Window Renovation Guide

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Summary of Window Restoration Guide

The guide provides a comprehensive approach to restoring windows, particularly those in historical buildings, emphasizing techniques and materials that preserve their original character. The key steps and considerations include:

1. Removing and Preparing the Sash:

- Carefully remove window sashes, label glass panes, and detach all hardware. Stripping paint is done using a heat gun or putty lamp, and damaged wood parts are replaced with similar material to match the original.

2. Oiling and Treating the Wood:

- The sash is treated with raw linseed oil, which is heated into the wood to ensure deep penetration, preserving the wood's integrity and sealing it against moisture. Any cracks are filled with linseed oil putty for long-lasting protection.

3. Re-glazing the Windows:

- Glass panes are reinserted into the sash with linseed oil putty and secured with pins. The putty is applied carefully, and practice is recommended to perfect the technique. The hardware is reattached, and corner brackets are filled with putty to prevent moisture accumulation.

4. Painting the Frame and Sash:

- The sash and putty are painted with linseed oil paint, overlapping slightly onto the glass to create a seal. Thin, multiple layers of paint are applied for maximum durability. The guide suggests using intermediate paint shades to make future maintenance easier.

5. Energy Efficiency Considerations:

- The guide addresses the misconception that old windows are inefficient, explaining that, when properly restored, they can achieve U-values comparable to modern windows. Additional measures like low-emission glass or secondary glazing can be added to improve thermal insulation while maintaining the historical appearance.

6. Long-term Maintenance:

- Regular inspections are recommended to check for damage, and maintenance tasks such as repainting or replacing damaged putty should be done as needed. The guide also covers techniques to clean and treat surfaces affected by algae.

The guide emphasizes using traditional materials like linseed oil and putty to maintain the windows' historical authenticity and durability while enhancing their energy efficiency.

Complete instruction on Renovating Older Windows

Assessing Damage in Older Windows:

- Older windows may appear more damaged than they actually are. Often, the wood used in older windows is high-quality core wood, naturally resistant to rot. Such quality is rarely found in modern windows, making it valuable to preserve and restore existing windows whenever possible.
- Usually, a simple repainting can suffice; however, common issues include rot in the lower parts of the window frame (sill) and the lower sections of the window sashes.

Step-by-Step Guide for Detailed Window Repainting

1. Removing and Labeling Glass Panes

- Removing Glass: Start by lifting the sashes out of the frame. Carefully remove the glass panes by removing the putty using a putty lamp. Be cautious to avoid cracking the glass. Label each pane based on its original location, such as the sash it belongs to and its orientation (e.g., top, bottom, inside, or outside). This helps ensure that panes are returned to their original positions after renovation.

- Cleaning and Storing Glass: Once removed, clean each pane and store them safely to prevent damage. Wrap the panes in protective material and place them in a secure location away from the renovation area.

2. Remove all hardware from the sash.

Strip paint from the fittings using a heat gun or putty lamp. Apply a rust-proof paint to the fittings before reattaching them.

3. Removing Paint from Sash and Frame

Using Heat: To remove old paint, use a Speedheater, heat lamp or hot air gun, taking care not to apply excessive heat near the glass or frame to avoid damage. Gently scrape off the softened paint with a putty knife.

4. Repairing Damaged Wooden Components

- Identifying Rot: Inspect the sashes and frame thoroughly for signs of rot, particularly in the lower sections where moisture damage is most likely. If rot is found, remove the affected area and replace it with new timber. Ensure that the replacement wood matches the existing wood type and grain pattern for a consistent appearance.
- Shaping Replacement Parts: Use a chisel and saw to shape replacement parts to fit seamlessly into the original frame or sash. Restoration supply stores may carry pre-shaped components that can be adapted for your specific needs.

5. Treating and Protecting the Wood

Applying Linseed Oil: Apply linseed oil to the sash, making sure to thoroughly saturate the glazing groove. An old, dry sash should be treated with raw linseed oil. It may require up to 0.5 liters of linseed oil per sash. Heat the oil into the wood until it boils vigorously!

Tips from the Window Restorer:

- Buy a high quality brush. Store it in clean linseed oil between painting sessions.
- Work the paint thoroughly into the wood to achieve a smooth and even surface.
- You don't need to paint all the windows at once; tackle one side of the house per year!

Heat the sash using a Speedheater or a hot air gun until the oil boils vigorously! Then, slowly move the heat source forward. Fill any cracks in the wood with putty to prevent moisture from penetrating the sash. It is important to prime the sash with the first layer of paint immediately after heating the linseed oil into the wood! It is also recommended to apply the intermediate coat before installing the glass. See more details in section 9.

6. Re-glazing the Sash

- Secure the glass using pins or a pin gun: A pin gun is convenient if you are concerned about cracking the glass. Apply the putty to the outer side of the glass using a putty knife. It might be a bit tricky at first, but after working on a few windows, you'll get the hang of it.
- Applying New Putty: Prepare linseed oil putty and apply a bead around the perimeter of the glazing rebate. Press the glass pane into the putty, ensuring it sits flush and secure. Use glazier's points or staples to hold the pane in place.
- Finishing with Putty: Apply an additional layer of putty on the outside edge of the glass, creating a smooth and even seal. Shape the putty using a putty knife, ensuring a clean and professional finish.

7. Reinstallation and Adjustment

Reattaching Hardware: Reattach the fittings and hooks to the window sash and frame. If replacements are needed, new versions in various styles are readily available. Note: Corner brackets should be filled with putty to prevent moisture from accumulating behind the metal.

8. Maintenance and Long-term Care

- Regular Inspections: Conduct annual inspections to identify any potential issues early, such as peeling paint, loose putty, or signs of moisture damage. Prompt maintenance can prevent more extensive repairs later.

