

APPROVED DOCUMENT L 2021 GUIDE (ENGLAND) - FOR SUPAFIL® 34

February 2024



**Total assurance from your partner
in low-carbon home insulation**



Thermal



Fire Safety



Acoustic



Sustainability



Real Performance

Housebuilding is Changing	- 3 -
Approved Document L: What's new for housebuilders	- 4 -
Insulation that gives real performance	- 6 -
Confidence in a job well done	- 7 -
What are the Part L U-values?	- 8 -
PSI-value calculations – what's changing?	- 9 -
How Knauf Insulation can help	- 10 -
Product information	- 13 -
Pitched Roof - Cold roof	- 14 -
Pitched Roof - Warm roof	- 15 -
Masonry Cavity Walls - Full-Fill with blown-in glass mineral wool	- 16 -
Timber Framed Walls - Blown-in glass mineral wool	- 17 -
Whole House Recipes	- 18 -
5 Bed detached with 3 wet rooms	- 20 -
4 Bed detached with 2 wet rooms and integral garage	- 22 -
3 Bed semi-detached with 2 wet rooms	- 24 -
2 Bed bungalow with 1 wet room	- 28 -
1 Bed apartment with 1 wet room (ground floor)	- 29 -
1 Bed apartment with 1 wet room (middle floor)	- 30 -
1 Bed apartment with 1 wet room (top floor)	- 31 -
Part B: What's new for housebuilders?	- 32 -
Reaction to fire – regulatory requirements	- 34 -
Part O: What's new for housebuilders?	- 36 -
A look ahead	- 38 -
About Knauf Insulation	- 40 -
Our accreditations	- 41 -
Glossary	- 42 -

HOUSEBUILDING IS CHANGING



Right now, developers face unprecedented demand for quality homes, built to precise standards, against an increasingly challenging backdrop of compliance, cost pressures and rising customer expectations.

And the updates to Part L of the Building Regulations are just the tip of the iceberg. These higher standards and greater scrutiny are indicative of a broader shift in our industry; in the last year alone we've seen a similar tightening of Part B (Fire safety) and Part V (Ventilation), along with the introduction of Part O (Overheating).

Insulation will play a crucial role in navigating this increasingly complex regulatory landscape, both today and in the long-term. But for products like insulation to be truly effective we must focus on closing the gap between the designed performance of buildings, and how they perform in the real world. At the moment that gap is significant, and it threatens to undermine our efforts towards safer, more comfortable, truly energy efficient homes.

It is essential that the industry pulls together to meet this challenge. Manufacturers, specifiers, installers and developers must operate collaboratively and with complete transparency, to ensure every part of the housebuilding process takes us closer to our shared goals.

We've developed this new edition of our guide to help those within the housebuilding industry find their optimal route to Part L compliance. The following pages review the headline regulation changes and provide technical information and example recipes. But we've also taken a look at the bigger picture, sharing an overview of Part O and changes to Part B, along with insights into upcoming regulations like the Future Homes Standard.

I hope this guide will be a valuable tool, not only for achieving compliance, but in raising the bar for quality and performance across the housebuilding sector.

