

Utility Pole Restoration

UPR™ Pole Repair Sealant

TECHNICAL DATA SHEET

Description:

UPR™ Pole Repair Sealant repairs woodpecker holes in wooden utility poles. It is easy and convenient to use. The two-part formula is deployed with a standard caulking gun and mixes right in the nozzle. There is no direct handling of product.

UPR™ Pole Repair expands in the hole to fill irregular shaped cavities and integrate with the wood. This creates superior adhesion to the wood. It hardens like wood with compression strength similar to the cross-sectional hardness of a wood pole. It remains gaffable and will not chip out in chunks when a climber's hooks are embedded into its surface structure.

Compressive Strength

UPR™ Pole Repair has similar compressive strength to wood strength, perpendicular to the grain. Wood common to pole manufacture is used for comparison.

(Data U.S. Forest Products Laboratory)

<u>Wood Pole Material</u>	<u>Compressive Strength Perpendicular to the Wood Grain</u>
UPR™ Pole Repair	1500 psi
Southern Yellow Pine	910 psi
Douglas Fir	760 psi

UPR™ Pole Repair matches wood pole strength. The repair area will not create a stress point when the pole flexes during storms and high winds.

Fungal Resistance

UPR™ Pole Repair is an inert material: mold and fungus cannot use it as a food source. The reaction temperature exceeds 212° F (100° C), eliminating most molds and fungus. The repair blocks moisture. This keeps the area dry and less likely to support mold and fungus growth.



Woodpecker damage repaired with UPR™ Pole Repair

Product Benefits:

- Expands to fill all voids
- Creates a strong resilient repair
- Blocks water ingress
- Matches wood characteristics, gaffable
- Wide installation temperature range

Installation Benefits:

UPR™ Pole Repair comes in a convenient package and kitting.

- No special deployment tools needed
Less expensive, more convenient
- No drilling to deploy the product
Less labor time
- No mixing or direct handling of the product
Less mess and safer
- Includes wood blocks to fill cavity space
Less product needed
- Single kit will repair one hole
Less waste

Component Properties:

UPR™ Pole Repair is a two-part, urethane structural foam mixed at a 1/1 ratio.

<u>Property</u>	<u>Part A (Resin)</u>	<u>Part B (Curing Agent)</u>
Color	Amber	Brown
Form	Liquid 250 cps	Liquid 1050 cps
VOC Content:	0 g/L	0 g/L
Specific Gravity	1.23	1.05

Cured Properties:

UPR™ Pole Repair cures to solid, closed-cell foam.

<u>Property</u>	<u>Typical Result</u>
Appearance	Brown with small, even cells
Closed Cell Percent	> 90%
Density (static mixer)	25 lbs/cu ft
Compressive Strength (ASTM D1691)	1500 psi

Moisture Testing:

UPR™ Pole Repair does not absorb water, so it will not increase the chance of pole decay. It is good practice to use a dry fungicide prior to deploying any wood pole repair product to reduce or negate any fungal growth that is present.

Moisture Repellency Testing

Six 1-1/2-inch cubes reacted UPR™ were aged in water for 7 days at 122°F (50°C). Weight gain was measured.

	<u>Water Weight Gain</u>
UPR™ Pole Repair	< 1%

The UPR™ Pole Repair acts to seal the hole from water and protect the pole from further degradation.

OSHA Requirements:

OSHA 1910.269 App D requires poles to be inspected and tested before climbing. The standard notes that “hollow spots and woodpecker holes can reduce the strength of the wood pole.” Pole repair satisfies OSHA requirements and improves the pole strength. It also reduces the likelihood of decay.

Gaff Testing:

Cut-Out Test

The “Pole Cut Out Test”¹ was used as a guideline to test Polywater’s UPR™ Pole Repair. In this test, the climber jabs the gaff into the pole at a 30° angle to a depth of ¼-inch. Pressure is exerted onto the gaff and the point of the gaff penetrates the wood. The pole surface cut is measured, and shall be no more than 2 inches.

¹ Buckingham Manufacturing Company, Inc. Buckingham Gaff & Climber Information; “How to Perform the Pole Cut Out Test”

<u>Gaff Surface Cut</u>	<u>Result</u>
½ to 1-½inch	Pass

The Pole Cut-Out Test showed that UPR™ Pole Repair is gaffable.

Penetration Test

UPR™ Pole Repair was molded into a 7-inch cylinder. A Buckingham gaff was used to penetrate the side of the form. An Instron unit was set to 50 mm/minute to drive the gaff into the form to a depth of 0.475 inches and load force was measured. An average of three tests was calculated:

<u>Substrate</u>	<u>Penetration Force</u>
UPR™ Pole Repair	270 lb _f
Douglas Fir	244 – 290 lb _f
Southern Yellow Pine	232 – 475 lb _f

The UPR™ Pole Repair falls within the same range as the wood poles² and is relatively easy to penetrate.

² Shupe, Todd F. and Freeman, Mike H. (October, 2011) *Effect of Preservative Type and Gaff Type on Gaff Penetration Into Wood Poles*. Eastern Utility Pole Conference, Baltimore, MD.