- Touch-ups and Reapplication: Reapply linseed oil paint as needed, particularly in high-exposure areas. If cracks or gaps in the putty appear, touch them up immediately to maintain the integrity of the seal and prevent moisture intrusion.

9. Painting the Frame and Sash

- Painting with Linseed Oil Paint: Paint the frame and sash using linseed oil paint, applying it very carefully to overlap the putty by about 1 mm onto the glass. This overlap helps create a seal that prevents moisture penetration.
- Intermediate and Final Coats: An effective technique is to use an intermediate paint layer that is a shade lighter or darker than the final coat. This way, it's easier to tell when the final layer needs maintenance or touch-ups.
- Conserving Paint on the Sides: Apply paint sparingly on the sides, as well as on the top and bottom edges of the sashes, particularly if you have double sashes. Excess paint in these areas can hinder the opening and closing of the windows.

Sealing the Window Sashes

- Double and Loose Inner Sashes: If you have double windows or windows with loose inner sashes, focus on sealing the inner sash. The air between the panes should be heated by radiant warmth from the room. Double sashes need a gap between them, and it's crucial not to paint them shut so that air can circulate properly.
- Preventing Condensation: Proper sealing ensures that warm indoor air doesn't heat up the cold outer sash, preventing condensation between the panes. Condensation can damage the lower part of the sash.
- Additional Insulation: Place window wool or other insulation material between the panes to further prevent condensation and heat loss. Adding colorful dried flowers during winter provides a decorative touch that can be removed come spring.

Improving Energy Efficiency for Older Windows

- Myth of Inefficiency: It's a misconception that old windows are far less energy-efficient than modern ones. Properly maintained, old windows can achieve U-values comparable to modern triple-glazed windows.
- Adding Low Emission (LE) Glass: For double-sash windows, adding LE glass to the inner sash can significantly lower the U-value. However, as LE glass is thicker and may reduce light transmission, it should only be used where absolutely necessary, such as on north-facing windows. There are also options for soundproof glass to reduce noise.

Long-term Window Maintenance

- Regular Inspections: Walk around your house and inspect each window, noting any damage incurred over the winter. Based on the inspection, determine the necessary maintenance for each window. Avoid excessive work; there's no need to remove intact linseed oil putty and thin paint layers that are still in good condition. When cleaning windows, take the opportunity to also clean the painted parts of the outer sash using a mild detergent. A well-diluted dish soap is pH-neutral and works excellently.

- Different Needs Based on Orientation: Windows on different sides of the house may require varying levels of maintenance. For example, windows facing south may need repainting every 8-12 years due to greater exposure.

Preserving Original Window Glass

- Value of Original Glass: Preserve original window glass whenever possible. Replacing panes with modern glass can significantly alter the character of your house.
- Sourcing Old or Traditional Glass: It is possible to find used window glass, and some manufacturers produce new glass using older methods. You can find both new and old mouth-blown glass and "culture glass" is machine-made but resembles mouth-blown glass, maintaining the aesthetic of historical windows.

Using Linseed Oil Paint on Windows

- Application Technique: Always use linseed oil paint for windows. Apply it in very thin layers; the more layers, the better the paint withstands environmental exposure. Linseed oil penetrates the wood, sealing the pores and preventing water from entering and causing damage.
- Repairing Cracks: Fill any cracks in the wood with linseed oil putty to maintain the window’s tight seal for a long time.
- Maintenance: Linseed oil paint rarely flakes, but the surface may become matte over the years due to pigment erosion during rain and the leaching of oil. Applying a thin final coat on the cleaned matte surface is a quick and easy way to maintain your windows.
- Dealing with Algae Growth: If algae appear on the paint, clean with a diluted vinegar solution (1:10). Make sure to rinse thoroughly before repainting.

Common Damages to Windows:

- Rusted corner brackets
- Gaps between the sash and the frame
- Missing putty
- Dry cracks and rot in the corners of the sash

- Rot in the bottom rail and frame
- Rusty window sills
- Lack of weatherstripping

Tool List for Window Renovation

- Putty scraper/small scraper
- Paint scrapers in various sizes
- Hot air gun
- Putty lamp (Speedheater/Cobra)
- Fine-tooth saw
- Flat pliers
- A high-quality brush
- Pin gun with pins or hammer and pins
- Putty knife
- Sander for vibrating the glass

Material List for Window Renovation

- Masking tape and pen
- Protective gloves
- Rust-proof paint
- Raw linseed oil –in large quantities
- Linseed oil putty
- Linseed oil paint
- Sealing tape or Ω-omega seal

Literature on the Subject

Windows & Doors on Older Houses, 2011, Nilsson Jarnerup, Liselotte, ICA, Västerås

This book describes the appearance of windows and exterior doors in Sweden from the 1600s onwards. It also includes chapters on window and door restoration, as well as a chapter on color schemes.

Old Windows: Renovate, Restore, and Maintain, 2010, Stenbacka, Alf; Stenbacka, Eva; Photography by von Scheele, Carl, Norstedt, Stockholm

This publication provides detailed guidance on the renovation, restoration, and maintenance of old windows, supported by photography.

Low-Emission Glass and Renovation Improves Older Windows' Thermal Insulation, 1999, from Report TABK, Lund

This study shows that it is possible to reduce heat loss through older windows by 35% without negatively impacting the original architecture. The method involves replacing the inner sash with new glass featuring a low-emission coating. This approach results in heat loss equal to or less than that of newly manufactured windows.

Tips and Advice on Building Preservation, 2008, Gudmundsson, Göran, Bonnier in collaboration with Gård & Torp, Stockholm

This book contains questions and answers about practical building preservation, organized by different parts of the house. The questions and answers were previously published in the magazine *Gård & Torp*.