

SECTION 06 30 00

REPAIR FOR DETERIORATION AND DECAY IN WOODEN MEMBERS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes guidance on stabilizing decayed wood elements with epoxy consolidant and filler.
- B. Deterioration and decay in wood results from moisture infiltration, accompanying fungal growth and insect infestation. Paint, caulk and sealant failures are also a major cause of wood deterioration.
- C. Some sources of moisture may include the original moisture in green wood, rainwater, condensation, ground water, piped water, and water released by water-conducting fungus through the process of decay itself.
- D. Epoxy repair may be appropriate if:
 - 1. the piece to be repaired is historically significant. Epoxy repair makes it possible to retain most of an original component by selectively repairing only the damaged area.
 - 2. if the piece is decorative and replacement would be too expensive or impossible.+
- E. Epoxy repair may NOT be appropriate if:
 - 1. the piece is a structural member. Epoxy has adequate compression strength, but is not the best choice to repair a member in tension. In this case, replacement is usually a better option.
 - 2. the wood to be repaired is to remain unpainted, as the epoxy is quite different in appearance than wood. In this case, the wood should be selectively replaced.
 - 3. if the area to be repaired is large, as epoxy repair can be expensive.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Conservation Services
8 Lakeside Trail

Kinnelon, NJ 07405
(201)838-6412

B. Abatron, Inc.
5501 95th Ave.
Kenosha, WI 53144
(800)445-1754 or (414)653-2000

C. Roux Laboratories
5344 Overmyer Dr.
Jacksonville, FL 32205
(904)693-1200

2.2 MATERIALS

A. Epoxy consolidant and epoxy filler, both are multiple part compounds. Purchase by the gallon unless a large amount of epoxying needs to be done. Use one of the following, or approved equal:

1. "Con Serv (T) Flexible Consolidant 100" (Conservation Services):
Cures slowly with a 5 to 7 hour application time to allow deep penetration. Complete hardness is achieved in 3 to 6 days.
2. "Con Serv (T) Flexible Patch 200" (Conservation Services): A four part putty-like filler; Is not easy to mix in small amounts; Consistency and hardness are easily controlled with this material.

NOTE: The products of Conservation Services are recommended for treatment of thicker wood such as window sills. Because of its slower curing time, it allows for deeper penetration into members.

3. "Liquidwood-1" Consolidant (Abatron): Solidifies in a short period of time.
4. "Woodepox-2" Adhesive Paste (Abatron): A two-part paste mix; final hardness is determined by varying the ratio of the two parts. The LiquidWood can be used as a thinner, but this reduces the flexibility of the filler.

NOTE: These Abatron products are recommended for use on smaller members such as window sashes where deep penetration of consolidant is not required. The quick drying feature is an advantage for small, but repetitive jobs. Abatron carries twenty different types of wood consolidants with varying degrees of penetration

- B. Oil clay that can be purchased from a hobby store - used to keep consolidant from leaking through cracks.
- C. Nitril Rubber Gloves (Abatron).
- D. Disposable vinyl gloves: Available from drug store or pharmaceutical supply distributor in 50 count or larger boxes.

