

Original sash windows can be energy efficient

New Research from English Heritage Renews Calls for Their Retention



For the first time in England important scientific evidence is available to counteract some of the misconceptions about the energy efficiency of original timber sash windows, a unique feature of England's built heritage which is under threat and fast disappearing.

English Heritage has released the findings of a study into the thermal performance of traditional sash windows using a 2 x 2 timber sliding sash window dating from the 1880s which had been rescued from a skip. The results showed that even the simplest repair and basic improvements will bring significant

Terrace of properties with timber sash windows
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reduction of draughts and heat loss, and that using a combination of these methods will upgrade most sash windows to meet building regulations.

The key findings are:

- Simple repairs to mend cracks and eliminate gaps can significantly reduce the amount of air infiltration (commonly called draughts). On the window that was tested, air infiltration was reduced by one third.
- Air infiltration through a sash window in good condition can be reduced by as much as 86% by adding draught proofing.
- Heat loss through contact with the glass and frames can be significantly reduced by adopting simple measures like closing thick curtains and plain roller blinds. In the test, heat loss was reduced by 41% and 38% respectively.
- More elaborate measures reduce heat loss even more and can improve windows to meet modern building regulations, which target a U value for windows of 2 or below. In a test with good quality secondary glazing, this value was 1.7. Well-fitted, closed shutters, also produce similarly good results. The best result is when the two methods are used together, resulting in a 62% reduction in heat loss and a U-value of 1.6.

The research comes at a time when large swathes of public and privately owned historic buildings will be subject to refurbishment and retro-fitting to improve their energy performance in order to meet the Government's ambitious climate change targets.

Dr Simon Thurley, Chief Executive of English Heritage, said: "It is very encouraging to see more buildings are being refurbished to meet modern energy requirements, but all too often a drastic and insensitive approach has led to the degradation of our streetscapes. Many original timber sash windows have lasted more than two hundred years and are capable of lasting another century. It is a waste to throw them away unnecessarily. This piece of research provides the hard evidence that shows how easy it is to upgrade them and supports our call for their retention."

Chris Wood, Head of Building Conservation and Research Team at English Heritage, who commissioned the research at Glasgow Caledonian University,

said: "There is a lot of misunderstanding about the potential for historic buildings to be brought up to date. We hope this research will herald serious rethinking, and help homeowners and local authorities refurbish historic buildings with the confidence that modern standards can be met without compromising historic character - whether it is individual dwellings, a local school, town hall or public library."

Details of the research is available from www.climatechangeandyourhome.org.uk

HOW THE RESEARCH WAS UNDERTAKEN

English Heritage provided Glasgow Caledonian University with a traditional 2 x 2 double-hung single-glazed sliding sash window in poor condition, 1.77 x 1.16 metres overall. The window was installed between two environmental chambers, one ("the cold room") maintained at 2°C to simulate outdoor winter conditions and the other ("the hot room") at 22°C to represent room conditions. Heat flow tests were undertaken with the window as-found, after repair, and then after draught proofing. The effects of added curtains, blinds, shutters and secondary glazing were also evaluated. Formation of condensation was also monitored with and without secondary glazing, both open and shut.

The table below shows conduction heat losses through the window glass and frame in 7 different situations as found during the test:

<i>Details of the assembly</i>	U-value of whole window W/m2K	Reduction in heat loss through whole window
Window as found	4.3	-
Joinery repaired	4.3	-
Heavy curtains	2.5	41%
Well-fitting shutters	1.7	58%
Plain roller blind	2.7	38%
Low emissivity secondary glazing	1.8	58%
Low E secondary glazing + shutters	1.6	62%



Timber sash windows © English Heritage