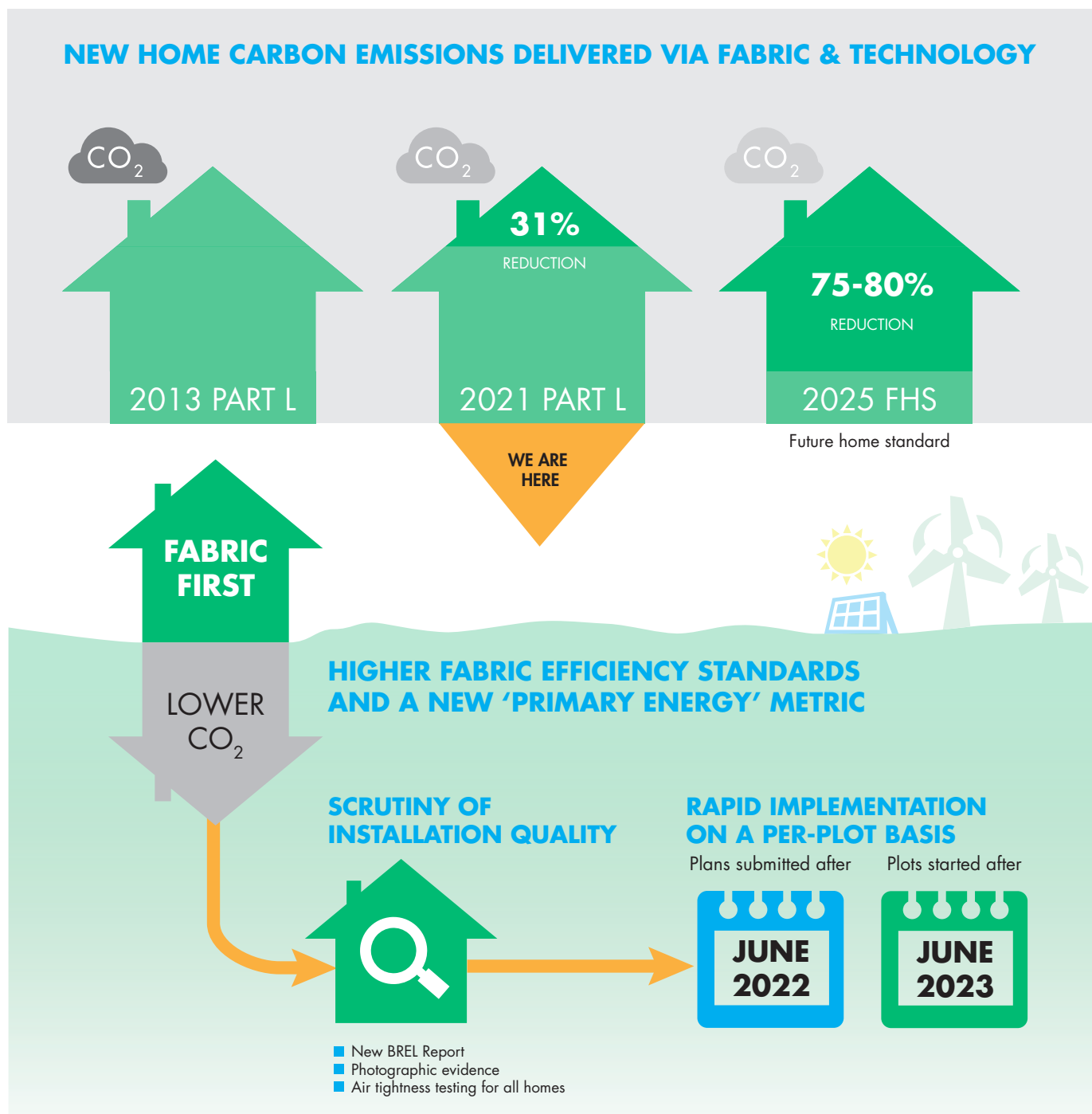
Neil Hargreaves

Managing Director, Knauf Insulation Northern Europe

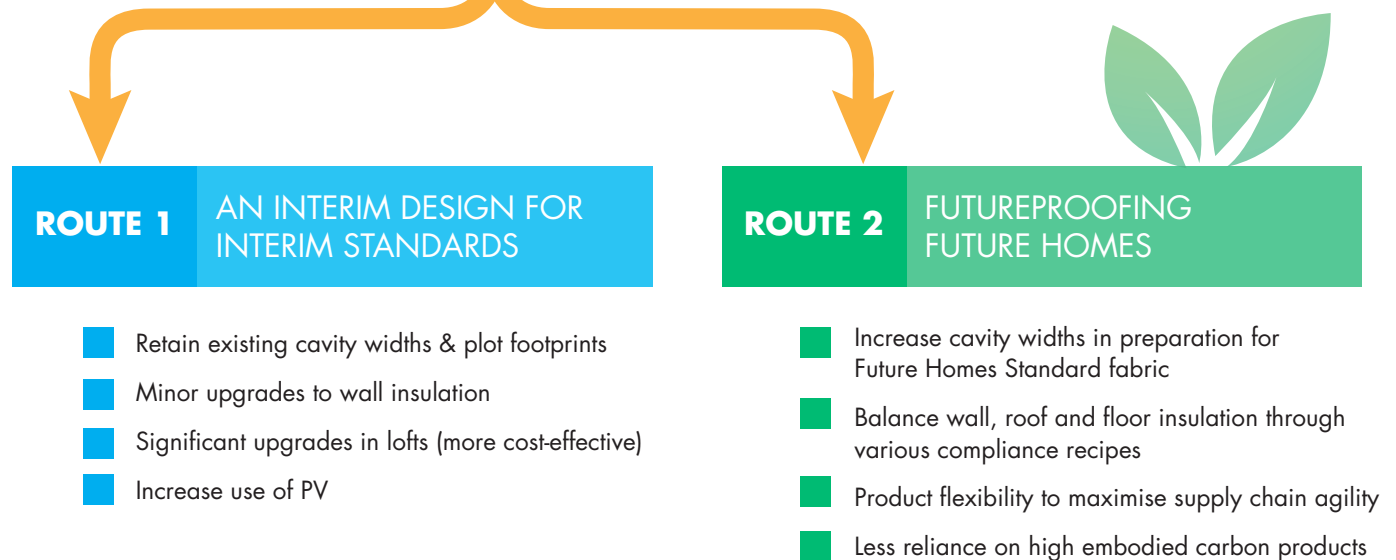
APPROVED DOCUMENT L: WHAT'S NEW FOR HOUSEBUILDERS

The updates to Approved Document L (ADL), or 'Part L', aim to lower the operational carbon emissions of new homes, raise fabric efficiency standards and introduce a new level of quality control.

At a glance



HOUSEBUILDERS HAVE TWO ROUTES TO COMPLIANCE USING NON-COMBUSTIBLE INSULATION



WHICHEVER PATH YOU TAKE, MAKE IT YOURS

Don't make the mistake of copying the notional dwelling. **The most cost-effective specification will always be a bespoke whole-house recipe based on SAP calculations.**

WE ARE READY TO HELP

As the UK's leading manufacturer of high performance, non-combustible insulation used in new build housing, we can help you achieve cost-effective compliance, without compromising on quality, combustibility, whole-life carbon or your customers' expectations. We offer:

- **Whole-house compliance recipes**
- **Free 3D U-value calculations**
- **Advice on quality assurance**
- **SAP optimisation and modelling**
- **Technical advice and guidance**