2.3 EQUIPMENT

- A. All equipment recommended by manufacturer.
- B. Plastic bottles, like those used for hair dye, to apply the consolidant; having many on hand is recommended. Cleaning of the bottles for reuse is possible.
- C. Applicator bottles: Available from drug store and sold for hair dye application usually in 8 fl. oz. size; Also available in bulk from Roux Laboratories. Roux Color Applicators lend themselves more easily to cleaning and reuse.
- D. Rags of different sizes to wipe up spills before epoxy has a chance to harden, small rags are recommended for quick one time uses such as wiping off spouts and caps.
- E. Thin wooden sticks, approximately 8" long for scooping out paste and mixing consolidant.
- F. Goggles and a respirator for protection from fumes.
- G. Putty knives for application of filler.
- H. Channel lock pliers for opening stuck caps.
- I. Allen wrench to clean out cap holes.
- J. Needle nose pliers to pull out hardened epoxy.
- K. 1/8"x8"x12" Masonite boards for mixing paste filler.
- L. Carbon dioxide fire extinguisher: Curing epoxy creates heat that may cause fire.
- M. Rotary saw.
- N. Air compressor.
- O. Drill.
- P. Stiff bristle brushes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Follow Manufacturer's application directions regarding use, surface preparation, application and environmental requirements.
- B. Detect rot using the "Pick Test":
 1. Insert an ice pick into the wood at a slight angle.
 2. Lift the pick out. If the wood splinters in long pieces, the wood is ok. If the wood snaps where the pick is being lifted, the wood is decayed.
- C. When rot is discovered:
 1. Determine the source of moisture infiltration and eliminate it.
 - a. If rot is only present on the surface, drying is all that is necessary to stop the spread of decay and kill off any growth.
 2. If source of moisture is unknown, treat the wood with a preservative.
 - a. Preservatives are caustic chemicals and should be handled with care.
 - b. A particularly dangerous wood preserving chemical is pentachlorophenol (a.k.a. penta).
CAUTION: THIS CHEMICAL IS CARCINOGENIC AND ITS USE IS BANNED IN MANY STATES.
 3. Preservatives will eliminate fungal growth, but generally do not restore strength to the deteriorated wood material.

3.2 PREPARATION

- A. Surface Preparation:
 1. Dry affected wood member completely to arrest further decay. Dry in place if possible -or- remove the member and keep in a cool dry place until dry.
CAUTION: IF THIS PRECAUTION IS NOT TAKEN, THE EPOXY CAN ACTUALLY TRAP MOISTURE IN WOOD FIBERS AND ACCELERATE THE DECAY PROCESS
 2. Have all materials at hand before the mixing process begins.
 3. Label all caps and lids so that a cap or lid is not placed on the wrong container or it may remain there permanently.

3.3 ERECTION, INSTALLATION, APPLICATION

CAUTION: AS EPOXIES CURE, HEAT IS PRODUCED. FOR THIS REASON, EPOXIES SHOULD BE USED IN SMALL QUANTITIES TO AVOID EXTENSIVE HEAT BUILD-UP. CARE SHOULD BE TAKEN WHEN USING EPOXY ON A HOT DAY.

A. Repair decayed wood using epoxy wood consolidant:

1. Drill 1/4" or 3/16" holes in affected wood to receive epoxy consolidant.

- a. Drill holes at an angle and spaced approximately 2" on center in staggered rows. The top of one hole should line up with the bottom of the next hole.

CAUTION: BE SURE NOT TO DRILL THROUGH THE ENTIRE SURFACE FOR CONSOLIDANT WILL LEAK OUT FROM BEHIND.

- b. Dam any surface cracks with oil clay so that epoxy will not leak.

2. Remove sawdust and dirt from drilled holes using compressed air or stiff bristle brushes.
3. Following manufacturer's instructions, mix a small amount of the consolidant components (resin and hardener) together in an applicator bottle. Stir the mixture thoroughly by hand with a thin stick for 4 minutes or with a bent coat hanger chucked into a drill for 2 minutes.
4. Using a large plastic syringe or squeeze bottle and tube spout, carefully squirt the consolidant into the pre-drilled holes. Completely saturate the wood, moving from hole to hole refilling until the wood can hold no more. More than one application may be needed.
5. Wipe off any excess consolidant or spills and cover the treated area to protect until cured as directed by epoxy manufacturer.
6. If severed pieces need to be re-attached, glue them in place with a mixture of consolidant and filler.

B. When the consolidant has cured, fill the voids in the surface with epoxy filler (wood-epoxy putty):

1. Mix the two part epoxy filler following the same procedures for mixing consolidant in Section 3.3 A.3. above. Mix filler to achieve the consistency of a glazing compound that can be worked with a putty knife.
2. Apply the filler to the surface:

- a. For large voids, apply filler in 1" thick layers.
This reduces the possibility of
problems associated with heat build-up.
 - b. Build up filler layers slightly above the wood
surface to allow for planing and sanding smooth after it
has cured.
3. When the filler has cured, sand or plane the surface smooth.
 4. Apply a wood preservative to surrounding wood surfaces and prime
and paint the entire surface.

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