

Save Your Wood Windows



Thousands of wood windows are ripped out of this country's older and historic buildings each year and hauled to the dump. This astonishing loss is due in large part to the fact that few people know how to care for existing wood windows. This report provides an economical and practical alternative to trashing your fine old windows and buying replacements made of plastic. You will learn the most practical and economic methods of window maintenance and repair:

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These pages are provide only as samples of the report. Successful and safe use of the methods shown here may depend on information in the rest of the report. Contents of the report may vary from what you see here since they are updated frequently. Feel free to copy and pass this sample file along to others. Obtain the complete report at:

<http://www.historichomeworks.com/hhw/reports/reports.htm>

Sash Joint Conditions & Causes

Loose and decayed joints are caused by water penetration, usually at the joint between the bottom rails and the styles. Water also soaks up into the end-grain of the stiles where they sit on wet sills. When the glazing or paint cracks at these joints water seeps in and the paint next to the joint peels off. More water enters and the wood expands. When it dries the wood shrinks breaking the joint open a little more. The cycle repeats with every change in the weather, the joint widens and moisture builds up within the joint. If it does not dry out the wood inside the joint begins to decay.



Failing joints occur as deterioration progresses. Here the left joint of the meeting rail has failed letting the meeting rail drop out of place.



Assess Conditions and Plan the Repair

Look for a crack in the paint film and paint peeling to bare wood right at the joint. Look for a gap between the rail and the style that can range from barely visible to 1/8" or wider. Lay your finger directly over the joint and feel for the parts on each side of the joint to move in relation to each other while you shake the sash and twist the rail with your other hand. More movement means the joint is more likely to be decayed. Probe into the joint with an ice pick to determine if the wood inside the joint is soft and decayed. Check the end-grain of the styles at the bottom edge of the lower sash for end-checks and decayed wood.

If you find the joint is loose but the wood is sound only minor treatments are needed. A missing, broken or bent pin can be replaced. A missing tenon wedge can be replaced.

If you suspect decayed wood, more substantial repairs will be needed. When you find substantial decay with dark brown or black wood or missing wood the joint will have to be rebuilt. If more than one joint is bad or other repairs are needed, it can be more effective to remove the sash and refurbish it rather than doing a spot repair with the sash in place.

Failing Joint Stabilization

When a sash joint is seriously weakened and letting go it can be stabilized to await a more permanent treatment in the future. An old-time repair method is to screw on a flat corner iron or brace.

Some people regard this quick fix as a slipshod shortcut. I have repaired many sashes that had corner irons slapped on years and even decades before. Without the angle irons those sashes would have fallen apart and been tossed out as trash long before I came along to save them with more effective repairs. I now consider corner irons a reasonable low-cost short-term repair that saves sashes. Even if everyone forgets what "short-term" means, the corner irons can do their job of holding sashes together for decades. I add preservative and sealant treatments that make this simple repair a more effective stabilization. -- JL

The photo shows a meeting rail joint that has failed because its pin hole and pin have decayed. The meeting rail has dropped an inch, leaving a gap between the edge of the glass pane and the putty, which is still attached to the rail. Sometimes the pane drops too, leaving a gap between the top rail and the top edge of the pane.

Failing joints at the top rail of the upper sash and bottom rail of the lower sash can also be stabilized with this same treatment.

Time and costs:

This is a quick low-cost treatment that can take 15 minutes to gear up and 15 minutes to stabilize two joints at one window. Material and supply costs are about \$3 per joint.

Before Treatment:



After Treatment:



Tools:

- Leather work gloves
- Goggles, to protect eyes
- Putty knife
- Small steel brush
- Screwdriver
- Electric drill & 3/16" twist bit
- Caulking gun
- Pliers

Supplies & Materials:

- Tape, for the glass panes
- Wooden stick & shingle, to brace the rail
- Nitrile rubber gloves, to protect hands from preservative
- Borate wood preservative (such as, Jecta brand, or BoraCare), to prevent decay
- Paper towels or rags, for clean up
- Flat corner irons (such as, Stanley, 4"/101mm, zinc plated steel, 30-6580, DP999; or, Brainerd® Flat Corner Braces, 32405, B56040G-ZP-U)
- Removable sealant (such as, Red-Devil® Zip-A-Way™ Clear), to seal the joint



Step 1. Tape and brace

Tape the glass panes above if you plan to leave it in place during this treatment and especially if they are broken or unstable. The tape will help control flying shards of sharp glass if a pane breaks during the treatment.

