Polywater® Splice Shield™ Environmental Barrier

TECHNICAL DATA SHEET

Description:

Polywater® Splice Shield™ Environmental Barrier protects cables and splices from moisture, corrosion and oils. Splice Shield™ creates a thick, flexible barrier for long term protection of low and medium voltage cable jacket. It coats and protects electrical apparatus from moisture and contaminants in numerous applications.

Polywater® Splice Shield™ dries quickly and can be taped for immediate burial. Only a single application is needed to create a thick, long-lasting barrier. Once cured, it remains flexible to withstand the rigors of contraction and expansion cycles. Polywater® Splice Shield™ is chemically resistant to many contaminants, including dielectric oil and gasoline.

Polywater® Splice Shield™ is packaged in an easy-to-use, self-dispensing syringe-style cartridge. The cartridge is re-sealable allowing for convenient multiple applications. Splice Shield™ contains no dangerous, low-TLV or highly flammable solvents and is safe to use in enclosed spaces.

Dielectric Breakdown Jacket Test

Dielectric breakdown testing is based on UL 2556 Sec 6.3, "Wire and Cable Test Methods". A ½-inch ring jacket material is removed from a 2 awg, aluminum XHHW cable. The bare area is repaired with Splice Shield™ Environmental Barrier and electrical tape, according to instructions. Repaired cable is soaked in water for 28 days and tested. Voltage is ramped up to 6000 volts in 500 volt intervals. Voltage is held for 10 seconds at each point.

28 Day, Ambient Water Soak

Voltage	Result	Leakage
6,000 Volts	No Failure	0 µA

28 Day, 50°C Water Soak

Voltage	Result	Leakage
6,000 Volts	No Failure	<3 µA

Polywater® Splice Shield™ with splice and tape

Product Benefits

- Seals out moisture and water
- Protects against electrical faults
- High dielectric strength
- Reusable dispensing syringe
- Only one application needed
- Zero VOC's

Applications

Splice Shield™ Environmental Barrier bonds to cable jacket materials and these types of metals:

- PVC
- HDPE
- Copper
- Aluminum
- Steel
- Stainless steel

Component Properties:

Polywater® Splice Shield™ is a two-part barrier coating. Each part is a thin paste packaged in a 1/1 ratio syringe.

Property	Part A (Resin)	Part B (Curing Agent)
Color	Black	Off-white
Form	Thin paste	Thin paste
Odor	Slight sulfur	Slight sulfur
VOC Content:	0 g/L	0 g/L
Specific Gravity	1.25	1.10
Solvent Content	None	None

Cured Properties:

Polywater® Splice Shield™ cures to form a flexible, solid environmental barrier.

Property	Typical Result
Appearance	Glossy gray
Peak Exotherm @ 70°F	< 140°F
Durometer Hardness Shore D Shore A	 18 78
Water Absorption	< 2%
Flexural Stress (ASTM D790)	53 psi

Adhesion Testing:

Substrate	Result
PVC to PVC	243 lbs/in^2
HDPE to HDPE	112 lbs/in^2
Steel to Steel	215 lbs/in^2
Stainless to Stainless	173 lbs/in^2
Copper to Copper	231 lbs/in^2
Aluminum to Aluminum	219 lbs/in^2

Tested using ASTM D1002. Samples are sanded, cleaned and allowed to cure for 24 hours.

Electrical Testing:

Polywater® Splice Shield™ is non-conductive. Dielectric strength was tested using a 2,000 volts/second rate of rise and type 3 circular electrodes with a 0.25-inch diameter. All tests were performed in insulating oil to prevent discharges and flashovers. Results are the average of 10 trials.

Sample Thickness	Breakdown Voltage	Dielectric Strength
0.06 Inch	31 kV	520 Volts/Mil

Tested using ASTM D149, Method A. Platen samples are cast and fully cured.

Chemical Resistance:

Polywater® Splice Shield™ chemically resists ultraviolet light, water, and oil.

Oil resistance was tested using ASTM D543. The Splice Shield™ sample was mixed, cast and cut into a dogbone using Die D. It was then immersed in the reagent and aged for7 days. Tensile strength was compared to a control that was air aged.

