chromium: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Increased incidences of respiratory cancer have been found in chromium (VI) workers. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion. Silicon: Can cause chronic bronchitis and narrowing of the airways. Manganese: Chronic exposure can cause inflammation of the lung tissue, scarring the lungs (pulmonary fibrosis). Anemia.

Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, and lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure. Lead: Exposure can result in lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; encephalopathy; kidney disease; hypertension.

Information on Toxicological Effects - Ingredient(s) LD50 and LC50 Data:

Iron (7439-89-6)	
LD50 Oral Rat	98.6 g/kg
Manganese (7439-96-5)	
LD50 Oral Rat	> 2000 mg/kg
Chromium (7440-47-3)	
LD50 Oral Rat	> 5000 mg/kg
Lead (7439-92-1)	
ATE US (oral)	500.00 mg/kg body weight
ATE US (dust, mist)	1.50 mg/l/4h
Chromium (7440-47-3)	
IARC Group	3
Lead (7439-92-1)	
IARC Group	2A
National Toxicology Program (NTP) Status	Reasonably anticipated to be Human Carcinogen.

12. ECOLOGICAL INFORMATION (non-mandatory)

Toxicity

Zinc (7440-66-6)		
LC50 Fish 1	2.16 - 3.05 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])	
EC50 Daphnia 1	0.139 - 0.908 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])	
LC 50 Fish 2	0.211 - 0.269 mg/l (Exposure time: 96 h - Species: Pimephales promelas [semi-static])	
Copper (7440-50-8)		
LC50 Fish 1	<= 0.0068 (0.0068 - 0.0156) mg/l (Exposure time: 96 h - Species: Pimephales promelas)	
EC50 Daphnia 1	0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])	
EC50 Other Aquatic Organisms 1	0.0426 (0.0426 - 0.0535) mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata [static])	
LC 50 Fish 2	0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])	
EC50 Other Aquatic Organisms 2	0.031 (0.031 - 0.054) mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [static])	
Manganese (7439-96-5)		
NOEC chronic fish	3.6 mg/l (Exposure time: 96h; Species: Oncorhynchus mykiss)	
Lead (7439-92-1)		
LC50 Fish 1	0.44 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])	
EC50 Daphnia 1	600 μg/l (Exposure time: 48 h - Species: water flea)	
LC 50 Fish 2	1.17 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])	

Persistence and Degradability

Copper (7440-50-8)	
Persistence and Degradability	Not readily biodegradable.

Bioaccumulative Potential: Not available

Mobility in Soil: Not available

Other Adverse Effects: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a

safe way.

Additional Information: Recycle the material as far as possible. **Ecology – Waste Materials:** Avoid release to the environment.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated for transport **IMDG:** Not regulated for transport **IATA:** Not regulated for transport **TDG:** Not regulated for transport

15. REGULATORY INFORMATION (non-mandatory)

US Federal Regulations

Aluminum (7429-90-5)		
· ·	Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on United States SARA Section 313		
SARA Section 313 - Emission Reporting	1.0 % (dust or fume only)	
Silicon (7440-21-3)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Zinc (7440-66-6)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on United States SARA Section 313		
SARA Section 313 - Emission Reporting	1.0 % (dust or fume only)	
Copper (7440-50-8)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Listed on United States SARA Section 313		
SARA Section 313 - Emission Reporting 1.0 %		
Magnesium (7439-95-4)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Iron (7439-89-6)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Manganese (7439-96-5)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Listed on United States SARA Section 313		
SARA Section 313 - Emission Reporting 1.0 %		
Chromium (7440-47-3)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Listed on United States SARA Section 313		
SARA Section 313 - Emission Reporting 1.0 %		
Lead (7439-92-1)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
Listed on United States SARA Section 313		
SARA Section 313 - Emission Reporting	0.1 %	

US State Regulations

Lead (7439-92-1)	
U.S California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to
	the State of California to cause cancer.
U.S California - Proposition 65 - Developmental Toxicity	WARNING: This product contains chemicals known to
	the State of California to cause birth defects.
U.S California - Proposition 65 - Reproductive Toxicity -	WARNING: This product contains chemicals known to
Female	the State of
	California to cause (Female) reproductive harm.
U.S California - Proposition 65 - Reproductive Toxicity -	WARNING: This product contains chemicals known to
Male	the State of California to cause (Male) reproductive
	harm.

Aluminum (7429-90-5)

- U.S. Massachusetts Right to Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) Environmental Hazard List
- U.S. Pennsylvania RTK (Right to Know) List

Silicon (7440-21-3)

- U.S. Massachusetts Right to Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) List

Zinc (7440-66-6)

- U.S. Massachusetts Right to Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) Environmental Hazard List
- U.S. Pennsylvania RTK (Right to Know) List

Copper (7440-50-8)

- U.S. Massachusetts Right to Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) Environmental Hazard List
- U.S. Pennsylvania RTK (Right to Know) List

Magnesium (7439-95-4)

- U.S. Massachusetts Right to Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) List

Manganese (7439-96-5)

- U.S. Massachusetts Right to Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) Environmental Hazard List
- U.S. Pennsylvania RTK (Right to Know) List

Chromium (7440-47-3)

- U.S. Massachusetts Right to Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) Environmental Hazard List
- U.S. Pennsylvania RTK (Right to Know) Special Hazardous Substances
- U.S. Pennsylvania RTK (Right to Know) List

Lead (7439-92-1)

- U.S. Massachusetts Right to Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) Environmental Hazard List
- U.S. Pennsylvania RTK (Right to Know) List

Canadian Regulations

Wrought Aluminum Products, 6xxx Series Alloys		
	WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

Aluminum (7429-90-5)	
Listed on the Canadian DSL (Domestic Substances List)	
Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification Class B Division 6 - Reactive Flammable Material	
	Class B Division 4 - Flammable Solid

mestic Substances List)		
•		
Uncontrolled product according to WHMIS classification criteria		
mestic Substances List)		
Uncontrolled product according to WHMIS classification criteria		
mestic Substances List) redient Disclosure List)		
Uncontrolled product according to WHMIS classification criteria		
mestic Substances List)		
Class B Division 4 - Flammable Solid		
Class B Division 6 - Reactive Flammable Material		
mestic Substances List)		
Class B Division 4 - Flammable Solid		
Class B Division 6 - Reactive Flammable Material		
mestic Substances List) redient Disclosure List)		
Uncontrolled product according to WHMIS classification criteria		
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)		
IDL Concentration 0.1 %		
Uncontrolled product according to WHMIS classification criteria		
mestic Substances List)		
Listed on the Canadian IDL (Ingredient Disclosure List) IDL Concentration 0.1 %		
Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects		

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

16. OTHER INFORMATION

GHS Full Text Phrases:

Acute Tox. 4 (Inhalation: dust,mist)	Acute toxicity (inhalation: dust,mist) Category 4	
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4	
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1	
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1	
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3	
Carc. 1B	Carcinogenicity Category 1B	
Comb. Dust	Combustible Dust	
Flam. Sol. 1	Flammable solids Category 1	
Repr. 1A	Reproductive toxicity Category 1A	
Self-heat. 1	Self-heating substances and mixtures Category 1	
Self-heat. 2	Self-heating substances and mixtures Category 2	
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1	
Water-react. 2	Substances and mixtures which in contact with water emit flammable gases Category 2	
H228	Flammable solid	
H232	May form combustible dust concentrations in air	
H251	Self-heating: may catch fire	
H252	Self-heating in large quantities; may catch fire	
H261	In contact with water releases flammable gases	
H302	Harmful if swallowed	
H332	Harmful if inhaled	
H350	May cause cancer	
H360	May damage fertility or the unborn child	
H372	Causes damage to organs through prolonged or repeated exposure	
H400	Very toxic to aquatic life	
H410	Very toxic to aquatic life with long lasting effects	
H412	Harmful to aquatic life with long lasting effects	

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.





8/24/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.spray (formerly ECOLINE-S), ECOBASE, ECODAMP

Product Description: Polymer Modified Asphalt Emulsion

CAS No: N/A

Manufacturer / Supplier: EPRO Services, Inc. PO Box 347 Derby, KS 67037 800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

GHS-US Classification of the Substance or Mixture

Carc.2: H351 STOT RE 2: H373

Aquatic Chronic 3: H412

Full text of H-phrases: see Section 16

GHS-US Label Elements
Signal Word: Warning
Hazard Statements

H351: Suspected of causing cancer

H373: May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure

H412: Harmful to aquatic life with long lasting effects

Precautionary Statements

P201: Obtain special instructions before use

P202: Do not handle until all safety precautions have been read and understood

P260: Do not breathe vapors, mist, and spray

P273: Avoid release to the environment

P280: Wear eye protection, protective clothing, and protective gloves P308+P313: If exposed or concerned, get medical advice/attention

P314: Get medical advice/attention if you feel unwell

P405: Store locked up

P501: Dispose of contents/container in accordance with local, regional, national, and international regulations

Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. If stored under heat for extended periods or significantly agitated, this material might evolve or release hydrogen sulfide, a flammable gas, which can raise and widen this material's actual flammability limits and significantly lower its auto-ignition

temperature. Hydrogen sulfide is a toxic gas that can be fatal. It also has a rotten egg smell that causes odor fatigue very quickly and should not be used as an indicator for the presence of gas. Flammable vapors can accumulate in head space of closed system

Unknown Acute Toxicity (GHS-US)

Up to 30% of the mixture consists of ingredient(s) of unknown acute toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	%	Classification (GHS-US)
Asphalt	(CAS No) 8052-42-4	50 - 70	Not classified
Water	(CAS No) 7732-18-5	30 - 40	Not classified
Proprietary Polymer	Proprietary*	< 30	Not classified
Proprietary Hydrocarbon	Proprietary*	0 - 5	Flam. Liq. 3, H226 Acute Tox. 3 (Inhalation:vapor), H331 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 3, H402 Aquatic Chronic 2, H411

^{*}The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret within the meaning of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Full text of H-phrases: See Section 16

4. FIRST-AID MEASURES

Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice.

First-aid Measures after Inhalation: When symptoms occur go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

First-aid Measures after Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Wash contaminated clothing before reuse. Obtain medical attention if irritation develops or persists.

First-aid Measures after Eye Contact: Rinse cautiously with water for at least 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if redness, pain, or irritation occurs.

First-aid Measures after Ingestion: Rinse mouth. Do NOT induce vomiting. Seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: There are potential chronic health effects to consider.

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated

exposure. Suspected of causing cancer

Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2).

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire. Application of water stream to hot product may cause frothing and increase fire intensity.

Special Hazards Arising from the Substance or Mixture

Fire Hazard: Will not support combustion unless the water has evaporated.

Explosion Hazard: Product is not explosive. Contains Sulfur, may release small amounts of hydrogen sulfide. Hydrogen sulfide is a highly flammable, explosive gas under certain conditions, is a toxic gas, and may be fatal. Gas can accumulate in the headspace of closed containers, use caution when opening sealed containers. Heating the product or containers can cause thermal decomposition of the product and release hydrogen sulfide.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not allow run-off from firefighting to enter drains or water sources. Do not breathe fumes or vapors from fire. Use water spray or fog for cooling exposed containers.

Protection During firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Other Information: Refer to Section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Use special care to avoid static electric charges. Keep away from heat, sparks, open flames, hot surfaces. – No smoking.

For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container. Contact competent authorities after a spill.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. Concerning disposal elimination after cleaning, see item 13.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Handle empty, enclosed containers with care because residual vapors may be flammable.

Precautions for Safe Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take precautionary measures against static discharge. Use only non-sparking tools. Keep away from heat, sparks, open flames, hot surfaces. – No smoking. Avoid breathing vapors, mist, spray.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment.

Storage Conditions: Store in a dry, cool, and well-ventilated place. Keep container closed when not in use.

Incompatible Products: Strong acids. Strong bases. Strong oxidizers.

Incompatible Materials: Heat sources. Storage Temperature: > 0 °C (32 °F) Storage Area: Store locked up.

Specific End Use(s): Asphalt Emulsion

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in Section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV, NIOSH (REL), or OSHA (PEL).

Asphalt (8052-42-4)		
USA ACGIH TWA (mg/m³) 0.5 mg/m³ (fume, inhalable fraction)		0.5 mg/m³ (fume, inhalable fraction)
USA ACGIH	ACGIH chemical category	Not classifiable as a human carcinogen fume, coat tar-free
USA NIOSH	NIOSH REL (ceiling) (mg/m³)	5 mg/m³ (fume)

Proprietary Hydrocarbon			
USA ACGIH	SA ACGIH ACGIH TWA (mg/m³) 100 mg/m³ (inhalable fraction and vapor)		
USA ACGIH	ACGIH chemical category	Skin – potential significant contribution to overall exposure by	
	the cutaneous route, Confirmed Animal Carcinogen with		
		Unknown Relevance to Humans	

Exposure Controls

Appropriate Engineering Controls: Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Take precautionary measures against static discharges. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases/vapors may be released.

Personal Protective Equipment: Protective goggles, gloves, protective clothing. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory

protection should be worn.

Thermal Hazard Protection: If material is hot, wear thermally resistant protective gloves.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink, or smoke during use.

Other Information: When using, do not eat, drink, or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid Odor: No data available pH: No data available

Melting Point: Not applicable Boiling Point: 100°C (212.00°F)

Auto-ignition Temperature: No data available Flammability (solid, gas): No data available Relative Vapor Density at 20°C: >1.0 (air=1) Specific Gravity: 1.0+ / -0.2 at 60°F (15.6°C)

Viscosity: No data available

Other Information VOC Content: 0%

Volitales (includes water): 30 - 50%

Appearance: Brown to Black Order Threshold: No data available

Evaporation Rate: Slower (butyl acetate-1)

Freezing Point: No data available Flash Point: No data available

Decomposition Temperature: No data available

Vapor Pressure: Not determined Relative Density: No data available

Solubility: Water: miscible

Partition Coefficient: N-Octanol/Water: No data available

10. STABILITY AND REACTIVITY

Reactivity: Hazardous reactions will not occur under normal conditions.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

 $Conditions\ to\ Avoid:\ Direct\ sunlight.\ Extremely\ high\ or\ low\ temperatures.\ Open\ flame.\ Overheating.\ Heat.\ Sparks.$

Do not freeze.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

Hazardous Decomposition Products: May release flammable gases. Thermal decomposition generates: Carbon oxides

(CO, CO2). Nitrogen oxides. Hydrogen sulfide. Sulfur dioxide. Irritating or toxic vapors.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: Not classified

Asphalt (8052-42-4	
LD50 Oral Rat > 5000 mg/kg	
LD50 Dermal Rabbit	> 2000 mg/kg

Proprietary Hydrocarbon	
LD50 Dermal Rabbit 4720 μl/kg	
LD50 Inhalation Rat	4.6 mg/l/4h

Skin Corrosion/Irritation: Not classified Serious Eye Damage/Irritation: Not classified Respiratory or Skin Sensitization: Not classified Germ Cell Mutagenicity: Not classified Carcinogenicity: Suspected of causing cancer.

Asphalt (8052-42-4)		
IARC Group	2B	
National Toxicology Program (NTP) Status	Twelfth Report-Items under consideration	
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list	

Proprietary Polymer	
IARC group	3

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or

repeated exposure.

Aspiration Hazard: Not classified

Symptoms/Injuries after Inhalation: May cause respiratory irritation. Symptoms/Injuries after Skin Contact: May cause skin irritation. Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated

exposure. Suspected of causing cancer.

12. ECOLOGICAL INFORMATION

Ecology – General: This material is hazardous to the aquatic environment. Keep out of sewers and waterways. Ecology – Water: Harmful to aquatic life with long-lasting effects.

	Proprietary Hydrocarbon	
LC50 Fish 1 35 mg/l (Exposure time: 96 h – Species: Pimephales promelas (flow-through))		

Persistence and Degradability: Not established. Bioaccumulative Potential: Not established

Asphalt (8052-42-4)		
BCF fish 1 (no bioaccumulation expected)		
Log Pow	> 6	

Mobility in Soil: No additional information available. Other Adverse Effects: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains. Do not dispose of waste into sewer.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable.

14. TRANSPORT INFORMATION

DOT: Not regulated for transport IMDG: Not regulated for transport IATA: Not regulated for transport

15. REGULATORY INFORMATION (non-mandatory)

US Federal Regulations

SARA Section 311/312 Hazard Classes: Delayed (chronic) health hazard

TSCA (Toxic Substances Control Act) Inventory – Asphalt (8052-42-4): Listed TSCA (Toxic Substances Control Act) Inventory – Water (7732-18-5): Listed

 ${\sf TSCA} \ ({\sf Toxic} \ {\sf Substances} \ {\sf Control} \ {\sf Act}) \ {\sf Inventory} - {\sf Proprietary} \ {\sf Hydrocarbon} \colon \ {\sf Listed}$

TSCA (Toxic Substances Control Act) Inventory – Proprietary Polymer: Listed

US State Regulations

Asphalt (8052-42-4)

Massachusetts: Right to Know List

New Jersey: Right to Know Hazardous Substance List

Pennsylvania: RTK (Right to Know) List

16. OTHER INFORMATION

GHS Full Text Phrases

Acute Tox. 3 (Inhalation:vapor)	Acute toxicity (inhalation:vapor) Category 3	
Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3	
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2	
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3	
Asp. Tox. 1	Aspiration hazard Category 1	
Carc. 2	Carcinogenicity Category 2	
Flam. Liq. 3	Flammable liquids Category 3	
Skin Irrit. 2	Skin corrosion/irritation Category 2	
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2	
H226	Flammable liquid and vapor	
H304	May be fatal if swallowed and enters airways	
H315	Causes skin irritation	
H331	Toxic if inhaled	
H351	Suspected of causing cancer	
H373	May cause damage to organs through prolonged or repeated exposure	
H402	Harmful to aquatic life	
H411	Toxic to aquatic life with long lasting effects	
H412	Harmful to aquatic life with long lasting effects	

NFPA Health Hazard: 1 – exposure could cause irritation but only minor residual injury even if not treatment is given.

NFPA Fire Hazard: 1 – must be preheated before ignition can occur

NFPA Reactivity: 0 – normally stable, even under fire exposure conditions, and are not reactive with water

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.catalyst

Product Description: liquid calcium chloride

Synonyms: Liquid Calcium Chloride, Food Grade Liquid Calcium Chloride

CAS No: 10043-52-4

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Serious Eye Damage/Eye Irritation - Category 2

Signal Word: Warning Hazard Statements

*Causes serious eye irritation Appearance: Colorless to amber

Physical State: Liquid Odor: Odorless

Precautionary Statements

Prevention

*Wash face, hands, and any exposed skin thoroughly after handling

*Wear eye/face protection

Response

*If IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

*If eye irritation persists: Get medical advice/attention.

Storage: None Disposal: None

Hazard Not Otherwise Classified (HNOC): Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

*The exact percentage (concentration) of composition has been withheld as a trade secret.

Chemical Name	CAS-No	Weight %	Trade Secret
Calcium Chloride	10043-52-4	20-40	*

4. FIRST-AID MEASURES

Description of necessary first-aid measures

Eye Contact: Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. If symptoms persist, call a physician.

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. If symptoms persist, call a physician.

Inhalation: Move to fresh air in case of accidental inhalation of vapors. Remove from exposure, lie down. If symptoms persist, call a physician.

Ingestion: Rinse mouth. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Drink plenty of water. Consult a physician.

Most important symptoms/effects, acute and delayed

Most Important Symptoms/Effects Irritation

Indication of immediate medical attention and special treatment needed, if necessary

Notes to Physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media No information available.

Specific Hazards Arising from the

Chemical No information available.

Explosion Data

Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures

Personal Precautions: Avoid contact with the skin and the eyes. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Do not touch or walk through spilled material.

Advice for emergency responders: Wear personal protective equipment.

Environmental Precautions

Environmental Precautions: Prevent product from entering drains. See Section 12 for additional Ecological Information.

Methods and materials for containment and cleaning up

Methods for Containment: Prevent further leakage or spillage if safe to do so. Dike far ahead of spill; use dry sand to contain the flow of material

Methods for Cleaning Up: Soak up with inert absorbent material. Pick up and transfer to properly labeled containers. After cleaning, flush away traces with water. Prevent product from entering drains.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling: Handle in accordance with good industrial hygiene and safety practice. Wear personal protective equipment. Avoid contact with skin, eyes, and clothing. Do not breathe vapors or spray mist.

Conditions for safe storage, including any incompatibilities

Storage: Keep container tightly closed in a dry and well-ventilated place. Keep in properly labeled containers.

Incompatible Products: None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
	ACGIH - (TLV-TWA) Guideline for	OSHA (PEL-TWA) - Z-3 Mineral	-
10043-52-4	nuisance particulate (inhalable	Dusts, Inert or Nuisance dusts,	
	particulate): 10 mg/m ³	(respirable fraction): 5 mg/m₃	

Appropriate engineering controls

Engineering Measures: When there is a potential for exposure, an emergency eyewash and safety shower should be provided within the immediate work area.

Individual protection measures, such as personal protective equipment

Eye/Face Protection: Wear safety glasses with non-flexible side shields or chemical goggles A face shield should be worn if a potential for splashing or spraying exists.

Skin and Body Protection: Wear appropriate protective non-leather protective gloves and boots. Wear appropriate protective, impervious clothing. Chemical protective gloves and boots such as PVC, Neoprene, or Heavy Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction.

Respiratory Protection: Respirator (N95 or greater) should be based on the presence of nuisance dusts.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical StateLiquidAppearanceColorless to amberOdorOdorlessOdor ThresholdNo information available

Values Remarks/ - Method **Property** 3.8 - 9.0None known Ha Melting Point/Range Not determined None known **Boiling Point/Boiling Range** 118 °C / 244 °F for 38% liquid solution Flash Point Not applicable. None known **Evaporation rate** No data available None known Flammability (solid, gas) No data available None known Flammability Limits in Air upper flammability limit No data available lower flammability limit No data available No data available **Vapor Pressure** None known **Vapor Density** No data available None known 1.376 @ 25 C (77 F) for 38% solution None known **Specific Gravity** Water Solubility Completely soluble None known Solubility in other solvents No data available None known Partition coefficient: n-octanol/water Not determined None known **Autoignition Temperature** No data available None known **Decomposition Temperature** No data available None known Viscosity Not applicable None known Flammable Properties Not flammable **Explosive Properties** No data available **Oxidizing Properties** No data available Other Information

Not applicable

10. STABILITY AND REACTIVITY

Reactivity: No data available.

VOC Content (%)

Chemical stability:_Stable under recommended storage conditions.

Possibility of hazardous reactions:_None under normal processing.

Hazardous Polymerization: Hazardous polymerization does not occur.

Conditions to avoid: None known based on information supplied. **Incompatible materials:** None known based on information supplied.

Hazardous decomposition products: None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation: May cause irritation.

Eye Contact: Irritating to eyes.

Skin Contact: Slightly toxic by dermal absorption.

Ingestion: May cause irritation.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Calcium Chloride	=2301 mg/kg (Rat)	=2630 mg/kg (Rat)	

Symptoms related to the physical, chemical, and toxicological characteristics

Symptoms: No information available.

Delayed and immediate effects and chronic effects from short- and long-term exposure

Sensitization: No information available. **Mutagenic Effects:** No information available.

Carcinogenicity: Contains no ingredients above reportable quantities listed as a carcinogen.

Reproductive Toxicity: No information available. STOT - single exposure: No information available. STOT - repeated exposure: No information available. Aspiration Hazard: No information available.

Numerical measures of toxicity - Product: No information available.

12. ECOLOGICAL INFORMATION (non-mandatory)

Ecotoxicity

The environmental impact of this product has not been fully investigated.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Calcium Chloride		LC50 96 h: = 10650 mg/L		LC50 48 h: = 2400 mg/L
10043-52-4		static (Lepomis macrochirus)		(Daphnia magna)

Persistence and Degradability: No information available.

Bioaccumulation: No information available.

Other Adverse Effects: No information available.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Waste Disposal Methods: This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements.

Contaminated Packaging: Do not re-use empty containers.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated **IATA:** Not regulated **IMDG:** Not regulated

15. REGULATORY INFORMATION (non-mandatory)

International Inventories

Legend

TSCA – United States Toxic Substances Control Act Section 8(b) Inventory **DLS/NDSL** – Canadian Domestic Substances List/Non-Domestic Substances List

U.S. Federal Regulations

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute Health Hazard

Chronic Health Hazard

No
Fire Hazard

No
Sudden Release of Pressure Hazard

No
Reactive Hazard

No

Clean Water Act

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

U.S. State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

U.S. EPA Label Information

EPA Pesticide Registration Number: Not Applicable

16. OTHER INFORMATION

NFPA Health Hazard 1 Flammability 0 Instability 0

HMIS Health Hazard 1 Flammability 0 Physical Hazard 0 Personal Protection X

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



7/1/20

SAFETY DATA SHEET

(conforms to HazCom 2012/United States)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.stop hpl (formerly EPROSTOP-HPL)

Synonyms: CS-231 CAS No: N/A

Supplier:

EPRO Services, Inc.
PO Box 347
Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Since the product is in paste form, the risk of exposure to a carcinogen dust is minimum, this is why the related hazard statements are not shown in this SDS.

OSHA/HCS status: While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture: Not Classified

GHS label elements

Signal word: No signal word

Hazard statements: No known significant effects or critical hazards.

Precautionary statements

General: Read label before use. Keep out of reach of children. If medical advice is needed, have product

container or label at hand. Prevention: Not applicable Response: Not applicable Storage: Not applicable Disposal: Not applicable

Hazards not otherwise classified: None known

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture: Mixture

Other means of identification: Not available

CAS number/other identifiers CAS number: Not applicable Product code: Not available

Ingredient name	%	CAS number
Crystalline silica, quartz	10-30	14808-60-7
1-Propene. 2-methyl homopolymer Titanium dioxide Carbon black	5-10 1-5 0.1-1	9003-27-4 1 3463-67-7 1333-86-4

Any concentration shown as a range is to protect confidentiality or is due to batch variation. There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4. FIRST-AID MEASURES

Description of necessary first aid measures

Eye contact: Not a likely route of exposure. Inhalation: Not a likely route of exposure. Skin contact: No first aid should be needed.

Ingestion: Wash mouth out with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact: No known significant effects or critical hazards. Inhalation: No known significant effects or critical hazards. Skin contact: No known significant effects or critical hazards. Ingestion: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact: No known significant effects or critical hazards. Inhalation: No known significant effects or critical hazards. Skin contact: No known significant effects or critical hazards. Ingestion: No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Carbon dioxide, dry chemical, foam and water fog or spray.

Unsuitable extinguishing media: None known

Specific hazards arising from the chemical: No specific fire or explosion hazard.

Hazardous thermal decomposition products: Decomposition materials may include the following materials:

Carbon dioxide and/or carbon monoxide

Special protective actions for firefighters: No special measurers are required

Special protective equipment for firefighters: Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Put on appropriate personal protective equipment.

For emergency responders: If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel."

Environmental precautions: None required if used according to recommended conditions.

Methods and materials for contaminant and cleaning up spill: Not applicable

7. HANDLING AND STORAGE

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored, and processed. Workers should wash hands and faces before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store away from direct sunlight in a dry, cool, and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Do not store in unlabeled containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational exposure

<u>limits</u>

Ingredient name	Exposure limits
-	OSHA PEL Z3 (United States, 2/2013).
	TWA: 10 mg/m ³ 8 hours. Form: Respirable
Crustollino silian	TWA: 250 mppcf 8 hours Form: Respirable
Crystalline silica,	NIOSH REL (United States, 10/2013).
quartz	TWA: 0.05 mg/m ³ 10 hours. Form: Respirable dust
	ACGIH TLV (United States, 4/2014).
	TWA: 0.025 mg/m ³ 8 hours. Form: Respirable fraction.
	OSHA PEL (United States, 2/2013).
	TWA: 15 mg/m ³ 8 hours. Form: Total dust
Titanium dioxide	ACGIH TLV (United States, 4/2014).
intamum dioxide	TWA: 10 mg/m ³ 8 hours.
	ACGIH TLV (United States, 4/2014).
	TWA: 3 mg/m ³ 8 hours. Form: Inhalable fraction
	NIOSH REL (United States, 10/2013).
Carbon	TWA: 3.5 mg/m ³ 10 hours.
Black	TWA: 0.1 mg of PAHs/c m ³ 10 hours
	OSHA PEL (United States, 2/2013).
	TWA: 3.5 mg/m ³ 8 hours.

Appropriate engineering controls: Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Eye/face protection: Not required under normal condition of use.

Skin protection: Chemical-resistant, impervious gloves complying with an approved standard should be work

at all times when handling chemical products if a risk assessment indicates this is necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid Odor: Odorless

Color: Not available

pH: Not available

Boiling point: Not available

Burning time: Not available

Solubility in Water: Insoluble

Melting point: Not available

Flash point: Not available

Burning rate: Not available

Evaporation rate: Not available Flammability (solid, gas): Not available

Vapor pressure: Not available Lower & upper explosive (flammable) limits: Not available

Vapor density: Not available Relative density: Not available

Auto-ignition temperature: Not available Partition coefficient n-octanol/water: Not available

Decomposition temperature: Not available SADT: Not available

Viscosity: Not available

10. STABILITY AND REACTIVITY

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not

occur.

Conditions to avoid: No specific data.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials. Non-reactive or compatible with the following materials: reducing materials, combustible materials, organic materials, metals, acids, alkalis, and moisture.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Carbon black	LD50 Oral	Rat	>1 5400 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Titanium dioxide	Skin- Mild irritant	Human	-	72 hours 300 μg intermittent	-

Sensitization

Skin: There is no data available

Respiratory: There is no data available

Mutagenicity

There is no data available

Carcinogenicity Classification

Product/ ingredient name	OSHA	IARC	NTP
Crystalline silica, quartz Titanium dioxide Carbon black		1 2B 2B	Known to be a human carcinogen

There is no data available

Reproductive toxicity

There is no data available

Teratogenicity

There is no data available

Specific target organ toxicity (single exposure)

There is no data available

Specific target organ toxicity (repeated exposure)

NAME	Category	Route of exposure	Target organs
Crystalline silica, quartz	Category 1	Inhalation	Kidneys, respiratory tract and testes

Aspiration hazard

There is no data available

Information on the likely routes of exposure: Routes of entry anticipated: Oral, Dermal

Potential acute health effects

Eye contact: No known significant effects or critical hazards. Inhalation: No known significant effects or critical hazards. Skin contact: No known significant effects or critical hazards. Ingestion: No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact: No known significant effects or critical hazards. Inhalation: No known significant effects or critical hazards. Skin contact: No known significant effects or critical hazards. Ingestion: No known significant effects or critical hazards.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects: No known significant effects or critical hazards. Potential delayed effects: No known significant effects or critical hazards.

Long term exposure

Potential immediate effects: No known significant effects or critical hazards. Potential delayed effects: No known significant effects or critical hazards.

