BLINDS, CURTAINS AND SHUTTERS

Most households use blinds and curtains for decoration and privacy but they often do not provide any significant thermal resistance. However in temperate climates with cool winters the addition of suitable internal window coverings provides the means to better insulate our windows. This creates an insulating air layer between room and the window, which, along with improved glazing, provides effective management of heat.

Benefits

The energy benefit of window coverings and pelmets is to provide an additional insulation barrier to heat loss through windows. They also provide:

1. reduced energy consumption from artificial heating and cooling by trapping thermal energy
2. assistance to passive heating in winter – if left open during the day and then closed in the evening, a room can absorb solar heat and contain it during the night
3. reduced glare
4. a limited reduction in noise.

Types and techniques

Pelmets. A pelmet is a box-like c vering that sits over the curtain at the top of windows. Curtains and pelmets were common in the past and recognised for their thermal performance, however recently they have been considered unfashionable. Pelmets need not be large imposing boxes, with a range of invisible and minimalist options available. Pelmets are an essential addition to heavy drapes, because they stop circulation of warm air behind the drapes that creates cold draughts. If the drapes or curtains are not properly sealed to the floor or top of the window then the warm air created by a heater will rise to the top of the window and be drawn down into the space between the window and curtains, driving a current of air that moves cold air into the room. By sitting atop the curtain and being adjacent to the wall, the pelmet blocks the air from circulating around the back of the curtains [43]. If pelmets are not used then thick blinds that are recessed into the window (on all sides) are necessary to stop the circulation of air [44]. The appropriate types of blinds in this case are Holland, Roman and Austrian Blinds.

High-performance blinds and curtains. Good insulating qualities can arise from either backing the curtain fabric with a heavy insulating material, or from having the curtain strucure with an integral air gap. An example of an air gap blind is shown in Figure 3.10, using a collapsible hexagonal cellular structure.

This particular blind type, when used with (and compared to) a single-glazed window, would reduce the U value from 5.4 down to 2.4, a 56% reduction in heat flow ([45] case 7).

Shutters. Adjustable internal shutters are becoming an increasingly common window covering in Australia. As a means of controlling heat flow they compare very well with heavy curtains so long as the shutters are able to close fully and there is minimal leakage around the sides of the shutter. They have the benefit of being adjustable, and therefore useful in daytime to control radiant heat, whereas a curtain would normally not be partially closed.

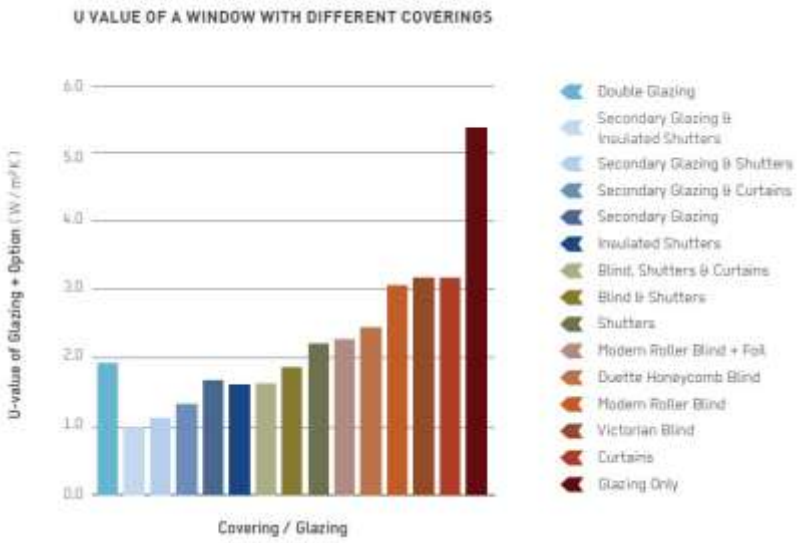

FIGURE 3.11
U value of a window with different coverings

Potential for Demand Reduction

A University study [45] examined the insulative benefits of different window coverings used in conjunction with a single-glazed window.

This is shown in Figure 3.11. On a single-glazed window, this shows that good window coverings provide a thermal benefit comparable to fitting double glazing. However the retractable window covering is obviously only beneficial when it is closed, which is usually at night.

Implementation Recommendations

The Buildings Plan proposes installing heavy drapes and pelmets (or recessed thick blinds) in residential buildings in climates with cool winters, climate zones 4, 5, 6, 7, 8 (see Appendix 2 for climate zones).

To provide good insulation drapes should be made from thick blackout material and preferably be backed with a thermal barrier. In order to avoid convection heat losses curtains need to be installed close to windows, with sufficient width to span the entire window and wrap onto the wall, and should ideally reach the ground. It is important there is no gap between the top of the curtains and the underside of the pelmet and the pelmets should be joined to the wall. This creates a vertically sealed system.

Source: http://decarboni.se/publications/zero-carbon-australia-buildings-plan/2-improving-thermal-performance-building-envelope