

# New Thermal Insulation Regulations

by Brian Anderson

The Building Regulations for the Conservation of Fuel and Power are being revised. Those for England & Wales have been recently published and will come into operation on 1st April 1990; those for Scotland will be published very soon. (Similar proposals for Northern Ireland are expected in the near future.)

The changes involve revisions to the current regulations in Part L of the Building Regulations 1985 and Part J of the Building Standards (Scotland) Amendment Regulations 1982. At present these Regulations themselves include maximum U-values for walls and roofs and maximum glazed areas; but in the new form the regulations simply require that "reasonable provision shall be made for the conservation of fuel and power", with supporting documents setting out interpretations of "reasonable". For England & Wales, Approved Document L provides guidance which, although not mandatory, can be expected to be the norm that will be followed in almost all cases. In Scotland the Technical Memorandum to Part J has statutory effect in terms of demonstrating compliance with the regulation.

The principal changes are to the U-values for walls and roofs, and the introduction of a U-value limit for ground floors. The cost effectiveness and technical feasibility of the new values has been demonstrated in the Energy Efficiency Demonstration Scheme (EEDS) which is managed by BRECSU on behalf of the Department of Energy, Energy Efficiency Office.

As at present, calculation procedures allow greater flexibility between glazed areas and/or the insulation levels of individual elements of the building envelope.

The requirements for England & Wales and for Scotland are being aligned, avoiding, for instance, the difference in glazed areas for dwellings which exists at the moment.

It will be possible to comply with the requirements of the regulations using either an Elemental Approach or by using Calculation Procedures.

## Elemental Approach

Under the elemental approach to compliance with the regulations, each element of the building fabric (walls, floors, roofs) is designed such that its U-value is not greater than the specified value, and the areas of glazing do not exceed certain limits which are dependent on the type of building.

The new values are given in Table 1.

Apart from the higher insulation requirement for the domestic roofs, the values in Table 1 amount to a general requirement of  $0.45\text{W/m}^2\text{K}$  all round the building envelope, for elements exposed to the outside air or next to the ground. Examples of a semi-exposed wall or floor include those between a dwelling space and an attached garage, or between heated commercial premises and an unheated store (the present exemptions from insulation regulations for unheated buildings or those with only a low level of heating are being continued).

The U-value of an uninsulated ground floor is dependent on the size of the floor. The level of  $0.45\text{W/m}^2\text{K}$  means that only smaller floors are required to be insulated: the critical size for a detached building is about  $15 \times 15\text{m}$ .

Maximum window areas for single glazing in buildings other than dwellings are unchanged. In dwellings single glazing is currently subject to a maximum percentage of the perimeter area; in future this will be 15% of the total floor area of

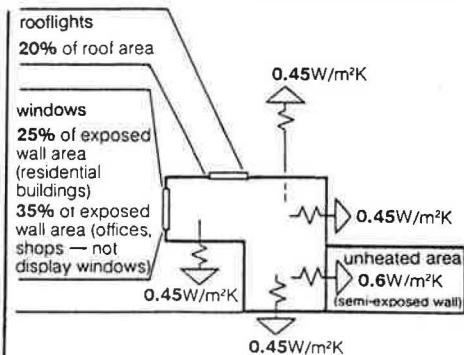
Table 1  
Maximum U-values of elements ( $\text{W/m}^2\text{K}$ )

Building type	Ground floors	Exposed walls Exposed floors	Semi-exposed walls and floors	Roofs
Dwellings	0.45	0.45	0.60	0.25
All other buildings	0.45	0.45	0.60	0.45

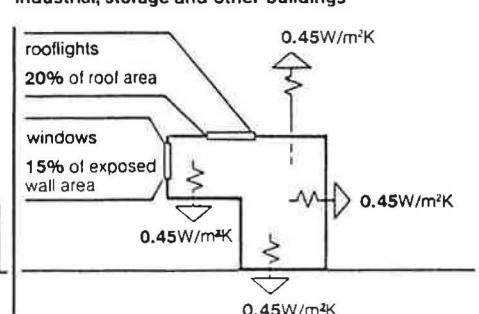
An exposed element is one exposed to the outside air; a semi-exposed element is one separating a heated space from a space having one or more elements which are not insulated to the levels in the Table.

## Elemental U values and glazing areas

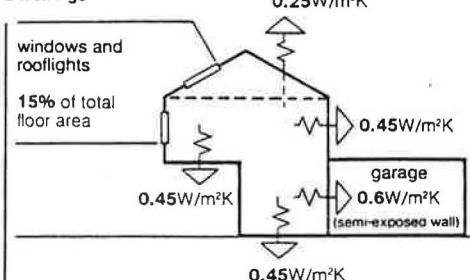
### Residential, offices, shops and assembly buildings



### Industrial, storage and other buildings



### Dwellings



the dwelling (summed over all storeys if more than one, but excluding the floor area of an attached or integral garage). The percentages are shown for all building types in Table 2.