Potential chronic health effects

General: No known significant effects or critical hazards.

Carcinogenicity: No known significant effects or critical hazards. Mutagenicity: No known significant effects or critical hazards. Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity – Acute toxicity estimates

There is no data available.

12. ECOLOGICAL INFORMATION

Toxicity

Product/ingredient name	Result	Species	Exposure
1-Propene, 2-methyl-, homopolymer	Acute LC50 >5600000 μg/L Fresh water	Fish-Oncorhynchus mykiss	96 hours
Titanium dioxide	Acute EC50 5.83 mg/L Fresh water	Algae-Pseudokirchneriella subcapitata Exponential growth phase	72 hours
	Acute LC50 3 mg/L Fresh water	Crustaceans-Ceriodaphnia dubia Neonate	48 hours
	Acute LC50 5.5 ppm Fresh water	Daphnia-Daphnia magna-Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	Acute LC50 1000 mg/L Fresh water Chronic NOEC 0.984 mg/L Fresh water	Fish- Pimephales promelas Algae- Pseudokirchneriella subcapitata Exponential growth phase	96 hours 72 hours

Persistence and degradability

There is no data available

Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
Titanium dioxide	-	352	low

Mobility in soil

Soil/water partition coefficient (KOC): Not available

Other adverse effects: No known significant effects or critical hazards.

13. DISPOSAL CONSIDERATIONS

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. TRANSPORT INFORMATION

	DOT Classification	IMDG	IATA
UN number	Not regulated	Not regulated	Not regulated
UN proper shipping name			
Transport hazard class			
Packing group			
Environmental hazards	NO	NO	NO
Additional information			

Special precautions for user: No special precautions are required.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available

15. REGULATORY INFORMATION

U.S. Federal regulations: TSCA 8(a) CDR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempt. Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs): Not Listed

Clean Air Act Section 602 Class I Substances: Not listed Clean Air Act Section 602 Class II Substances: Not listed DEA List I Chemicals (Precursor Chemicals): Not listed DEA List II Chemicals (Essential Chemicals): Not listed

Sara 302/304

Composition/information on ingredients

			SARA 302 TPQ		SARA 304 RQ	
Name	%	EHS	(lbs)	(gallons)	(lbs)	(gallons)
No products were found						

SARA 304 RQ: Not applicable

SARA 311/312

Classification: Not applicable

Composition/information on ingredients

_	eomposition/information on nigredients						
	Name	%	Fire	Sudden	Reactive	Immediate	Delayed
			hazard	release of		(acute)	(chronic)
				pressure		health	health
						hazard	hazard
	Crystalline silica, quartz	10-30	No.	No.	No.	No.	Yes.
	Titanium dioxide	1-5	No.	No.	No.	No.	Yes.
	Carbon black	0.1-1	No.	No.	No.	No.	Yes.

Sara 313

	Product name	CAS number	%
Form R-Reporting requirements			
Supplier notification			

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts: The following components are listed: Titanium dioxide; Crystalline silica, quartz; Talc

New York: None of the components are listed

New Jersey: The following components are listed: Titanium dioxide; Crystalline silica, quartz,

Distillates (petroleum), solvent-dewaxed heavy paraffinic; Talc; Carbon black

Pennsylvania: The following components are listed: Titanium dioxide; Crystalline silica, quartz; Talc;

Carbon black California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Crystalline silica, quartz	Yes	No	No	No
Titanium dioxide	Yes	No	No	No
Carbon black	Yes	No	No	No
Isoprene	Yes	No	No	No

International regulations

International lists:

Australia inventory (AICS): Not determined.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: Not determined.

Korea inventory: All components are listed or exempted Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted

Philippines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals: Not listed Chemical Weapons Convention List Schedule II Chemicals: Not listed Chemical Weapons Convention List Schedule III Chemicals: Not listed

16. OTHER INFORMATION

Key to abbreviations ATE = Acute Toxicity Estimate

BCF = Bioconcentration Factor

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

IATA = International Air Transport Association

IBC = Intermediate Bulk Container

IMDG = International Maritime Dangerous Goods

LogPow = logarithm of the octanol/water partition coefficient

MARPOL 73/78 = International Convention for the Prevention of Pollution from Ships

1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)

UN = United Nations

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): Calcium Chloride Chemical Name: Calcium Chloride

Synonyms: DOWFLAKE

Supplier:

EPRO Services, Inc.
PO Box 347

Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

OSHA Regulatory Status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency Overview

Color: White

Appearance: Flakes Odor: Odorless

Signal Word: Warning

MAJOR HEALTH HAZARDS: CAUSES SERIOUS EYE IRRITATION. CAUSES SKIN IRRITATION. HARMFUL IF

SWALLOWED.

PHYSICAL HAZARDS: Heat is generated when mixed with water or aqueous acid solutions. PRECAUTIONARY STATEMENTS: Avoid contact with eyes. Wash thoroughly after handling.

GHS Classification:

GHS: CONTACT HAZARD - SKIN:	Category 2 - Causes skin irritation
GHS: CONTACT HAZARD - EYE:	Category 2A - Causes serious eye irritation
GHS: ACUTE TOXICITY - ORAL:	Category 4 - Harmful if swallowed

UNKNOWN ACUTE TOXICITY: A percentage of this product consists of ingredient(s) of unknown acute toxicity.

Unknown Acute Dermal Toxicity: 3% of this product consists of ingredient(s) of unknown acute dermal toxicity.

GHS Symbol: Exclamation mark GHS Signal Word: Warning

GHS Hazard Statements

GHS - Health Hazard Statement(s)

Causes serious eye irritation
Causes skin irritation
Harmful if swallowed

GHS - Precautionary Statement(s) - Prevention

Wear eye and face protection

Wear protective gloves

Wash thoroughly after handling

Do not eat, drink, or smoke when using this product

GHS - Precautionary Statement(s) - Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

If eye irritation persists: Get medical advice/attention

IF ON SKIN: Wash with plenty of water

Take off contaminated clothing and wash it before reuse If skin irritation occurs: Get medical advice/attention

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell

Rinse mouth

Specific treatment (see First Aid information on product label and/or Section 4 of the SDS)

GHS - Precautionary Statement(s) - Storage

There are no Precautionary-Storage phrases assigned

GHS - Precautionary Statement(s) - Disposal

Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Additional Hazard Information

Mixing with water may cause heat to be released

See Section 11: Toxicological Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent [%]	CAS Number
Calcium chloride	> 83 - < 87	10043-52-4
Water	> 8 - < 14	7732-18-5
Potassium Chloride	> 2 - < 3	7447-40-7
Sodium Chloride	> 1 - < 2	7647-14-5

Notes: Potassium chloride and sodium chloride are impurities from the naturally occurring source material, brine solution.

4. FIRST-AID MEASURES

INHALATION: If inhalation of dust occurs and adverse effects result, remove to uncontaminated area. Call a Poison Center or doctor/physician if you feel unwell.

SKIN CONTACT: If on skin, wash with plenty of water. If skin irritation occurs: Get medical advice/ attention. Take off contaminated clothing and wash before reuse. SPECIFIC TREATMENT: Wash with lots of water.

EYE CONTACT: If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation occurs, get medical advice/attention.

INGESTION: If swallowed, rinse mouth. Contact a poison center or doctor/physician if you feel unwell. Most

Important Symptoms/Effects (Acute and Delayed):

Acute Symptoms/Effects:

Inhalation (Breathing): Inhaling dust may cause irritation to upper respiratory tract (nose and throat). Nasal mucosal and oropharyngeal erythema.

Skin: Skin Irritation. Direct abrasion of skin from solid, erythema and burn from reaction with water. Prolonged contact and occlusion may cause more severe symptoms. Damage is localized to contact areas.

Eye: Eye Irritation. Direct abrasion of cornea from solid, erythema and burn from reaction with water, conjunctival swelling and cornea opacification from hypertonic solution and heat. Corneal eye pain, redness, acute corneal thickening, or whitening.

Ingestion (Swallowing): Consumption of solids or hypertonic solutions causes nausea, vomiting, and increased thirst.

Delayed Symptoms/Effects:

Chronic exposures to skin and mucus membranes that cause irritation may cause a chronic dermatitis or mucosal membrane problem

Interaction with Other Chemicals Which Enhance Toxicity: None known.

Medical Conditions Aggravated by Exposure: Any skin condition that disrupts the skin, such as abrasions, cuts, psoriasis, fungal infections, etc. Any upper respiratory conditions that compromise mucosa can increase local damage from dust contact. Any eye condition that compromises tear production, conjunctiva, or normal corneal homeostasis.

Protection of First Aiders: At minimum, treating personnel should utilize PPE sufficient for prevention of bloodborne pathogen transmission. If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Notes to Physician: Due to irritant properties, resulting from heat created as solid material dissolves in water, swallowing may result in burns/ulceration of mucus membranes. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE-FIGHTING MEASURES

Fire Hazard: This material does not burn.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire

Fire Fighting: Keep unnecessary people away, isolate hazard area and deny entry. This material does not burn. Fight fire for other material that is burning. Water should be applied in large quantities as fine spray. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Wear protective fire-fighting clothing (includes fire-fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire-fighting operations. If contact is likely, change to full chemical resistant fire-fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Hazardous Combustion Products: Formed under fire conditions: hydrogen chloride gas, calcium oxide

Sensitivity to Mechanical Impact: Not sensitive. Sensitivity to Static Discharge: Not sensitive. Lower Flammability Level (air): Not applicable Upper Flammability Level (air): Not applicable

Flash point: Not applicable

Auto-ignition Temperature: Not applicable

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard on some surfaces. Use appropriate safety equipment. For additional information refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures.

Methods and Materials for Containment and Cleaning Up: Small and large spills: Contain spilled material if possible. Collect in suitable and properly labeled containers. Flush residue with plenty of water. See Section 13, Disposal considerations, for additional information.

Environmental Precautions: Prevent large spills from entering soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. HANDLING AND STORAGE

Precautions for Safe Handling:

Heat developed during diluting or dissolving is very high. Use cool water when diluting or dissolving (temperature less than 80°F, 27°C). Avoid contact with eyes, skin, and clothing. Do not swallow. Wash thoroughly after handling. See Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Safe Storage Conditions:

Store in a dry place. Protect from atmospheric moisture. Keep container tightly closed. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

Incompatibilities/ Materials to Avoid:

Heat is generated when mixed with water or aqueous acids. Spattering and boiling can occur. Avoid contact with bromide trifluoride, 2-furan percarboxylic acid because calcium chloride is incompatible with those substances. Contact with zinc forms flammable hydrogen gas, which can be explosive. Catalyzes exothermic polymerization of methyl vinyl ether. Attacks metals in the presence of moisture and may release flammable hydrogen gas. Reaction of bromide impurity with oxidizing materials may generate trace levels of impurities such as bromates.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Regulatory Exposure Limit(s): Listed below for the product components that have regulatory occupational exposure limits (OEL's) established.

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PELCeiling
Particles Not Otherwise Regulated	15 mg/m³ (Total)		
(PNOR)	5 mg/m ³ (Respirable)		
00-00-001	,		

OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration. PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit

Non-Regulatory Exposure Limit(s): Listed below for the product components that have advisory (non-regulatory) occupational exposure limits (OEL's) established.

The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or education institutions in the US. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

Additional Advice: Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

ENGINEERING CONTROLS: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear safety glasses with side-shields. For dusty operations or when handling solutions of the material, wear chemical goggles.

Skin and Body Protection: Wear clean, body-covering clothing.

Hand Protection: Use gloves chemically resistant to this material. If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. Examples of preferred glove barrier materials include: Neoprene, Polyvinyl chloride ("PVC" or "vinyl"), Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In dusty or misty atmospheres, use an

approved particulate respirator. The following should be effective types of air-purifying respirators: High efficiency particulate air (HEPA) N95. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Flakes Color: White

Odor: Odorless Order Threshold (ppm): No data available

Molecular Formula: CaCl2 Decomposition Temperature: N/A
Boiling Point/Range: N/A to solids Freezing Point/Range: N/A to solids

Melting Point/Range: 772°C (1,422°F) Vapor Pressure: Negligible at ambient temperature

Vapor Density (air=1): N/A Specific Gravity (water=1): N/A to solids

Bulk Density: 51 – 61 lb/ft3 Water Solubility: Readily soluble

pH: N/A to solids Volatility: N/A Evaporation Rate (ether=1): N/A Flash point: N/A

Flammability (solid, gas): N/A

Upper Flammability Level (Air): N/A

Auto-ignition Temperature: N/A

Viscosity: N/A Hygroscopic: Yes

Partition Coefficient (n-octane/water): No data available

10. STABILITY AND REACTIVITY

Reactivity: Hygroscopic. Liberates large amounts of heat when dissolving in water or aqueous acids.

Chemical Stability: Stable at normal temperatures and pressures.

Possibility of Hazardous Reactions: Avoid moisture.

Conditions to Avoid: (e.g., static discharge, shock, or vibration) -. None known.

Incompatibilities/ Materials to Avoid: Heat is generated when mixed with water or aqueous acids. Spattering and boiling can occur. Avoid contact with bromide trifluoride, 2-furan percarboxylic acid because calcium chloride is incompatible with those substances. Contact with zinc forms flammable hydrogen gas, which can be explosive. Catalyzes exothermic polymerization of methyl vinyl ether. Attacks metals in the presence of moisture and may release flammable hydrogen gas. Reaction of bromide impurity with oxidizing materials may generate trace levels of impurities such as bromates

Hazardous Decomposition Products: Formed under fire conditions: hydrogen chloride gas, calcium oxide Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
1126 mg/kg-Oral Acute Toxicity	2637 mg/kg-Dermal Acute Toxicity	No data is available
Estimate (ATE)	Estimate (ATE)	

OMPONENT TOXICITY DATA: The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given.

POTENTIAL HEALTH EFFECTS

Eye contact: For solid: May cause slight eye irritation, mechanical injury only. Dust formation should be avoided, as dust can cause severe eye irritation with corneal injury.

Skin contact: Brief contact is essentially nonirritating to skin. Prolonged contact may cause skin irritation, even a burn. Not classified as corrosive to the skin according to DOT guidelines. May cause more severe response if skin is damp, abraded (scratched or cut), or covered by clothing, gloves, or footwear.

Inhalation: Dust may cause irritation to upper respiratory tract (nose and throat).

Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause local mucosal damage to esophagus and stomach. Swallowing may result in gastrointestinal irritation or ulceration.

Chronic Effects: Chronic exposures to calcium chloride that cause irritation may cause a chronic dermatitis or mucosal membrane problem. For the minor component(s): POTASSIUM CHLORIDE: In animals, effects have been reported on the following organs after ingestion: Gastrointestinal tract, heart, and kidney. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use. SODIUM CHLORIDE: Medical experience with sodium chloride has shown a strong association between elevated blood pressure and prolonged dietary overuse. Related effects could occur in the kidneys.

SIGNS AND SYMPTOMS OF EXPOSURE

Solution and or solids may be visible on the skin and or eyes. Localized redness, warmth, and irritation consistent with mechanism of injury: abrasion, burn, hypertonic solution.

Inhalation (Breathing): Inhaling dust may cause irritation to upper respiratory tract (nose and throat). Nasal mucosal and oropharyngeal erythema.

Skin: Skin Irritation. Direct abrasion of skin from solid, erythema and burn from reaction with water. Prolonged contact and occlusion may cause more severe symptoms. Damage is localized to contact areas.

Eye: Eye Irritation. Direct abrasion of cornea from solid, erythema and burn from reaction with water, conjunctival swelling and cornea opacification from hypertonic solution and heat. Corneal eye pain, redness, acute corneal thickening, or whitening.

Ingestion (swallowing): Consumption of solids or hypertonic solutions causes nausea, vomiting, and increased thirst.

Interaction with Other Chemicals Which Enhance Toxicity: None known.

GHS Health Hazards

GHS: Acute Toxicity – Oral: Category 4 – Harmful if swallowed.

GHS: Contact Hazard – Eye: Category 2A – Causes serious eye irritation

GHS: Contact Hazard – Skin: Category 2 – Causes Skin irritation.

Skin Absorbent / Dermal Route: No

MUTAGENIC DATA: Not classified as a mutagen per GHS criteria. The data presented are for the following material: Calcium chloride (CaCl2) - In vitro genetic toxicity studies were negative. The data presented are for the following material: Potassium chloride - In vitro genetic toxicity studies were positive. However, the relevance of this to humans is unknown. For the minor component(s): Sodium chloride - In vitro genetic toxicity studies were predominantly negative.

DEVELOPMENTAL TOXICITY: Not classified as a developmental or reproductive toxin per GHS criteria. For the major component(s): Did not cause birth defects or any other fetal effects in laboratory animals.

12. ECOLOGICAL INFORMATION

Component	Freshwater Fish	Invertebrate Toxicity	Algae Toxicity	Other Toxicity
Calcium	-LC50, bluegill	-LC50, water flea	No data available	No data available
chloride	(Lepomis	Daphnia magna: 759		
	macrochirus): 8350 -	- 3005 mg/l		
	10650 mg/l			
Potassium	-LC50, rainbow trout	-EC50, water flea	No data available	No data available
Chloride	(Oncorhynchus	Daphnia magna, 24		
	mykiss), 96 h: 4,236	h, immobilization:		
	mg/l	590 mg/l		
		-LC50, water flea		
		Ceriodaphnia dubia,		
		96 h: 3,470 mg/l		
Sodium	-LC50, fathead	-LC50, water flea	-IC50, OECD 209	-IC50, OECD 209
Chloride	minnow (Pimephales	Daphnia magna:	Test; activated	Test; activated
	promelas) 10,610 mg/l	4,571 mg/l	sludge, respiration	sludge, respiration
			inhibition: >1,000	inhibition: >1,000
			mg/l	mg/l

Aquatic Toxicity

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested)

Invertebrate Toxicity:

Calcium Chloride: LC50, water flea Daphnia magna: 759 - 3,005 mg/l

Potassium Chloride: EC50, water flea Daphnia magna, 24 h, immobilization: 590 mg/l LC50, water flea

Ceriodaphnia dubia, 96 h: 3,470 mg/l

Sodium Chloride: LC50, water flea Daphnia magna: 4,571 mg/l

FATE AND TRANSPORT

BIODEGRADATION: This material is inorganic and not subject to biodegradation.

PERSISTENCE: Calcium chloride is believed not to persist in the environment because it is readily dissociated into calcium and chloride ions in water. Calcium chloride released into the environment is thus likely to be distributed into water in the form of calcium and chloride ions. Calcium ions may remain in soil by binding to soil particulate or by forming stable salts with other ions. Chloride ions are mobile and eventually drain into surface water. Both ions originally exist in nature, and their concentrations in surface water will depend on various factors, such as geological parameters, weathering, and human activities.

BIOCONCENTRATION: No bioconcentration is expected because of the relatively high-water solubility. Potential for mobility in soil is very high (Koc between 0 and 50). Partitioning from water to n-octanol is not applicable.

BIOACCUMULATIVE POTENTIAL: Calcium chloride and its dissociated forms (calcium and chloride ions) are ubiquitous in the environment. Calcium and chloride ions can also be found as constituents in organisms. Considering its dissociation properties, calcium chloride is not expected to accumulate in living organisms. MOBILITY IN SOIL: Calcium chloride is not expected to be absorbed in soil due to its dissociation properties and high-water solubility. It is expected to dissociate into calcium and chloride free ions, or it may form stable inorganic or organic salts with other counter ions, leading to different fates between calcium and chloride ions in soil and water components. Calcium ions may bind to soil particulate or may form stable inorganic salts with sulfate and carbonate ions. The chloride ion is mobile in soil and eventually drains into surface water because it is readily dissolved in water.

13. DISPOSAL CONSIDERATIONS

Waste from material

Reuse or reprocess, if possible. All disposal practices must be in compliance with all Federal, State/Provincial, and local laws and regulations. Regulations may vary in different locations. Report spills if applicable. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN SDS SECTION: Composition Information. FOR UNUSED AND UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Landfill and wastewater treatment system.

Container Management

Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container must be disposed of in compliance with applicable regulations.

14. TRANSPORT INFORMATION

Land Transport

U.S. DOT 49 CFR 172.101 Status: Not Regulated.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS Status: Not Regulated.

Maritime Transport

(IMO / IMDG) Status: Not Regulated

15. REGULATORY INFORMATION

U.S. Regulations

OSHA Regulatory Status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

CERCLA Sections 102a/103 Hazardous Substances (40 CFR 302.4): Not regulated

SARA EHS Chemical (40 CRF 355.30): Not regulated

EPCRA Sections 311/312 Hazard Categories (40 CRF 370.10): Acute Health Hazard

EPCRA Section 313 (40 CFR 372.65): To the best of our knowledge product does not contain chemicals at levels which require reporting under this statute

OSHA Process Safety (PSM) (29 CRF 1910.119): Not regulated

National Inventory Status

US Inventory Status: Toxic Substance Control Act (TSCA): All components are listed or exempt.

TSCA 12(b): This product is not subject to export notification.

Canadian Chemical Inventory: All components of this product are listed on either the DSL or the HDSL.

Component	DSL	NDSL
Calcium chloride	Listed	Not Listed
10043-52-4		
Potassium Chloride	Listed	Not Listed
7447-40-7		
Sodium Chloride	Listed	Not Listed
7647-14-5		

STATE REGULATIONS

California Proposition 65:

This product is not listed, but it may contain impurities/trace elements known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act. WARNING: This product (when used in aqueous formulations with a chemical oxidizer such as ozone) may react to form calcium bromate, a chemical known to the State of California to cause cancer.

Component	California Proposition 65 Cancer WARNING:	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	Know Hazardous	New Jersey Special Health Hazards Substance List
Calcium chloride 10043-52-4	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Potassium Chloride 7447-40-7	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Sodium Chloride 7647-14-5	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

Component	Environmental	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Know	Rhode Island Right to Know Hazardous Substance List
Calcium chloride 10043-52-4	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Potassium Chloride 7447-40-7	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Sodium Chloride 7647-14-5	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

Canadian Regulations

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Component	Canadian Chemical	NDSL:	WHMIS - Classifications of Substances:	
	Inventory:			
Calcium chloride	Listed		D2B	
Potassium Chloride	Listed		Uncontrolled product according to WHMIS classification criteria	
Sodium Chloride	Listed		Uncontrolled product according to WHMIS classification criteria	

16. OTHER INFORMATION

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.





8/24/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.roll (formerly ECOLINE-R)

Product Description: Polymer Modified Asphalt Emulsion

CAS No: N/A

Manufacturer / Supplier: EPRO Services, Inc. PO Box 347 Derby, KS 67037 800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

GHS-US Classification of the Substance or Mixture

Carc.2: H351 STOT RE 2: H373

Aquatic Chronic 3: H412

Full text of H-phrases: see Section 16

GHS-US Label Elements
Signal Word: Warning
Hazard Statements

H351: Suspected of causing cancer

H373: May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure

H412: Harmful to aquatic life with long lasting effects

Precautionary Statements

P201: Obtain special instructions before use

P202: Do not handle until all safety precautions have been read and understood

P260: Do not breathe vapors, mist, and spray

P273: Avoid release to the environment

P280: Wear eye protection, protective clothing, and protective gloves P308+P313: If exposed or concerned, get medical advice/attention

P314: Get medical advice/attention if you feel unwell

P405: Store locked up

P501: Dispose of contents/container in accordance with local, regional, national and international regulations

Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. If stored under heat for extended periods or significantly agitated, this material might evolve or release hydrogen sulfide, a flammable gas, which can raise and widen this material's actual flammability limits and significantly lower its auto-ignition

temperature. Hydrogen sulfide is a toxic gas that can be fatal. It also has a rotten egg smell that causes odor fatigue very quickly and should not be used as an indicator for the presence of gas. Flammable vapors can accumulate in head space of closed system

Unknown Acute Toxicity (GHS-US)

Up to 30% of the mixture consists of ingredient(s) of unknown acute toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	%	Classification (GHS-US)
Asphalt	(CAS No) 8052-42-4	50 - 70	Not classified
Water	(CAS No) 7732-18-5	30 - 40	Not classified
Acrysol		>1.3	Not classified
Ethanol	(CAS No) 34375-28-5	>.03	Not classified
Proprietary Polymer	Proprietary*	> 30	Not classified
Proprietary Hydrocarbon	Proprietary*	0 - 5	Flam. Liq. 3, H226 Acute Tox. 3 (Inhalation:vapor), H331 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 3, H402 Aquatic Chronic 2, H411

^{*}The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret within the meaning of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Full text of H-phrases: See Section 16

4. FIRST-AID MEASURES

Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice.

First-aid Measures after Inhalation: When symptoms occur go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

First-aid Measures after Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Wash contaminated clothing before reuse. Obtain medical attention if irritation develops or persists.

First-aid Measures after Eye Contact: Rinse cautiously with water for at least 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if redness, pain, or irritation occurs.

First-aid Measures after Ingestion: Rinse mouth. Do NOT induce vomiting. Seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: There are potential chronic health effects to consider.

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated exposure. Suspected of causing cancer

Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2).

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable but will burn at high temperatures.

Explosion Hazard: Product is not explosive. Contains Sulfur. May release small amounts of hydrogen sulfide.

Hydrogen sulfide is a highly flammable, explosive gas under certain conditions, is a toxic gas, and may be fatal. Gas can accumulate in the headspace of closed containers. Use caution when opening sealed containers. Heating the product or containers can cause thermal decomposition of the product and release hydrogen sulfide.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not allow run-off from firefighting to enter drains or water sources. Do not breathe fumes or vapors from fire. Use water spray or fog for cooling exposed containers.

Protection During firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Other Information: Refer to Section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Use special care to avoid static electric charges. Keep away from heat, sparks, open flames, hot surfaces. – No smoking.

For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container. Contact competent authorities after a spill.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. Concerning disposal elimination after cleaning, see item 13.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors may be flammable.

Precautions for Safe Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take precautionary measures against static discharge. Use only non-sparking tools. Keep away from heat, sparks, open flames, hot surfaces. – No smoking. Avoid breathing vapors, mist, spray.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment.

Storage Conditions: Store in a dry, cool, and well-ventilated place. Keep container closed when not in use.

Incompatible Products: Strong acids. Strong bases. Strong oxidizers.

Incompatible Materials: Heat sources. Storage Temperature: > 0 °C (32 °F) Storage Area: Store locked up.

Specific End Use(s): Asphalt Emulsion

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in Section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV, NIOSH (REL), or OSHA (PEL).

Asphalt (8052-42-4)					
USA ACGIH	ACGIH TWA (mg/m³)	0.5 mg/m³ (fume, inhalable fraction)			
USA ACGIH	ACGIH chemical category	Not classifiable as a human carcinogen fume, coat tar-free			
USA NIOSH	NIOSH REL (ceiling) (mg/m³)	5 mg/m³ (fume)			

Proprietary Hydrocarbon					
USA ACGIH	ACGIH TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)			
USA ACGIH	ACGIH chemical category	Skin – potential significant contribution to overall exposure by			
		the cutaneous route, Confirmed Animal Carcinogen with			
		Unknown Relevance to Humans			

Exposure Controls

Appropriate Engineering Controls: Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Take precautionary measures against static discharges. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases/vapors may be released.

Personal Protective Equipment: Protective goggles, gloves, protective clothing. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory

protection should be worn.

Thermal Hazard Protection: If material is hot, wear thermally resistant protective gloves.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink, or smoke during use.

Other Information: When using, do not eat, drink, or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid Odor: No data available pH: No data available

Melting Point: Not applicable Boiling Point: 100°C (212.00°F)

Auto-ignition Temperature: No data available Flammability (solid, gas): No data available Relative Vapor Density at 20°C: >1.0 (air=1) Specific Gravity: 1.0+ / -0.2 at 60°F (15.6°C)

Viscosity: No data available

Other Information VOC Content: 0

Volatiles (includes water): 30 - 50%

Appearance: Brown to Black Order Threshold: No data available Evaporation Rate: Slower (butyl acetate-1)

Freezing Point: No data available

Flash Point: No data available

Decomposition Temperature: No data available

Vapor Pressure: Not determined Relative Density: No data available

Solubility: Water: miscible

Partition Coefficient: N-Octanol/Water: No data available

10. STABILITY AND REACTIVITY

Reactivity: Hazardous reactions will not occur under normal conditions.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Direct sunlight. Extremely high or low temperatures. Open flame. Overheating. Heat. Sparks.

Do not freeze.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

Hazardous Decomposition Products: May release flammable gases. Thermal decomposition generates: Carbon

oxides

(CO, CO2). Nitrogen oxides. Hydrogen sulfide. Sulfur dioxide. Irritating or toxic vapors.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: Not classified

Asphalt (8052-42-4	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg

Proprietary Hydrocarbon	
LD50 Dermal Rabbit	4720 μl/kg
LD50 Inhalation Rat	4.6 mg/l/4h

Skin Corrosion/Irritation: Not classified Serious Eye Damage/Irritation: Not classified Respiratory or Skin Sensitization: Not classified Germ Cell Mutagenicity: Not classified Carcinogenicity: Suspected of causing cancer.

Asphalt (8052-42-4)	
IARC Group	2B
National Toxicology Program (NTP) Status	Twelfth Report-Items under consideration
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list

Proprietary Polymer		
IARC group	3	

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or

repeated exposure.

Aspiration Hazard: Not classified

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated

exposure. Suspected of causing cancer.

12. ECOLOGICAL INFORMATION

Ecology – General: This material is hazardous to the aquatic environment. Keep out of sewers and waterways. Ecology – Water: Harmful to aquatic life with long-lasting effects.

Proprietary Hy	drocarbon	
LC50 Fish 1	35 mg/l (Exposure time: 96 h – Species: Pimephales promelas (flow-through))	

Persistence and Degradability: Not established. Bioaccumulative Potential: Not established

Asphalt (8052-42-4)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	>6

Mobility in Soil: No additional information available.

Other Adverse Effects: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains. Do not dispose of waste into sewer.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable.

14. TRANSPORT INFORMATION

DOT: Not regulated for transport IMDG: Not regulated for transport IATA: Not regulated for transport

15. REGULATORY INFORMATION (non-mandatory)

US Federal Regulations

SARA Section 311/312 Hazard Classes: Delayed (chronic) health hazard

 ${\sf TSCA} \ ({\sf Toxic} \ {\sf Substances} \ {\sf Control} \ {\sf Act}) \ {\sf Inventory-Asphalt} \ ({\sf 8052-42-4}) \colon \ {\sf Listed}$

TSCA (Toxic Substances Control Act) Inventory – Water (7732-18-5): Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Hydrocarbon: Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Polymer: Listed

US State Regulations

Asphalt (8052-42-4)

Massachusetts: Right to Know List

New Jersey: Right to Know Hazardous Substance List

Pennsylvania: RTK (Right to Know) List

16. OTHER INFORMATION

GHS Full Text Phrases

Acute toxicity (inhalation:vapor) Category 3
Hazardous to the aquatic environment - Acute Hazard Category 3
Hazardous to the aquatic environment - Chronic Hazard Category 2
Hazardous to the aquatic environment - Chronic Hazard Category 3
Aspiration hazard Category 1
Carcinogenicity Category 2
Flammable liquids Category 3
Skin corrosion/irritation Category 2
Specific target organ toxicity (repeated exposure) Category 2
Flammable liquid and vapor
May be fatal if swallowed and enters airways
Causes skin irritation
Toxic if inhaled
Suspected of causing cancer
May cause damage to organs through prolonged or repeated exposure
Harmful to aquatic life
Toxic to aquatic life with long lasting effects
Harmful to aquatic life with long lasting effects

NFPA Health Hazard: 1 – exposure could cause irritation but only minor residual injury even if not treatment is given.

