Structural Plywood Field Repairs

Plywood surface defects can often be successfully repaired by field repairs to or near its original condition. In allowing these types of field repairs, the plywood must be decay free and all damaged wood removed. The risk lies in covering up progressive defects such as decay, which may grow worse under the repair material. Each plywood panel that needs to be repaired must be evaluated as to cause, location, extent of damage, and materials and strength achieved through the selected repair method.

Small surface defects may be repaired using commercial fillers such as epoxy putty. Use a 100%-solids two–component high-performance epoxy resin system with high-strength filler that meets and/or exceeds the minimum requirements for AFG-01, Adhesives for Field-Gluing Plywood to Wood Framing and ASTM D 3498-76, Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems. Another high-performance resin system that has been found to perform satisfactorily is a polyester-based auto body and marine structure repair putty. Read and follow the manufacturer’s recommendations carefully and follow mixing and application directions exactly. Since these two-component high-performance resins systems cure very rapidly, it is recommended that only small amounts of these materials be mixed at a time. The proposed repair methods for plywood panels pertain only to the panels with face or back veneer delaminations. If the delamination involves more than the face and/or back veneer, the panels must be replaced.

Repair Method A

This method is recommended for repairing of broken out areas in the face veneer, dents, gouges, knotholes, grooves and scrapes. Use Repair Method A by following the step-by-step procedures summarized below (see Figure 1).

1. Remove all loose and damaged wood and any exposed plywood glueline by chiseling or routing. Care should be taken to remove as much of delaminated areas as possible.
2. Apply masking tape around the periphery of each area to be repaired to avoid spread of the resin on the surrounding surfaces.
3. Trowel unthickened repair epoxy to the clean void with a putty knife or similar tool, leaving it slightly higher than the surrounding area.
4. Allow the repair material to partially set (follow the manufacturer’s recommendation) and remove the masking tape.
5. Apply fiberglass cloth or tape over the repaired area to provide reinforcement and abrasion resistance. fiberglass cloth should be applied to an epoxy-coated surface before the coated surface begins to gel. Prepare the surface and trim the fiberglass fabric to size. Roll a heavy coat of epoxy on the surface. Position the cloth on the wet epoxy, smoothing out wrinkles with a gloved hand or a plastic spreader. Apply
a coat of epoxy, using a roller to thoroughly saturate the fiberglass fabric. If needed, remove the excess epoxy.

**Repair Method B**

This method is recommended for repairing face veneers with blisters or localized delamination. Blisters and localized delamination can be effectively rebonded and restored to near their original condition and appearance. The rebonding can be successfully achieved by using a gap-filling resin system meeting or exceeding the requirements stated *above*. The repairing sequences provided in Repair Method B are shown for both small and larger face veneer delaminations (see Figure 2 and 3).

**B.1. Blistering and delamination of the face veneer exceeding 6in²**

1. Cut the portion of the delaminated and/or blistered face veneer with a box knife and remove that portion of veneer. Care should be taken to remove as much of the delaminated areas as possible. The cutout can be rectangular or oval shape.

2. Prepare (gently sand) the exposed glueline by chiseling or routing to remove adhesive/wood fiber residual. Check if the panels are dry and look for any additional delamination in the layers below. If additional delamination is found, the panels must be replaced.

3. Apply masking tape around the perimeter of the removed veneer areas to avoid spread of the resin on the surrounding surfaces.

4. Using a putty knife or similar tool, trowel unthickened epoxy resin into the clean void, creating an epoxy patch slightly higher than the surrounding wood area.

5. Allow the repair material to partially set (follow the manufacturer's recommendation) and remove the masking tape.

6. Re-install the removed portion of the face veneer, making sure that it is laying flat and tight on the panel. Fasten the veneer (repair block) with non-corrosive wood screws or staples at a maximum 4" on center spacing. To improve the bond between the delaminated face veneer and panel, place a pressure block or weight over the repaired area. This weight could be a concrete block placed on top of a piece of plywood that has been cut 6" longer in all directions than the repaired veneer section. Place a piece of plastic sheet between the deck and weight to keep the weight from sticking to the face veneer.

7. Remove the masking tape and sand the repair across the grain direction of the face veneer. Use a 36 grit coarse paper.

If the cutout portion of the delaminated face veneer is damaged beyond the repair, then a repair using epoxy in combination with fiberglass cloth as described in step 5 of Repair Method A should be used.

**B.2. Blistering and delamination of small areas (i.e., less than 6in²)**

1. Depending on the width and length of the blister, make one or two slits for the full length of the blistered area. The slits should be parallel to the direction of the face
grain. Carefully lift the veneer at the slits and inject the gap-filling epoxy resin after the surfaces have been prepared according to step 2 of the Repair Method B.1. Spread the epoxy over the entire blistered area.

If the blister is wide, make additional cuts at the blister ends perpendicular to the longitudinal slits and flip the blistered section of the face veneer. Prepare the surface for bonding and apply the repair epoxy material over the entire blistered area.


3. Allow the adhesive to cure following the manufacturer’s recommendation and-if needed-refinish the blistered area to match the rest of the panel surface.

If the plywood surface defects consist of a combination of the broken out areas and large blisters and/or delamination in the face veneer, then a combination of Repair Method A and B should be used (see Figure 4)

**Repair Method C**

The proposed repair method below for plywood panels pertains only to the panels with back veneer delaminations that cannot be replaced due to costly replacement and/or overlay of the damaged plywood panels (see Figure 5).

An example of a repair recommendation for a building with a flat roof sheathed with 23/32” 48/24 plywood panels that exhibited delamination of the back veneer is presented (Figs 5 and 6). The repair recommendation included reinforcing the existing panels by cutting and fitting a 2nd layer of 23/32” 48/24 plywood sheathing (minimum 5 ply) tight to the underside of the deck and supported by continuous lumber stringers attached to the sides of the existing rafters.
Figure 1.
Field repair and reinforcement of plywood using repair method A. Broken out areas in the face veneer (photos on the left) and repaired and reinforced panels (photos on the right)

Figure 2.
Field repair and reinforcement of plywood panels with blistered and delaminated face veneer exceeding 6 in$^2$ using repair method B. Blisters and localized delamination (photos on the left) and repaired plywood panels (photos on the right)
Figure 3.
Field repair and reinforcement of plywood panels with blistered and delaminated face veneer not exceeding 6 in$^2$ using repair method B. Blister and localized delamination (left) and repaired plywood panel (right)

Figure 4.
Field repair and reinforcement of plywood panels with combination of blistered and broken out veneer exceeding 6 in$^2$ using repair methods A and B. Blister and broken out face veneer (left) and repaired plywood panel (right)
Figure 5.
Roof sheathing panels with large delamination of the face veneer (left) and finished roofing membrane at the time of inspection (b).

Figure 6.
Repair recommendation including reinforcing the existing panels by cutting and fitting a 2nd layer of 23/32" 48/24 tight to the underside of the deck and supported by continuous lumber stringers.