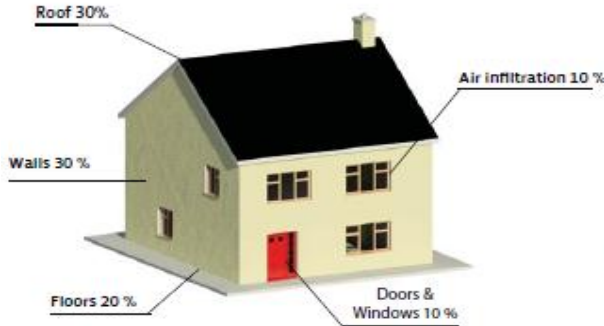


## Fact Sheet No.2



### THERMAL INSULATION: How to cut heat loss and save money

The amount of heat that can escape from badly insulated homes:



#### Introduction

Thermal insulation is still *the* most important and *the* most cost effective way of saving energy and for virtually all homes will have the single largest impact on reducing fuel costs year after year. Improving the thermal insulation standards of the home should therefore be the No.1 priority.

Before planning improvements to the Thermal Environment of the home (to replace an old boiler, etc.) it is advised to pay important attention to the thermal insulation within the home. Not only will this reduce fuel consumption and bills year after year, but the home will become more comfortable to live in.

#### U-Values (W/m<sup>2</sup>K)

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 5.7- while double glazed windows have an efficient U-Value of 1.4, and less than 1.1 for the triple glazing.

#### Near Zero Energy Buildings (NZEB)

NZEB standards will be passed into legislation before 2020. NZEB means a building that has a very high energy performance where the very low amount of energy required should be covered by energy from renewable sources. With these standards all new buildings will have to be designed to nearly zero energy building standards. For houses, the NZEB standard will equate to an A2 Building Energy Rating (BER).

#### Building Regulations 2011 – Part L Conservation of Fuel and Energy

##### - Revised U-Values:

Building Fabric:	U-Value 1997	U-Value 2011
External Walls	0.45	0.21
Pitched roof insulation horizontal at ceiling level	0.25	0.16
Pitched roof (insulation on slope)		0.16
Flat roof	0.25	0.22
Dwarf Wall (Room in the roof) Insulation fitted between timber studs	0.45	0.27
Ground Floor (Standard Heating System)	0.45	0.21
Ground Floor (Under Floor Heating System)		0.15
Windows	3.3	1.6

Building Fabric: Insulation Method	Equivalent Insulation Thickness	
	1997	2011
Attic (fibreglass/Rockwool)	150 mm	300 mm
Cavity Insulated Wall (thermal insulation)		
(a) Conventional inner leaf	60 mm	80 mm
(b) Lightweight concrete block inner leaf	60 mm	90 mm
Wall with insulation between timber frames or studs e.g. timber frame wall, internal insulation to hollow block or cavity wall	75 mm	150 mm
Slab-on-ground floor (typical semi-detached house)	40 mm	100 mm
NB: Insulation thickness will vary with thermal conductivity of each product.		

#### Loft Insulation

Loft insulation is one of the easiest and most cost-effective ways of improving the energy efficiency of the home, but there are still many homes that have insulation that doesn't meet the current Building Regulations or in some cases have no loft insulation at all.

When installing loft insulation for the first time, or upgrading existing insulation, the recommended thickness is now in excess of 300mm for fibreglass / Rockwool. Various insulating materials can be used, for example mineral wool, sheep's wool or cellulose fibre (certified products should only be used).

A specialist installer would normally carry out the work, but if the homeowner decides to undertake the work as a DIY project, the instructions have to be followed for

handling the insulation material, and for proper completion of the work (e.g. for maintaining eaves ventilation). As part of the loft insulation work, take the opportunity to make sure that any pipes and tanks in the loft are properly insulated to avoid freezing and heat loss.

### Cavity Wall Insulation

Cavity wall insulation is a very cost effective way of saving energy for most homes – about 30% of the heat lost from an average home is through the walls.

Cavity fill should only be carried out by a professional installer who is licensed to undertake this type of work. A 25 years guarantee/certificate on materials and workmanship should be provided on completion of installation.



The process is quite simple for a certified insulation installer. Essentially a number of small holes are drilled through the external leaf of the wall, the thermal insulation material is then pumped into the cavities through these holes, and on completion the holes are plugged so as to be virtually unnoticeable. Any ventilation openings in the walls (such as air bricks etc.) must be protected during the process so that they are not blocked in any way.

### Draught proofing

Effective draught proofing will not only save money on fuel bill, but will also make the home more comfortable to live in. Draughts are where cold air is entering through gaps in windows and doors frames. This means hot air is escaping somewhere.

Also, check pet flaps and places where pipes and cables etc. pass through walls - the heat could be lost there too. And don't forget the letterbox. Special draught proofers are available for letterboxes which cut down draughts but still allow your mail to pass through.

When carrying out draught proofing, remember that it is important to maintain a reasonable level of ventilation. Without it the whole house could become stale, stuffy or even damp. Ventilation is also essential for certain types of heating equipment, and for gas fires etc., so never block off ventilators or air bricks unless they are not needed.

Most of the thermal insulation companies can give expert advice on draught proofing possibilities and can check what ventilation is needed for heating equipment etc. – please take their advice.

### External Wall Insulation

External Wall Insulation is a method of insulating the outside walls by applying insulation panels to the walls of the buildings and finishing with a rendering system to provide protection from external forces and the weather. Approximately an excess of 120mm of insulation is required to meet requirements.

External wall insulation is most suitable for masonry walls that are of solid construction Not generally recommended for steel or timber frames.

The National Standards Authority of Ireland provides guidelines in relation to the application of external wall insulation along with a comprehensive list of Irish certified products and a directory of approved installers that can provide both a guarantee and a warranty for the installation.

<i>External wall Insulation</i>	<i>Cost</i>	<i>Grant Value</i>
<i>Apartment or Mid-terrace House</i>	€8,000 - €10,600	€2,750
<i>Semi-detached or End of terrace</i>	€14,000 - €16,500	€4,500
<i>Detached House</i>	€18,000 - €30,000	€6,000

### Floor Insulation

Wooden Floors can be insulated. For example, this could be done by:

- Fixing mineral wood insulation beneath wooden floor boards (ensure that any necessary air vents are not blocked).

Again, though, floor insulation is not normally a suitable DIY project, and you should always seek qualified advice.

### Product Certification

Agrément certification is designed specifically for new building materials, products and processes that do not yet have a long history of use and for which published national standards do not yet exist. NSAI Agrément assesses, specifies testing, and where appropriate, issues Agrément certificates for such products.

Any contractor wishing to install insulation upgrades must also have the relevant certification. A number of installer schemes have been developed whose aim is to verify the competency of installers carrying out improvements to dwellings. NSAI Agrément offer registration to installers of Blown Loft Insulation, Full Fill Cavity Wall Insulation and External Insulation.

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