NFPA Fire Hazard: 1 – must be preheated before ignition can occur

NFPA Reactivity: 0 - normally stable, even under fire exposure conditions, and are not reactive with water

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): PM Sealant

Product Description: Adhesives. Sealant.

Synonyms: N/A CAS No: N/A

Supplier:

EPRO Services, Inc. PO Box 347 Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (49CFR1910.1200).

Classification of the substance or mixture

Acute toxicity-Oral-Category 4

Serious Eye Damage/Eye Irritation-Category 2A

Carcinogenicity-Category 1A

Reproductive Toxicity-Category 1B

Specific target organ toxicity (single exposure)-Category 1 (central nervous system)

Specific target organ toxicity (repeated exposure)-Category 1 (respiratory system)

Specific target organ toxicity (repeated exposure)-Category 2 (bladder)

GHS label elements

Hazard pictogram





Signal word: Danger

Hazard statements

Harmful if swallowed. Causes serious eye irritation. May cause cancer. May damage fertility or the unborn child. Cause damage to organs through prolonged or repeated exposure.

Precautionary statements

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear eye and face protection. Do not breathe dust/fumes/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product.

Response: If exposed, call a POISON CENTER or physician if you feel unwell. If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical attention. IF SWALLOWED, immediately call a POISON CENTER or physician. Rinse mouth. Get medical attention if you feel unwell.

Storage: Store locked up.

Disposal: Dispose of contents and container in accordance with all local, regional, national, and international

regulations.

Statement of Unknown Acute Toxicity: Oral 71.91% of the mixture consists of ingredients of unknown acute toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient name	%	CAS Number
Calcium Carbonate	30-60	1317-65-3
Carbonic acid, calcium salt (1:1)	15-40	471-34-1
Titanium Dioxide	1-5	13463-67-7
Organosilane	1-5	2768-02-7
Dibutyltin oxide	0.1-1	818-08-6
Diisonoyl phthalate	15-40	28553-12-0
Carbon Black	0.05 - <0.1	1333-86-4

4. FIRST-AID MEASURES

Description of necessary first aid measures

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses if easy to do so. Continue rinsing. If irritation persists, get medical attention.

Inhalation: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Call poison center or physician if you feel unwell.

Skin contact: Wash with plenty of soap and water. If skin irritation or rash occurs, get medical attention. Remove contaminated clothing and wash before reuse.

Ingestion: If swallowed, immediately call a poison center or physician. DO NOT induce vomiting.

Most important symptoms/effects, acute and delayed

Acute

Harmful if swallowed. Causes serious eye irritation.

Delayed

May cause cancer. May damage fertility or the unborn child. Causes damage to organs. Causes damage to organs through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated exposure.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Use dry chemical, CO2, water, or foam.

Unsuitable extinguishing media: Do not use high pressure water streams.

Specific hazards arising from the chemical: Upon decomposition, product emits carbon dioxide, carbon monoxide, and/or low molecular weight hydrocarbons.

Hazardous thermal decomposition products: Decomposition products may include carbon dioxide, carbon monoxide, and/or low molecular weight hydrocarbons.

Special protective actions for firefighters: Heating may cause an explosion. Containers may rupture or explode. Move containers from fire area if it can be done without risk. Avoid inhalation of vapors or combustion products. Dike for later disposal. Stay upwind and keep out of low areas.

Special protective equipment for firefighters: Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures

Wear personal protective clothing and equipment. See Section 8.

Methods and materials for containment and cleaning up

Keep unnecessary people away. Isolate hazard area and deny entry. In case of spillage, stop the flow of material and block any potential routes to water systems. Only personnel trained for the hazards of this material should perform clean up and disposal.

Environmental Precautions

Do not flush into sanitary sewer systems, drains, or surface water. Avoid release to the environment.

7. HANDLING AND STORAGE

Precautions for safe handling

Protective measures: Do not handle until all safety precautions have been read and understood. Keep away from all ignition sources. Avoid contact with eyes or skin. Do not eat, drink, or smoke when using this product. Always wear recommended personal protective equipment (section 8). Take precautionary measures against static discharge. Avoid release to the environment. Empty containers retain product residue and can be hazardous. Do not reusecontainer.

Conditions for safe storage, including any incompatibilities: Store locked up and in accordance with local regulations. Store in original container in a cool dry well-ventilated area away from incompatible materials. Empty containers may contain product residue. Avoid contact with temperatures above 120°C.

Incompatible Materials: Strong oxidizer. Strong acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Component Exposure Limits

Calcium carbonate	NIOSH: 10 mg/m3 TWA total dust; 5 mg/m3 TWA respirable dust				
1317-65-3	OSHA (US): 15 mg/m3 TWA total dust; 5 mg/m3 TWA respirable fraction				
	Mexico: 10 mg/m3 TWA VLE-PPT				
	20 mg/m3 STEL (PPT-T)				
Carbonic acid, calcium salt (1:1)	NIOSH: 10 mg/m3 TWA total dust; 5 mg/m3 TWA respirable dust				
471-34-1					
Titanium dioxide	ACGIH: 10 mg/m3 TWA				
13463-67-7	NIOSH: 2.4 mg/m3 TWA (CIB 63) fine; 0.3 mg/m3 TWA (CIB 63) ultrafine, including				
	engineered nanoscale				
	5000 mg/m3 IDLH				
	OSHA (US): 15 mb/m3 TWA total dust				
	Mexico: 10 mg/m3 TWA VLE-PPT as Ti				
	20 mg/m3 STEEL (PPT-CT) as Ti				
Carbon Black	ACGIH: 3 mg/m3 TWA inhalable particulate matter				
1333-86-4	NIOSH: 3.5 mg/m3 TWA; 0.1 mb/m3 TWA (Carbon black in presence of Polycyclic				
	aromatic hydrocarbons) as PAH				
	1750 mb/m3 IDLH				
	OSHA (US): 3.5 mg/m3 TWA				
	Mexico: 3.5 mg/m3 TWA VLE-PPT				
	7 mg/m3 STEL (PPT-CT)				

ACGIH – Threshold Limit Values – Biological Exposure Indices (BEI): There are no biological limit values for any of this product's components.

Appropriate engineering controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor, or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures

Hygiene measures: Wash hands, forearms, and face thoroughly after handling chemical products, before eating, smoking, and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstationlocation.

Eye/face protection: Wear splash resistance safety goggles with a face shield.

Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection: Wear appropriate chemical resistant clothing.

Respiratory protection: Use a properly fitted, air-purifying or supplied air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid paste

Odor: Mild pH: Not available

Boiling point: Not available **Flash point:** 93.3°C (>200°F)

Flammability (solid, gas): Not available

Color: black, white, gray
Odor threshold: Not available
Melting point: Not available

Freezing point range: Not available Evaporation rate: Not available

Auto-ignition temperature: Not available

Lower explosive (flammable) limit: Not available

Decomposition temperature: Not available

Vapor density: Not available Water solubility: Slightly soluble

Viscosity: Not available

Solubility (Other): Not available **Molecular Weight:** Not available

Upper explosive (flammable) limit: Not available

Vapor pressure: Not available **Specific gravity:** 1.3 – 1.7

Partition coefficient n-octanol/water: Not available

Kinematic Viscosity: Not available

Density: Not available

10. STABILITY AND REACTIVITY

Reactivity: No reactivity hazard is expected.

Chemical stability: Product is stable at normal temperatures and pressure.

Possibility of hazardous reactions: Under normal conditions of storage and use hazardous will not polymerize. **Conditions to avoid:** Avoid heat, flames, sparks, and other ignition sources. Avoid contact with incompatible

materials and temperatures above 120°C (248°F).

Incompatible materials: Strong oxidizers and strong acids.

Hazardous decomposition products: Upon decomposition, this product emits carbon monoxide, carbon

dioxide, and/or molecular weight hydrocarbons.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effect

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Carbonic acid, calcium salt (1:1) Titanium dioxide Organosilane Dibutyltin oxide Diisononyl phthalate Carbon black Product toxicity- acute toxicity estimated	Oral LD50 Oral LD50 Oral LD50 Oral LD50 Oral LD50 Oral LD50 Inhalation LC50 Oral LD50 Oral LD50	Rat Rat Rat Rat Rat Rat Rat	6450 mg/kg > 10000 mg/kg 7340 ml/kg 44.9 mg/kg > 9750 mg/kg > 4.4 mg/l > 15400 mg/kg	4 hours

Immediate effects: Harmful if swallowed. Causes serious eye irritation. May cause skin irritation. May be

harmful if inhaled.

Acute Toxicity Estimate: Oral: 1261.241 mb/kg

Delayed effects: May cause cancer. May damage fertility or the unborn child. Causes damage to organs.

Causes damage to organs through prolonged or repeated exposure.

Irritation/Corrosion: Causes serious eye irritation.

Respiratory Sensitization: No information on significant adverse effects. **Dermal Sensitization:** No information on significant adverse effects.

Component Carcinogenicity

Product/ingredient name	ACGIH	IARC	OSHA	NIOSH
Titanium Dioxide	A 4	Group 2 B	Yes	Potential Occupational Carcinogen
Carbon black	A 3	Group 2 B	Yes	Potential Occupational Carcinogen

Results of a DuPont epidemiology study showed that employees who had been exposed to titanium dioxide pigments were at no greater risks of developing lung cancer than were employees who had not been exposed to titanium dioxide pigments. No pulmonary fibrosis was found in any of the employees and no associations were observed between titanium dioxide pigment exposure and chronic respiratory disease or lung

abnormalities. Based on the results of this study, DuPont has concluded that titanium dioxide pigment will not cause lung cancer or chronic respiratory disease in humans at concentrations experienced in the workplace.

Germ Cell Mutagenicity: No information on significant adverse effects.

Tumorigenic Data: No information on significant adverse effects. **Reproductive toxicity:** May damage fertility or the unborn child.

Specific target organ toxicity (single exposure): Central nervous system.

Specific target organ toxicity (repeated exposure): Respiratory system, bladder.

Aspiration hazard: No information on significant adverse effects. **Medical Conditions Aggravated by Exposure:** No data available.

12. ECOLOGICAL INFORMATION (non-mandatory)

Toxicity: May cause long lasting harmful effects to aquatic life.

Product/ingredient name	Result	Species	Exposure
Diisononyl phthalate	LC50 100 mg/l (semi static)	Brachydanio rerio	96 hours
	LC50 > 0.14 mg/l (flow thru)	Lepomis macrochirus	96 hours
	LC50 > 0.17 mg/l (static)	Lepomis macrochirus	96 hours
	LC50 > 0.19 mg/l (flow thru)	Pimephales promelas	96 hours
	LC50 > 0.14 mg/l (static)	Pimephales promelas	96 hours
	EC50 > 500 mg/I (IUCLID)	Desmodesmus subspicatus	72 hours
	EC50 > 1.8 mg/l static)	Pseudokirchneriella	96 hours
	EC50 > 500 mg/I (IUCLID)	Daphnia magna	48 hours
	EC50 > 0.06 mg/l (static)	Daphnia magna	48 hours

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Disposal methods: Dispose of in accordance with all applicable local, state, regional, and federal regulations. **Component Waste Numbers:** The US EPA has not published waste numbers for this product components.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated as a dangerous good. **IATA:** Not regulated as a dangerous good. **ICAO:** Not regulated as a dangerous good. **IMDG:** Not regulated as a dangerous good.

International Bulk Chemical Code: This material contains one or more of the following chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Titanium dioxide (13463-67-7): IBC Code – Category Z (slurry)

15. REGULATORY INFORMATION (non-mandatory)

US Federal regulations: None of this product's components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CRF 372.65), CERCLA (40 CRF 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA 311/312: Carcinogenicity. Acute Toxicity. Reproductive Toxicity. Serious Eye damage/Eye irritation. Specific Target Organ Toxicity.

State regulations

California: The following components are listed: Carbon Black

Massachusetts: The following components are listed: Calcium carbonate, Titanium dioxide & Carbon Black Minnesota: The following components are listed: Calcium carbonate, Titanium dioxide & Carbon Black New Jersey: The following components are listed: Calcium carbonate, Titanium dioxide & Carbon Black Pennsylvania: The following components are listed: Calcium carbonate, Titanium dioxide & Carbon Black

California Prop. 65

WARNING: This product can expose you to chemicals including Titanium dioxide, Diisononyl phthalate, and carbon black, which are known to the State of California to cause cancer.

Titanium dioxide: carcinogen, 9/2/2011 (airborne, unbound particles of respirable size)

Diisononyl phthalate: carcinogen, 12/20/2013

Carbon black: carcinogen, 2/21/2003 (airborne, unbound particles of respirable size)

Canada Regulations

Canadian WHMIS Ingredient Disclosure List (IDL): Components of this material have been checked against the list. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIX criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL.

Dibutyltin oxide (818-08-6): 1% Carbon black (1333-86-4): 1%

Component Analysis – Inventory

•	Calcium	Carbonic	Titanium	Organosilane	Dibutyltin	Diisononyl	Carbon
	carbonate		dioxide	Organiosnane	oxide		black
	carbonate	acid,calcium salt ((1:1)	uioxiue		Uxide	phthalate	DIACK
	1317-65-3	471-34-1	13463-67-7	2768-02-7	818-08-6	28553-12-0	1333-86-4
US	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CA	NSL	DSL	DSL	DSL	DSL	DSL	DSL
EU	EIN	EIN	EIN	EIN	EIN	EIN	EIN
AU	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PH	Yes	Yes	Yes	Yes	Yes	Yes	Yes
JP-ENCS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
JP-ISHL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
KR KECI	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Annex 1							
KR KECI	No	No	No	No	No	No	No
Annex 2							
KR-	No	No	No	No	No	No	No
REACH							
CCA							
CN	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NZ	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MX	Yes	Yes	Yes	Yes	No	Yes	Yes
TW	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VN	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(draft)							

16. OTHER INFORMATION

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.stop gu

Product Description: Hydrophilic elastic waterstop

Synonyms: N/A CAS No: N/A

Supplier:

EPRO Services, Inc. PO Box 347 Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

GHS classification

Flammable liquid: Not classified
Acute toxicity-oral: Not classifiable
Acute toxicity-dermal: Not classifiable
Acute toxicity-inhalation: Not classifiable

Skin irritation: Category 3

Eye damage/irritation: Not classifiable
Sensitization-respiratory: Category 1
Sensitization-respiratory skin: Category 1
Germ cell mutagenicity: Not classifiable

Carcinogenicity: Category 2

Toxic to reproduction: Category 1

Specific target organ systemic toxicology (single exposure): Category 1 (liver, kidney, central nerve)

Specific target organ systemic toxicology (repetitive exposure: Category 1 (nerve)

Aspiration hazard: Not classifiable

Hazardous to the aquatic environment-acute: Category 3

Hazardous to the aquatic environment-chronicity: Not classifiable

GSA Label element



Signal Word: Danger

Hazard and Toxicity Information

Causes mild skin irritation.

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

May cause an allergic skin reaction.

Suspected of causing cancer.

May damage fertility or the unborn child.

May cause damage to organs.

May cause damage to organs through prolonged or repeated exposure.

Harmful to aquatic life.

Prevention

Do not handle until all safety precautions have been read and understood.

Keep away from heat/sparks/open flames/hot surfaces.

Avoid drinking or breathing.

Do not get in eyes, on skin, or on clothing.

Wear protective gloves/protective clothing/eye protection/face protections.

Wash hands and face thoroughly after handling.

Avoid release to the environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Classification of the substance or mixture: Mixture

Chemical/common name: No name

Components, ingredients, and CAS number:

Components	Content (%)	MITI no.	CAS no.	Remarks (PRTR)
Inorganic powder	33%			
Titanium dioxide	5%	(1)-558	13463-67-7	
Silica gel	2%	(1)-548	14808-60-7	
Ethylbenzene	2.1%	(3)-28	100-41-4	(Class 1) 53
Xylene	2.5%	(3)-3	1330-20-7	(Class 1) 80
Phthalate series plasticier	15%			
Polyurethane polymer	40%			

4. FIRST-AID MEASURES

If inhalation: Move to a place with fresh air. If you feel unwell, call a doctor/physician.

If on skin: Take off contaminated clothes, shoes, etc. and flush affected area of skin with large amount of water or lukewarm water and soap. If you feel unwell, call a doctor/physician.

If in eyes: Rinse with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. If irritation persists, get medical advice/attention.

If swallowed: Rinse mouth. Do not induce vomiting. Get medical advice/attention.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing agents: Dry powder, carbon dioxide, air foam fire extinguisher, water spray.

Unsuitable extinguishing agents: A stream of water.

Specific firefighting: Keep away from near ignition source. Extinguish from windward with protective

equipment.

Protective equipment: Use respiratory protective device.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Use only non-sparking tools. Keep unprotected persons away. **Protective equipment and emergency procedures:** Wear protective equipment.

Environmental precautions: Avoid release to the environment.

Methods and materials for containment and cleaning up: Absorb with liquid-binding material (sand,

diatomite, acid binders, universal binders, sawdust).

7. HANDLING AND STORAGE

Handling:

Fire strict prohibition.

Use explosion-proof electrical/ventilating/lighting/equipment.

Wear protective gloves/protective clothing/eye protection/face protection. Use personal protective equipment as required.

Keep away from heat/sparks/open flames/hot surfaces.

Avoid contact with strongly oxidizing agent.

Wash hands thoroughly after handling.

Storage: Keep receptacle tightly sealed. Store in cool, dry conditions in well-sealed receptacles.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters: 50ppm (Xylene)

Allowable parameters

Japan society for occupational health: (2005) 50ppm (Xylene)

ACGIH: (2005) TLB-TWA 100ppm (Xylene)

Equipment measures: When steam or fume and mist occur, set up a local exhaust ventilation. Set up facilities

for washing eyes and physical cleaning near handling locality.

Protective equipment

Respiratory protection: Gas mask (for organic gas), an airline respirator.

Hand protection: Protective gloves.

Eye protection: Tightly fitting safety goggles. **Skin/body protection:** Impervious clothing.

Sanitary requirement: Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Paste **pH:** Not applicable

Boiling point: No data available
Evaporation rate: No data available
Vapor density: No data available
Solubility: Insoluble in water

Flammability (solid, gas): No data available

Odor: Xylene odor

Melting/freezing point: No data available

Flash point: 52°C

Vapor pressure: No data available **Specific gravity:** 1.29 (20°C)

Auto-ignition temperature: No data available

10. STABILITY AND REACTIVITY

Stability and reactivity: Product is stable at normal temperature and ordinary pressure.

Possibility of hazardous reactions: This component is dangerous in response to a strongly oxidizing agent. This

component can run not in response to active hydrogen workplace.

Conditions to avoid: Heating.

Incompatible materials: Oxidizing agent.

11. TOXICOLOGICAL INFORMATION

Acute toxicity-oral: Not classifiable
Acute toxicity-dermal: Not classifiable
Acute toxicity-inhalation: Not classifiable
Skin corrosion/irritation: Category 3
Eye damage/irritation: Not classifiable
Sensitization-respiratory: Category 1
Sensitization-respiratory skin: Category 1
Germ cell mutagenicity: Not classifiable

Carcinogenicity: Category 2 **Toxic to reproduction:** Category 1

Specific target organ systemic toxicology (single exposure): Category 1 (liver, kidney, central nerve)

Specific target organ systemic toxicology (repetitive exposure): Category 1 (nerve)

Aspiration hazard: Not classifiable

12. ECOLOGICAL INFORMATION (non-mandatory)

No information available.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Dispose of contents/container in accordance with local regulation for industrial waste disposal. Consign a qualified industrial waste disposer.

14. TRANSPORT INFORMATION (non-mandatory)

Prevent cargo from falling, damaging, or collapsing.

ERG number: 171 **UN number:** Not applicable

15. REGULATORY INFORMATION (non-mandatory)

In Japan

Industrial Safety and Health Act: Article 57-2 (Notifiable substances)

Xylene

Ethylbenzene

Titanium dioxide

Silica gel

4.4'-MDI

Poisonous and Deleterious Substances Control Act: Not applicable

Fire Service Act: Not applicable

Air Pollution Control Act: Not applicable

Pollutant Release and Transfer Register: Class 1 Designated Chemical Substances – Xylene, Ethylbenzene

16. OTHER INFORMATION

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8/24/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.trowel (formerly ECOLINE-T)

Product Description: Polymer Modified Asphalt Emulsion

CAS No: N/A

Manufacturer / Supplier: EPRO Services, Inc. PO Box 347 Derby, KS 67037 800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

GHS-US Classification of the Substance or Mixture

Carc.2: H351 STOT RE 2: H373

Aquatic Chronic 3: H412

Full text of H-phrases: see Section 16

GHS-US Label Elements
Signal Word: Warning
Hazard Statements

H351: Suspected of causing cancer

H373: May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure

H412: Harmful to aquatic life with long lasting effects

Precautionary Statements

P201: Obtain special instructions before use

P202: Do not handle until all safety precautions have been read and understood

P260: Do not breathe vapors, mist, and spray

P273: Avoid release to the environment

P280: Wear eye protection, protective clothing, and protective gloves P308+P313: If exposed or concerned, get medical advice/attention

P314: Get medical advice/attention if you feel unwell

P405: Store locked up

P501: Dispose of contents/container in accordance with local, regional, national and international regulations

Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. If stored under heat for extended periods or significantly agitated, this material might evolve or release hydrogen sulfide, a flammable gas, which can raise and widen this material's actual flammability limits and significantly lower its auto-ignition

temperature. Hydrogen sulfide is a toxic gas that can be fatal. It also has a rotten egg smell that causes odor fatigue very quickly and should not be used as an indicator for the presence of gas. Flammable vapors can accumulate in head space of closed system

Unknown Acute Toxicity (GHS-US)

Up to 30% of the mixture consists of ingredient(s) of unknown acute toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	%	Classification (GHS-US)
Asphalt	(CAS No) 8052-42-4	50 - 70	Not classified
Water	(CAS No) 7732-18-5	30 - 40	Not classified
Acrysol		>1.5	Not classified
Ethanol	(CAS No) 34375-28-5	>.03	Not classified
Proprietary Polymer	Proprietary*	> 30	Not classified
Proprietary Hydrocarbon	Proprietary*	0 - 5	Flam. Liq. 3, H226 Acute Tox. 3 (Inhalation:vapor), H331 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 3, H402 Aquatic Chronic 2, H411

^{*}The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret within the meaning of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Full text of H-phrases: See Section 16

4. FIRST-AID MEASURES

Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice.

First-aid Measures after Inhalation: When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

First-aid Measures after Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Wash contaminated clothing before reuse. Obtain medical attention if irritation develops or persists.

First-aid Measures after Eye Contact: Rinse cautiously with water for at least 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if redness, pain, or irritation occurs.

First-aid Measures after Ingestion: Rinse mouth. Do NOT induce vomiting. Seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: There are potential chronic health effects to consider.

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated exposure. Suspected of causing cancer

Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2).

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable but will burn at high temperatures.

Explosion Hazard: Product is not explosive. Contains Sulfur. May release small amounts of hydrogen sulfide.

Hydrogen sulfide is a highly flammable, explosive gas under certain conditions, is a toxic gas, and may be fatal. Gas can accumulate in the headspace of closed containers. Use caution when opening sealed containers. Heating the product or containers can cause thermal decomposition of the product and release hydrogen sulfide.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not allow run-off from firefighting to enter drains or water sources. Do not breathe fumes or vapors from fire. Use water spray or fog for cooling exposed containers.

Protection During firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Other Information: Refer to Section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Use special care to avoid static electric charges. Keep away from heat, sparks, open flames, hot surfaces. – No smoking.

For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container. Contact competent authorities after a spill.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. Concerning disposal elimination after cleaning, see item 13.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors may be flammable.

Precautions for Safe Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take precautionary measures against static discharge. Use only non-sparking tools. Keep away from heat, sparks, open flames, hot surfaces. – No smoking. Avoid breathing vapors, mist, spray.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment.

Storage Conditions: Store in a dry, cool, and well-ventilated place. Keep container closed when not in use.

Incompatible Products: Strong acids. Strong bases. Strong oxidizers.

Incompatible Materials: Heat sources. Storage Temperature: > 0 °C (32 °F) Storage Area: Store locked up.

Specific End Use(s): Asphalt Emulsion

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in Section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV, NIOSH (REL), or OSHA (PEL).

Asphalt (8052-42-4)		
USA ACGIH	ACGIH TWA (mg/m³)	0.5 mg/m³ (fume, inhalable fraction)
USA ACGIH	ACGIH chemical category	Not classifiable as a human carcinogen fume, coat tar-free
USA NIOSH	NIOSH REL (ceiling) (mg/m³)	5 mg/m³ (fume)

Proprietary Hydrocarbon		
USA ACGIH	ACGIH TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
USA ACGIH	ACGIH chemical category	Skin – potential significant contribution to overall exposure by
		the cutaneous route, Confirmed Animal Carcinogen with
		Unknown Relevance to Humans

Exposure Controls

Appropriate Engineering Controls: Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Take precautionary measures against static discharges. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases/vapors may be released.

Personal Protective Equipment: Protective goggles, gloves, protective clothing. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory

protection should be worn.

Thermal Hazard Protection: If material is hot, wear thermally resistant protective gloves.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink, or smoke during use.

Other Information: When using, do not eat, drink, or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid Odor: No data available pH: No data available

Melting Point: Not applicable Boiling Point: 100°C (212.00°F)

Auto-ignition Temperature: No data available Flammability (solid, gas): No data available Relative Vapor Density at 20°C: >1.0 (air=1) Specific Gravity: 1.0+ / -0.2 at 60°F (15.6°C)

Viscosity: No data available

Other Information VOC Content: 0

Volatiles (includes water): 30 - 50%

Appearance: Brown to Black
Order Threshold: No data available

Evaporation Rate: Slower (butyl acetate-1) Freezing Point: No data available

Flash Point: No data available

Decomposition Temperature: No data available

Vapor Pressure: Not determined Relative Density: No data available

Solubility: Water: miscible

Partition Coefficient: N-Octanol/Water: No data available

10. STABILITY AND REACTIVITY

Reactivity: Hazardous reactions will not occur under normal conditions.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Direct sunlight. Extremely high or low temperatures. Open flame. Overheating. Heat. Sparks.

Do not freeze.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

Hazardous Decomposition Products: May release flammable gases. Thermal decomposition generates: Carbon

oxides

(CO, CO2). Nitrogen oxides. Hydrogen sulfide. Sulfur dioxide. Irritating or toxic vapors.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: Not classified

Asphalt (8052-42-4	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg

Proprietary Hydrocarbon	
LD50 Dermal Rabbit	4720 μl/kg
LD50 Inhalation Rat	4.6 mg/l/4h

Skin Corrosion/Irritation: Not classified Serious Eye Damage/Irritation: Not classified Respiratory or Skin Sensitization: Not classified Germ Cell Mutagenicity: Not classified Carcinogenicity: Suspected of causing cancer.

Asphalt (8052-42-4)	
IARC Group	2B
National Toxicology Program (NTP) Status	Twelfth Report-Items under consideration
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list

Proprietary Polymer	
IARC group	3

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or

repeated exposure.

Aspiration Hazard: Not classified

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated

exposure. Suspected of causing cancer.

12. ECOLOGICAL INFORMATION

Ecology – General: This material is hazardous to the aquatic environment. Keep out of sewers and waterways. Ecology – Water: Harmful to aquatic life with long-lasting effects.

Proprietary Hydr	ocarbon
LC50 Fish 1	35 mg/l (Exposure time: 96 h – Species: Pimephales promelas (flow-through))

Persistence and Degradability: Not established. Bioaccumulative Potential: Not established

Asphalt (8052-42-4)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	>6

Mobility in Soil: No additional information available.

Other Adverse Effects: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains. Do not dispose of waste into sewer.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable.

14. TRANSPORT INFORMATION

DOT: Not regulated for transport IMDG: Not regulated for transport IATA: Not regulated for transport

15. REGULATORY INFORMATION (non-mandatory)

US Federal Regulations

SARA Section 311/312 Hazard Classes: Delayed (chronic) health hazard

TSCA (Toxic Substances Control Act) Inventory – Asphalt (8052-42-4): Listed

TSCA (Toxic Substances Control Act) Inventory – Water (7732-18-5): Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Hydrocarbon: Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Polymer: Listed

US State Regulations

Asphalt (8052-42-4)

Massachusetts: Right to Know List

New Jersey: Right to Know Hazardous Substance List

Pennsylvania: RTK (Right to Know) List

16. OTHER INFORMATION

GHS Full Text Phrases

Acute Tox. 3 (Inhalation:vapor)	Acute toxicity (inhalation:vapor) Category 3
Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 2	Carcinogenicity Category 2
Flam. Liq. 3	Flammable liquids Category 3
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
H226	Flammable liquid and vapor
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H331	Toxic if inhaled
H351	Suspected of causing cancer
H373	May cause damage to organs through prolonged or repeated exposure
H402	Harmful to aquatic life
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

NFPA Health Hazard: 1 – exposure could cause irritation but only minor residual injury even if not treatment is given.

NFPA Fire Hazard: 1 – must be preheated before ignition can occur

NFPA Reactivity: 0 – normally stable, even under fire exposure conditions, and are not reactive with water

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7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.poly (formerly Polyester) Product Description: polyester fabric

Synonyms: N/A CAS No: N/A

Supplier:

EPRO Services, Inc. PO Box 347 Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Classification

OSHA Regulatory Status

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Not classified
Acute toxicity - Dermal	Not classified
Acute toxicity - Inhalation (Gases)	Not classified
Acute toxicity - Inhalation (Vapors)	Not classified
Acute toxicity - Inhalation (Dusts/Mists)	Not classified
Skin corrosion/irritation	Not classified
Serious eve damage/eve irritation	Not classified
Respiratory sensitization	Not classified
Skin sensitization	Not classified
Germ cell mutagenicity	Not classified
Carcinogenicity	Not classified
Reproductive toxicity	Not classified
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Not classified
Aspiration toxicity	Not classified

Label elements

Hazard Statements: None Appearance: Reinforced fabric/sheet

Physical state: Solid Order: Slight/None

Precautionary Statements-Prevention: Not applicable
Precautionary Statements-Storage: Not applicable
Precautionary Statements-Disposal: Not applicable
Hazards not otherwise classified (HNOC): N/A

Other Information: 100% of mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

The product contains no substances which at their given concentration, are considered to be hazardous to health.

