

What is a U-value?



Mayo Energy Agency

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To put it simply, U-Value is the measure of the rate of heat loss through a material. Thus in all aspects of home design one should strive for the lowest U-Values possible because the lower the U-value – the less heat that is needlessly escaping. So for example single glazed windows have a typical U-value of 5.6 W/m²K while double glazed windows have a typical U-value of 2.8 W/m²K or lower. Reference Building Regulations 2005 TGD-part L May 2006

The calculation of U-values can be rather complex - it is measured as the amount of heat lost through a one square meter of the material for every degree difference in temperature either side of the material. It is indicated in units of Watts per Meter Squared per Degree Kelvin or W/m²K. Note that Kelvin is used as the scale of temperature difference, but this is numerically equal to °C. So for example, one square meter of a standard single glazed window will transmit about 5.6 watts of energy for each degree difference either side of the window or a U-Value of 5.6. A double glazed window will be significantly better with a U-value of 2.8 i.e. only transmitting 2.8 watts of energy in similar conditions.

Typical U-Values

Note: These U-values are provided as a guide. U-values may vary depending on the particular construction e.g. block or brick wall. The choice of materials has an impact on energy's consumption..

WALLS (Building Regulations: Max U - 0.27)

Cavity Wall Insulation	U-Value
100mm Blown Polystyrene	0.30
100mm Blown Mineral Wool	0.30
100mm Blown Cellulose Fibre	0.30
60mm Extruded Polystyrene Insulation	0.40
35mm Polyurethane Foam Board	0.39
35mm Phenolic Foam Board	0.37
Timber Frame 150mm, Mineral Quilt	0.25
Timber Frame 140mm, Cellulose Fibre	0.19
Safe-warm Home Construction	0.31

External Wall Insulation	U-Value
60mm Moulded Polystyrene	0.44

Internal Wall Insulation	U-Value
50mm Expanded Polystyrene	0.48
38mm Polyurethane	0.45

FLOORS (Building Regulations: Max U - 0.25)

Note: U-values are based on concrete slab construction

	U-Value
60mm Polystyrene	0.45
38mm Polyurethane	0.45

ROOF ATTIC, ATTIC ROOM and FLAT ROOF. (Building Regulations: Max U - 0.16, 0.20 & 0.22)

Pitched Roof with Attic Space U-Value
Note: To achieve these U-values, insulation must be between and over ceiling joists.

150mm Glass Wool	0.25
150mm Rock Wool	0.23
150mm Sheep's Wool	0.23
200mm Glass Wool	0.19
200mm Cellulose Fibre	0.16

Attic Room	U-Value
70 mm Polyurethane	0.21
130 mm Expanded Polystyrene	0.25

WINDOWS, EXTERNAL DOORS AND ROOFLIGHTS (Building Regulations: Av U- 2.20)

Windows	U-Value
Single Glazing	5.7
Double Glazing	2.8
Double Glazing, with Argon	2.6
Double Glazing, Low-E	1.8
Double Glazing, Low-E with Argon	1.5

Externals Doors	U-Value
Solid wooden part glazed	3.0

Roof lights	2.2
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National standards Authority of Ireland,
Irish agreement board:
www.nsai.ie

Department of the Environment,
Building Regulation 2005, technical guidance
document L:
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