



## Historic England: Secondary Glazing Guidance note summary

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The loss of traditional windows from our older buildings poses one of the major threats to our heritage.

Windows are the eyes of a building - they let in light and give views out - and profoundly affect its appearance. In addition, traditional windows bear witness to the artistic, social, economic and technological developments of past ages. Every effort should be made to retain them.

Unfortunately, older windows can be draughty as over time they distort and become weakened. Although ventilation is important in older buildings, too much air leakage through windows wastes heat, money and is uncomfortable.

Carefully designed and installed secondary glazing allows the original windows to be retained unaltered and repaired, whilst reducing air leakage and heat losses. As a result, there is no loss of historic value and the building

*Carefully designed and installed secondary glazing allows the original windows to be retained unaltered and repaired, whilst reducing air leakage and heat losses*

is warmer and cheaper to heat.

Recent research has shown heat losses by conduction and radiation through a window can be reduced by over 60% by using secondary glazing with a low emissivity (low-E) hard coating facing the outside.

The research has also shown that further savings can be made if the secondary glazing uses insulating frames or incorporates double or vacuum glazed units.

Besides increasing the thermal performance of windows secondary glazing (unlike double glazing) can have other benefits including being highly effective at reducing noise transmission. But before we discuss the benefits, you might be asking “*What is secondary glazing?*”.

## What is secondary glazing?

Secondary glazing is nothing new. In the 19th century some buildings were constructed with internal secondary glazing as part of the original design. Often a second double hung sash window or solid panels with counterbalancing weights were fitted in the space below the window. Their function was to cut down the heat loss and provide acoustic insulation.

Secondary glazing is a fully independent window system installed to the room side of existing windows. The original windows remain in position and in their original form.

Secondary glazing is available as openable, removable or fixed units. The openable panels allow access to the external window for cleaning and the opening of both the secondary glazing and external windows. Fixed forms of secondary glazing are designed to be removed in warmer months when the thermal benefits are not required.

## Why repair existing windows?

Repairing windows is the best way of maintaining the visual character and architectural significance of a building's elevation and can add to its value.

Traditional timber and metal windows can almost always be repaired, even when in quite poor condition and normally at significantly less cost than complete replacement. The timber used in the past to make windows was of a high quality and very durable. Many Georgian and Victorian windows are still in place today whereas modern windows can need replacement after only 20 years.

Choosing between secondary glazing or double glazing.

Double glazed windows usually have sealed glazing units with two panes of glass separated by an air gap which improves thermal insulation. Generally, it is an important development that

has produced energy savings and reductions in carbon dioxide emissions, particularly in new buildings. The Building Regulations make double glazing practically compulsory in new buildings.

However, in historic buildings, there should be a strong preference for repair rather than replacement as the use of double glazing will inevitably lead to a loss of historic value.

Replacement of existing windows with double glazed units can in many cases lead to a change in appearance, particularly the flatness of new glass and the need for thicker timber sections and glazing bars.

Much of the comfort and energy efficiency benefits of new double glazing come from the reduction of draughts that will result from newly-fitted window frames with draught-proofing. These benefits are also available through repair and draught-proofing of the existing windows, or from fitting secondary glazing.

*The benefits of double glazing over other methods of window upgrading are often overestimated and adding secondary glazing would often be the preferred option*

Continual improvements in the performance of secondary glazing are leading to the performance of secondary glazed windows exceeding that of new double glazing.

In terms of noise reduction, double glazed units are often no better than single glazed units; and can be slightly worse for traffic noise. The important criteria for noise reduction are that the windows are well fitted and draught-proofed. Secondary glazing, with its larger gap between the panes, is a better sound insulator. Shutters and heavy curtains can also make significant improvements to noise insulation.

## Secondary glazing or draught-proofing?

Draught-proofing is usually the first option to consider for improving the thermal performance of windows in an older building. As windows are often a major source of air infiltration, draught-proofing is one of the best ways of improving comfort and reducing energy use, with little or no change to a building's appearance at minimal cost.

However, secondary glazing can provide a considerably higher thermal performance than draught-proofing alone. It may also be chosen where installing draught-proofing seals to the windows is particularly difficult. Similarly, many metal-framed windows have gaps that are too large to seal. Windows with leaded lights may allow air infiltration around the lead which can only be satisfactorily addressed with the addition of secondary glazing.

## What are the Benefits of Secondary Glazing?

Although the main purpose of secondary glazing units in older buildings is to improve the thermal performance of windows by draught-proofing as well as reducing the conduction of heat through glass, secondary glazing can provide a number of benefits...