Chemical Name	Cas No	Weight-%	Trade Secret
Polyester Fabric	NA - Mixture	60 - 100	*

^{*}The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

Description of first aid measures

Eye Contact: Rinse thoroughly with plenty of water for at least 15 minutes. Consult a physician.

Skin contact: Wash with soap and water.

Inhalation: Remove to fresh air.

Ingestion: Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects, both acute and delayed

Symptoms: No information available.

Indication of any immediate medical attention and special treatment needed

Note to physicians: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. **Unsuitable extinguishing media** CAUTION: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical

No information available.

Explosion data

Sensitivity to Mechanical Impact: None. **Sensitivity to Static Discharge:** None.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions: Ensure adequate ventilation, especially in confined areas.

Environmental precautions

See section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment: Prevent further leakage or spillage if safe to do so. Methods for cleaning up: Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions: Keep containers tightly closed in a dry, cool and well-ventilated place.

Incompatible materials: None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines: This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Appropriate engineering controls

Engineering Controls Showers, Eyewash stations, Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/face protection: Wear safety glasses with side shields (or goggles). **Skin and body protection:** Wear protective gloves and protective clothing.

Respiratory protection: If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations: Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state: Solid

Appearance: Reinforced fabric/sheet

Odor: Slight/None

Color: White

Odor threshold: No information available

Property	Values	Remarks • Method
рН	Not applicable	

p Melting point / freezing point No information available

Boiling point / boiling range > 100 °C > 100 °C Flash point

No information available **Evaporation rate** Flammability (solid, gas) No information available

Flammability Limit in Air

Upper flammability limit: No information available Lower flammability limit: No information available Vapor pressure No information available Vapor density No information available

Relative density >1

Water solubility No information available Solubility in other solvents No information available **Partition coefficient** No information available **Auto-ignition temperature** No information available **Decomposition temperature** No information available **Kinematic viscosity** No information available **Dynamic viscosity** No information available **Explosive properties** No information available **Oxidizing properties** No information available

Other Information

Softening point No information available Molecular weight No information available VOC Content (%) No information available No information available Density **Bulk density** No information available

10. STABILITY AND REACTIVITY

Reactivity

No data available.

Chemical stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Extremes of temperature and direct sunlight.

Incompatible materials

None known based on information supplied.

Hazardous Decomposition Products

None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information: No data available

Inhalation: None known. Eye contact: None known. Skin contact: None known. Ingestion: No data available.

Information on toxicological effects

Symptoms: No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization: No information available.

Germ cell mutagenicity: No information available.

Carcinogenicity: No information available.

Reproductive toxicity: No information available. STOT - single exposure: No information available. STOT - repeated exposure: No information available.

Aspiration hazard: No information available.

Numerical measures of toxicity - Product Information

 ATEmix (oral)
 99,999.00

 ATEmix (dermal)
 99,999.00

 ATEmix (inhalation-gas)
 99,999.00

 ATEmix (inhalation-dust/mist)
 99,999.00

 ATEmix (inhalation-vapor)
 99,999.00

12. ECOLOGICAL INFORMATION (non-mandatory)

Ecotoxicity

None known.

100% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

Persistence and degradability

No information available.

Bioaccumulation

Bioaccumulative potential.

Other Adverse effects

No information available.

Ozone

Not applicable.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Waste treatment methods

Disposal of wastes: Disposal should be in accordance with applicable regional, national and local laws and

regulations.

Contaminated packaging: Do not reuse container.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated TDG: Not regulated IATA: Not regulated IMDG: Not regulated

15. REGULATORY INFORMATION (non-mandatory)

International Inventories

TSCA Complies
DSL/NDSL Complies
EINECS/ELINCS Complies

ENCS Does not comply

IECSCCompliesKECLCompliesPICCSCompliesAICSComplies

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of

Notified Chemical Substances **ENCS** - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Sara 311/312 Hazard Categories

Acute health hazard	No
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

U.S. EPA Label Information

EPA Pesticide Registration Number: Not applicable.

16. OTHER INFORMATION

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7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.drain (formerly ECODRAIN-E), e.drain 6000 (formerly ECODRAIN-S6000), e.drain 6200 (formerly ECODRAIN-S6200), e.drain 9000 (formerly ECODRAIN-S9000), e.drain 990 (formerly ECORAIN-S900),

e.drain ds (ECODRAIN-DS)

Product Description: Dimpled HDPE Sheet Chemical Name: Polyethylene Compounds

Chemical Family: Polyolefin

CAS No: N/A

Supplier:

EPRO Services, Inc. PO Box 347 Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Based on pertinent data available, these products are considered "articles" and are not hazardous under OSHA Hazard Communication Standard (29 CFR 1910.1200). GHS Label Elements not required.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product does not meet the definition given in 29 CFR 1910.1200 for hazardous material and composition is not required.

<u>NO</u>	<u>Components</u>	CAS No.	OSHA PEL
1	Polyethylene	9002-88-4	Not established
2	Polypropylene	9003-07-0	Not established
3	Proprietary	Mixtures	Not established

4. FIRST-AID MEASURES

Inhalation: Not likely in current form Ingestion: Not likely in current form

Eye Contact: As with any foreign object, flush with water. If pain or irritation persists, consult physician.

Skin Contact: Wash with soap and water. In case of irritation, consult physician.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Dry chemical, carbon dioxide or foam.

Special Fire Fighting Procedures: Wear NIOSH approved, positive pressure, self-contained breathing apparatus (SCBA) and full protective clothing. Extinguish fires with foam or dry chemical. Do not use water jet. Unusual Fire and Explosion Hazards: Avoid accumulation and dispersion of dust to reduce explosion potential. Fire may produce irritating gases and dense smoke.

6. ACCIDENTAL RELEASE MEASURES

Spill is not applicable. Sold in solid form.

7. HANDLING AND STORAGE

Handling: Wear safety glasses during cutting and fabricating processes. Electrostatic charge may build up during handling. Grounding of equipment is recommended.

Handling: No special handling unless large rolls are used. Use lifting devices, as necessary.

Storage: Store in a dry place and away from direct sunlight.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Emergency Overview: Practically nontoxic

Primary Route(s) of Exposure: Inhalation, Eye, Skin Contact

Potential Health Effects and Symptoms of Over-Exposure

Negligible hazard at room temperature under normal use.

Eye Contact: Solid flake or dust may cause transient irritation as a result of mechanical abrasion.

Skin Contact: Essentially no irritation to skin. Mechanical injury only. Hot solid may cause thermal burns.

Inhalation: Exposure to dust at high concentration may cause irritation to respiratory tract.

Ingestion: May cause choking if swallowed.

Medical Conditions Aggravated by Overexposure: Not expected. Film is generally accepted as being biologically

inert. No specific antidotal treatment, symptomatic support required. Carcinogenicity: NTP: No IARC: No OSHA: No

Eye Protection: As required by site-specific conditions. Not normally required.

Skin Protection: Gloves required when handling hot material. Not normally required.

Respiratory Protection: None required in normal use of product. NIOSH approved dust mask recommended if dust conditions exist.

Engineering Control: Ventilation Requirements — General

General ventilation should be sufficient. However, if operating conditions create high airborne concentrations of this material, special ventilation may be needed. If handling results in dust generation, special ventilation may be needed to ensure that dust exposure does not exceed the OHSA PEL for nuisance dust.

Required Work/Hygiene Procedure: Minimize contact with skin. Do not eat, drink, or smoke in work area. Wash hands thoroughly after handling, especially before eating drinking, smoking, chewing, or using restroom facility. Dusted clothing and shoes should be thoroughly cleaned before use.

Exposure guidelines

No.	<u>Components</u>	OSHA-PEL	ACGIH-TLV
1	Polyethylene	None	None
2	Polypropylene	None	None

9. PHYSICAL AND CHEMICAL PROPERTIES

Flash Point: Greater than 400° Autoignition: Not applicable

Flammable Limits in Air (LEL, %): Not applicable

(UEL, %): Not applicable Physical Form: Solid

Color: Black

Odor: Insignificant

Boiling Point: Not applicable Melting Point: ~ 320°F Freezing Point: Not applicable Solubility in Water: None

Specific Gravity: Less than 1 (water = 1) Vapor Density: Not applicable (air = 1) Evaporation Rate: None (Butyl acetate = 1)

Vapor Pressure: Not applicable

% Volatile: None pH: Not applicable

10. STABILITY AND REACTIVITY

Stability: Stable

Conditions to Avoid: Strong oxidizers

Hazardous Decomposition: Carbon dioxide, carbon monoxide

Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Inhalation: Not likely under normal use Injection: Not likely under normal use Ingestion: Not likely under normal use

Skin Contact: Prolonged contact may cause irritation to some individuals

Eye Effects: Not toxic, may irritate eyes Skin Effects: Not toxic, may irritate skin

Target Organs: None

Chronic: No known health effects from long term use or contact

Carcinogenicity: The IARC evaluation is the "Carbon black (airborne, unbound particles of respirable size) is

possibly carcinogenic to humans (Group 2B)"

Mutagenicity & Reproductive Effects: Not believed to be mutagenic or a reproductive hazard

The information provided below can be subject to misinterpretation. Therefore, it is essential the following information be interpreted by individuals trained in its evaluation.

Chemical

Polyethylene and Polypropylene: No toxicology data available.

Polyethylene and polypropylene are not considered hazardous materials under the OHSA Hazard Communication Standard

12. ECOLOGICAL INFORMATION

Environmental Data: Not expected to be hazardous to the environment in present form.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with Federal, State, and local environmental control regulations.

14. TRANSPORT INFORMATION

DOT Shipping Name: Not listed

DOT Label: Not regulated

DOT Hazard Class: Not applicable UN/NA Number: Not applicable Hazard Label(s): Not applicable Hazard Placard(s): Not applicable Packing Group: Not applicable Bulk Packaging: Not applicable

RQ: Not applicable

Emergency Response Guide (ERG) No.: Not applicable

15. REGULATORY INFORMATION

FEDERAL REGULATORY INFORMATION - Polyethylene, Polypropylene

OSHA Status: None

EPA Clean Air Act Status: None

EPA Clean Water Act Status: None

TSCA Status: All ingredients are listed on TSCA Inventory (40 CFR710)

CERCLARQ: None

USA TSCA: This product is considered an article and is exempt from TSCA requirements. Canada Domestic Substances List (DSL): This product is not specified on the DSL or NDSL.

SARA Title III Polyethylene, Polypropylene

<u>Section 302*</u> <u>Section 313**</u> <u>Section 311/312***</u>

None None None

California Proposition 65: Carbon Black (airborne, unbound particles of respirable size), CAS# 1333-86-4 is listed as a possible carcinogen.

Canada Regulations (WHMIS): Not listed

^{*}Reportable quantity of extremely hazardous substance, Sec. 302

^{*}Threshold planning quantity, extremely hazardous substance, Sec. 302

^{**}Toxic chemical. Sec. 313

^{**}Category as required by Sec 313 (40CFR372.65C). Must be used on Toxic Release Inventory form.

^{***}Hazard category for SARA Sec311/312 reporting H1=acute health hazard, H2=chronic health hazard, P3=fire hazard, P4 sudden release of pressure hazard, P5=reactive hazard

RCRA Status: If disposed of in its purchased form, this would not be a RCRA hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product used to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40CFR261.20-24).

OTHER REGULATORY INFORMATION

The following chemicals are specifically listed by individual states; other product-specific health and safety data in other sections of the SDS may also be applicable for state requirements. For details on your regulatory requirements, you should contact the appropriate agency in your state.

StateChemicalRegulationNonePolyethyleneNoneNonePolypropyleneNone

International

None

16. OTHER INFORMATION

NFPA HMIS
Fire—1 Health - 0
Health—0 Flammability - 1
Reactivity—0 Reactivity - 0

Specific Hazard — None Personal Protection Index - E

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7/1/20

SAFETY DATA SHEET

According to OSHA HCS

1. PRODUCT IDENTIFICATION

Trade Name(s): e.stop b (formerly EPROSTOP-BP)

Product Description: Sealant

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Classification of the substance or mixture: The product does not meet the criteria for classification a hazardous under the GHS and 29 CFR 1910.1200.

Label elements

GHS label elements: Void Hazard pictograms: Void Hazard pictograms: Void

Signal word: Void

Hazard statements: Void

Classification system

NFPA ratings (scale 0 - 4)

Health = 1

Fire = 1

Reactivity = 0

HMIS-ratings (scale 0-4)

Health = 1

Fire = 1

Physical Hazard = 0

Other hazards – Results of PBT and vPvB assessment

PBT: Not applicable vPvB: Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterization: Mixtures

Description: Mixture

•	Hazardous	
471-34-1	calcium carbonate	2,5-10%
14808-60-7	Quartz (SiO2)	≤2.5%
546-93-0	Magnesite	≤1. 0%
1333-86-4	Carbon black	≤0.5%

Additional information: All concentrations are in percent by weight unless the ingredient is a gas. Gas concentrations are in percent by volume. Any pigments or fillers in this product which may be considered "Hazardous" are potentially hazardous only if inhaled as an airborne dust. Exposure by these ingredients as used in sealants, putties, bedding compounds and non-sprayable products is highly unlikely. For the wording of the listed risk phrases refer to section 15.

4. FIRST-AID MEASURES

General information: No special measures required.

After inhalation: Overexposure, remove to fresh air and seek medical attention.

After skin contact: Wipe excess from skin. Immediately wash with water and soap and rinse thoroughly. After eye contact: Rinse opened eye for 20 minutes under running water. If eye becomes irritated, obtain medical treatment.

After swallowing: Seek medical treatment.

Information for doctor: Most important symptoms and effects, both acute and delayed No further relevant information available.

Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing agents: CO2, extinguishing powder, or water spray. Fight larger fires with water spray. Special hazards arising from the substance or mixture: No further relevant information available. Advice for firefighters: Protective equipment: Protective clothing and respiratory protective device.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures: Ensure adequate ventilation Environmental precautions: No special measures required.

Methods and material for containment and cleaning up: Dispose of contaminated material as waste in accordance with federal state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling: No special measures required.

Information about protection against explosions and fires: Keep container closed when not in use.

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility: Keep away from open flames and high temperatures.

Further information about storage conditions: None.

Specific end use(s): No further relevant information available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Compor	Components with limit values that require monitoring at the workplace:		
471-34-	1 calcium carbonate		
PEL	Long-term value: 15* 5** mg/m ³ *total dust **respirable fraction		
REL	Long-term value: 10* 5** mg/m ³ *total dust **respirable fraction		
TLV	TLV withdrawn		
546-93-	0 Magnesite		
PEL	Long-term value: 15* 5** mg/m ³ *total dust **respirable fraction		
REL	Long-term value: 10* 5** mg/m ³ *total dust **respirable fraction		
TLV	TLV withdrawn		

The lists that were valid during the creation were used as basis.

Exposure controls

Personal protective equipment: (see listings below)

General protective and hygienic measures: The usual precautionary measures for handling chemicals should be followed.

Breathing equipment: Not required.

Protection of hands: The glove material must be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation. The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application. Penetration time of glove material: The exact break through time must be found out by the manufacturer of the protective gloves and must be observed.

Eye protection: Safety glasses with side shields.

Body protection: Protective work clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form: Solid Color: Black

Odor: Slight earthy

Odor threshold: Not determined

pH-value: Not applicable Melting point: Undetermined Boiling point: Undetermined Flash point: 293° C (559° F)

Flammability (solid, gaseous): Not determined Decomposition temperature: Not determined Auto igniting: Product is not self-igniting

Danger of explosion: Product does not present an explosion hazard Flammable limits: Lower: Not determined Upper: Not determined

Vapor pressure: Not applicable

Specific gravity at 23°C (73°F): 1.6 g/cm³ (13.352 lbs/gal)

Relative density: Not determined Vapor density: Not applicable Evaporation rate: Not determined

Solubility in / Miscibility with Water: Insoluble

Partition coefficient (n-octanol/water): Not determined

Viscosity – Dynamic: Not applicable Viscosity – Kinematic: >20.5 cSt

Organic solvents: 0.0% Solids content: 100.0%

10. STABILITY AND REACTIVITY

Reactivity: No further relevant information available.

Chemical stability

Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.

Possibility of hazardous reactions: No dangerous reactions known.

Conditions to avoid: Heat, flames, sparks.

Incompatible materials: Reacts with strong oxidizing agents.

Hazardous decomposition products: No dangerous decomposition products know.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Primary irritant effect on the skin: Generally this product does not irritate the skin. Primary irritant effect on the eye: Generally this product does not irritate the eye.

Sensitization: No sensitizing effects known.

Additional information: The product is not subject to classification according to internally approved calculation methods for preparations. When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

Carcinogenic categories

IARC (Internati	ional Agency for Research on Cancer)	
14808-60-7	Quartz (SiO2)	1
1333-86-4	Carbon black	2B
NTP (National	Toxicology Program)	
14808-60-7	Quartz (SiO2)	K
OSHA-Ca (Occupational Safety & Health Administration)		
None of the ingredients is listed.		

12. ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity: Not expected to be harmful to aquatic organisms Persistence and degradability: No further relevant information available.

Behavior in environmental systems:

Bioaccumulative potential: No further relevant information available.

Mobility in soil: No further relevant information available.

Additional ecological information

General notes: At present there are no ecotoxicological assessments.

Generally not hazardous for water

Results of PB T and vPvB assessment

PBT: Not applicable. vPvB: Not applicable.

Other adverse effects: No further relevant information available.

13. DISPOSAL CONSIDERATIONS

Dispose of according the state and local regulations.

14. TRANSPORT INFORMATION

UN-Number: DOT, ADR, AND, IMDG, IATA: Not regulated

UN proper shipping name: DOT, ADR, AND, IMDG, IATA: Not regulated Transport hazard classes: DOT, ADR, AND, IMDG, IATA: Not regulated

Packing group: DOT, ADR, IMDG, IATA: Not regulated

Environmental hazards: Not applicable Special precautions for user: Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

US "Model Regulation": Not regulated

15. REGULATORY INFORMATION

Section 355 (extremely hazardous substances): None of the ingredients is listed.

Section 313 (Specific toxic chemical listings): None of the ingredients is listed.

TSCA (Toxic Substances Control Act): All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

(DSL) Canada Domestic Substance List: All components of this product are on the DSL or are exempt from DSL requirements.

New Jersey Right-to Know List: None of the ingredients is listed.

New Jersey Special Hazardous Substance List: None of the ingredients is listed.

Pennsylvania Right-to Know List: None of the ingredients is listed.

Pennsylvania Special Hazardous Substance List: None of the ingredients is listed.

California Proposition 65

Chemicals known to cause cancer: 1333-86-4 Carbon Black

Chemicals known to cause reproductive toxicity: None of the ingredients is listed. Chemicals known to cause developmental toxicity: None of the ingredients is listed.

Cancerogenity categories

EPA (Environmental Protection Agency): None of the ingredients is listed.

TLV (Threshold Limit Value established by ACGIH): 14808-60-7 Quartz (SiO2) 1333-86-4 Carbon black MAK (German Maximum Workplace Concentration): 14808-60-7 Quartz (SiO2) 1333-86-4 Carbon black NIOSH-Ca (National Institute for Occupational Safety & Health): 14808-60-7 Quartz (SiO2) 1333-86-4 Carbon black

National regulations

Water hazard class: Generally not hazardous for water.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

Abbreviations and acronymes

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International

Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists EINECS: European Inventory of Existing

Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) PBT:

Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

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7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.term strip (formerly Term Bar)

CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

CONTAINS NO HAZARDOUS INGREDIENTS.

3. COMPOSITION/INFORMATION ON INGREDIENTS

PE Strip

4. FIRST-AID MEASURES

None.

5. FIRE-FIGHTING MEASURES

Flash Point: (°C) 350

Extinguishing Materials: All

Unusual Fire and Explosion Hazards Burns from Molten Material – First Aid: Cool with water. Do not remove

material. Call physician.

Hazardous Combustion Products: Do not inhale combustion gases

6. ACCIDENTAL RELEASE MEASURES

Not applicable. Material is normally in solid form.

7. HANDLING AND STORAGE

Storage Requirements: Keep away from ignition sources

Personal Protective Equipment Respiratory Protection, Hand Protection, Eye Protection: None

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

No protective measures are required under normal process conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Change in Physical State (°C): 120 - 160 Density (g/cm3) 0.960 Area Weight (g/m2): 400 - 1000 Thermal Decomposition (°C) > 300

Explosion Limits None Hazardous Reactions: None Hazardous Decomposition Products: combustible gas

10. STABILITY AND REACTIVITY

None

11. TOXICOLOGICAL INFORMATION

No hazardous materials.

12. ECOLOGICAL INFORMATION (non-mandatory)

13. DISPOSAL CONSIDERATIONS

Dispose of according to State and Local regulations. Disposal Pure Polyolefins: waste code no. 57128 Other Pure Plastic Refuse: waste code no. 57129 Impure Plastic Sheet: waste code no. 57119

14. TRANSPORT INFORMATION

Contains no hazardous ingredients.

15. REGULATORY INFORMATION (non-mandatory)

16. OTHER INFORMATION

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7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.adhesive

Product Description: Waterborne acrylic coating

Synonyms: N/A CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347 Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Physical hazards: Not classified.

Health hazards: Skin corrosion/irritation (Category 2); Serious eye damage/eye irritation (Category 2B);

Carcinogenicity (Category 2) Environmental hazards: Not classified. OSHA defined hazards: Not classified.

Hazard statement: Suspected of causing cancer. Causes eye irritation. Causes skin irritation.

Precautionary statement

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection. Wash hands thoroughly after handling.

Response: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. IF exposed or concerned: Get medical advice/attention. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash before reuse.

Storage: Store locked up.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazards not otherwise classified (HNOC): None known.

Supplemental Information: Not applicable.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixtures:

Chemical NameCAS Number%Vinyl Acetate108-05-4<0.5</td>Other components below reportable levels99.5

4. FIRST-AID MEASURES

Inhalation: Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact: Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact: Rinse with water. Get medical attention if irritation develops and persists.

Ingestion: Rinse mount. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed: Direct contact with eyes may cause temporary irritation.

Indication of immediate medical attention and special treatment needed: Treat symptomatically.

General information: Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical: During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters: Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Firefighting equipment/instructions: Move containers from fire area if you can do so with risk.

Specific methods: Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards: No unusual fire or explosion hazards noted.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up:

Large spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use.

Environmental precautions: Avoid discharge into drains, water courses or onto the ground.

7. HANDLING AND STORAGE

Precautions for safe handling: Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities: Keep container tightly closed in a cool, well-ventilated place. Protect from freezing. Store between 5°C (41°F) and 38°C (100°F). Use care in handling/storage.

^{*}Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limits: This mixture has no ingredients that have PEL, TLV, or other recommended exposure limit.

Biological limit values: No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls: Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.

Individual protection measures, such as personal protective equipment

Eye/face protection: Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection: Hand protection: Rubber gloves are recommended. Other: Wear appropriate thermal protective clothing when necessary.

Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards: Wear appropriate thermal protective clothing when necessary.

General hygiene considerations: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Milky Physical state/Form: Liquid

Color: Red Odor: Slight odor

pH: 4 – 6 Odor threshold: Not available Melting point/freezing point: 32°F (0°C) Initial boiling point: 212°F (100°C) Flash point: >300.0°F (>148.9°C) Evaporation rate: Not available

Flammability (solid, gas): Not available Flammability limit-lower (%): Not available Explosive limit-lower (%): Not available

Explosive limit-upper (%): Not available
Vapor density: Not available
Relative density: Not available

Solubility (water): Not available Partition coefficient (n-octanol/water): Not available

Auto-ignition temperature: Not available Decomposition temperature: Not available

Decomposition temperature: Not available

Density: 8.00 – 9.20 lb/gal

Viscosity: Not available

Specific gravity: 1.02

10. STABILITY AND REACTIVITY

Reactivity: The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability: Material is stable under normal conditions.

Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use.

Conditions to avoid: Contact with incompatible materials.

Incompatible materials: Strong oxidizing agents.

Hazardous decomposition products: No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation: Prolonged inhalation may be harmful. However, this product does not currently meet the criteria for

classification.

Skin contact: Irritating to skin.

Eye contact: Direct contact with eyes may cause temporary irritation.

Ingestion: Expected to be a log ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics: Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity: Not available

Skin corrosion/irritation: Causes mild skin irritation Serious eye damage/eye irritation: Causes eye irritation

Respiratory or skin sensitization

Respiratory sensitization: Not available

Skin sensitization: This product is not expected to cause skin sensitization.

Germ cell mutagenicity: No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity: Suspected of causing cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity: Not listed

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052): Not regulated

US. National Toxicology Program (NTP) Report on Carcinogens: Not listed

Reproductive toxicity: This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity – single exposure: Not classified Specific target organ toxicity – repeated exposure: Not classified

Aspiration hazard: Not available

12. ECOLOGICAL INFORMATION (non-mandatory)

Ecotoxicity: The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability: No data is available on the degradability of this product.

Bioaccumulative potential: No data available.

Mobility in soil: No data available.

Other adverse effects: No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Disposal instructions: Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Local disposal regulations: Dispose in accordance with all applicable regulations.

Hazardous waste code: The waste code should be assigned in discussion between the user, the producer, and the waste disposal company.

Waste from residues / unused products: Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instruction).

Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated as dangerous goods. IATA: Not regulated as dangerous goods. IMDG: Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

15. REGULATORY INFORMATION (non-mandatory)

US federal regulations: All components are on the U>S> EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D): Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4): Not listed.

SARA 304 Emergency release notification: Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052): Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance: Not listed.

Classified hazard categories: Skin corrosion or irritation. Serious eye damage or eye irritation.

Carcinogenicity.

SARA 303 (TRI reporting): Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List: Not regulated.

Clean Air Act (CAA) Section 112® Accidental Release Prevention (40 CFR 68.130): Not regulated.

Safe Drinking Water Act (SDWA): Not regulated.

US state regulations

California Proposition 65: California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On Inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	No
US & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

^{*}A "yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s). A "no" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. OTHER INFORMATION

NFPA ratings: Health: 1

Flammability: 1 Instability: 0

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7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.shield 110b (formerly ECOSHIELD-EB, e.shield 110b scr (formerly ECOSHIELD-EB SCR)

Chemical Family: Bentonite

Synonyms: None

Supplier:

EPRO Services, Inc. PO Box 347 Derby, KS 67037 800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Emergency Overview: Generally not required under normal conditions of use.

Acute Potential Health Effects/ Routes of Entry

Inhalation: Not applicable under normal conditions of use. Eyes: Not applicable under normal conditions of use. Ingestion: Not applicable under normal conditions of use.

Skin: May cause mild irritation.

Aggravated Medical Conditions

Pre-existing eye, skin and respiratory disorders may be aggravated by exposure.

Chronic Health Effects

This product contains granular materials which may cause mechanical skin, eye or respiratory irritation. Inhalation of crystalline silica (quartz) can cause cancer based on animal data, and IARC concludes sufficient evidence in humans (Group 1). Prolonged and repeated overexposure to free crystalline silica dust above the TLV level may cause scarring of the lungs with cough and shortness of breath. A delayed lung injury, silicosis may result from breathing free silica.

Target Organs: Skin, Eye, Lung.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Chemical Name</u>	CAS-No.	Weight%
Bentonite	1302-78-9	>60.0
Water	7732-18-5	10.0-30.0
Polyethylene-cross –laminated high density	9002-88-4	<10%
n-Butyl acrylate resin	9003-49-0	3.0-7.0
Crystalline Silica (Quartz)/ Silica Sand	14808-60-7	1.0-5.0
Silica (crystalline-tridymite)	15468-32-3	<1.0
Silica (crystalline-cristobalite)	4464-46-1	<1.0

4. FIRST-AID MEASURES

Get immediate medical attention for any significant overexposure. Inhalation: Generally not required under normal conditions of use. Eye contact: Generally not required under normal conditions of use.

Skin contact: Clean area of contact thoroughly using soap and water. If irritation, rash or other disorders develop,

get medical attention immediately.

Ingestion: Generally not required under normal conditions of use.

5. FIRE-FIGHTING MEASURES

Flash Point: N/A

Auto ignition Temperature: N/A

Flammability Limits: NA

Fire Extinguishing Media: All standard firefighting media.

Special Exposure Hazards: N/A

Special Protective Equipment for Fire-Fighters: N/A NFPA Ratings: Health 0, Flammability 0, Reactivity 0 HMIS Ratings: Health 0, Flammability 0, Reactivity 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Use appropriate protective equipment. Avoid creating and breathing dust. Environmental Precautionary Measures: None known.

Procedure for Cleaning/Absorption: Collect using dustless method and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions: Material is slippery when wet.

Storage Information: Store under normal warehouse conditions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: General ventilation is acceptable.

Respirator Protection: Not required under normal working conditions

Hand Protection: Normal work gloves.

Skin Protection: Wear clothing appropriate for the work environment. Dusty clothing should be laundered before

reuse

Eye Protection: Wear safety glasses or goggles to protect against exposure.

Other Precautions: None known.

Chemical Name	CAS Number	Regulation	Limit	Form
Bentonite	1302-78-9	ACGIH TWA:	3 mg/m3	Respirable particles.
		ACGIH TWA:	10 mg/m3	Inhalable particles.
		OSHA PEL:	15mg/m3	Total dust.
		OSHA PEL:	5mg/m3	Respirable fraction.
		OSHA TWA:	15 mg/m3	Total dust.
		OSHA TWA:	5mg/m3	Respirable fraction
Crystalline Silica	14808-60-7	ACGIH TWA:	0.05 MG/M3	Respirable fraction.
(Quartz)/ Silica Sand		OSHA TWA:	0.1 mg/m3	Respirable.
		OSHA TWA:	0.1 mg/mc	Respirable.
		OSHA TWA:	0.3 mg/m3	Total dust.
		OSHA PEL:	15 mg/m3	Total dust.
		OSHA PEL:	5 mg/m3	Respirable fraction.
Silica	14464-46-1	ACGIH TWA:	0.05 mg/m3	Respirable fraction
(crystallineecristobalite)		OSHA TWA:	0.05mg/m3	Respirable.
		OSHA TWA	0.15 mg/m3	Total dust.
		OSHA PEL:	15 mg/m3	Total dust.
		OSHA PEL:	5 mg/m3	Respirable fraction.
Silica	15468-32-3	ACGIH TWA:	0.05 mg/m3	Respirable fraction.
(crystalliinetridymite)		OSHA TWA:	0.05 mg/m3	Respirable.
		OSHA TWA:	0.15 mg/m3	Total dust.
		OSHA PEL:	15 mg/m3	Total dust
		OSHA PEL:	5 mg/m3	Respirable fraction.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: Black Odor: None

pH: Not applicable.