- **Psi-value calculations**



INSULATION THAT GIVES REAL PERFORMANCE

31% Reduction in operational CO₂

The updates require all new homes to produce 31% less operational carbon emissions, compared with Part L 2013. Housebuilders must also ensure that new homes meet targets for:

Target	Influenced by Fabric	Influenced by Fuel
Primary Energy	✓	✓
Emissions	✓	✓
Fabric energy efficiency	✓	



The primary energy rate is a new addition to ADL and the limiting U-values for fabric energy efficiency have also been tightened in this revision of the regulations.

To allow for design flexibility, housebuilders can meet the primary energy and emission target rates through any combination of fabric and fuel. However, **the target fabric energy efficiency rate can only be met by using insulation.**



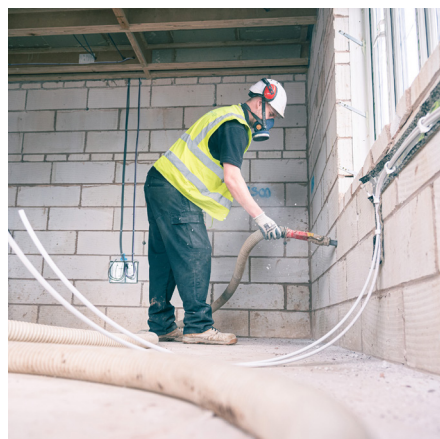
As-built scrutiny

The new regulations introduce a shift in focus, towards measuring a home based on its as-built performance, rather than its notional design. All dwellings built to ADL 2021 must be assessed using the latest version of the government's Standard Assessment Procedure (SAP), through the latest SAP software.