### ✓ THERMAL BENEFITS

Heat loss from a room through a window during the heating season is complex as three main mechanisms are in play:

- By convection and conduction, from the warm room air to the colder surfaces of the glass and the frame
- By the colder surface of the window absorbing infra-red radiation from the room
- By uncontrolled air leakage, which can either bring in cold air from the exterior or take warm air out from the interior; often called air infiltration, this can occur even when the window is closed

Single glazing is a poor insulator and conducts heat easily. For better thermal performance adding a secondary glazing pane reduces heat loss. The optimum airspace between panes is 16 - 20mm. A larger air space allows convection currents to develop within the cavity and more heat to be lost.

The position of a secondary unit is usually dictated by the existing window and can often only be fitted at a distance of about 100mm from the primary glazing. However, a significant proportion of the thermal benefit of secondary glazing comes from separating the frame from the main timber moving parts and frame. In addition, using low emissivity glass for the secondary glazing can further improve the thermal performance.

### ✱ HEAT LOSS THROUGH THE GLASS AND FRAMES

Lost heat passes through the glass and the frame as conduction. The glass is the most conductive part of the window, but heat is also lost through the frame.

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## **HEAT LOSS THROUGH AIR LEAKAGE**

Most heat losses from a typical traditional window are through gaps around the window. With larger windows the proportion of heat lost by conduction through the glass tends to be greater.

Since draughts make people feel colder, occupants may turn up the heating, and also run it for longer. Purpose-made secondary windows form an effective seal over the whole of the frame of the original window and can significantly reduce excessive draughts.

## **NOISE INSULATION**

Windows are one of the most vulnerable parts of a building to noise transmission. A single glazed window without seals may only achieve a noise reduction of 18 – 25dBA. When closed, sealed double glazed units perform little better than single glazing because the two panes of glass are rigidly connected with a minimal cavity so the two panes resonate together.

*‘Secondary glazing can provide a considerably higher thermal performance than draught-proofing alone.’*

A secondary window with an air space of 100mm or more separates the movement of the two panes of glass and reduces the resonance between the two. Sound insulation of up to 45dBA can typically be achieved. Higher levels of sound insulation are obtained as the gap increases particularly if the reveals are lined with an acoustic material. The use of thicker or acoustic laminate glass within the secondary window also improves the acoustic performance of the installation.

## **PROTECTION FROM ULTRA VIOLET LIGHT**

Ultra Violet (UV) light from the sun can cause extensive damage to paintings, fabrics, furnishing and other objects. The use of a film either in laminated glass in the secondary glazing unit or applied as a film to the primary window, will absorb UV light and reduce this risk of damage.

## **SOLAR GAIN**

Windows can admit large amounts of solar energy leading to overheating. Secondary glazing can make this worse if they restrict summertime ventilation. However, curtains or blinds, glare coatings and summer ventilation of the air space can be used to help make the room cooler during the day. Some secondary glazing systems can be taken down in the warmer months.

## **SECURITY**

A second window provides an additional barrier to entry and therefore can provide improved security. The secondary glazing can provide that additional security whilst retaining the existing windows.

Source: This is a summary of a Historic England guidance note, one of a series which explain ways of improving the energy efficiency of roofs, walls and floors in historic buildings. The full range of guidance is available from the English Heritage website <http://historicengland.org.uk/images-books/publications/eehb-secondary-glazing-windows/>

Mitchell & Dickinson are specialists in insulating period and listed properties. We manufacture and install energy saving secondary glazing, draught proofing and insulation. Our unique energy saving systems are quick to install with little disruption to your property. We estimate that the energy used for the installation is saved in around three months and with a phenomenally high return on investment, it's a system that works equally for your pocket, your property and the planet.

CosyGlazing is a unique secondary glazing system that is elegant, effective and unobtrusive. Made of Plexiglass – a modern, lightweight equivalent to glass – and fixed using magnetic strips, it is easy to remove for cleaning. It can be supplied in white or with a wooden frame to complement your property.

## CosyGlazing

1. Reduces heat loss from single glazed windows by 70%
2. Fits to every type of window
3. You can open your windows as usual
4. Is approved for Grade I and Grade II listed buildings
5. Is made from Plexiglass, an ultra-high insulation material which is used for aeroplane windows

Unlike conventional secondary glazing, which has a large aluminium frame, CosyGlazing mounts directly on to the opening window sashes, making it virtually invisible from the inside or outside, and allowing you to open your sash or casement windows as usual.

To find out how we can help make your home warmer, cheaper to heat and more beautiful call the team on 01237 429826 (Bideford) or 0845 347 9367 (Bristol). Or email us on [info@mitchellanddickinson.co.uk](mailto:info@mitchellanddickinson.co.uk)