Vapor pressure: Not applicable.
Vapor density: Not applicable.
Melting point/range: Not available.
Freezing point: Not available.
Boiling point/range: Not available.

Water solubility: Gels Specific Gravity: 1.7 % Volatile Weight: 13 %

10. STABILITY AND REACTIVITY

Stability: Stable

Conditions to avoid: None anticipated.

Hazardous Polymerization: Will not occur.

Incompatibility (materials to avoid): Hydrofluoric acid

Hazardous Decomposition or Byproducts: Amorphous silica may transform at elevated temperatures to tridymite

(870 C) or cristobalite (1470 C). Additional Guidelines: N/A

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure: Eye or skin contact, inhalation.

Inhalation: Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A). Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below.)

Skin Contact: May cause mechanical skin irritation.

Eye Contact: May cause eye irritation.

Ingestion: None known.

Aggravated Medical Conditions: Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.

Chronic Effects / Carcinogenicity

Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Other Information

For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761 -768 (1997).

Toxicity Tests

Oral Toxicity: Not determined
Dermal Toxicity: Not determined
Inhalation Toxicity: Not determined
Primary Irritation Effect: Not determined

Carcinogenicity: Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).

Genotoxicity: Not determined

Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air): Not determined Persistence/Degradability: Not determined

Bio-accumulation: Not determined

Ecotoxicological Information

Acute Fish Toxicity: TLM96: 10000 ppm (Oncorhynchus mykiss)

Acute Crustaceans Toxicity: Not determined

Acute Algae Toxicity: Not determined

Chemical Fate Information: Not determined

Other Information: Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method: Bury in a licensed landfill according to federal, state, and local regulations.

Contaminated Packaging: Follow all applicable national or local regulations.

Disposal Method: As purchased, this product, when discarded, is not a listed or characteristic hazardous waste according to Federal regulations (40 CFR 261). Check local, regional, state or provincial regulations for applicable requirements for disposal. Any processing, using, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under Federal regulations, it is the generator's responsibility to determine if a waste is a hazardous waste. Empty containers may retain product residue. Do not reuse.

14. TRANSPORT INFORMATION

Land Transportation

Dot: Not restricted

Canadian TDG: Not restricted

ADR: Not restricted

Air Transportation

ICAO/IATA: Not restricted

<u>Sea Transportation</u> IMDG: Not restricted

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory: All components listed on inventory.

EPA SARA Title III Extremely Hazardous Substances: Not applicable

EPA SARA (311,312) Hazard Class: Acute Health Hazard. Chronic Health Hazard.

EPA SARA (313) Chemicals: This product does not contain a toxic chemical for routine annual "Toxic Chemical

Release Reporting" under Section 313 (40 CFR 372).

EPA CERCLA/Superfund Reportable Spill Quantity: Not applicable.

EPA RCRA Hazardous Waste Classification: If product becomes a waste, it does NOT meet the criteria of a

hazardous waste as defined by the US EPA.

California Proposition 65: The California Proposition 65 regulations apply to this product.

MA Right-to-Know Law: One or more components listed. NJ Right-to-Know Law: One or more components listed. PA Right-to-Know Law: One or more components listed.

Canadian Regulations

Canadian DSL Inventory: All components listed on inventory.

WHMIS Hazard Class: Crystalline silica

North American Inventories

All components are listed or exempt from the TSCA inventory.

This product or its components are listed on, or exempt from the Canadian Domestic Substances List.

U.S. Federal Regulations

SARA 313 Components: None present or none present in regulated quantities.

SARA 311/312 Hazards: Acute Health Hazard

OSHA Hazardous Components

Bentonite: 1302-78-9

Crystalline Silica (Quartz)/ Silica Sand: 14808-60-7

Silica (crystalline-cristobalite): 14464-46-1 Silica (crystalline-tridymite): 15468-32-3

OSHA Status: Considered hazardous based on the following criteria: Irritant

OSHA Flammability: Not Regulated

Regulatory VOC (less water and exempt solvent): 0 g/l

VOC Method 310: 0 %

Chemical is listed as an IARC, NTP, OSHA, or ACGIH Carcinogen

Crystalline Silica (Quartz)/ Silica Sand: 14808-60-7 Silica (crystalline-cristobalite): 14464-46-1 Silica (crystalline-tridymite): 15468-32-3

U.S. State Regulations

MASS RTK Components: Crystalline Silica (Quartz)/ Silica Sand 14808-60-7

Penn RTK Components: Bentonite 1302-78-9

Water 7732-18-5

n-Butyl acrylate resin 9003-49-0

Crystalline Silica (Quartz)/ Silica Sand 14808-60-7

NJ RTK Components : Bentonite 1302-78-9

Water 7732-18-5 n-Butyl acrylate resin 9003-49-0 Crystalline Silica (Quartz)/ Silica Sand 14808-60-7 Silica (crystalline-tridymite) 15468-32-Silica (crystalline-cristobalite) 14464-46-1

Chemicals known to the State of California to cause cancer birth defects and/or other reproductive harm:

14808-60-7 Crystalline Silica (Quartz)/ Silica Sand

14464-46-1 Silica (crystalline-cristobalite) 15468-32-3 Silica (crystalline-tridymit

16. OTHER INFORMATION

HMIS Rating

Health 1 0 = MinimumFlammability 1 1 = SlightReactivity 0 2 = ModeratePPE 3 = Serious4 = Severe

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7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.shield 205b (formerly ECOSHIELD-PB), e.shield 205b sr (formerly ECOSHIELD-PB/SR)

Chemical Family: Bentonite

Synonyms: None

Supplier:

EPRO Services, Inc. PO Box 347 Derby, KS 67037 800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Emergency Overview: Generally not required under normal conditions of use.

Acute Potential Health Effects/ Routes of Entry

Inhalation: Not applicable under normal conditions of use. Eyes: Not applicable under normal conditions of use. Ingestion: Not applicable under normal conditions of use.

Skin: May cause mild irritation.

Aggravated Medical Conditions

Pre-existing eye, skin and respiratory disorders may be aggravated by exposure.

Chronic Health Effects

This product contains granular materials which may cause mechanical skin, eye or respiratory irritation. Inhalation of crystalline silica (quartz) can cause cancer based on animal data, and IARC concludes sufficient evidence in humans (Group 1). Prolonged and repeated overexposure to free crystalline silica dust above the TLV level may cause scarring of the lungs with cough and shortness of breath. A delayed lung injury, silicosis may result from breathing free silica.

Target Organs: Skin, Eye, Lung.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Chemical Name</u>	CAS-No.	Weight%
Bentonite	1302-78-9	>60.0
Water	7732-18-5	10.0-30.0
Polyethylene-cross –laminated high density	9002-88-4	<10%
n-Butyl acrylate resin	9003-49-0	3.0-7.0
Crystalline Silica (Quartz)/ Silica Sand	14808-60-7	1.0-5.0
Silica (crystalline-tridymite)	15468-32-3	<1.0
Silica (crystalline-cristobalite)	4464-46-1	<1.0

4. FIRST-AID MEASURES

Get immediate medical attention for any significant overexposure. Inhalation: Generally not required under normal conditions of use. Eye contact: Generally not required under normal conditions of use.

Skin contact: Clean area of contact thoroughly using soap and water. If irritation, rash or other disorders develop,

get medical attention immediately.

Ingestion: Generally not required under normal conditions of use.

5. FIRE-FIGHTING MEASURES

Flash Point: N/A

Auto ignition Temperature: N/A

Flammability Limits: NA

Fire Extinguishing Media: All standard firefighting media.

Special Exposure Hazards: N/A

Special Protective Equipment for Fire-Fighters: N/A NFPA Ratings: Health 0, Flammability 0, Reactivity 0 HMIS Ratings: Health 0, Flammability 0, Reactivity 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Use appropriate protective equipment. Avoid creating and breathing dust. Environmental Precautionary Measures: None known.

Procedure for Cleaning/Absorption: Collect using dustless method and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions: Material is slippery when wet.

Storage Information: Store under normal warehouse conditions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: General ventilation is acceptable.

Respirator Protection: Not required under normal working conditions

Hand Protection: Normal work gloves.

Skin Protection: Wear clothing appropriate for the work environment. Dusty clothing should be laundered before

reuse

Eye Protection: Wear safety glasses or goggles to protect against exposure.

Other Precautions: None known.

Chemical Name	CAS Number	Regulation	Limit	Form
Bentonite	1302-78-9	ACGIH TWA:	3 mg/m3	Respirable particles.
		ACGIH TWA:	10 mg/m3	Inhalable particles.
		OSHA PEL:	15mg/m3	Total dust.
		OSHA PEL:	5mg/m3	Respirable fraction.
		OSHA TWA:	15 mg/m3	Total dust.
		OSHA TWA:	5mg/m3	Respirable fraction
Crystalline Silica	14808-60-7	ACGIH TWA:	0.05 MG/M3	Respirable fraction.
(Quartz)/ Silica Sand		OSHA TWA:	0.1 mg/m3	Respirable.
		OSHA TWA:	0.1 mg/mc	Respirable.
		OSHA TWA:	0.3 mg/m3	Total dust.
		OSHA PEL:	15 mg/m3	Total dust.
		OSHA PEL:	5 mg/m3	Respirable fraction.
Silica	14464-46-1	ACGIH TWA:	0.05 mg/m3	Respirable fraction
(crystallineecristobalite)		OSHA TWA:	0.05mg/m3	Respirable.
		OSHA TWA	0.15 mg/m3	Total dust.
		OSHA PEL:	15 mg/m3	Total dust.
		OSHA PEL:	5 mg/m3	Respirable fraction.
Silica	15468-32-3	ACGIH TWA:	0.05 mg/m3	Respirable fraction.
(crystalliinetridymite)		OSHA TWA:	0.05 mg/m3	Respirable.
		OSHA TWA:	0.15 mg/m3	Total dust.
		OSHA PEL:	15 mg/m3	Total dust
		OSHA PEL:	5 mg/m3	Respirable fraction.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: Black Odor: None

pH: Not applicable.

Vapor pressure: Not applicable.
Vapor density: Not applicable.
Melting point/range: Not available.
Freezing point: Not available.
Boiling point/range: Not available.

Water solubility: Gels Specific Gravity: 1.7 % Volatile Weight: 13 %

10. STABILITY AND REACTIVITY

Stability: Stable

Conditions to avoid: None anticipated.

Hazardous Polymerization: Will not occur.

Incompatibility (materials to avoid): Hydrofluoric acid

Hazardous Decomposition or Byproducts: Amorphous silica may transform at elevated temperatures to tridymite

(870 C) or cristobalite (1470 C). Additional Guidelines: N/A

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure: Eye or skin contact, inhalation.

Inhalation: Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A). Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below.)

Skin Contact: May cause mechanical skin irritation.

Eye Contact: May cause eye irritation.

Ingestion: None known.

Aggravated Medical Conditions: Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.

Chronic Effects / Carcinogenicity

Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Other Information

For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761 -768 (1997).

Toxicity Tests

Oral Toxicity: Not determined
Dermal Toxicity: Not determined
Inhalation Toxicity: Not determined
Primary Irritation Effect: Not determined

Carcinogenicity: Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).

Genotoxicity: Not determined

Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air): Not determined Persistence/Degradability: Not determined

Bio-accumulation: Not determined

Ecotoxicological Information

Acute Fish Toxicity: TLM96: 10000 ppm (Oncorhynchus mykiss)

Acute Crustaceans Toxicity: Not determined

Acute Algae Toxicity: Not determined

Chemical Fate Information: Not determined

Other Information: Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method: Bury in a licensed landfill according to federal, state, and local regulations.

Contaminated Packaging: Follow all applicable national or local regulations.

Disposal Method: As purchased, this product, when discarded, is not a listed or characteristic hazardous waste according to Federal regulations (40 CFR 261). Check local, regional, state or provincial regulations for applicable requirements for disposal. Any processing, using, alteration or chemical additions to the product, as purchased, may alter the disposal requirements. Under Federal regulations, it is the generator's responsibility to determine if a waste is a hazardous waste. Empty containers may retain product residue. Do not reuse.

14. TRANSPORT INFORMATION

Land Transportation

Dot: Not restricted

Canadian TDG: Not restricted

ADR: Not restricted

Air Transportation

ICAO/IATA: Not restricted

<u>Sea Transportation</u> IMDG: Not restricted

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory: All components listed on inventory.

EPA SARA Title III Extremely Hazardous Substances: Not applicable

EPA SARA (311,312) Hazard Class: Acute Health Hazard. Chronic Health Hazard.

EPA SARA (313) Chemicals: This product does not contain a toxic chemical for routine annual "Toxic Chemical

Release Reporting" under Section 313 (40 CFR 372).

EPA CERCLA/Superfund Reportable Spill Quantity: Not applicable.

EPA RCRA Hazardous Waste Classification: If product becomes a waste, it does NOT meet the criteria of a

hazardous waste as defined by the US EPA.

California Proposition 65: The California Proposition 65 regulations apply to this product.

MA Right-to-Know Law: One or more components listed. NJ Right-to-Know Law: One or more components listed. PA Right-to-Know Law: One or more components listed.

Canadian Regulations

Canadian DSL Inventory: All components listed on inventory.

WHMIS Hazard Class: Crystalline silica

North American Inventories

All components are listed or exempt from the TSCA inventory.

This product or its components are listed on, or exempt from the Canadian Domestic Substances List.

U.S. Federal Regulations

SARA 313 Components: None present or none present in regulated quantities.

SARA 311/312 Hazards: Acute Health Hazard

OSHA Hazardous Components

Bentonite: 1302-78-9

Crystalline Silica (Quartz)/ Silica Sand: 14808-60-7

Silica (crystalline-cristobalite): 14464-46-1 Silica (crystalline-tridymite): 15468-32-3

OSHA Status: Considered hazardous based on the following criteria: Irritant

OSHA Flammability: Not Regulated

Regulatory VOC (less water and exempt solvent): 0 g/l

VOC Method 310: 0 %

Chemical is listed as an IARC, NTP, OSHA, or ACGIH Carcinogen

Crystalline Silica (Quartz)/ Silica Sand: 14808-60-7 Silica (crystalline-cristobalite): 14464-46-1 Silica (crystalline-tridymite): 15468-32-3

U.S. State Regulations

MASS RTK Components: Crystalline Silica (Quartz)/ Silica Sand 14808-60-7

Penn RTK Components: Bentonite 1302-78-9

Water 7732-18-5

n-Butyl acrylate resin 9003-49-0

Crystalline Silica (Quartz)/ Silica Sand 14808-60-7

NJ RTK Components : Bentonite 1302-78-9

Water 7732-18-5 n-Butyl acrylate resin 9003-49-0 Crystalline Silica (Quartz)/ Silica Sand 14808-60-7 Silica (crystalline-tridymite) 15468-32-Silica (crystalline-cristobalite) 14464-46-1

Chemicals known to the State of California to cause cancer birth defects and/or other reproductive harm:

14808-60-7 Crystalline Silica (Quartz)/ Silica Sand

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7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): GFG 16, e.shield 311 (formerly Ecoshield H11), e.base 316 (formerly Ecoshield H16),

e.base 305 (formerly Ecoshield H)

Product Description: Film

Chemical Name: Polyethylene Compounds

Chemical Family: Polyolefin

CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347 Derby, KS 67037

800-882-1896 (8:00am - 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Physical Appearance: Firms that are natural translucent or in various colors.

Immediate Concerns: When using or handling as supplied there are very low hazards.

OSHA Hazard Category: Combustible dust. **GHS Hazard Categories:** Not classified.

Signal Word: Warning! This product as shipped is not classified as a combustible dust; however, a combustible concentration of dust may occur if fine powders accumulated or suspended in an enclosed or confined area (e.g. from cutting or sanding the films.

Pictogram: There is no pictogram for a combustible dust hazard.

Rough edges of films could result in minor cuts to hands. Appropriate gloves should be worn to prevent cuts and/or scraps. Avoid contact with strong oxidizing agents. When working with film at hot temperatures, the material may begin to decompose producing fumes that can contain carbon dioxide, carbon monoxide, and other unidentified organic compounds that come from the breakdown of the materials used to make the films. Adequate ventilation should be provided to minimize exposures to vapors and fumes. When cutting, shaping, or modifying films, other hazards may exist.

Potential Health Effects

Eyes: Dust from cutting may result and mechanically irritate the eyes. If using elevated temperatures, vapors may irritate eyes.

Skin: Cuts or scraps referenced above. If using elevated temperatures to soften films exposure to molten resin may cause thermal burns.

Ingestion: May cause choking if swallowed.

Inhalation: Inhalation of dust at high concentration may cause irritation of the respiratory system. Inhalation of vapors from use of elevated temperatures may also cause irritation of the respiratory system.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>NO</u>	Components	<u>CAS No.</u>	<u>Percent</u>	<u>OSHA PEL</u>
1	Polyethylene	9002-88-4	50 – 100%	Not established
2	Proprietary	Mixtures	0 – 50%	Not established

4. FIRST-AID MEASURES

The following applies if films are cut, sanded, or otherwise processed which generates dust, debris, or vapors.

Eye Contact: Immediately flush eyes with water for at least 15 minutes. Do not rub the eyes. If irritation or other symptoms occur, consult a physician.

Skin Contact: Get medical attention for serious burns. In case of skin contact with hot product immediately immerse in or flush with clean, cold water.

Inhalation: Remove to fresh air. Consult physician if irritation of respiratory passage occurs.

Ingestion: Consult physician.

Notes to Physician: No known delayed effects following single exposure.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Dry chemical, carbon dioxide or foam.

Hazardous Combustion Products: Carbon monoxide, carbon dioxide, and other possible toxic combustion products.

Explosion Hazard: Avoid generating dust, fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Special Fire Fighting Equipment: Wear NIOSH approved, positive pressure, self-contained breathing apparatus (SCBA) and full protective clothing.

Sensitive to Static Discharge: Static discharge could be an ignition source for a combustible concentration of dust.

6. ACCIDENTAL RELEASE MEASURES

As supplied, the product presents no risk of spill or release.

7. HANDLING AND STORAGE

Precautions for Safe Handling: Wear safety glasses during cutting and fabricating processes. Electrostatic charge may build up during handling. Grounding of equipment is recommended.

Handling: If product is cut or sanded, avoid exposure to dust and debris. Provide appropriate local ventilation at machinery and at places where dust can be generated. In addition, wear suitable respiratory equipment to avoid breathing dusts containing titanium dioxide and/or carbon black.

Storage: Store in a dry place and away from direct sunlight. Keep away from heat, flame, and strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits: Not applicable.

Engineering Controls: Ventilation Requirements—General ventilation should be sufficient. However, if operating conditions create high airborne concentrations of this material, special ventilation may be needed. If handling results in dust generation, special ventilation may be needed to ensure that dust exposure does not exceed the OSHA PEL for nuisance dust.

Personal Protective Equipment

Respiratory Protection: None required in normal use of product. NIOSH approved dust mask recommended if dust

conditions exist.

Eye Protection: When cutting or processing product, wear safety glasses with side shields.

Body Protection: Wear protective gloves to avoid incidental cuts or scraps that could occur when handling the

edges of product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: Solid

Specific Gravity: 0.7 - 1.2 (water = 1)

Appearance: Solid film **Odor:** Insignificant

Solubility in Water: Insoluble Melting Point: 120 - 130°C Flash Point: Not applicable Autoignition: Not applicable

Physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Stability: Stable

Conditions to Avoid: Do not store product near heat or flame. When cutting or sanding, minimize dust generation and

accumulation. Avoid contact with strong oxidizing agents.

Hazardous Decomposition: No dangerous decomposition products known.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Skin Irritation: Not expected to cause skin irritation.

Eye Irritation: Mechanical eye irritation.

Sensitization/Allergic Reaction: No sensitizing effects known. **Repeated dose toxicity:** No known chronic health effects.

12. ECOLOGICAL INFORMATION

Ecotoxicity: No data is available on the adverse effects of this product on the environment.

Persistence and Degradability: No data available. **Bioaccumulative Potential:** No data available.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with Federal, State, and local environmental control regulations.

14. TRANSPORT INFORMATION

This product is not regulated as a hazardous material/dangerous good for transportation. This product is not regulated by US DOT, IMO, and IATA. It is not applicable for UN/NA number, hazard label, hazard placard, packing group, bulk packaging, RQ, and emergency response guide (ERG) number.

15. REGULATORY INFORMATION

United States

US Toxic Substances Control Act (TSCA): All components comprising these products are compliant with TSCA. These products have no special requirements under TSCA (e.g. consent orders, test rules, 12(b) requirements, etc.)

OSHA Hazard Communication Rule: This product is not considered a hazardous material as shipped or at temperatures below the melting point according to OSHA definitions.

SARA Title III: This product is not subject to SARA Title III requirements.

SARA Section 302 Toxic Chemical List: No components listed. **SARA Section 3313 Toxic Chemical List:** No components listed.

OTHER REGULATORY INFORMATION

The following chemicals are specifically listed by individual states; other product-specific health and safety data in other sections of the SDS may also be applicable for state requirements. For details on your regulatory requirements, you should contact the appropriate agency in your state.

StateChemicalRegulationNonePolyethyleneNone

<u>International</u>

None

16. OTHER INFORMATION

HMIS Health: 0

Flammability: 1 Physical Hazard: 0

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E.PROTECT+ COMPOSITE MEMBRANE SYSTEM FOR HYDROSTATIC WATERPROOFING AND VAPOR INTRUSION MITIGATION

SECTION 02 56 16 – GAS CONTAINMENT
SECTION 02 56 19.13 – FLUID-APPLIED GAS BARRIER
SECTION 07 13 54 – THERMOPLASTIC SHEET WATERPROOFING
SECTION 07 14 16 – COLD FLUID-APPLIED WATERPROOFING
SECTION 07 17 16 – BENTONITE COMPOSITE SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including general and supplementary conditions, and Division 1 specification section, apply to this section.

1.2 SECTION INCLUDES

- A. The installation of materials designed to provide below grade waterproofing and vapor intrusion protection when installed per project specification, this section covers the waterproofing and vapor intrusion membrane, along with the following:
- B. Surface preparation and substrate treatment.
- C. Auxiliary materials.
- D. Prefabricated drainage composite.
- E. Foundation drain.

1.3 RELATED SECTIONS

- A. Section 02 24 00: Environmental Assessment
- B. Section 02 32 00: Geotechnical Investigation
- C. Section 03 15 00: Concrete Accessories
- D. Section 03 30 00: Cast-in-Place Concrete
- E. Section 03 40 00: Precast Concrete
- F. Section 07 90 00: Joint Protection
- G. Section 31 30 00: Earthwork Methods
- H. Section 33 41 00: Subdrainage

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide a composite membrane system that prevents the passage of water under hydrostatic conditions, methane gas, contaminant vapor, and complies with the physical requirements as demonstrated by testing performed by an independent testing agency.

1.5 SUBMITTALS

- A. Product Data: For each type of waterproofing specified submit manufacturer's published technical data, tested physical and performance properties, instructions for evaluating, preparing, and treating substrates, and installation instructions.
- B. Shop Drawings: Project specific drawings showing locations and extent of waterproofing, manufacturer's typical details for substrate joints and crack treatment, sheet flashing, penetrations, transitions, and termination conditions.
- C. Samples: Submit two standard size samples of each of the following:
 - 1. Individual components of the specified composite membrane system.
- D. Applicator Certification: Submit written confirmation at the time of bid that applicator is currently approved by the composite membrane system manufacturer.

1.6 QUALITY ASSURANCE

- A. Applicator Qualifications: Waterproofing applicator shall be an EPRO Authorized Applicator who is trained and performs work that in accordance with EPRO standards and policies. For project requiring a no-dollar-limit labor and material warranty, the waterproofing applicator must be E.Assurance Certified at the time of bid.
- B. Third Party Inspection: Independent inspection of the composite system installation may be required based on project conditions and desired warranty coverage. Inspection reports shall be submitted directly to the composite waterproofing manufacturer and made available to other parties per the owners' direction. For projects requiring a no-dollar-limit labor and material warranty, an independent inspector must be E.Assurance Certified and comply with the documentation requirements.
- C. Water Sample: A 2-liter representative ground water sample shall be sent by the installation contractor to the manufacturer, if contaminated groundwater and/or salt water is believed to be present on the site. Email watersample@eproinc.com to receive shipping instructions.
- D. Pre-Construction Meeting: A meeting shall be held prior to application of the composite waterproofing system to assure proper substrate preparation, confirm installation conditions, and any additional project specific requirements. Attendees of the meeting shall include, but are not limited to the following:
 - 1. EPRO representative
 - 2. EPRO certified applicator
 - 3. EPRO certified third party inspector
 - 4. General contractor
 - 5. Owner representative
 - 6. Concrete/Shotcrete contractor
 - 7. Rebar contractor
 - 8. Project design team
 - 9. All appropriate related trades, i.e. plumbing, electrical, and mechanical contractors.

- E. Field Sample: Apply each assembly of the composite membrane system field sample to 100 ft² (9.3 m²) to demonstrate proper application techniques and establish a standard of workmanship that meets the project and manufacturer's requirements.
 - 1. Notify composite membrane system manufacturer representative, architect, certified inspector, and other appropriate parties one week in advance of the dates and times when field sample will be prepared.
 - 2. If architect and certified inspector determine that field sample does not meet requirements; reapply composite membrane system until field sample is approved.
 - 3. Retain and maintain approved field sample during construction in an undisturbed condition as a standard for judging the completed composite membrane system. An undamaged field sample may become part of the completed work.
- F. Materials: Composite membrane system and auxiliary materials shall be single sourced.

1.7 MATERIAL DELIVERY, STORAGE AND DISPOSAL

- A. Delivery: Deliver materials to site labeled with manufacturer's name, product brand name, material type, and production number. Upon the arrival of materials to the jobsite, inspect materials to confirm material has not been damaged during transit.
- B. Storage: Proper storage of onsite materials is the responsibility of the certified applicator. Consult product data sheets to confirm storage requirements. Storage area shall be clean, dry, and protected from the elements. If ambient air temperatures are expected to fall below 40°F, precautions will need to be taken to protect any polymer modified asphalt product from near freezing temperatures. Protect stored materials from direct sunlight.
- C. Disposal: Remove and replace any material that cannot be properly applied in accordance with local regulations and the general conditions found in specification section 01 74 00.

1.8 PROJECT CONDITIONS

- A. Substrate Review: Substrates shall be reviewed by the certified applicator and accepted by the certified inspector prior to application. Application without signoff from certified inspector will likely result in voidance of warranty.
- B. Penetrations: All plumbing, electrical, mechanical, and structural items to be passing through the composite membrane system shall be properly spaced, positively secured in their proper positions, and appropriately protected prior to system application and throughout the construction phase. Braided grounding rods are not allowed to pass through the membrane in waterproofing applications.
- C. Reinforcement Steel: Composite membrane system shall be installed before placement of reinforcing steel. Any anchor bolts, or other methods, of securing reinforcement steel must be in place prior to the application of the polymer modified asphalt. Piano wire, shotcrete wire rods, or similar methodologies, are prohibited from penetrating the system post installation.
- D. Clearance: Minimum clearance of 24 inches is required for application of spray applied polymer modified asphalt membrane, *e.spray*. For areas with less than 24-inch clearance, the *e.spray* membrane may be applied by hand using *e.roll*.
- E. Overspray: Protect all adjacent areas not receiving **e.spray** or **e.roll**. Masking is necessary to prevent unwanted overspray from adhering to, or staining, areas not receiving the membrane. Once **e.spray** or **e.roll** adheres to a surface it is extremely difficult to remove.

- F. Weather Limitations: Perform work only when existing and forecast weather conditions are within manufacturer's recommendations.
 - 1. Spray Applied Polymer Modified Asphalt Membrane: Minimum ambient temperature must be 40°F (7°C) and rising. For applications temperatures below 38 degrees, but greater than +19°F/-7°C, special equipment and material handling is needed. Substrate shall be clean and free from standing moisture.
 - 2. EPRO applicators reserve the right not to install product when application conditions might be within manufactures acceptance, but ambient conditions may limit a successful application.
 - 3. Heat Welding: Do not weld seams during rain or periods of moisture. Sheet membranes shall be clean, and free from moisture when welding.
 - 4. Bentonite: Application of bentonite materials to damp surfaces is acceptable provided it is being installed over **e.spray**.

1.9 WARRANTY

- A. General Warranty: The special warranty specified in this section shall not deprive the owner of other rights the owner may have under other provisions of the contract documents, and shall be in addition to, and run concurrent with, other warranties made by the contractor under requirements of the contract documents.
- B. Special Warranty: Submit a written warranty signed by waterproofing manufacturer agreeing to replace system materials that do not conform with manufactures published specifications, or are deemed to be defective. Warranty does not include failure of waterproofing due to failure of soil substrate prepared and treated according to requirements or formation of new joints and cracks in the specially applied concrete that exceed 1/8 inch (3.175 mm) in width.
 - 1. Warranty Period: 5 years after date of substantial completion. Longer warranty periods are available upon request.
 - 2. Coverage: Manufacturer will guarantee that the material provided is free of defects for the warranty period.
- C. Additional Warranty Options: Upgraded warranties are available by contacting the manufacturer. These warranties may have additional requirements and approval must be granted in accordance to the manufacturer's warranty requirements. Additional warranty options include:
 - 1. Standard Labor and Material (E.Series L&M): Manufacturer will provide non-prorated coverage for the warranty term, agreeing to repair or replace material that does not meet requirements or remain watertight.
 - 2. No-Dollar-Limit Labor and Material Warranty (E.Assurance NDL): Manufacturer will provide a non-prorated, no-dollar-limit, coverage for the warranty term, agreeing to repair or replace material that does not meet requirements or remain watertight.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: EPRO Services, Inc. (EPRO), P.O. Box 347; Derby, KS 67037; Tel: (800) 882-1896; Email: Info@eproinc.com; Web: www.eproinc.com

- B. Underslab: E.Protect+ Underslab (196 mils) e.base 316, e.spray (100 mils), e.shield 205b
- C. Shoring Walls: E.Protect+ Shoring (176 mils) e.drain 12ds, e.drain 6000, e.base 316, e.spray (80 mils), e.shield 205b, e.shield bb
- D. Cast-in-Place Walls: E.Protect+ Wall (160 mils) e.spray (80 mils), e.shield 110b, e.drain 6000

2.2 SYSTEM PHYSICAL PROPERTIES

- A. The physical properties listed in this section reflect testing on the entire composite system. Physical properties of the individual system composite can be found in Specification Section 2.3.
 - E.Protect+ Underslab maximizes redundancy by combining the benefits of e.base 316
 (16 mil HDPE thermoplastic membrane with heat welded seams), a 100 mil layer of
 e.spray (polymer modified asphaltic membrane), and e.shield 205b (HDPE reinforced
 bentonite sheet). In hydrostatic conditions this system will provide protection against
 ingress from water, methane gas, and chemical vapor intrusion.

