REGULATING FOR ENERGY EFFICIENCY -
PART L (DWELLINGS) 2002

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Department of the Environment and Local Government
Part L - Update

Driving Forces

• Sustainability

• KYOTO Targets

Commitment to Improve Standards
Part L - Update

Step 1: Dwellings

- Consultation - Nov 2001
- Final version - June 2002
- Implementation - Jan 2003
Part L - Dwellings

Implementation

Commencement of works - 1/1/2003 except
• planning applied - 31/12/02, and
• substantial work - 31/12/05

**replacement of ext. doors, windows, rooflights**
• commencement of works - 1/7/03
Part L - Dwellings

MAIN CHANGES

• Improved fabric insulation
• Application
  - Replacement windows/doors - treat as material alteration
    but not
  - works (incl. extensions) to “protected structures” or “proposed protected structures”
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**MAIN CHANGES (contd.)**

- No “reduced provision” for
  - *Conservatory style sunrooms* - treat as integral *or* as extension
  - *Holiday Homes* - no special treatment
- *Heating and water controls* - clarification
- *H.W. Storage Insulation* - factory fitted
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MAIN CHANGES (contd.)

• *New I.S. EN calculation standards*
  - opaque areas
  - windows
  - floors
  - “semi-exposed areas”.
• *Treatment of Thermal bridging.*
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HOW TO SHOW COMPLIANCE

Retain existing three methods

• Elemental Method.

• Overall Heat Loss Method.

• Heat Energy Rating.

+ Thermal Bridging, Air Infiltration, Controls and Insulation of Space Heating and Hot Water Systems
### Part L - Dwellings

#### Heat Energy Rating

<table>
<thead>
<tr>
<th>Area of Heat Loss Elements/ Building Volume (At / V) (m⁻¹)</th>
<th>Maximum Permitted Heat Energy Rating (MPHER) (kWh/m²/yr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>101.4 (138.4)</td>
</tr>
<tr>
<td>1.0</td>
<td>99.0 (127.0)</td>
</tr>
<tr>
<td>0.8</td>
<td>92.6 (115.6)</td>
</tr>
<tr>
<td>0.6</td>
<td>88.2 (104.2)</td>
</tr>
<tr>
<td>0.4</td>
<td>83.8 (92.8)</td>
</tr>
<tr>
<td>0.3</td>
<td>81.6 (87.1)</td>
</tr>
</tbody>
</table>

MPHER = 22 \( \frac{A_t}{V} \) + 75

*Current values in brackets*
### Part L - Dwellings

#### Overall Heat Loss

<table>
<thead>
<tr>
<th>Area of Heat Loss Elements/Building Volume ($A_t/V$) ($m^{-1}$)</th>
<th>Maximum Average U Value ($U_m$) ($W/m^2K$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>0.39</td>
</tr>
<tr>
<td>1.2</td>
<td>0.40 (0.61)</td>
</tr>
<tr>
<td>1.1</td>
<td>0.41</td>
</tr>
<tr>
<td>1.0</td>
<td>0.43 (0.64)</td>
</tr>
<tr>
<td>0.9</td>
<td>0.45</td>
</tr>
<tr>
<td>0.8</td>
<td>0.48 (0.69)</td>
</tr>
<tr>
<td>0.7</td>
<td>0.51</td>
</tr>
<tr>
<td>0.6</td>
<td>0.56 (0.79)</td>
</tr>
<tr>
<td>0.5</td>
<td>0.62</td>
</tr>
<tr>
<td>0.4</td>
<td>0.72 (0.97)</td>
</tr>
<tr>
<td>0.3</td>
<td>0.87</td>
</tr>
</tbody>
</table>

$U_m = 0.24 + 0.19V/A_t$

• Current values in brackets.
Part L - Dwellings

MAXIMUM U VALUES (W/m$^2$K) (HER and OHL methods)