If the joint has decayed enough to let go, the meeting rail may have dropped down a little. The meeting rail needs to be braced up in case the joint lets go all together. Cut a stick of wood about 1" longer than the distance from the sill up to the bottom surface of the meeting rail. Lay a wood shingle on the sill to protect it from marring. Wedge the stick lengthways between the shingle and the meeting rail, right near the loose joint (photo, right). Don't force it in too tightly, wedge it just enough to hold the stick and the meeting rail in place.

**Step 2. Clean and position**

Clean loose debris out of the stile joints, any muntin joints and glazing dados with a putty knife so the meeting rail can be lifted back up into its original position next to the glass pane, without stressing the glass. The pane may have shifted downward, so pay attention to the top edge of the pane where some cleaning may also be needed. Slide the lower end of the bracing stick toward the window frame to provide a slight and controlled pressure to lift the rail up into position. If the pane needs to shift upward, but it is not moving easily, it may have to be removed or you may accept its current position and the fact that the meeting rail cannot be lifted all the way into its original position.

Clean loose paint and debris off the surrounding wood and glass surfaces with a wire brush for good adhesion of the sealant to come.

**Step 3. Inject preservative**

Prevent or limit decay by injecting borate preservative directly into the joint if moisture problems around the window cannot be resolved right away. Inject the preservative right into the open joint while it is still open a little if decay is minor. Or, drill an injection hole so it does not weaken the joint by cutting the tenon. In cases of major decay inject right at the interface between decayed and sound wood. The wood need not be dry for this treatment; in fact, borate preservatives migrate into wet wood faster than dry wood. Borate preservatives are usually compatible with effective future treatments such as wood-epoxy repairs and wood Dutchmen. Keep the borate preservative well within the joint or holes so it does not prevent adhesion of the sealant to come. Do not use penetrating water-repellent preservatives because they can prevent future treatments from penetrating and may cause adhesion problems for paints and sealants.



Step 4. Seal gaps and joints

Seal any gaps in the joint and between the glass and glazing compound or glazing rabbet with removable sealant. This type of sealant can be easily removed in the future without significant contamination of the surfaces. The surfaces must be dry for good adhesion. Fan wet surfaces or warm gently with a hair drier or hot-air gun for several minutes to promote drying. Apply the sealant with a caulking gun and tool away excess sealant flush with the face of the sash right away. Then let the sealant cure for several minutes until it is no longer tacky, so the corner iron to come will not be unintentionally glued to the sash.



Step 5. Screw on the angle iron

Pre-drill pilot holes and screw on the corner iron. Use utility screws (similar to wallboard screws) made of hot-dipped galvanized or stainless steel. Ordinary wallboard screws could be used, but they may rust out in a few years making later removal difficult and may not withstand the shear-loads encountered on larger sash.

The stabilization is complete. List the sash in a future project for a more permanent repair, or add it to the maintenance schedule to monitor its condition at least once every three years.



Shop Set Up

Set up a sash repair workstation in a work-space and isolate it from occupied spaces to safely control the health hazard of lead containing dust that is generated during sash work. A flat, steady work table is needed and a carpenter's workbench with vises is handy for holding sash and parts while you work on them. Arrange enough room nearby to stack sash and stockpile materials such as wood, glass, glazing compound and paint.