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	522.7 psi
Elongation	ASTM D412	911%
Adhesion to Concrete	ASTM D903	8 lbf/in
Puncture Resistance	ASTM D1709	319.6 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.007 perms
PCE Diffusion Rate		4.3 x 10 ⁻¹⁸ m ² /sec
TCE Diffusion Rate		3.4 x 10 ⁻¹⁸ m ² /sec

2. **E.Protect+ Shoring** combines the redundant benefits of **e.base 316**, (16 mil HDPE thermoplastic membrane with heat welded seams), an 80 mil layer of **e.spray** (polymer modified asphaltic membrane), and e.shield 205b (an HDPE reinforced bentonite sheet). E.Protect+ shoring assembly is designed to address hydrostatic conditions in zero-lot-line applications that present significant complexity and risk.

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	522.7 psi
Elongation	ASTM D412	911%
Adhesion to Concrete	ASTM D903	8 lbf/in
Puncture Resistance	ASTM D1709	319.6 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.007 perms

3. **E.Protect+ Wall** combines the redundant benefits of an 80 mil layer of **e.spray** (polymer modified asphaltic membrane), and **e.shield 110b** (a polyolefin reinforced bentonite to provide unparalleled protection for positive side applications. Ideal for complex conditions, sensitive building areas, or anywhere maximum protection is needed.

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	196 psi
Elongation	ASTM D412	351%

Adhesion to Concrete	ASTM D903	20.0 lbf/in
Puncture Resistance	ASTM D1709	65.5 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.0374 perms

2.3 WATERPROOFING MATERIALS

A. Polymer Modified Asphalt

e.spray: e.spray is a non-hazardous, low-viscosity, water-based, anionic asphalt emulsion modified with a blend of synthetic polymerized rubbers and proprietary additives. e.spray is highly stable during transit and proper storage, but becomes highly reactive during the spray application to form a rapidly cured membrane with exceptional bonding, elongation, and hydrophobic characteristics.

PROPERTIES	TEST METHOD	VALUE
Color		Brown to Black
Solvent Content		No Solvents
Shelf Life		6 Months
Tensile Strength	ASTM D412	32 psi
Elongation	ASTM D412	4140%
Resistance to Decay	ASTM E154 Section 13	4% Perm Loss
Accelerated Aging	ASTM G23	No Effect
Moisture Vapor Transmission	ASTM E96	0.026 g/ft²/hr
Hydrostatic Water Pressure	ASTM D751	26 psi
Perm Rating	ASTM E96	0.21 perms
Methane Transmission Rate	ASTM D1434	0
Adhesion to Concrete & Masonry	ASTM C836 & C704	20 lbf/inch
Adhesion to HDPE	ASTM C836	28.363 lbf/inch
Adhesion to Polypropylene Fabric	ASTM C836	31.19 lbf/inch
Hardness	ASTM C836	80
Crack Bridging	ASTM C836-00	No Cracking
Low Temp. Flexibility		No Cracking at -20° C
Packaging: 55 gallon drum, 275 gallon tote, 330 gallon tote		

2. **e.roll**: **e.roll** is a medium viscosity water-based, polymer-modified anionic asphalt emulsion, which exhibits exceptional bonding, elongation and waterproofing characteristics.

PROPERTIES	TEST METHOD	VALUE
Color		Brown to Black
Solvent Content		No Solvents
Shelf Life		6 Months
Tensile Strength	ASTM D412	32 psi
Elongation	ASTM D412	3860%
Resistance to Decay	ASTM E154 SECTION 13	9% Perm Loss
Accelerated Aging	ASTM G23	No Effect
Moisture Vapor Transmission	ASTM E96	0.071 g/ft²/hr
Hydrostatic Water Pressure	ASTM D751	28 psi
Perm Rating	ASTM E96	0.17 perms
Methane Transmission Rate	ASTM D14334	0
Adhesion to Concrete & Masonry	ASTM C836	1 lbf/inch

Hardness	ASTM C836	85
Crack Bridging	ASTM C836	No Cracking
Low Temp. Flexibility	ASTM C836-00	No Cracking at -20° C
Packaging: 5 gallon bucket		

B. Thermoplastic Membrane

1. **e.base 316**: **e.base 316** is a 16 mil geomembrane comprised of high density polyethylene (HDPE). While **e.base 316** is always installed as a component of EPRO's E.Series assemblies, it alone exceeds all Class A, B, and C vapor barrier requirements.

PROPERTIES	TEST METHOD	VALUE
Material		HDPE
Color		Green
Thickness		16 mil
Classification	ATSM E1745	Exceeds Class A, B & C
Water Vapor Permeance	ATSM E96	.029 perms
Tensile Strength	ATSM E154 (ATSM D882)	63 lbf/in
Puncture Resistance	ATSM D1709 Method B	2,750 grams
Life Expectancy	ATSM E154	Indefinite
Chemical Resistance	ATSM E154	Unaffected
Dimensions: 12' x 150'		
Weight: 137 pounds		

C. Geocomposite Bentonite Membrane

1. **e.shield 205b**: **e.shield 205b** is a redundant geocomposite bentonite membrane comprised of three distinct layers, a nonwoven polypropylene geotextile, an HDPE film, and then a chemically bonded layer of sodium montmorillonite bentonite.

PROPERTIES	TEST METHOD	VALUE
Film Material		HDPE
Film Color		Gray
Fabric Material		Non-woven Polypropylene
Fabric Color		White
Bentonite		Sodium Montmorillonite (>90%)
Tensile Strength: Membrane (psi)	ATSM D882	6,100 psi (42 MPa)
% Elongation at break	ATSM D882	100%
Overall Weight		0.6 lb per ft² (2.44 kg/m²)
Resistance	ATSM D751 Procedure A	174 ft. (52.9 m) of water
Crack Bridging		1.8" (.032 cm) crack
Water Vapor Permeability	ATSM E96	0.53 x 10 ⁻³ cm/sec
Dimensions: 4' x 32'		
Weight: 75 pounds		

2. **e.shield 110b**: **e.shield 110b** is a black and gray redundant geocomposite bentonite membrane comprised of two distinct layers. The membrane consists of an HDPE film chemically bonded to a layer of sodium montmorillonite bentonite.

PROPERTIES	TEST METHOD	VALUE
Film Material		HDPE
Film Color		Black
Bentonite		Sodium Montmorillonite
Weight		0.6 lb per ft ² (4.89 kg/m ²)
Puncture Resistance	ASTM E154-88 SEC 10	170 lbs (77.3 kg)
Tensile Strength	ASTM D882	6100 psi
% Elongation at Break	ASTM D882	100%
Crack Bridging		1/8" (.032 cm) crack
Resistance to Hydrostatic Head	ASTM D751 Procedure A	174 ft. (52.9 m) of water
Water Vapor Permeability	ASTM E96-80	0.53x10 ⁻³ cm/sec
Resistance to Microorganisms	ASTM E154-88 SEC 13	Unaffected
Freeze/thaw Cycles		Unaffected
Installation temperatures	ASTM D746 & D1238	-40°F to 150°F (-40°C to 65.5°C)
Dimensions: 3.25' x 37'		
Weight: 72 pounds		

D. Geocomposite Bentonite Transition Course

1. **e.shield bb**: **e.shield bb** is a double layer of bentonite reinforce with a 20 mil layer of high density polyethylene.

PROPERTIES	TEST METHOD	VALUE		
Reinforcement Membrane		HDPE		
Reinforcement Membrane Thickness		20 mil		
Bentonite		Sodium Montmorillonite		
Weight		1.5 lb per ft ² (7.34 kg/m2)		
Puncture Resistance	ASTM E154-88	172 lb. (77.5 kg)		
Membrane Tensile Strength	ASTM D638	MD: 3670 psi (31.3 MPa),		
		TD: 3500 psi (29.9 MPa)		
% Elongation at Break	ASTM D638	>700%		
Peel Adhesion of Geotextile	ASTM C836	28 lb/in		
Resistance to Hydrostatic Head	ASTM D5385	100 psi (231 ft)		
Permeability	ASTM E96-80	0.024 perms (grains/ ft² hr in HG)		
Resistance to Micro-organisms	ASTM E154-88-13	Unaffected		
Toxicity		Non-Toxic		
Freeze Thaw Cycles		No effect before or after		
		installation		
Installation Temperatures		-25°F to 150°F (-31.7°C to 54.4°C)		
Dimensions: 3.5' X 14.3'				
Weight: 75 pounds				

E. Prefabricated Drainage Composite

1. **e.drain 6000**: **e.drain 6000** features a lightweight three-dimensional, high-compressive strength polypropylene core and bonded non-woven geotextile fabric. The bonded filter fabric allows water to pass freely into the molded drain while preventing soil particles from entering and clogging the core structure.

PROPERTIES	TEST METHOD	VALUE		
DIMPLED CORE				
Core Material		Polypropylene		
Color		Black		
Dimple Height	ASTM D1777-96	0.4" (10.16 mm)		
Compressive Strength	ASTM D6364-06	16,500 psf (790 kN/m²)		
Flow rate	ASTM D4716	21 gal/min/ft		
FILTER FABRIC				
Grab Tensile	ASTM D4632-91	100 lbs		
CBR Puncture resistance	ASTM D6241	250 lbs		
Apparent Operating Size	ASTM D4751-99	70 sieve size (.0212 mm)		
Water Flow Rate	ASTM D4491-99	140 gpm/ft ² (5704 l/min/m ²)		
UV Resistance	ASTM D4355-92	70% (500 hrs)		
Dimensions: 6' x 50'				
Weight: 63 pounds				

2. **e.drain 12ds**: **e.drain 12ds** features a lightweight three-dimensional, highly flexible polypropylene core and a non-woven geotextile filter fabric. The filter fabric is bonded to the dimples of the polypropylene core to prevent clogging within the drain.

PROPERTIES	TEST METHOD	VALUE		
DIMPLED CORE				
Core Material		Polypropylene		
Color		Black		
Compressive strength	ASTM D1621	9,500 PSF (455 kN/m²)		
Thickness	ASTM D1777	1 Inch		
Flow rate	ASTM D4716	30 gpm/ft of width		
FILTER FABRIC				
CBR puncture	ASTM D6241	250 lbs		
Grab tensile strength	ASTM D4632	100 lbs		
AOS	ASTM D4751	70 U.S. sieve		
Permitivity	ASTM D4491	2.0 sec ⁻¹		
Flow rate	ASTM D4491	140 gpm/ft²		
UV resistance	ASTM D4355	70% (500 hrs)		
Dimensions: 165' x 12" x 1"				
Weight: 65 pounds				

2.4 AUXILIARY MATERIALS

A. General: All accessory products shall be provided by the specified waterproofing manufacturer. Auxiliary products used in lieu of, or in addition to, the manufactures products must be approved in writing by EPRO prior to installation.

- B. Reinforcement Fabric: Manufacturer's polyester fabric, **e.poly** is available in 6 inch, 12 inch, and 40 inch widths.
- C. Detailing Material: **e.roll**, a roller applied water based high viscosity polymer modified asphaltic material OR **e.trowel**, a trowel applied water based high viscosity polymer modified asphaltic material.
- D. Backer Rod: Closed cell polyethylene foam
- E. Water Stop: Water Stop: A double row **e.stop b** shall be placed at all cold joints, construction joints, penetrations, and steel beams in back lagged conditions. Water stop is not required at lift joints. A single row of **e.stop b** is actable at elevations above the design water table.
- F. Vertical Membrane Fastener: **e.hanger** with ¾ inch washer
- G. Termination Bar: e.term hd, or approved alternate
- H. Shot Pins: Minimum 1-inch galvanized steel pins with ¾ inch aluminum washer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Comply with project documents, manufacturer's product information, including product application and installation guidelines, pre-job punch list, as well as, manufacturer's shipping and storage recommendations.

3.1.2 SURFACE PREPARATION

- A. The general contractor shall engage the certified waterproofing contractor and certified inspector to ensure surfaces are prepared in accordance with manufacturer's instructions. Unless, explicitly stated in the contract documents, the waterproofing contractor is not responsible for surface preparation.
- B. Examine all substrates, areas, and conditions under which the composite membrane system will be installed, applicator and inspector must be present. Do not proceed with installation until unsatisfactory conditions have been corrected and a surface prep requirements have been met. If conditions exist that are not addressed in this section notify inspector and contact EPRO for additional clarification.
- C. Soil Substrates: Native soil and sand substrates shall be uniformly compacted to meet structural and building code requirements. All surfaces shall be free from protrusions and debris that may compromise the membrane system. Free standing water must be removed prior to application.
- D. Aggregate Substrates: Aggregate substrates shall be compacted to meet structural and building code requirements and then rolled flat to provide a uniform substrate. 3/4 inch minus aggregate with no more than one fractured face is recommended. Other aggregates substrates may be approved by the manufacturer provided they do not create sharp angular protrusions that may compromise the composite membrane system.
- E. Working Slab: Mud slab, rat slab, or other concrete working slab shall have a uniform plane with a light broom or light trowel finish.

- F. Wood Lagging: Wood lagging shoring should extend to the lowest level of the waterproofing installation. Any voids or cavities exterior of the lagging timbers must be filled with compacted soil or cementitious grout. Interior surface of lagging boards should be planar with no greater than 1-inch variance in a 12-inch plane, and fit tight together with gaps less than 1 inches (25 mm). Gaps in excess of 1 inch should be filled with cementitious grout, or EPRO approved polyurethane spray foam. Marine grade plywood, or other approved surface treatment, may be used over large lagging gaps up to 6 inches, if soil conditions permit. All lagging board nails and other mechanical projections shall be removed or flattened. Install a protection material over all soldier piles with raised lagging hanger bolts, form tie rods, or other irregular surface; prefabricated drainage composite shall extend a minimum 6 inches (150 mm) to both sides of the steel piling.
- G. Shotcrete, Secant Pile, Rock Face, or Caisson Shoring Walls: Interior surface of retention walls should be planar without irregular surface conditions and a light trowel finish. Voids and sharp transitions that leave a void space to the outside of the drainage and waterproofing installation need to be filled to create a uniform and planer surface. Irregular rock and concrete, void pockets greater than 3/4" inch, cracks, sharp concave transitions should be completely filled or smoothed with cementitious grout, shotcrete, or other solid material approved by the manufacturer.
- H. Sheet Piles: Minimum ½ inch marine grade plywood must be butt jointed to form a uniform substrate that spans deviations created by the piles. Voids between the plywood and shoring shall be filled a high strength grout or other suitable material.
- I. Negative Side Internal Bracing: Internal shoring bracing, such as rakers, should be uniform and circular when interfacing with the shoring wall. Irregular bracing, such as soldier piles, creates problematic detailing and is not an approved material at the wall interface.
- J. Cast-in-Place or Shotcrete Walls: Application to green concrete is acceptable provided the substrate is prepared in accordance with manufacturers specifications and published instructions.
 - 1. Provide a clean, dust-free, and dry substrate for waterproofing application.
 - 2. Surfaces shall be power washed to remove grease, oil, form release agents, or any other penetrating contaminants from the concrete.
 - 3. Remove all fins, ridges, and other protrusions.
 - 4. Fill honeycomb, aggregate pockets, tie holes, and other voids with hydraulic cement, or rapid-set grout.

K. Precast Concrete Walls:

- 1. Provide a clean, dust-free, and dry substrate for waterproofing application.
- 2. Surfaces shall be power washed to remove grease, oil, form release agents, or any other penetrating contaminants from the concrete.
- 3. Remove all fins, ridges, and other protrusions.
- 4. Fill honeycomb, aggregate pockets, tie holes, and other voids with hydraulic cement, or rapid-set grout. All grout should be struck smooth and without pinholes.
- 5. Fill precast panel and control joints with a suitable backer rod material and sealant approved by manufacturer.

3.2 UNDERSLAB MEMBRANE INSTALLATION- E.PROTECT+ UNDERSLAB

- A. General: The underslab composite membrane system shall be installed under strict accordance with the manufactures guideline and project specifications. The underslab system shall transition to, and overlap the vertical waterproofing membrane as specified.
- B. Termination: The underslab system shall terminate a minimum of 2 feet past the top of the slab, or 2 feet past the design water table, whichever is the higher elevation. Coordination between the applicator, inspector, general contractor and concrete contractor is crucial and necessary to ensure proper installation of the termination detail.
- C. Transition to Vertical Walls: When transitioning the horizontal underslab system vertically to a blindside shoring wall, the first layer of drainage shall be installed prior to the placement of any concrete at the perimeter of the excavation, and prior to the placement of any other system materials. The first lift of the composite membrane system shall extend a minimum of 4 feet past the first lift of rebar.

3.2.1 THERMOPLASTIC BASE COURSE

- A. Whenever possible roll out **e.base 316** base layer in the same direction over the substrate. When multiple pours will occur, extend **e.base 316** a minimum of 2 feet past the pour joint. In order to ensure a proper tie-in, mask off the 2 foot section past the pour joint and protect it from damage.
- B. Overlap **e.base 316** a minimum of 6 inches.
- C. Using a hand held hot air welder similar to Leister Technologies GHIBLI-AW or an automated welder similar to Leister Technologies VARIMAT V2, calibrate equipment welder settings to create a continuous uniform weld free from fish mouths or deficiencies.
- D. Confirm seam overlaps are clean and dry prior to utilizing properly calibrated welding equipment to create a minimum 1 ½ inch welded seam.
- E. Wait for seam to cool and probe prior to smoke testing.
- F. NOTE: In windy conditions secure the **e.base 316** base course a long edges of application area using 6-inch nail with a 2 ½ inch diameter washer. If nails are used to secure the base course, a 6-inch square patch of **e.base 316** shall be centered over the nail head and then hot air welded to create watertight seal.

3.2.2 SEALING OF PENETRATIONS

- A. Sealing of Standard Penetrations: Prepare penetrations so they are free of any material that will inhibit a direct bond to the penetration surface.
 - 1. Trim the **e.base 316** field base sheet to within 1/8 inch of the penetration.
 - 2. Cut target piece of **e.base 316** so that it extends a minimum of 6" from the base of the penetration.
 - 3. On the target piece create two offsetting "x" to the inside diameter of the pipe to create a total of 8 triangular flanges.
 - 4. Slide target piece over the penetration with the triangular flanges facing up.
 - 5. Heat weld the **e.base 316** target piece to the underlying **e.base 316** field base sheet.
 - 6. Apply **e.roll** between the triangular flanges and the penetration.

- 7. Place a nylon cable tie around the penetration and firmly tighten around the penetration to reinforce the bond between the *e.roll*, the triangular tabs, and penetration.
- 8. Tightly wrap the penetration by pressing **e.stop b** firmly around the base of the penetration.
- 9. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, encapsulating **e.stop b**.
- 10. Embed reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
- 11. Apply a second layer of **e.roll** to reinforcement fabric until the reinforcement fabric is fully saturated. Secure reinforcement fabric to penetration with a nylon cable tie.
- 12. Cut to a target piece of reinforcement fabric to the outside diameter of the penetration.
- 13. Place target piece around the penetration and embed into existing saturated reinforcement fabric, saturate fabric with **e.roll**.
- 14. Prior to the placement of concrete install additional **e.stop b** at the middle of slab and secure with a cable tie.
- B. Soldier Pile Penetrations: Sealing of soldier piles in the field or in a back lagged condition.
 - 1. Clean pile to remove any dirt or rust.
 - 2. Create a uniform collar around each soldier pile penetration by cutting a target piece of e.base 316 for each interior and exterior face of the soldier pile. Each target piece of e.base 316 shall extend 6 inches vertically up the soldier pile and 12 inches horizontally from the base of the soldier pile. If applying in a back lagged condition, cut target piece so it also extends minimum 6 inches horizontally from the base of the soldier pile.
 - 3. Heat weld the **e.base 316** target pieces together in order to form a uniform collar.
 - 4. Apply a 30 mil coat of **e.roll** onto all of underlying vertical surfaces and embed **e.base 316** into **e.roll**.
 - 5. Tightly wrap the pile by pressing **e.stop b** firmly around the base of the soldier pile.
 - 6. From the base of the soldier pile apply **e.roll** 3 inches vertically and horizontally onto the **e.base 316** collar while encapsulating the **e.stop b**.
 - 7. Embed reinforcement fabric into the previously applied **e.roll** and then saturate fabric with another 30 mil application of **e.roll**.
 - 8. Trim **e.base 316** base sheet and heat weld to collar piece to form a continuous and uniform transition from the base sheet to the collar.
 - 9. 2 rows of **e.stop b** shall be installed vertically on the interior cross section of the soldier pile and extend from the top of the collar to the top of wall.

3.2.3 POLYMER MODIFED ASPHALT MEMBRANE

A. Mask off adjoining surfaces where unwanted **e.spray** polymer modified asphalt membrane may impact other construction trades.

- B. Commence application of **e.spray** when ambient air temperatures are within manufacturer recommendations.
- C. Surfaces that will receive the **e.spray** must be uniform, clean, and free from standing moisture.
- D. Start installing *e.spray* in presence of approved 3rd party inspector.
- E. Moving from the low point to the high point of grade, apply one application of **e.spray** in accordance with manufacturer's instructions in order to obtain a seamless membrane with a minimum dry film thickness of 100 mils (2.5 mm).
- F. Apply **e.spray/e.roll** in and around penetrations and cavities to ensure the formation of monolithic seal around all penetrations.
- G. Apply **e.spray/e.roll** to prepared wall terminations and vertical surfaces to heights indicated according to manufacturer's recommendations and details. (if applicable)
- H. Verify thickness of **e.spray** membrane every 1000 ft² (93 m²) using a non-destructive approved by EPRO.

3.2.4 GEOCOMPOSITE BENTONITE PROTECTION COURSE

- A. Install **e.shield 205b** protection course perpendicular to the direction of base course.
- B. Overlap **e.shield 205b** seams a minimum of 3 inches and seal the seams in order to prevent moisture from prematurely activating the bentonite layer. Either option is acceptable to the manufacturer, however any prematurely activated bentonite may be need to be replaced. The available options are as follows:
 - 1. Option 1: Secure the seams of **e.shield 205b** by applying 30 mils of **e.spray** in-between the seam overlap. Apply a second 30 mil layer of **e.spray** on top of the seam overlap, completely covering the seam overlap.
 - 2. Option 2: Apply a reinforcement detail over the **e.shield 205b** seam overlap. Apply 30 mils of **e.roll** 3 inches onto both sides of the seam overlap, center and embed 6-inch reinforcement fabric over the seam, and apply 30 mils of **e.roll** to fully saturate the reinforcement fabric.
- C. Do not penetrate or damage the composite membrane system once it has been applied. If the system is penetrated or damaged, contact the applicator immediately. Failure to bring the breach of the system to the applicator's attention and not allowing adequate time to make the necessary repair will result in voiding any warranty.

3.2.5 WATERSTOP INSTALLATION

- A. Surface to receive waterstop shall be clean, dry, and have a smooth finish.
- B. Place two rows of **e.stop b** at minimum of 3 inches with minimum of 2 inches of coverage at all cold joints, and concrete to steel beam connections.
- C. Place a minimum of 2 rows of **e.stop b** around all penetrations, with a minimum of 3 inch spacing, or as directed by manufacturer in specification sections that address penetrations.

3.3 SHORING WALL INSTALLATION - E.PROTECT+ SHORING

A. General: The composite membrane system shall be installed to the shoring system under strict accordance with the manufactures guideline and project specifications. This section describes the installation process for the system application to a shored wall condition. B. Sequencing: The first lift of the composite membrane system shall be installed prior to the placement of any concrete at the perimeter of the excavation and prior to any transition from the underslab system to vertical system. This initial drainage and underslab barrier shall extend a minimum of 4 feet past the first lift of rebar.

3.3.1 PREFABRICATED STRIP DRAIN

A. e.drain 12ds is not required for projects in the water table. If required for dewatering above the water table, install e.drain 12ds horizontally against the shoring wall at specified elevation above the design water table. Allow for positive drainage flow into water discharge system. Attach to shoring using washered mechanical fasteners.

3.3.2 PREFABRICATED DRAINAGE COMPOSITE

- A. General: For applications to wood lagging, ½ inch cement backer board must be centered on the soldier pile and extend laterally a minimum of 6 inches past the edge of the pile flange. The board must then extend 1 foot past the intended top elevation of the pile. Cement backer board must be installed prior to the prefabricated drainage composite.
- B. Install drainage composite panels either horizontally or vertically with the geotextile fabric facing the soil retention system.
- C. Overlap seams of the drainage composite panels 6 inches and fasten **e.drain 6000** to substrate with 2-inch flat washer fasteners a minimum of every 24 inches on center on seams and terminations, and a minimum of every 48 inches on center in field.
- D. Place anchors or tie backs through the drainage composite by slitting vertically and sliding over the anchor as snug as possible.

3.3.3 THERMOPLASTIC BASE COURSE

- A. General: When tying into an underslab system extend the vertical base onto the horizontal and extend 1 foot past the inside face of the foundation wall.
- B. Install the **e.base 316** base course over the **e.base 316** by running the **e.base 316** vertically from the top of the wall to the bottom of the excavation and then extending 2 feet horizontally from the base of the wall.
- C. Overlap the seams of the **e.base 316** a minimum of 6 inches.
- D. Calibrate hot air welding equipment settings to create a continuous uniform weld free from fish mouths or deficiencies.
- E. Confirm seam overlaps are clean and dry prior to utilizing properly calibrated welding equipment to create a minimum 1 ½ inch welded seam.
- F. Secure e.base 316 to soil retention system using e.hanger.
 - 1. Install a row of **e.hanger** 3 feet on center along the bottom of the wall 3 inches from the bottom of the slab. Secure using galvanized steel pins.
 - 2. Alternate the next row of **e.hanger** 3 feet and 4.5 feet from the first row of **e.hanger**, and then run additional stick pins every three feet on center to the top of wall.
 - 3. Run an additional row of **e.hanger** 2 inches on center and placed 3 inches from planned top edge of **e.shield bb**. **e.shield bb** shall be centered over the top of slab at the bottom of wall elevation.

- 4. Install **e.hanger** 2 feet on center along the seam overlap of **e.base 316**. Do not place **e.hanger** directly on a welded seam.
- 5. Cut a 1 inch by ½ inch piece of **e.stop b** and press the center of the water stop through the stick **e.hanger**.
- 6. Cut a minimum 6-inch patch of **e.base 316** and push it over the **e.hanger**. The ridges of the **e.base 316** shall run perpendicular to the initial base sheet for added reinforcement. Heat weld patch to underlying **e.base 316**.
- G. Corner Detail: Transition **e.base 316** through all inside corners. Corner detailing should occur in conjunction with the installation of the thermoplastic base sheet if an underslab system is used, and after the installation of the prefabricated drainage composite.
 - 1. First Corner Target Piece: Cut a corner detailing target piece of **e.base 316** that will be placed to reinforce the corner. This detailing target piece must be a 4 feet wide. The length/height of the piece should account for the target piece extending two feet onto the horizontal underslab area and must extend a minimum of 2 feet past the first lift. It is possible to extend this target piece from the base of the wall to the top of grade, but not mandatory. The target piece shall then be folded in half along its longest edge to form a crease, and then the bottom two feet of the target piece shall be cut along the crease to create to flanges at the bottom of the sheet. Place the **e.base 316** corner target piece into the corner with 2 foot flanges extending onto the underslab area. Overlap the flanges and hot air weld together the flanges to create a 1 ½ inch continuous uniform seam free from fish mouths or deficiencies.
 - 2. Place target piece into the corner and secure to the shoring wall using galvanized steel fasteners. Hot air weld a 6 inch by 6 inch *e.base 316* repair patch over the fasteners.
 - 3. If necessary, extend the target piece vertically to grade or lift height. Overlap onto previously installed target piece 6 inches and hot air weld a 1 ½ inch continuous uniform seam free from fish mouths or deficiencies.
 - 4. Install **e.base 316** on the remainder of the vertical wall to the top of the wall or previously determined height and extend over the previously installed corner detail piece. Terminate the vertically placed **e.base 316** onto the target piece 6 inches from the corner. At the base of foundation wall corner, extend **e.base 316** over the previously installed target piece and hot air weld edges to the target piece to form a 1 ½ inch continuous uniform seam free from fish mouths or deficiencies.
 - 5. Second Corner Target Piece: Cut a corner detailing target piece of **e.base 316** that will be placed to reinforce the corner. This detailing target piece must be a 2 feet wide. The length/height of the piece should account for the target piece extending two feet onto the horizontal underslab area and must extend a minimum of 2 feet past the first lift, or top of wall. Hot air weld all overlaps to create a 1 ½ inch continuous uniform seam free from fish mouths or deficiencies
 - 6. Do not place **e.hanger** into the corner detail. Securing of vertical sheets shall take place at the 6 inches from the corner target edge.
 - 7. Underslab Base Sheet: Install underslab **e.base 316** and overlap onto the target sheet a minimum of 12 inches. Heat weld edges to the target piece to form a 1 ½ inch continuous uniform seam free from fish mouths or deficiencies. If rebar rods or fasteners are used to secure concrete reinforcement they shall be installed upon completion of the thermoplastic base course.

3.3.4 SEALING OF PENETRATIONS

- A. Standard Pipe Penetrations: Standard penetration detailing should occur around all penetrations that are in place prior to system application, this includes soil nails, rock anchors, and tiebacks (non-hydrostatic).
 - 1. Prepare penetrations so they are free of any material that will inhibit a direct bond to the penetration surface.
 - 2. Trim the **e.base 316** filed base sheet to within 1/8 inch of the penetration.
 - 3. Cut target piece of **e.base 316** so that it extends a minimum of 6 inches from the base of the penetration.
 - 4. On the target piece create two offsetting "x" to the inside diameter of the pipe in order to create a total of 8 triangular flanges.
 - 5. Slide target piece over the penetration with the triangular flanges facing up.
 - 6. Heat weld the **e.base 316** target piece to the underlying **e.base 316** field base sheet.
 - 7. Apply **e.roll** between the triangular flanges and the penetration.
 - 8. Place a nylon cable tie around the penetration and firmly tighten around the penetration to reinforce the bond between the **e.roll**, the triangular tabs, and penetration.
 - 9. Tightly wrap the penetration by pressing **e.stop b** firmly around the base of the penetration.
 - 10. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, encapsulating **e.stop b**.
 - 11. Embed reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
 - 12. 6-inch reinforcement fabric is acceptable for most penetrations, for soil nails, rock anchors, and tiebacks (non-hydrostatic) 12-inch reinforcement fabric is required.
 - 13. Apply a second layer of **e.roll** 3 inches to reinforcement fabric until the reinforcement fabric is fully saturated.
 - 14. Cut a target piece of reinforcement fabric to the outside diameter of the penetration.
 - 15. Place target piece around the penetration and embed into existing saturated reinforcement fabric, saturate fabric with **e.roll** and secure flanges to the penetration with a nylon cable tie.
 - 16. Prior to the placement of concrete place another **e.stop b** in the middle of the wall and secure with a cable tie.
- B. Tieback Covers: Tieback covers are required in hydrostatic conditions.
 - 1. Provide at 24 inch by 24 inch block out area around all tiebacks and ensure a 6-inch minimum clearance around each tieback. The block out area must free of any material that may hinder a successful seal.
 - 2. EPRO Tieback Cover (or galvanized steel canisters) shall be placed over the tieback and secured to the shoring.