**Table 2**  
Maximum single glazed areas of windows and rooflights.

Building type	Windows	Rooflights
Dwellings	Windows and rooflights together: 15% of total floor area	
Other Residential	25% of exposed wall area	20% of roof area
Places of assembly, offices, shops*	35% of exposed wall area	20% of roof area
Industrial and storage	15% of exposed wall area	20% of roof area

\* in shops, any display window at access level may be ignored.

**Approved Document L would also allow one of the following options:**

(a) areas which are double glazed may have up to twice the areas in Table 2 or  
(b) for dwellings only, double glazing half the total window area with U-value for

able in Scotland by using a calculation procedure.)

#### Calculation Procedures

Calculation procedures allow, within

certain limits, greater flexibility in the design. The U-values and/or glazed areas specified in Tables 1 and 2 can be exceeded provided that

(a) the building does not have a greater calculated rate of fabric heat loss as a result, or

(b) the building does not have a greater calculated net energy consumption (taking into account any useful heat gains) as a result.

These options will be examined in a later article.

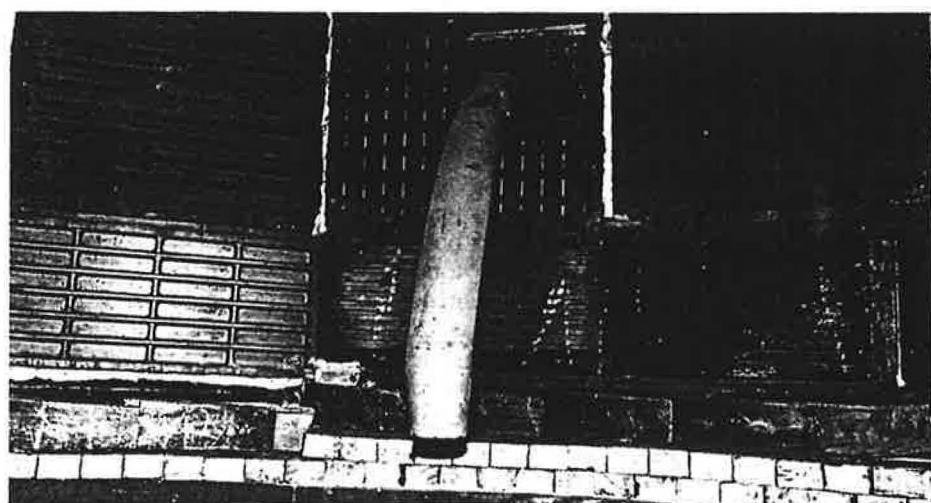
#### Building Services

Part L in England & Wales and Part J in Scotland also deal with the provision of heating controls and the insulation of hot water storage vessels, pipes and ducts. Essentially the existing requirements would be continued, with the addition of one calling for the provision of temperature control on domestic heating systems.

Further information on related project profiles can be obtained free of charge from the Programme Office, BRECSU, Building Research Establishment, Garston, Watford WD2 7JR.

## Using fossil fuel to reduce electricity demand in arc furnaces

(Continued from page 23)



The flexible sidewall burner.

of foaming slag. This feature enables higher electrical powers at improved power factor to be used, thereby reducing the overall operating time of the electric arc during the refining and temperature

raising part of the production cycle. Brymbo have suffered some problems with premature failure of the refractory roof lining. Modifications to both the refractory lining and the control of the burner have been made to reduce these problems. At present, operation of the unit and the power input in burner mode is automatically restricted to 10 minutes

been maintained at approximately 80 minutes, while the average tap weight has been increased by something approaching 10%.

#### Further information

Peter Williams, the ETSU project officer for the steel sector, will gladly answer any queries regarding energy saving opportunities in this industry. Peter can be contacted on 0235 433576. Queries of a more general nature should be directed to the Energy Efficiency Enquiries Bureau, ETSU, Building 156, Harwell Laboratory, Oxon OX11 0RA. Tel No: 0235 436747.

## REO changes

There have been a number of personnel changes amongst the Regional Energy Efficiency Officers recently. Don Bennett has retired in the West Midlands and has been replaced by Michael Russell. Robin Gardner of North West region is going on secondment to Brussels and has been succeeded by his deputy, John Mortimer. Allan Franklin has moved from South East region to join the Energy Efficiency Office HQ in London.

per basket at a gross power of 10MW.

Despite this restricted usage, year on year saving achieved was 14 therms,