Lead-Safe Operations Highlights

- **Protect People and the Environment:** Prevent the spread of lead to the rest of the building and the environment.
 - **Generate the least amount of dust,**
 - **In the smallest space,**
 - **For the shortest time,**
 - **Exposing the fewest people.**
 - **Use a Floor Containment** system that catches lead-containing debris and dust. Notice this floor containment serves both the sash easel and the end of the workbench. It is made of 6-mil poly with wood 1"x2" furring strips rolled into the edges of the poly and fastened at the corners with two sheetrock screws. Size the floor containment system to be 5 feet in each direction from the location where debris is generated. The floor containment can be made with a gap in the furring strips of the long-side so it folds up like a clam shell. This allows the containment to be moved from one area to another while keeping all the dust in the containment.
 - **Wear Tyvek slippers** within the floor containment and removed them when ever you step out of the containment.
 - **Damp-wipe** sash and tools before removal from the containment.
 - **Change work clothes** for street clothes as you leave the work-space at the end of each work session. Launder work clothes separately from family clothes and then double rinse the washing machine before family laundry is done.
- **Protect Occupants:** Keep them and their pets out of the work-space.
- **Protect Workers:** Minimize exposure to keep lead out of their bodies.
 - **Wear hat** to keep lead dust out of hair.
 - **Wear goggles** to protect eyes from flying debris.
 - **Wear respirator** fit tightly to face around the mouth and nose that filters the air through replaceable cartridges.
 - **Do not eat or drink** during work periods to prevent ingestion of lead. This means workers must be well hydrated by drinking lots of water during breaks and off hours.
 - **Do not smoke** during work periods. Lead containing dust is easily transferred from fingers to the cigarette and is then vaporized and inhaled.
 - **Wash hands and face** when leaving work-space and before eating, drinking or smoking.
- **Establish a Comprehensive Lead-Safe Program:** These highlights do not make up a complete lead-safe program.
 - Study and use the Lead Paint and Historic Buildings Training Manual. (See Appendix.)
 - Hold a daily safety meeting.
 - Test workers for blood-lead levels.
 - Test work-spaces for lead before and after operations.



How to Use this Report

Architects:

Refer to Practical Restoration Reports in your specifications then just include an issue of the report. Provides a hands-on approach contractors appreciate.

Contractors:

Bring your crews up to speed quickly on new preservation techniques with Practical Restoration Reports. Move into productive work with less time and hassle.

Homeowners:

Practical Restoration Reports give you the information you need to talk with tradespeople and contractors confidently. Use them as do-it-yourself guides.

PRACTICAL RESTORATION REPORTS™

This is a detailed technical series on preservation topics. The reports are packed with practical methods you can use now. Sidestep costly mistakes that waste time and money with Practical Restoration Reports.

"These reports are based on real projects and my own thirty years experience as a preservation tradesman and contractor. Each report brings that experience to work for you. During the past twenty years I have consulted on many preservation projects and written about my work in national publications and books. I developed these reports in response to your need for detailed accurate information on a timely basis. The reports contain complete descriptions of useful techniques with drawings and photos. Information in each report is updated as new developments in preservation are actually used on projects around the country." -- John Leeke

"Your Practical Restoration Report is really superb. It is the best thing I've seen on the subject. It's clearly written, not overly technical and easy to understand."—Roger Reed, Maine Historic Preservation Commission

"I landed the contract because your Reports gave me the insight and confidence needed to explain the project to the clients. They said I was the only contractor to give them any hope that the job could be done." "Your reports are most informative and concise. I'm very impressed!", James A. McGrath, Contractor, Eggleston, VA

"Practical Restoration Reports are short, non-technical, and well illustrated...For the building owner, contractor, or architect with a need of solid working information about both what to do and how to do it, they are economical and useful."—Allen Charles Hill, AIA, Winchester, MA

Safety, Accuracy, Non-warranty

While safety topics may be mentioned in this report do not consider this to be complete coverage of safety issues. Always keep safety foremost in your mind throughout your project, especially when working with or near chemicals, electricity or when working in high places (if your feet are off the ground you are in a high place). Building construction and renovation is one of the most hazardous industries.

Every effort is expended to make this report as accurate as possible. If you find inaccuracies, please write. This report is subject to change without notice. This report is presented for its informational value only. It is up to you, your architect, contractor, tradespeople or building owner to determine if the methods, materials and ideas presented here should be used on your project. John Leeke assumes no responsibility or liability for how you use the information. When specific technical advice or other expert assistance is required bring in a qualified and competent professional or specialist for onsite advice.

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If you have any questions on this report, or would like to see a report on a particular topic please write or send email.

Have a better idea? If I have learned one thing working on old buildings it is that there is always more than one way to do any job. Let me know if you have found a better way. I will reward you with free reports for any ideas I use. – John Leeke

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