- 3. Treat tieback detailing as a standard penetration.
- 4. Inject tieback cover with waterproof closed cell foam.
- C. Rebar Rods: Rebar rods, steel fasteners, or anchor bolts used to secure concrete reinforcement shall be in place upon completion of the thermoplastic base course. No additional rebar rods, steel fasteners, or anchor bolts are to be installed after completion of the entire system.
 - 1. Rebar rods shall be secured directly perpendicular to the vertical wall. Each rod shall be secured without the need of any additional support.
 - 2. Install **e.stop b** around the base of the penetration.
 - 3. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, encapsulating **e.stop b**.
 - 4. Embed reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
 - 5. 6-inch reinforcement fabric is acceptable for most penetrations, but soil nails, rock anchors, and tiebacks (non-hydrostatic) will require 12-inch reinforcement fabric.
 - 6. Apply a second layer of **e.roll** 3 inch to reinforcement fabric until the reinforcement fabric is fully saturated.

3.3.5 POLYMER MODIFIED ASPHALT MEMBRANE

- A. Mask off adjoining surfaces where unwanted **e.spray** polymer modified asphalt membrane may impact other construction trades.
- B. Commence application of **e.spray** when ambient air temperatures are within manufacturer recommendations.
- C. Surfaces that will receive the **e.spray** must be uniform, clean, and free from standing moisture.
- D. Start installing *e.spray* in presence of approved 3rd party inspector.
- E. Moving from the low point to the high point of the wall, apply one application of **e.spray** in accordance with manufacturer's instructions in order to obtain a seamless membrane with a minimum dry film thickness of 80 mils (2 mm).
- F. Apply **e.spray/e.roll** in and around penetrations and cavities to ensure the formation of monolithic seal around all penetrations.
- G. Apply **e.spray/e.roll** to prepared wall terminations and vertical surfaces to heights indicated according to manufacturer's recommendations and details. (if applicable)
- H. Verify film thickness of **e.spray** every 1000 ft² (93 m²).

3.3.6 GEOCOMPOSITE BENTONITE PROTECTION COURSE

- A. The previously installed membrane shall not be penetrated by any pins, nails, pencil rods, or other foreign objects.
- B. Hang e.shield 205b protection course vertically over nominally cured e.spray membrane. The gray bentonite side shall face the e.spray, and the geotextile fabric shall be facing away from the wall.

- C. Overlap **e.shield 205b** seams a minimum of 3 inches.
- D. Carefully press **e.shield 205b** against the wall to secure the system onto the previously installed **e.hanger**. Secure **e.shield 205b** in place with ½ inch stick pin washer. Do not place on, or below, the row of stick pins designated for the protection course.
- E. Seal the seams in order to prevent moisture from prematurely activating the bentonite layer. Either option is acceptable to the manufacturer, however any prematurely activated bentonite may be need to be replaced. The available options are as follows:
 - 1. Option 1: Secure the seams of **e.shield 205b** by applying 30 mils of **e.spray** in-between the seam overlap. Apply a second 30 mil layer of **e.spray** on top of the seam overlap, completely covering the seam overlap.
 - Option 2: Apply a reinforcement detail over the e.shield 205b seam overlap. Apply 30 mils of e.roll 3 inches onto both sides of the seam overlap, center and embed 6-inch reinforcement fabric over the seam, and apply 30 mils of e.roll to fully saturate the reinforcement fabric.
- F. Do not penetrate or damage the composite membrane system once it has been applied. If the system is penetrated or damaged, contact the applicator immediately. Failure to bring the breach of the system to the applicator's attention and not allowing adequate time to make the necessary repair will result in voiding any warranty.

3.3.7 GEOCOMPOSITE BENTONITE TRANISTION COURSE

- A. **e.shield bb** is designed provide additional redundancy along the slab to wall interface. Center **e.shield bb** along the cold joint making certain to have a minimum 18 inches of **e.shield bb** above the top of the joint.
- B. Overlap the **e.shield bb** seams a minimum of 6 inches.
- C. Carefully press the **e.shield bb** onto the previously installed **e.hanger**. Secure **e.shield bb** in place with ½ inch stick pin washer.
- D. Secure the seams of **e.shield bb** by applying 30 mils of **e.spray** in-between the seam overlap.
- E. Apply a second 30 mil layer of **e.spray** on top of the seam overlap.
- F. Do not penetrate or damage the membrane system once it has been applied. If the waterproofing system is penetrated or damaged, contact the applicator immediately. Failure to bring the breach of the membrane to the applicators attention and not allowing adequate time to make the necessary repair will result in voiding any warranty.

3.3.8 TERMINATION AT TOP OF GRADE

- A. The system shall extend 2 feet past the top of the wall and be temporarily secured and protected in place.
- B. When the wall is extended or a slab is placed at the top of wall, the cold joint shall be reinforced by applying 30 mils of **e.roll** on 3 inches of either side of the joint, embedding 6-inch reinforcement fabric, and then saturating the fabric with another application of 30 mils of **e.roll**.
- C. Trim the system to grade height and attach to the wall with a termination bar, e.term hd
- D. Apply a reinforcement detail or bead of low VOC acrylic caulking over the top of the termination bar and continue transition per project drawings.

3.3.9 WATERSTOP INSTALLATION

- A. Surface to receive waterstop shall be clean, dry, and have a smooth finish.
- B. Place two rows of **e.stop b** at minimum of 3 inches with minimum of 2 inches of coverage at all cold joints, lift joints, and concrete to steel beam connections.
- C. Place a minimum of 2 rows of **e.stop b** around all penetrations, with a minimum of 3 inch spacing, or as directed by manufacturer in specification sections that address penetrations.

3.4 POSITIVE SIDE CONCRETE WALL INSTALLATION – E.PROTECT+ WALL

- A. General: The composite membrane system shall be installed to the positive side vertical wall under strict accordance with the manufacture's guideline and project specifications. This section describes the installation process for the system application to a freestanding cast-in-place concrete or shotcrete wall.
- B. Green Concrete: Application to green concrete is acceptable. Ambient temperatures, humidity, and concrete mix ratio can create blistering. If applying the system within 7 days of concrete placement contact manufacturer for further instruction.

3.4.2 TREATMENT OF CRACKS, JOINTS, AND REPAIRED AREAS

- A. Treat, rout, and fill cracks larger than 1/8 inch with hydraulic cement or rapid set grout.
- B. The following areas shall receive a reinforcement detail of e.roll and reinforcement fabric:
 - 1. All cracks less than 1/8 inch.
 - 2. All previously repaired cracks.
 - 3. All cold joints.
- C. Reinforcement Detail: Apply a 30 mil coat of e.roll to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the e.roll. Apply a second 30 mil coat of e.roll over e.poly reinforcement fabric ensuring full saturation.

3.4.3 DETAILING OF TRANSITIONS

- A. Corners: A reinforcement detail shall be applied to all transitions including all inside and outside corners, and all transitions from a horizontal to vertical planes.
- B. Underslab Transition: When the underslab composite membrane system transitions to a positive side concrete wall, the underslab system will terminate 2 feet above the slab to wall cold joint, or 2 feet above the design water table, whichever is greater.
- C. The underslab system will be fastened to the wall using **e.hanger**. .
- D. Reinforcement Detail: Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.

3.4.4 E.HANGER INSTALLATION

A. Install a **e.hanger** 5 feet on center onto the wall using galvanized steel pins. If an underslab composite membrane system is terminating onto the wall, begin the installation of the first row of **e.hanger** just above the properly terminated underslab system.

B. Apply 30 mils of **e.roll** to the **e.hanger** and extend 6 inches around the base of the **e.hanger**. Cut a 6 inch by 6 inch square of reinforcement fabric, center over the stick pin and embed into the **e.roll**. Fully saturate the reinforcement fabric with 30 mils with **e.roll**.

3.4.5 SEALING OF PENETRATIONS

- A. Standard Pipe Penetrations: Prepare membrane penetrations so they are free of any material that will inhibit a direct bond to the penetration surface: foam, insulation, protective coatings, etc.
 - 1. Tightly wrap the penetration by pressing **e.stop b** firmly around the base of the penetration.
 - 2. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, including **e.stop b**.
 - 3. Embed **e.poly** reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
 - 4. Apply a second layer of **e.roll** to the **e.poly** reinforcement fabric until the reinforcement fabric is fully saturated, and then secure the reinforcement fabric to the penetration with a cable tie.
 - 5. Cut a target piece of **e.poly** reinforcement fabric to the outside diameter of the penetration.
 - 6. Place target piece around the penetration and embed into existing saturated reinforcement fabric, saturate fabric with **e.roll**.

3.4.6 POLYMER MODIFIED ASPHALT MEMBRANE

- A. Mask off adjoining surfaces where unwanted **e.spray** polymer modified asphalt membrane may impact other construction trades.
- B. Commence application of **e.spray** when ambient air temperatures are within manufacturer recommendations.
- C. Surfaces that will receive **e.spray** must be sound, uniform, clean, and free from standing moisture.
- D. Start installing *e.spray* in presence of approved 3rd party inspector.
- E. Apply a 10 mil primer coat of un-catalyzed e.spray and allow to set. The primer coat is designed to reduce that amount of potential blistering that may occur as the concrete continues to release moisture.
- F. Moving from the low point to the high point of the wall, apply one application of **e.spray** in accordance with manufacturer's instructions in order to obtain a seamless membrane with a minimum dry film thickness of 80 mils (2 mm).
- G. Apply **e.spray/e.roll** in and around penetrations and cavities to ensure the formation of monolithic seal around all penetrations.
- H. Apply **e.spray/e.roll** to prepared wall terminations and vertical surfaces to heights indicated according to manufacturer's recommendations and details. (if applicable)
- I. Verify film thickness of **e.spray** every 1000 ft² (93 m²).

3.4.7 GEOCOMPOSITE BENTONITE PROTECTION COURSE

- A. Install **e.shield 110b** protection course vertically with the bentonite layer facing the **e.spray** and the smooth side facing away from the wall.
- B. Overlap **e.shield 110b** seams a minimum 3 inches.
- C. Secure **e.shield 110b** onto previously installed stick pins and secure **e.shield 110b** with the ½ inch stick pin washer.
- D. Apply 30 mils of **e.roll** to the **e.hanger** and extend 6 inches around the base of the stick pin. Cut a 6 inch by 6 inch square of reinforcement fabric, center over the stick pin and embed into the **e.roll**. Fully saturate the reinforcement fabric with 30 mils with **e.roll**.
- E. Secure **e.shield 110b** protection course seams with e.tape.

3.4.8 PREFABRICATED DRAINAGE COMPOSITE

- A. Horizontal Installation: Starting from one corner, run **e.drain 6000** horizontally along the base of the foundation.
 - 1. Secure drainage composite panels to the wall by using by pressing drainage composite onto previously washered stick pins. Secure drainage composite by placing another stick pin washer over the drainage composite.
 - 2. Install the next layer of **e.drain 6000** in the same manner and overlap the next layer of drain composite 6 inches over the first layer of drain mat, thus creating a "shingle" effect. Continue this process to the top of the wall.
 - 3. Terminate the drainage and composite membrane system using a termination bar and a reinforcement detail.
 - 4. Care shall be taken when backfilling against the composite membrane system in order to prevent any damage during the backfill process. Angular rock 1 inch or greater shall not be used without written approval from the manufacturer.
 - 5. Backfill in lifts, taking precaution to not backfill above the previously placed e.drain 6000.
- B. Vertical Installation: Starting from the top of wall, install **e.drain 6000** from the top of the wall to the base of the foundation.
 - 1. Overlap each roll of **e.drain 6000** 6 inches on all overlaps.
 - 2. Secure drainage composite panels to the wall by using by pressing drainage composite onto previously washered stick pins. Secure drainage composite by placing another stick pin washer over the drainage composite.
 - 3. Secure **e.drain 6000** with a termination bar at the top of grade and no greater than 3 inches from the top of the drain.
 - 4. Secure **e.drain 6000** using approved adhesives.
- C. Geocomposite Strip Drain: If using **e.drain 12ds**, secure strip drain at the bottom of the footing or iust above the design water table.

Do not penetrate or damage the composite membrane system once it has been applied. If the system is penetrated or damaged, contact the applicator immediately. Failure to bring the breach of the system to the applicator's attention and not allowing adequate time to make the necessary repair will result in voiding any warranty.

3.4.9 TERMINATION AT TOP OF GRADE

- A. Termination at the top of grade shall be done with using at termination bar. Secure the termination bar every 12 inches on center and the center a reinforcement detail on the termination bar.
- B. Reinforcement Detail Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.

3.5 FIELD QUALITY CONTROL

- A. Smoke Test: Conduct smoke test on all under slab areas upon installation of the base sheet and sealing all penetrations. All deficient areas shall be noted and marked for repair, then the necessary repairs shall be made. Refer to manufactures smoke testing protocol for additional guidance.
- B. Destructive coupon sampling of the membrane in areas subjected to hydrostatic pressure is not allowed. Refer to manufactures target coupon sampling protocol for additional guidance.
- C. Seam Testing: Probe all welded seams using a seam probe. All deficient areas shall be noted and marked for repair, then the necessary repairs shall be made and noted in inspection reports.
- D. Independent inspectors and certified applicators shall document the gallons of *e.spray* used in the inspection report.

3.6 CURING PROTECTING AND CLEANING

- A. Allow for **e.spray** to fully bond with the substrate, generally this occurs 24 to 48 hours after application depending on ambient weather conditions.
- B. Take care to prevent contamination and damage during application stages and curing. All machinery, other trades, and general construction, shall NOT take place over the composite membrane system until inspection is complete and concrete has been placed.
- C. Prevent damage during the placement of overburden.

3.7 REPAIRS

A. Shoring and Underslab:

- Inspect damaged area to determine which system components have been damaged.
- 2. If the base sheet has not been compromised, patch only the areas that have been damaged by re-installing the damaged materials. The patch should extend 6 inches beyond the damaged area.
- 3. If the base sheet has been breached but no additional system components have been installed, install a patch below and above the base sheet that extends 6 inches beyond the damaged area. Area shall be sealed using the specified method for sealing the base sheet.

- 4. If the damaged area has breached the base sheet and additional components have been installed over the base sheet, the area will require removal of the overlying components to expose the base sheet.
- 5. If the damage is less than 3 inches, the base sheet will need to opened up to create a minimum 4-inch diameter circle to allow access Place a minimum 8-inch diameter coupon under the base sheet and seal using the specified method for seaming the base sheet. If heat welding the seam, probe the seam to ensure a uniform seal.
- 6. Apply a reinforcement detail of **e.roll** and reinforcement fabric 6 inches beyond the edge of the repair area.
- 7. Apply the remaining layers as specified.

B. Concrete Walls:

- 1. Inspect damaged area to determine which system components have been damaged.
- 2. Only patch the areas that have been damaged by re-installing the damaged materials. The patch should extend 6 inches beyond the damaged area.

End of Section

E.PROTECT+ WALL FOR COMPOSITE MEMBRANE SYSTEM FOR HYDROSTATIC WATERPROOFING AND VAPOR INTRUSION MITIGATION

SECTION 02 56 16 – GAS CONTAINMENT
SECTION 02 56 19.13 – FLUID-APPLIED GAS BARRIER
SECTION 07 13 54 – THERMOPLASTIC SHEET WATERPROOFING
SECTION 07 14 16 – COLD FLUID-APPLIED WATERPROOFING
SECTION 07 17 16 – BENTONITE COMPOSITE SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including general and supplementary conditions, and Division 1 specification section, apply to this section.

1.2 SECTION INCLUDES

- A. The installation of materials designed to provide below grade waterproofing and vapor intrusion protection when installed per project specification, this section covers the waterproofing and vapor intrusion membrane, along with the following:
- B. Surface preparation and substrate treatment.
- C. Auxiliary materials.
- D. Prefabricated drainage composite.
- E. Foundation drain.

1.3 RELATED SECTIONS

- A. Section 02 24 00: Environmental Assessment
- B. Section 02 32 00: Geotechnical Investigation
- C. Section 03 15 00: Concrete Accessories
- D. Section 03 30 00: Cast-in-Place Concrete
- E. Section 03 40 00: Precast Concrete
- F. Section 07 90 00: Joint Protection
- G. Section 31 30 00: Earthwork Methods
- H. Section 33 41 00: Subdrainage

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide a composite membrane system that prevents the passage of water under hydrostatic conditions, methane gas, contaminant vapor, and complies with the physical requirements as demonstrated by testing performed by an independent testing agency.

1.5 SUBMITTALS

- A. Product Data: For each type of waterproofing specified submit manufacturer's published technical data, tested physical and performance properties, instructions for evaluating, preparing, and treating substrates, and installation instructions.
- B. Shop Drawings: Project specific drawings showing locations and extent of waterproofing, manufacturer's typical details for substrate joints and crack treatment, sheet flashing, penetrations, transitions, and termination conditions.
- C. Samples: Submit two standard size samples of each of the following:
 - 1. Individual components of the specified composite membrane system.
- D. Applicator Certification: Submit written confirmation at the time of bid that applicator is currently approved by the composite membrane system manufacturer.

1.6 QUALITY ASSURANCE

- A. Applicator Qualifications: Waterproofing applicator shall be an EPRO Authorized Applicator who is trained and performs work that in accordance with EPRO standards and policies. For project requiring a no-dollar-limit labor and material warranty, the waterproofing applicator must be E.Assurance Certified at the time of bid.
- B. Third Party Inspection: Independent inspection of the composite system installation may be required based on project conditions and desired warranty coverage. Inspection reports shall be submitted directly to the composite waterproofing manufacturer and made available to other parties per the owners' direction. For projects requiring a no-dollar-limit labor and material warranty, an independent inspector must be E.Assurance Certified and comply with the documentation requirements.
- C. Water Sample: A 2-liter representative ground water sample shall be sent by the installation contractor to the manufacturer, if contaminated groundwater and/or salt water is believed to be present on the site. Email Watersample@eproinc.com to receive shipping instructions.
- D. Pre-Construction Meeting: A meeting shall be held prior to application of the composite waterproofing system to assure proper substrate preparation, confirm installation conditions, and any additional project specific requirements. Attendees of the meeting shall include, but are not limited to the following:
 - 1. EPRO representative
 - 2. EPRO certified applicator
 - 3. EPRO certified third party inspector
 - 4. General contractor
 - 5. Owner representative
 - 6. Concrete/Shotcrete contractor
 - Rebar contractor
 - 8. Project design team
 - 9. All appropriate related trades, i.e. plumbing, electrical, and mechanical contractors.

- E. Field Sample: Apply each assembly of the composite membrane system field sample to 100 ft² (9.3 m²) to demonstrate proper application techniques and establish a standard of workmanship that meets the project and manufacturer's requirements.
 - 1. Notify composite membrane system manufacturer representative, architect, certified inspector, and other appropriate parties one week in advance of the dates and times when field sample will be prepared.
 - 2. If architect and certified inspector determine that field sample does not meet requirements; reapply composite membrane system until field sample is approved.
 - 3. Retain and maintain approved field sample during construction in an undisturbed condition as a standard for judging the completed composite membrane system. An undamaged field sample may become part of the completed work.
- F. Materials: Composite membrane system and auxiliary materials shall be single sourced.

1.7 MATERIAL DELIVERY, STORAGE AND DISPOSAL

- A. Delivery: Deliver materials to site labeled with manufacturer's name, product brand name, material type, and production number. Upon the arrival of materials to the jobsite, inspect materials to confirm material has not been damaged during transit.
- B. Storage: Proper storage of onsite materials is the responsibility of the certified applicator. Consult product data sheets to confirm storage requirements. Storage area shall be clean, dry, and protected from the elements. If ambient air temperatures are expected to fall below 40°F, precautions will need to be taken to protect any polymer modified asphalt product from near freezing temperatures. Protect stored materials from direct sunlight.
- C. Disposal: Remove and replace any material that cannot be properly applied in accordance with local regulations and the general conditions found in specification section 01 74 00.

1.8 PROJECT CONDITIONS

- A. Substrate Review: Substrates shall be reviewed by the certified applicator and accepted by the certified inspector prior to application. Application without signoff from certified inspector will likely result in voidance of warranty.
- B. Penetrations: All plumbing, electrical, mechanical, and structural items to be passing through the composite membrane system shall be properly spaced, positively secured in their proper positions, and appropriately protected prior to system application and throughout the construction phase. Braided grounding rods are not allowed to pass through the membrane in waterproofing applications.
- C. Clearance: Minimum clearance of 24 inches is required for application of spray applied polymer modified asphalt membrane, *e.spray*. For areas with less than 24-inch clearance, the *e.spray* membrane may be applied by hand using *e.roll*.
- D. Overspray: Protect all adjacent areas not receiving e.spray or e.roll. Masking is necessary to prevent unwanted overspray from adhering to, or staining, areas not receiving the membrane. Once e.spray or e.roll adheres to a surface it is extremely difficult to remove.
- E. Weather Limitations: Perform work only when existing and forecast weather conditions are within manufacturer's recommendations.

- 1. Spray Applied Polymer Modified Asphalt Membrane: Minimum ambient temperature must be 40°F (7°C) and rising. For applications temperatures below 38 degrees, but greater than +19°F/-7°C, special equipment and material handling is needed. Substrate shall be clean and free from standing moisture.
- 2. EPRO applicators reserve the right not to install product when application conditions might be within manufactures acceptance, but ambient conditions may limit a successful application.
- 3. Heat Welding: Do not weld seams during rain or periods of moisture. Sheet membranes shall be clean, and free from moisture when welding.
- 4. Bentonite: Application of bentonite materials to damp surfaces is acceptable provided it is being installed over **e.spray**.

1.9 WARRANTY

- A. General Warranty: The special warranty specified in this section shall not deprive the owner of other rights the owner may have under other provisions of the contract documents, and shall be in addition to, and run concurrent with, other warranties made by the contractor under requirements of the contract documents.
- B. Special Warranty: Submit a written warranty signed by waterproofing manufacturer agreeing to replace system materials that do not conform with manufactures published specifications, or are deemed to be defective. Warranty does not include failure of waterproofing due to failure of soil substrate prepared and treated according to requirements or formation of new joints and cracks in the specially applied concrete that exceed 1/8 inch (3.175 mm) in width.
 - 1. Warranty Period: 5 years after date of substantial completion. Longer warranty periods are available upon request.
 - 2. Coverage: Manufacturer will guarantee that the material provided is free of defects for the warranty period.
- C. Additional Warranty Options: Upgraded warranties are available by contacting the manufacturer. These warranties may have additional requirements and approval must be granted in accordance to the manufacturer's warranty requirements. Additional warranty options include:
 - 1. Standard Labor and Material (E.Series L&M): Manufacturer will provide non-prorated coverage for the warranty term, agreeing to repair or replace material that does not meet requirements or remain watertight.
 - 2. No-Dollar-Limit Labor and Material Warranty (E.Assurance NDL): Manufacturer will provide a non-prorated, no-dollar-limit, coverage for the warranty term, agreeing to repair or replace material that does not meet requirements or remain watertight.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: EPRO Services, Inc. (EPRO), P.O. Box 347; Derby, KS 67037; Tel: (800) 882-1896; Email: Info@eproinc.com; Web: www.eproinc.com
- B. Cast-in-Place Walls: E.Protect+ Wall (160 mils) e.spray (80 mils), e.shield 110b, e.drain 6000

2.2 SYSTEM PHYSICAL PROPERTIES

- A. The physical properties listed in this section reflect testing on the entire composite system. Physical properties of the individual system composite can be found in Specification Section 2.3.
 - 1. **E.Protect+ Wall** combines the redundant benefits of an 80 mil layer of **e.spray** (polymer modified asphaltic membrane), and **e.shield 110b** (a polyolefin reinforced bentonite to provide unparalleled protection for positive side applications. Ideal for complex conditions, sensitive building areas, or anywhere maximum protection is needed.

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	196 psi
Elongation	ASTM D412	351%
Adhesion to Concrete	ASTM D903	20.0 lbf/in
Puncture Resistance	ASTM D1709	65.5 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.0374 perms

2.3 WATERPROOFING MATERIALS

A. Polymer Modified Asphalt

e.spray: e.spray is a non-hazardous, low-viscosity, water-based, anionic asphalt emulsion modified with a blend of synthetic polymerized rubbers and proprietary additives. e.spray is highly stable during transit and proper storage, but becomes highly reactive during the spray application to form a rapidly cured membrane with exceptional bonding, elongation, and hydrophobic characteristics.

PROPERTIES	TEST METHOD	VALUE
Color		Brown to Black
Solvent Content		No Solvents
Shelf Life		6 Months
Tensile Strength	ASTM D412	32 psi
Elongation	ASTM D412	4140%
Resistance to Decay	ASTM E154 Section 13	4% Perm Loss
Accelerated Aging	ASTM G23	No Effect
Moisture Vapor Transmission	ASTM E96	0.026 g/ft²/hr
Hydrostatic Water Pressure	ASTM D751	26 psi
Perm Rating	ASTM E96	0.21 perms
Methane Transmission Rate	ASTM D1434	0
Adhesion to Concrete & Masonry	ASTM C836 & C704	20 lbf/inch
Adhesion to HDPE	ASTM C836	28.363 lbf/inch
Adhesion to Polypropylene Fabric	ASTM C836	31.19 lbf/inch
Hardness	ASTM C836	80
Crack Bridging	ASTM C836-00	No Cracking
Low Temp. Flexibility		No Cracking at -20° C
Packaging: 55 gallon drum, 275 gallon	tote, 330 gallon tote	

2. **e.roll**: **e.roll** is a medium viscosity water-based, polymer-modified anionic asphalt emulsion, which exhibits exceptional bonding, elongation and waterproofing characteristics.

PROPERTIES	TEST METHOD	VALUE
Color		Brown to Black
Solvent Content		No Solvents
Shelf Life		6 Months
Tensile Strength	ASTM D412	32 psi
Elongation	ASTM D412	3860%
Resistance to Decay	ASTM E154 SECTION 13	9% Perm Loss
Accelerated Aging	ASTM G23	No Effect
Moisture Vapor Transmission	ASTM E96	0.071 g/ft²/hr
Hydrostatic Water Pressure	ASTM D751	28 psi
Perm Rating	ASTM E96	0.17 perms
Methane Transmission Rate	ASTM D14334	0
Adhesion to Concrete & Masonry	ASTM C836	1 lbf/inch
Hardness	ASTM C836	85
Crack Bridging	ASTM C836	No Cracking
Low Temp. Flexibility	ASTM C836-00	No Cracking at -20° C
Packaging: 5 gallon bucket		

3. **e.shield 110b**: **e.shield 110b** is a black and gray redundant geocomposite bentonite membrane comprised of two distinct layers. The membrane consists of an HDPE film chemically bonded to a layer of sodium montmorillonite bentonite.

PROPERTIES	TEST METHOD	VALUE
Film Material		HDPE
Film Color		Black
Bentonite		Sodium Montmorillonite
Weight		0.6 lb per ft² (4.89 kg/m²)
Puncture Resistance	ASTM E154-88 SEC 10	170 lbs (77.3 kg)
Tensile Strength	ASTM D882	6100 psi
% Elongation at Break	ASTM D882	100%
Crack Bridging		1/8" (.032 cm) crack
Resistance to Hydrostatic Head	ASTM D751 Procedure A	174 ft. (52.9 m) of water
Water Vapor Permeability	ASTM E96-80	0.53x10 ⁻³ cm/sec
Resistance to Microorganisms	ASTM E154-88 SEC 13	Unaffected
Freeze/thaw Cycles		Unaffected
Installation temperatures	ASTM D746 & D1238	-40°F to 150°F (-40°C to 65.5°C)
Dimensions: 3.25' x 37'		
Weight: 72 pounds		

- B. Prefabricated Drainage Composite
 - 1. **e.drain 6000**: **e.drain 6000** features a lightweight three-dimensional, high-compressive strength polypropylene core and bonded non-woven geotextile fabric. The bonded filter fabric allows water to pass freely into the molded drain while preventing soil particles from entering and clogging the core structure.

PROPERTIES	TEST METHOD	VALUE
	DIMPLED CORE	
Core Material		Polypropylene
Color		Black
Dimple Height	ASTM D1777-96	0.4" (10.16 mm)
Compressive Strength	ASTM D6364-06	16,500 psf (790 kN/m²)
Flow rate	ASTM D4716	21 gal/min/ft
	FILTER FABRIC	
Grab Tensile	ASTM D4632-91	100 lbs
CBR Puncture resistance	ASTM D6241	250 lbs
Apparent Operating Size	ASTM D4751-99	70 sieve size (.0212 mm)
Water Flow Rate	ASTM D4491-99	140 gpm/ft² (5704 l/min/m²)
UV Resistance	ASTM D4355-92	70% (500 hrs)
Dimensions: 6' x 50'		
Weight: 63 pounds		

2. **e.drain 12ds**: **e.drain 12ds** features a lightweight three-dimensional, highly flexible polypropylene core and a non-woven geotextile filter fabric. The filter fabric is bonded to the dimples of the polypropylene core to prevent clogging within the drain.

PROPERTIES	TEST METHOD	VALUE
	DIMPLED CORE	
Core Material		Polypropylene
Color		Black
Compressive strength	ASTM D1621	9,500 PSF (455 kN/m²)
Thickness	ASTM D1777	1 Inch
Flow rate	ASTM D4716	30 gpm/ft of width
FILTER FABRIC		
CBR puncture	ASTM D6241	250 lbs
Grab tensile strength	ASTM D4632	100 lbs
AOS	ASTM D4751	70 U.S. sieve
Permitivity	ASTM D4491	2.0 sec ⁻¹
Flow rate	ASTM D4491	140 gpm/ft²
UV resistance	ASTM D4355	70% (500 hrs)
Dimensions: 165' x 12" x 1"		
Weight: 65 pounds		

2.4 AUXILIARY MATERIALS

A. General: All accessory products shall be provided by the specified waterproofing manufacturer. Auxiliary products used in lieu of, or in addition to, the manufactures products must be approved in writing by EPRO prior to installation.