Installation:

Polywater® UPR™ Pole Repair is packaged in kit form. Everything needed to repair damage to wood poles caused by woodpeckers is included.

The two-part formula is dispensed using a 2-part coaxial caulking tube with static mixing nozzle. It does not require hand mixing, which allows for multiple applications and makes it easier to direct the product into the hole when deployed. UPR's curing temperature is not dangerously hot as are some other repair products, yet may be warm enough to reduce pole decay.

Once a skin has formed, the foam may be visually inspected through the shrink wrap to determine whether the hole has been completely filled.

To decrease cure time in cold temperatures, warm UPR™ Pole Repair cartridges prior to use.

Usage Quantity

Hole Depth (in)	Product Required	Hole Diameter	
		6 inches	8 inches
8	Cartridge	3	6
	Blocks	5	7
12	Cartridge	5	9
	Blocks	6	10
16	Cartridge	6	11
	Blocks	11	18

For full installation information, please see the [UPR™ Pole Repair Installation Instructions](http://www.polywater.com/UPRinstallation.pdf) (www.polywater.com/UPRinstallation.pdf)

Find video link:

[UPR™ Pole Repair Website](http://www.polywater.com/upr.asp)
(www.polywater.com/upr.asp)

Cure Rate:

UPR™ Pole Repair can be used in temperatures down to 20° F (-6° C). At low temperatures, the reaction is slow, but will completely foam and cure with time. At cold temperatures, the components become more viscous and flow through the mixing nozzle at a slower rate. Cure times are as follows:

	Reaction Time (Minutes)	
	40° F (4° C)	70° F (21° C)
Foaming, Expansion Complete	8 - 9	4 - 5
Hard, Non-sticky Skin Formation	15 - 18	7 - 9

Environmental Resistance:

UPR™ Pole Repair withstands the rigors of the changing, outdoor environment.

Cured Sealant Temperature Use Range
-40° F to 150° F (-40° C to 65° C)

Storage and Handling:

Keep containers cool, dry and away from sunlight. Leave cartridges in the protective foil pouch until ready to use/reuse.

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

Clean-up

Any unreacted material may be cleaned from surfaces with a solvent wipe such as Polywater's Type HP™ Cleaner/Degreaser. The Part A, amber resin will react with water if surfaces are washed with a soap and water solution. Once reacted, the foam has strong adhesion, and may be scraped or cut from surface. The reacted product is an inert solid with non-hazardous character.

Safety:

UPR™ Pole Repair is a two-part urethane foam containing reactive chemicals. Polyurethanes are common in the construction industry and have been used for many years. Some individuals may become sensitized to components in the unreacted resin. Precautions must be observed during use and handling of these materials.

The use of UPR™ Pole Repair in the prepackaged cartridge controls and reduces exposure. Once reacted, the foam is solid, closed-cell polyurethane. The finished product may be considered non-toxic. See MSDS 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 utility pole repair sealant is UPR™ Pole Repair Sealant. The repair sealant shall come in a multiple-use cartridge to fill various sized defects in poles. The sealant shall be an expanding foam system to best fill all voids in the defect.

The packaging shall automatically meter and mix the sealant. The sealant kit shall include wood blocks which act as filler reducing the needed amount of sealant. The cure rate of the sealant shall be fast. It shall reach full expansion in less than 5 minutes at 70°F (21°C) and form a hard, non-sticky skin in less than 10 minutes at 70°F (21°C). The reaction temperature of the sealant should reach a minimum of 212°F (100°C) to help kill microbes present in the defect.

Once cured, the sealant shall be waterproof. The sealant shall have compressive strength between 1,000 and 2,000 psi. The foamed sealant shall have a density of 25 lbs/cu ft. The foamed sealant shall pass the Cut-Out Test to determine gaffability. The sealant shall yield a result of approximately 270 lbf in the Gaff Penetration Test.

Order Information:

Cat #**Package Description**

UPR-PRKIT12
(1 units/case)

12 - 8½-oz two-part foam caulking style cartridges with resealing cap
16 - Static mixing nozzles
1 - Roll shrink wrap
18 - Wood blocks (filler) 1.5" X 1.5" X 4"
4 - Pair gloves
1 - Instructions

UPR-PRKIT3
(1 units/case)

3 - 8½-oz two-part foam caulking style cartridges with resealing cap
4 - Static mixing nozzles
1 - Roll shrink wrap
5 - Wood blocks (filler) 1.5" X 1.5" X 4"
1 - Pair gloves
1 - Instructions

TOOL-250
(1 unit/case)

Ratchet application tool

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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.

American Polywater expressly disclaims any implied warranties and conditions of merchantability and fitness for a particular purpose. American Polywater's only obligation shall be to replace such quantity of the product proven to be defective. Except for the replacement remedy, American Polywater shall not be liable for any loss, injury, or direct, indirect, or consequential damages resulting from product's use, regardless of the legal theory asserted.

LIT-UPRTECH/(5-13)

Makers of Polywater® and Dyna-Blue® Cable Lubricants and Pull-Planner™ Software

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