Fluid	Comparison to Control
Dielectric Oil	> 100%
Hydrocarbon Fluid	> 100%
Gasoline	> 100%

Additionally, Splice Shield™ samples were mixed, cast and immersed in a variety of fluids for 7 days. Weight change over time was measured.

Fluid	Weight Gain
1% Dish Detergent	9.9% (pass)
3% Bleach	5.8% (pass)
10% Salt Solution	4.3% (pass)
20% Caustic (pH 12)	3.5% (pass)

Polywater® Splice Shield™ shows good resistance to a variety of oils and chemicals. It provides good protection under a variety of field conditions.

Installation:

Polywater® Splice Shield™ is easy to use.

1. Surface must be clean, dry, and free from oil, wax and dirt.

2. For large cable jacket cuts or to improve performance, tape damaged area prior to Splice Shield application. Rigid metal and plastic surfaces may be sanded prior to application to improve adhesion.

3. Remove the re-sealable cap from the end of the cartridge. Retain for multiple uses.

4. Depress the double pistons to dispense the two materials.

5. Mix resin and hardener until they are a uniform color (about 30 seconds).

6. Apply mixed resin over the area to be protected with a gloved finger or a mixing stick.

7. The sealant will be tack free in 25 minutes at room temperature; fully cured in 24 hours.

8. For immediate burial of repaired cable, cover the sealant with electrical tape.

9. To close the cartridge for reuse: wipe tips, retract piston slightly and plug with re-sealable cap.

Working Temperature 45° to 120°F (5° to 50°C)

For full installation information, please see the **Splice Shield™ Installation Instructions** *(www.polywater.com/CSInstructions.pdf)*

Environmental Resistance:

Polywater® Splice Shield™ moves and flexes with low and medium voltage cable. It withstands the rigors of the changing, cable environment.

Cured Sealant Temperature Use Range
-60° F to 212° F (-51° C to 100° C)

Temperature Cycle Testing:
10 cycles from 0°F to 130°F showed no significant change in adhesion. 7 day aging at 212°F showed no significant change in adhesion.

Storage and Handling:

Keep cool, dry and away from sunlight. Reseal syringe after use. Protect from freezing. Dispose in accordance with local regulations.

Product shelf life is one year. Shelf life is one month after the product is opened.

Clean-up

Use a clean towel with soap and water or Polywater® Grime-Away™ to clean hands or surfaces.

Safety:

Polywater® Splice Shield™ has a low level of toxicity. Good industrial hygiene practice and appropriate precautions should be employed during use. Pre-packaged cartridge controls and reduces exposure. The reacted product is a non-toxic, inert resin. See SDS for more information.

Model Specification:

The statement below may be inserted into a customer specification to help maintain engineering standards and ensure work integrity.

Approved environmental barrier is Polywater® Splice Shield™ or CS-KIT. The environmental barrier shall come in a multiple-use syringe that dispenses material in proper ratio and without special tools. It shall not contain any solvents. The cure rate of the material shall be fast, becoming tack-free in 25 minutes @ 75°F

Cured product shall be suitable for use on various low and medium voltage cable materials. It shall have excellent adhesion to a variety of cable jackets and metals. Once cured, the barrier shall be water-tight and flexible. It shall be impervious to water, salt water, oils, and dilute acids and bases. Cured barrier shall withstand temperature extremes from -60°F to 212°F.

Environmental barrier shall not contain any metals and shall not corrode. It shall be non-conductive with minimum dielectric breakdown voltage of 520 Volts/mil as measured by ASTM D 149. Cable dielectric breakdown testing according to UL 2556 Sec 6.3 should yield no failure at 6,000 Volts with 0 µA leakage after 28 days water soak at ambient temperature. Cable dielectric breakdown testing according to UL 2556 Sec 6.3 should yield no failure at 6,000 Volts with <3 µA leakage after 28 days water soak at 50°C.

Order Information:

Cat #	Package Description
CS-KIT (1 units/case)	1 – Polywater® Splice Shield™ two-part, self-dispensing syringe with resealing cap 5 – Mixing Sticks 5 – Single gloves

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Important Notice: The statements here are made in good faith based on tests and observations we believe to be reliable. However, the completeness and accuracy of the information is not guaranteed. Before using, the end-user should conduct whatever evaluations are necessary to determine that the product is suitable for the intended use.

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