- ROOF 0.25
- WALL 0.37
- FLOOR 0.37
# Part L - Dwellings

## Elemental U Values (W/m²K)

<table>
<thead>
<tr>
<th>Component</th>
<th>New</th>
<th>Existing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall</td>
<td>0.27 (0.45)</td>
<td>0.60</td>
</tr>
<tr>
<td>Roof (ceiling level)</td>
<td>0.16 (0.25)</td>
<td>0.35</td>
</tr>
<tr>
<td>Ground Floor</td>
<td>0.25 (0.45)</td>
<td>-</td>
</tr>
<tr>
<td>Exposed Floor</td>
<td>0.25 (0.45)</td>
<td>0.60</td>
</tr>
<tr>
<td>Window</td>
<td>2.20 (3.30)</td>
<td>2.20 (3.30)</td>
</tr>
</tbody>
</table>
### Part L - Dwellings

**ELEMENTAL U VALUES - ROOFS**

(W/m²K)  

<table>
<thead>
<tr>
<th>Element</th>
<th>New</th>
<th>Existing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitched roof</td>
<td>0.16</td>
<td>0.35</td>
</tr>
<tr>
<td>- ceiling level</td>
<td>0.16</td>
<td>0.35</td>
</tr>
<tr>
<td>- slope</td>
<td>0.20</td>
<td>0.35</td>
</tr>
<tr>
<td>Flat roof</td>
<td>0.22</td>
<td>0.35</td>
</tr>
</tbody>
</table>
Part L - Dwellings
<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall</td>
<td>50-70</td>
<td>80 - 150</td>
</tr>
<tr>
<td>Roof</td>
<td>150-200</td>
<td>250 - 300</td>
</tr>
<tr>
<td>Floor</td>
<td>50-60</td>
<td>100</td>
</tr>
<tr>
<td>Window</td>
<td>double glazing</td>
<td>+low-E</td>
</tr>
</tbody>
</table>
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Windows and Doors - New Dwellings

• **OHL & HER Methods:** No specific U value set.

• **Elemental Method**

  Average U-value < 2.2 W/m$^2$K BUT may vary with area (see Table 2)

[Element values may vary provided AVERAGE value acceptable]
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Extensions & Conservatories

• Elemental Method - as new building
  BUT if using Table 2 for windows & doors, can
  – treat as part of overall building, or
  – treat extension separately [Par.1.2.3].

• When separate from dwelling can use U value
  of 2.2 W/m²K, with no limit on glazed area.
  [Pars. 1.1.3 & 1.2.3]
Windows and Doors - Determination of U-value

[complete window unit, i.e. frame and glass combined]

• Measurement - I.S. EN ISO 12567-1: 2001
• Estimation - TGD L(2002), Table 31
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Limitation of Thermal Bridging

- lintel, jamb & sill details in TGD.
- Homebond “Right on the site No. 28”
- “Robust Details” published by DTLR(UK)
- Use of details satisfying Table 42 (TGD)
- Thermal Bridge losses less than 16% of element losses (Appendix D).
Part L - Dwellings - Robust Details

- Proprietary cross flow rafter ventilator
- Ensure roof insulation meets wall insulation in this area
- Soffit vent
- Vapour control layer

Source: HomeBond Right on the Site no. 28
Part L - Dwellings - Robust Details

- Perimeter insulation e.g. 25mm insulation of conductivity 0.035
- Internal wall
- Insulation
- Edge insulation
- Party wall
- 65mm min. screed
- 150mm concrete slab
- Edge insulation

Source: HomeBond Right on the Site no. 28
Part L - Dwellings - Robust Details

- Source: HomeBond Right on the Site no. 28

Diagram: Robust Details of an external wall with layers labeled as follows:
- External wall
- Vapour control layer
- Insulation
- Party wall

Legend:
- Party wall (and any other internal masonry walls) should be insulated for a minimum distance of 1 m from the external wall.
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Construction Precautions

• Proper Installation of Insulation.
  – Ensure completeness
  – Avoid gaps

• Detailing at Joints, Junctions, Openings to eliminate Thermal Bridging.

• Minimise Air Infiltration.

• Vapour Control Membranes where appropriate.
Part L - Update

Step 2: Other Buildings

- Proposals to BRAB - end 2003
- Consultation - Spring 2004
- Final Version - Autumn 2004
- Implement - Spring 2005