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Windows for historic and listed buildings

Windows from past eras are not only required for listed buildings. Owners of public and private buildings from past centuries or with historical substance usually also want to use windows true to the original when renovating. In this case, windows with wood frames are best suited, since this material has been commonly used since the beginning of construction.

There are numerous products on the market today that are used to manufacture or renovate historic windows. Often enough, such windows for renovations are individually crafted products made of pine, spruce or oak scantlings.

"When renovating a building, elements from old and unusable windows are often removed, repaired and reused or reproduced by hand based on historical drawings," explains Eduard Appelhans, managing director of [Bundesverbandes Pro Holzfenster](#) (Pro Wooden Window Association).

In principle, the characteristic features of the original windows should be retained when renovating a building:

- Construction: simple, double or box windows
- Form of window frames: e.g. casement or transom
- Type of opening: number of wings and fanlights, sash windows
- Surface treatment of frame: e.g. paint, varnish
- Type of glass and method used to fasten it
- Fittings
- Decorative elements

Thermal insulation is possible today
Single windows have an average U_w value of 4.5 W/m^{2}K. To achieve greater living comfort, a second pane – the outer window – was often installed in front of the main window or hung in winter. This construction is often called a winter window or storm window.

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With the appropriate frame geometry, insulated glazing can replace the single pane so the window's historical appearance isn't disturbed. With this solution, U_w values of roughly 1.9 W/m^2K can be achieved. If the window frame is wide enough, a second casement wing can also be installed and possibly even fit with double glazing, creating a box window.

Old box windows with original glazing have an average U_w value of approximately 2.3 W/m^2K. It's possible here to use insulated glazing in the inner wing if the frame is suitably dimensioned, and U_w values of 1.0 W/m^2K can be achieved. In addition, an all-round seal should be installed on the inside of the perimeter strip in order to prevent condensation. In any case, this type of window can be thermally improved at low cost by using seals.

Composite or coupled windows reached the mass market around 1920 and there are currently still around 40 million of them installed in buildings. In this window type, two casements with single glazing are tightly connected and open on a common hinge. The composite window was the competitor of the insulated glass window, which has dominated the market for the last 70 years.

Sash windows are opened by sliding up the lower section of the window. These windows are still commonly used in the U.S. and England and were popular at the time of the Bauhaus in Germany because they offered the possibility of large glass surfaces and good ventilation. Renovating this type of window usually involves installing new seals and renewing the channels in which the sections slide to improve the sliding function. The Walddörfer Gymnasium in Hamburg is a good example of a current renovation project. The school, built in 1929, was fitted with 167 new sash windows that precisely match the originals.

A tool developed by the Bern University of Applied Sciences has been available on request since 2014 for calculating the thermal renovation of historic windows.

Historic windows are handcrafted
"For us and our member companies, no two windows are the same – regardless of whether they are in a new or old building. Especially when it comes to historic or listed buildings, these custom-made products are the ultimate solution: By integrating modern technology and distinctive

craftsmanship, we create windows and doors that meet the most varied demands in terms of design, technology and function," explains Eduard Appelhans.

The Bundesverband Pro Holzfenster represents around 260 companies, including over 100 that also restore windows in historic buildings. The association is represented at the FENSTERBAU FRONTALE and serves as a contact for appropriate specialists.

There are still several manufacturers who offer decorative wood elements and antique fixtures in their product portfolios. Products from this area will be shown at the FENSTERBAU FRONTALE. Relevant exhibitors can be found at: www.frontale.de/aussteller-produkte using the keyword search.

Caption: Historical windows being tested by Holzforschung Austria.

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