- B. Reinforcement Fabric: Manufacturer's polyester fabric, **e.poly** is available in 6 inch, 12 inch, and 40 inch widths.
- C. Detailing Material: e.roll, a roller applied water based high viscosity polymer modified asphaltic material OR e.trowel, a trowel applied water based high viscosity polymer modified asphaltic material.
- D. Backer Rod: Closed cell polyethylene foam
- E. Water Stop: Water Stop: A double row **e.stop b** shall be placed at all cold joints, construction joints, penetrations, and steel beams in back lagged conditions. Water stop is not required at lift joints. A single row of **e.stop b** is actable at elevations above the design water table.
- F. Vertical Membrane Fastener: **e.hanger** with ¾ inch washer
- G. Termination Bar: **e.term hd**, or approved alternate
- H. Shot Pins: Minimum 1-inch galvanized steel pins with ¾ inch aluminum washer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Comply with project documents, manufacturer's product information, including product application and installation guidelines, pre-job punch list, as well as, manufacturer's shipping and storage recommendations.

3.1.2 SURFACE PREPARATION

- A. The general contractor shall engage the certified waterproofing contractor and certified inspector to ensure surfaces are prepared in accordance with manufacturer's instructions. Unless, explicitly stated in the contract documents, the waterproofing contractor is not responsible for surface preparation.
- B. Examine all substrates, areas, and conditions under which the composite membrane system will be installed, applicator and inspector must be present. Do not proceed with installation until unsatisfactory conditions have been corrected and a surface prep requirements have been met. If conditions exist that are not addressed in this section notify inspector and contact EPRO for additional clarification.
- C. Cast-in-Place or Shotcrete Walls: Application to green concrete is acceptable provided the substrate is prepared in accordance with manufacturers specifications and published instructions.
 - 1. Provide a clean, dust-free, and dry substrate for waterproofing application.
 - 2. Surfaces shall be power washed to remove grease, oil, form release agents, or any other penetrating contaminants from the concrete.
 - 3. Remove all fins, ridges, and other protrusions.
 - 4. Fill honeycomb, aggregate pockets, tie holes, and other voids with hydraulic cement, or rapid-set grout.

D. Precast Concrete Walls:

- 1. Provide a clean, dust-free, and dry substrate for waterproofing application.
- 2. Surfaces shall be power washed to remove grease, oil, form release agents, or any other penetrating contaminants from the concrete.
- 3. Remove all fins, ridges, and other protrusions.
- 4. Fill honeycomb, aggregate pockets, tie holes, and other voids with hydraulic cement, or rapid-set grout. All grout should be struck smooth and without pinholes.
- 5. Fill precast panel and control joints with a suitable backer rod material and sealant approved by manufacturer.

3.2 POSITIVE SIDE CONCRETE WALL INSTALLATION – E.PROTECT+ WALL

- A. General: The composite membrane system shall be installed to the positive side vertical wall under strict accordance with the manufacture's guideline and project specifications. This section describes the installation process for the system application to a freestanding cast-in-place concrete or shotcrete wall.
- B. Green Concrete: Application to green concrete is acceptable. Ambient temperatures, humidity, and concrete mix ratio can create blistering. If applying the system within 7 days of concrete placement contact manufacturer for further instruction.

3.2.2 TREATMENT OF CRACKS, JOINTS, AND REPAIRED AREAS

- A. Treat, rout, and fill cracks larger than 1/8 inch with hydraulic cement or rapid set grout.
- B. The following areas shall receive a reinforcement detail of *e.roll* and reinforcement fabric:
 - 1. All cracks less than 1/8 inch.
 - 2. All previously repaired cracks.
 - 3. All cold joints.
- C. Reinforcement Detail: Apply a 30 mil coat of e.roll to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the e.roll. Apply a second 30 mil coat of e.roll over e.poly reinforcement fabric ensuring full saturation.

3.2.3 DETAILING OF TRANSITIONS

- A. Corners: A reinforcement detail shall be applied to all transitions including all inside and outside corners, and all transitions from a horizontal to vertical planes.
- B. Underslab Transition: When the underslab composite membrane system transitions to a positive side concrete wall, the underslab system will terminate 2 feet above the slab to wall cold joint, or 2 feet above the design water table, whichever is greater.
- C. The underslab system will be fastened to the wall using **e.hanger**. .
- D. Reinforcement Detail: Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.

3.2.4 E.HANGER INSTALLATION

- A. Install a **e.hanger** 5 feet on center onto the wall using galvanized steel pins. If an underslab composite membrane system is terminating onto the wall, begin the installation of the first row of **e.hanger** just above the properly terminated underslab system.
- B. Apply 30 mils of **e.roll** to the **e.hanger** and extend 6 inches around the base of the **e.hanger**. Cut a 6 inch by 6 inch square of reinforcement fabric, center over the stick pin and embed into the **e.roll**. Fully saturate the reinforcement fabric with 30 mils with **e.roll**.

3.2.5 SEALING OF PENETRATIONS

- A. Standard Pipe Penetrations: Prepare membrane penetrations so they are free of any material that will inhibit a direct bond to the penetration surface: foam, insulation, protective coatings, etc.
 - 1. Tightly wrap the penetration by pressing **e.stop b** firmly around the base of the penetration.
 - 2. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, including **e.stop b**.
 - 3. Embed **e.poly** reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
 - 4. Apply a second layer of **e.roll** to the **e.poly** reinforcement fabric until the reinforcement fabric is fully saturated, and then secure the reinforcement fabric to the penetration with a cable tie.
 - 5. Cut a target piece of **e.poly** reinforcement fabric to the outside diameter of the penetration.
 - 6. Place target piece around the penetration and embed into existing saturated reinforcement fabric, saturate fabric with *e.roll*.

3.2.6 POLYMER MODIFIED ASPHALT MEMBRANE

- A. Mask off adjoining surfaces where unwanted **e.spray** polymer modified asphalt membrane may impact other construction trades.
- B. Commence application of **e.spray** when ambient air temperatures are within manufacturer recommendations.
- C. Surfaces that will receive **e.spray** must be sound, uniform, clean, and free from standing moisture.
- D. Start installing **e.spray** in presence of approved 3rd party inspector.
- E. Apply a 10 mil primer coat of un-catalyzed **e.spray** and allow to set. The primer coat is designed to reduce that amount of potential blistering that may occur as the concrete continues to release moisture.
- F. Moving from the low point to the high point of the wall, apply one application of **e.spray** in accordance with manufacturer's instructions in order to obtain a seamless membrane with a minimum dry film thickness of 80 mils (2 mm).
- G. Apply **e.spray/e.roll** in and around penetrations and cavities to ensure the formation of monolithic seal around all penetrations.
- H. Apply **e.spray/e.roll** to prepared wall terminations and vertical surfaces to heights indicated according to manufacturer's recommendations and details. (if applicable)

I. Verify film thickness of **e.spray** every 1000 ft² (93 m²).

3.2.7 GEOCOMPOSITE BENTONITE PROTECTION COURSE

- A. Install **e.shield 110b** protection course vertically with the bentonite layer facing the **e.spray** and the smooth side facing away from the wall.
- B. Overlap **e.shield 110b** seams a minimum 3 inches.
- C. Secure **e.shield 110b** onto previously installed stick pins and secure **e.shield 110b** with the ½ inch stick pin washer.
- D. Apply 30 mils of **e.roll** to the **e.hanger** and extend 6 inches around the base of the stick pin. Cut a 6 inch by 6 inch square of reinforcement fabric, center over the stick pin and embed into the **e.roll**. Fully saturate the reinforcement fabric with 30 mils with **e.roll**.
- E. Secure **e.shield 110b** protection course seams with e.tape.

3.2.8 PREFABRICATED DRAINAGE COMPOSITE

- A. Horizontal Installation: Starting from one corner, run *e.drain 6000* horizontally along the base of the foundation.
 - 1. Secure drainage composite panels to the wall by using by pressing drainage composite onto previously washered stick pins. Secure drainage composite by placing another stick pin washer over the drainage composite.
 - 2. Install the next layer of **e.drain 6000** in the same manner and overlap the next layer of drain composite 6 inches over the first layer of drain mat, thus creating a "shingle" effect. Continue this process to the top of the wall.
 - 3. Terminate the drainage and composite membrane system using a termination bar and a reinforcement detail.
 - 4. Care shall be taken when backfilling against the composite membrane system in order to prevent any damage during the backfill process. Angular rock 1 inch or greater shall not be used without written approval from the manufacturer.
 - Backfill in lifts, taking precaution to not backfill above the previously placed e.drain 6000.
- B. Vertical Installation: Starting from the top of wall, install **e.drain 6000** from the top of the wall to the base of the foundation.
 - 1. Overlap each roll of **e.drain 6000** 6 inches on all overlaps.
 - 2. Secure drainage composite panels to the wall by using by pressing drainage composite onto previously washered stick pins. Secure drainage composite by placing another stick pin washer over the drainage composite.
 - 3. Secure **e.drain 6000** with a termination bar at the top of grade and no greater than 3 inches from the top of the drain.
 - 4. Secure **e.drain 6000** using approved adhesives.
- C. Geocomposite Strip Drain: If using **e.drain 12ds**, secure strip drain at the bottom of the footing or just above the design water table.

D. Do not penetrate or damage the composite membrane system once it has been applied. If the system is penetrated or damaged, contact the applicator immediately. Failure to bring the breach of the system to the applicator's attention and not allowing adequate time to make the necessary repair will result in voiding any warranty.

3.2.9 TERMINATION AT TOP OF GRADE

- A. Termination at the top of grade shall be done with using at termination bar. Secure the termination bar every 12 inches on center and the center a reinforcement detail on the termination bar.
- B. Reinforcement Detail Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.

3.3 FIELD QUALITY CONTROL

A. Independent inspectors and certified applicators shall document the gallons of **e.spray** used in the inspection report.

3.4 CURING PROTECTING AND CLEANING

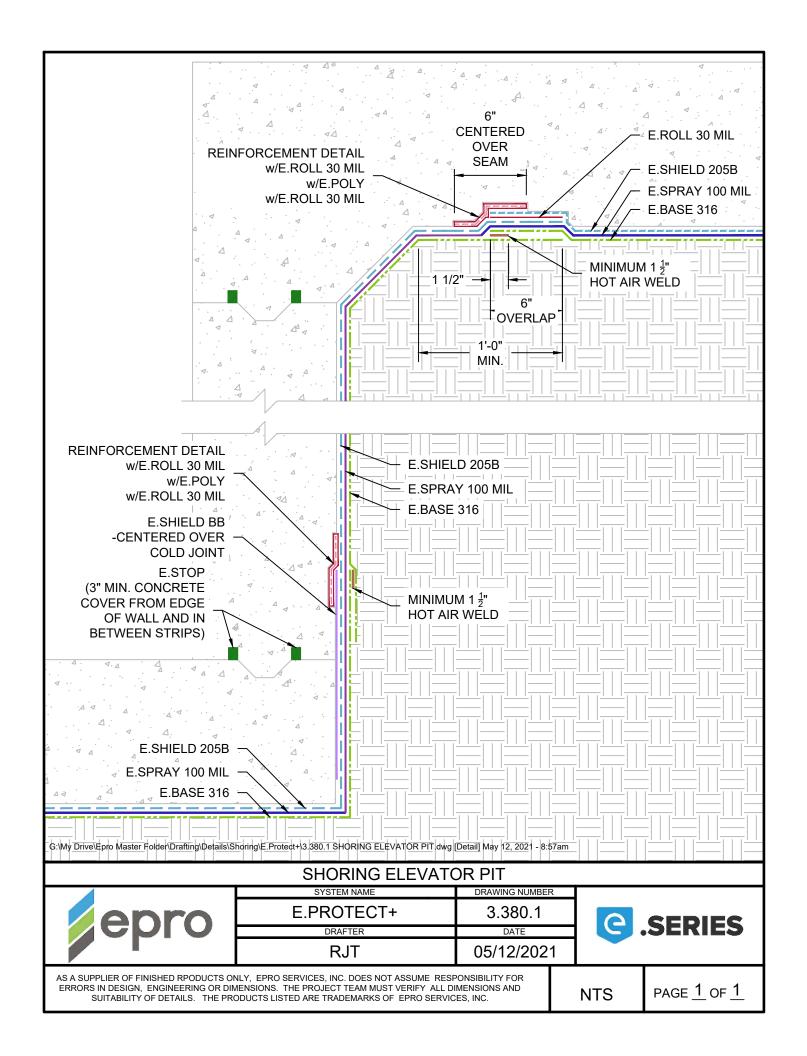
- A. Allow for **e.spray** to fully bond with the substrate, generally this occurs 24 to 48 hours after application depending on ambient weather conditions.
- B. Take care to prevent contamination and damage during application stages and curing. All machinery, other trades, and general construction, shall NOT take place over the composite membrane system until inspection is complete and concrete has been placed.
- C. Prevent damage during the placement of overburden.

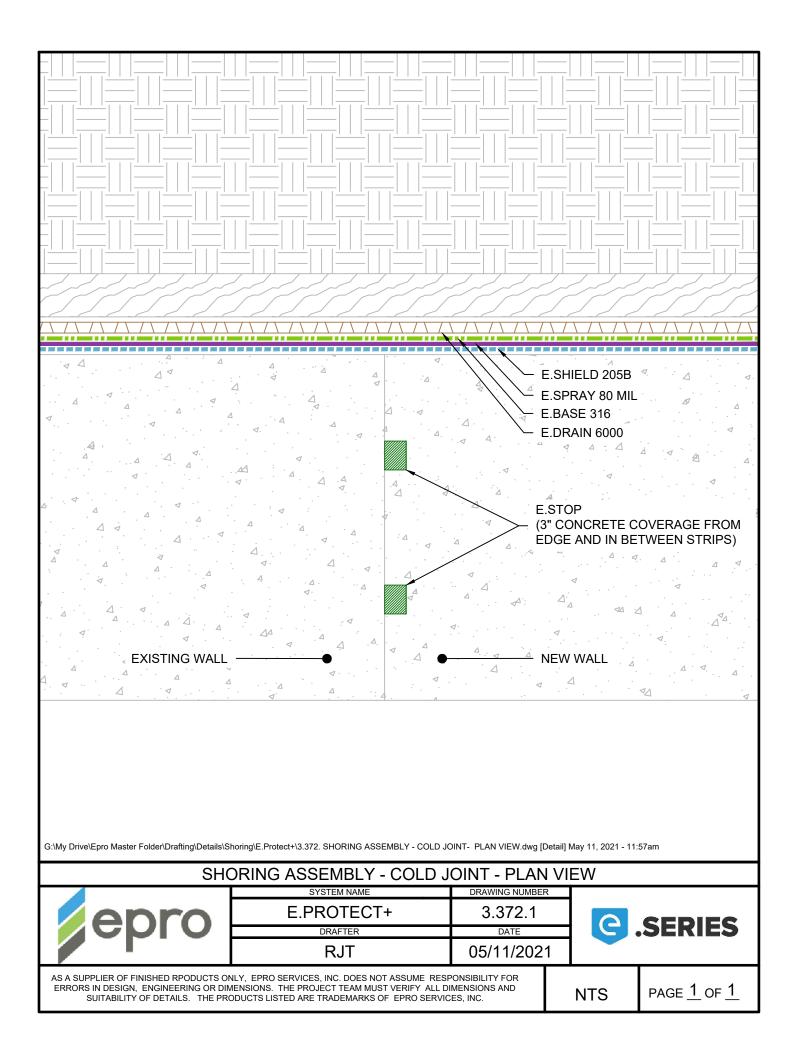
3.5 REPAIRS

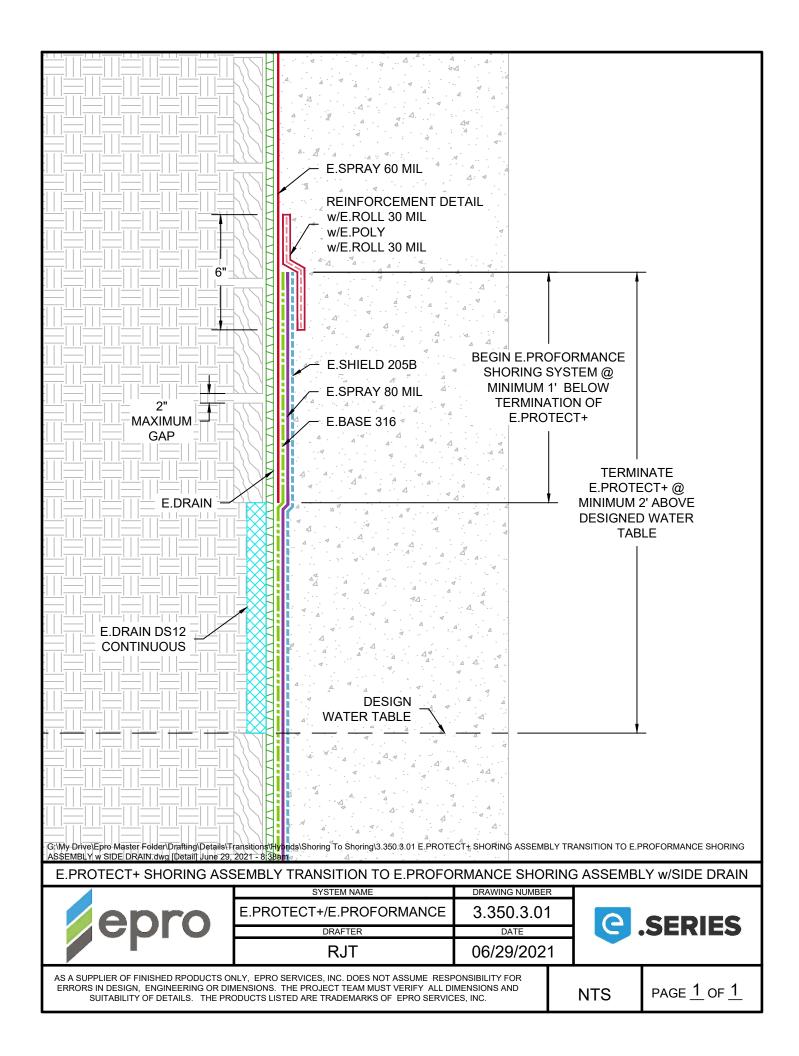
A. Concrete Walls:

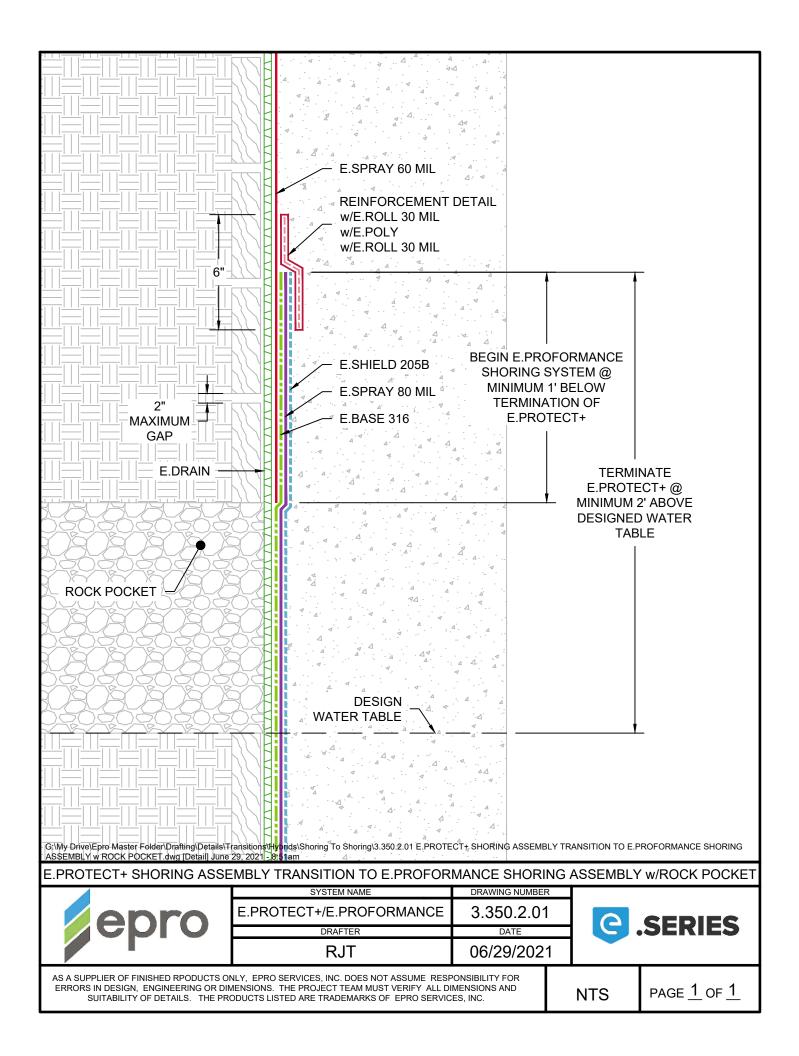
- 1. Inspect damaged area to determine which system components have been damaged.
- 2. Only patch the areas that have been damaged by re-installing the damaged materials. The patch should extend 6 inches beyond the damaged area.

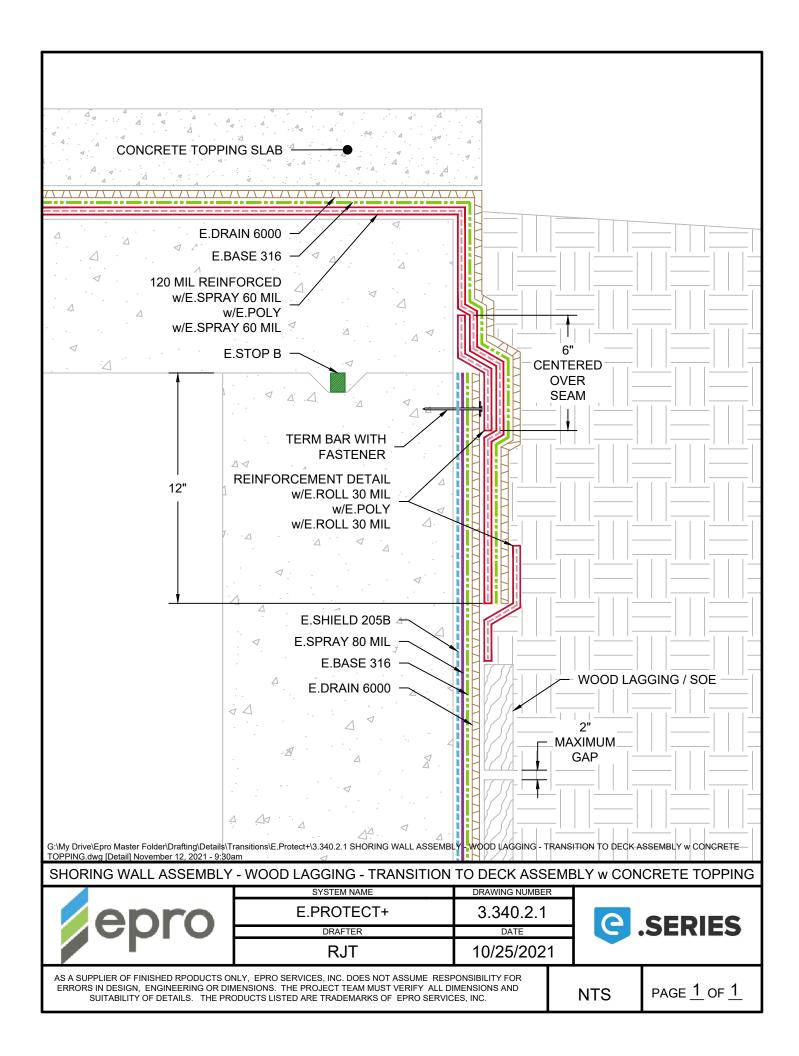
End of Section

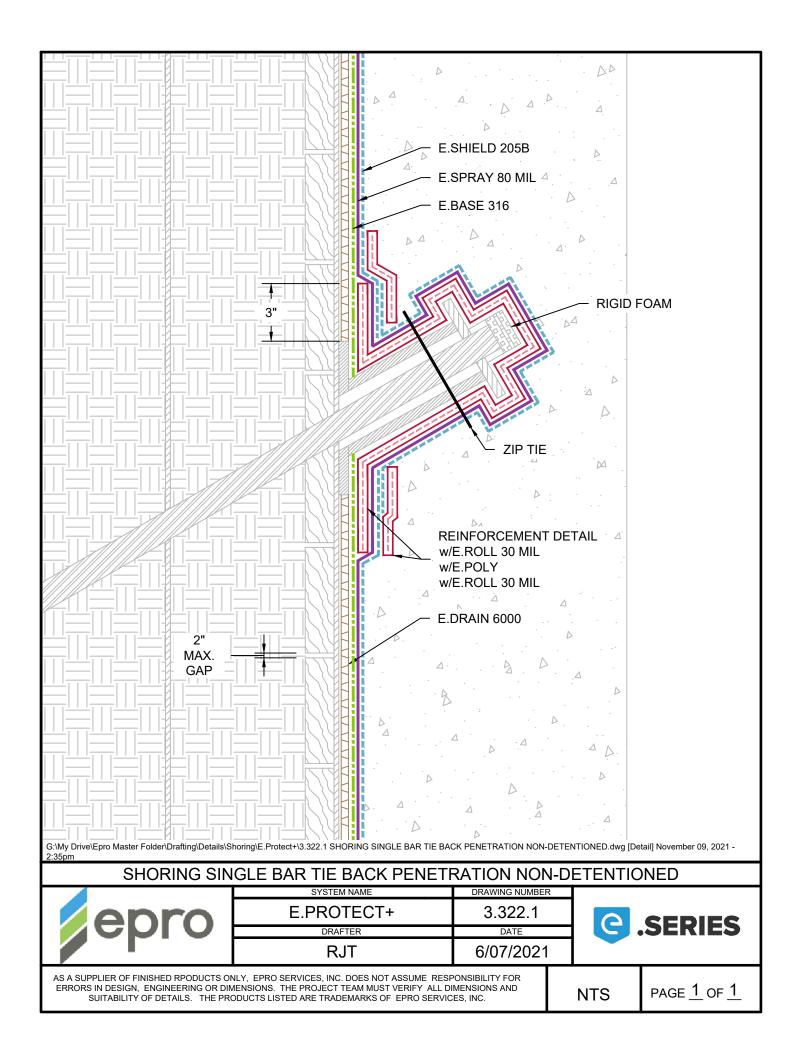


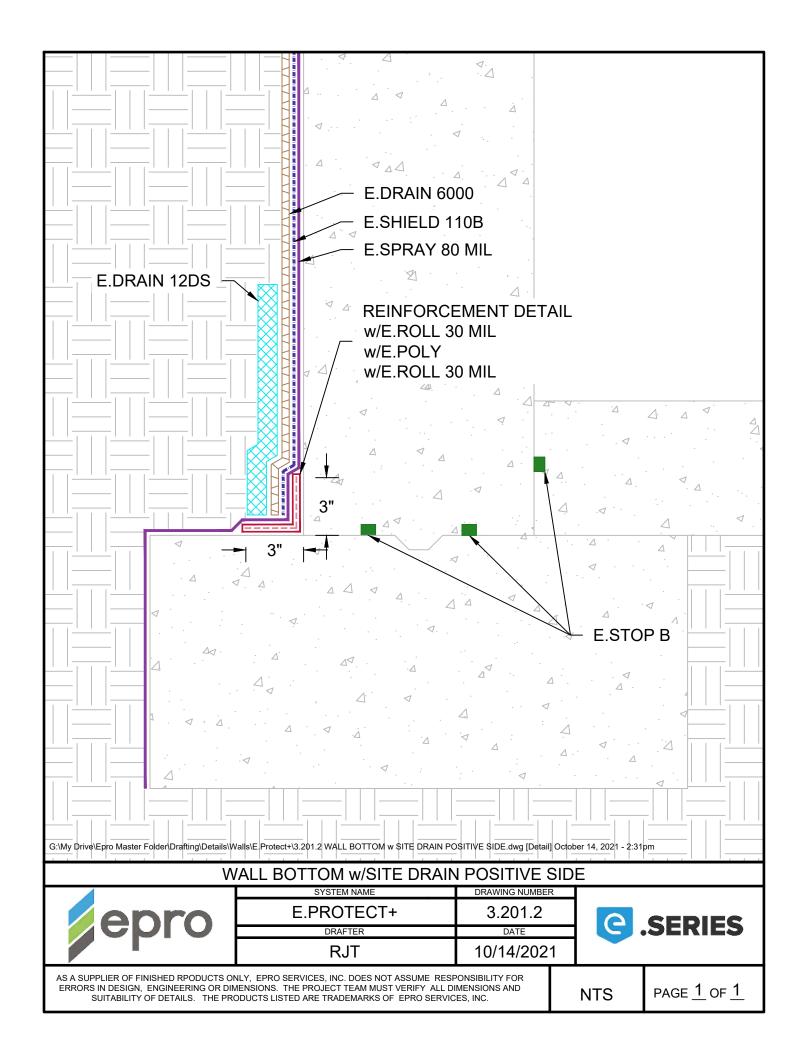


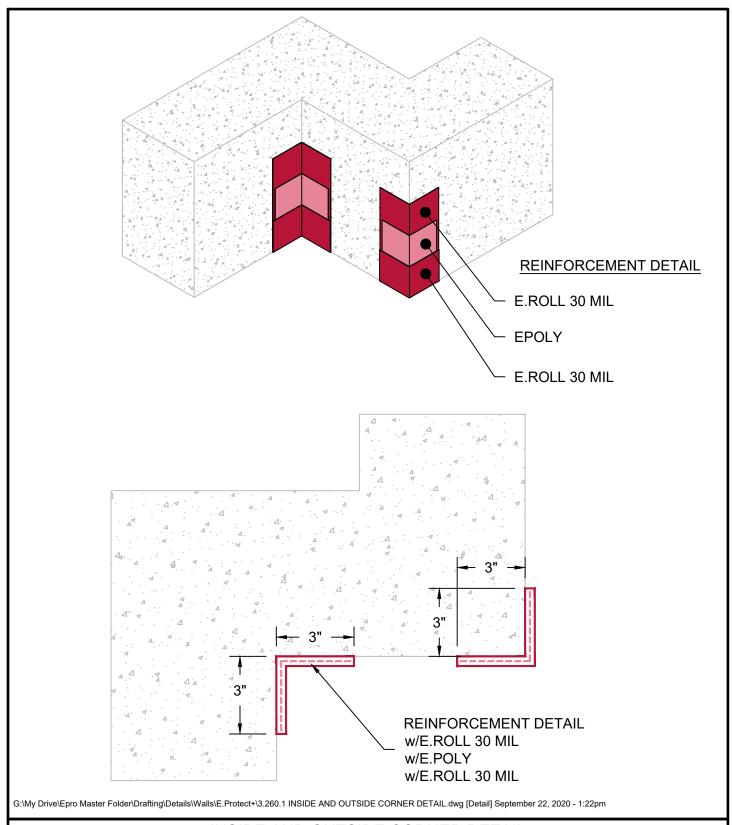












INSIDE AND OUTSIDE CORNER DETAIL



SYSTEM NAME	DRAWING NUMBER
E.PROTECT+	3.260.1
DRAFTER	DATE
RJT	9/17/2020



AS A SUPPLIER OF FINISHED RPODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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