ADL calls for housebuilders to demonstrate continuity of insulation, using the new Buildings Regulations England Part L (BREL) report. Two BREL reports must be submitted for a new build:

- Design stage BREL report – showing that the house specification will meet its target rates
- As-built BREL – showing that the target rates have been met.

The as-built BREL report will also require housebuilders to supply a photographic record of key stages during construction, as evidence of thermal continuity and quality of insulation.



CONFIDENCE IN A JOB WELL DONE

With as-built quality under increasing scrutiny, housebuilders need confidence that their specified products have been installed.

That's why we developed KinetiK®.

KinetiK® is the app-based site reporting system that creates an instant digital record of Supafil® installations. This happens quickly and easily, and at no extra cost.

How it works:

Your Approved Supafil® Installer simply opens the KinetiK® app on their mobile device and...

- Selects the site and plot number from a drop-down list, then takes a photo of each elevation, to show the plot is ready for installation.
- Selects the relevant product specification and scans a unique QR code on each pack of Supafil®.
- Installs the product as specified.

Knauf Insulation can then provide the housebuilder with feedback, confirming that the specified product has been installed.

'Best Site Product'

Housebuilder Product Awards, 2022

'Product of the Year'

Housebuilder Awards, 2022

Want to learn more about KinetiK®?

Watch the video: knaufinsulation.co.uk/kinetik

Speak to our Housing Team:
knaufinsulation.co.uk/contact-us

WHAT ARE THE PART L U-VALUES?

The new ADL contains 'limiting U-values' for insulating fabric elements in new dwellings (excerpt below). These are sometimes mistakenly referred to as 'minimum U-values' however this term is not quite accurate.

Whilst they indicate a minimum thermal performance requirement for each element, they are actually maximum U-values (i.e. heat transfer through the element should not exceed this value).

Limiting U-values for new fabric elements in new dwellings

Element type	Maximum U-value W/(M ² K)
All roof types	0.16
Wall	0.26
Floor	0.18
Party wall	0.20

Source: Approved Document L

Note:

Remember that Part L compliance is achieved for the full build, not individual elements, so matching the limiting U-values throughout a build or copying those in ADL's 'notional dwelling' will not necessarily result in compliance overall.

Considering cavity widths

As regulations tighten it's worth considering building with wider cavities.

150mm provides optimal fabric performance in low-rise homes and gives you more flexibility to choose the best insulation for the job.

When the Future Homes Standard arrives, most homes will likely be built with a wider cavity, so it's worth adding the extra 50mm now to avoid having to retrofit later. Especially as a 150mm cavity also gives you more room to manoeuvre in times of supply chain disruption, because you have more insulation options to achieve compliance than with a narrower cavity.

As always, it's about finding the best solution for each specific project.



PSI-VALUE CALCULATIONS – WHAT’S CHANGING?

The difference between U-values and Psi-values

U-values measure the rate of heat lost through thermal elements of a building, such as a wall, roof or floor. These are measured in watts per square metre Kelvin ($\text{W/m}^2\text{K}$).

Psi-values measure the rate of heat lost through junctions where two elements meet, for example where a floor meets an external wall, or a window interrupts a wall. Psi-values are measured in watts per metre Kelvin (W/mK).

Both U-values and Psi-values must be taken into account, when assessing the energy efficiency of a building. The lower the U-values and Psi-values of a build, the better the building will retain heat.



How do the ADL updates affect calculations?

To quantify the heat loss through junctions in a building's design, Psi-values must be inputted into Standard Assessment Procedure (SAP) software. In the past, SAP assessors have had the option to produce these Psi-value calculations using the Government's 'approved' Accredited Construction Details (ACDs) – a pre-set list of standardised details, based on different types of thermal element and junction. However, these became outdated and have been removed from the latest version of the SAP method. Assessors can still use non-government ACDs, as well as SAP's default values, but the latter have been adjusted to be less favourable.

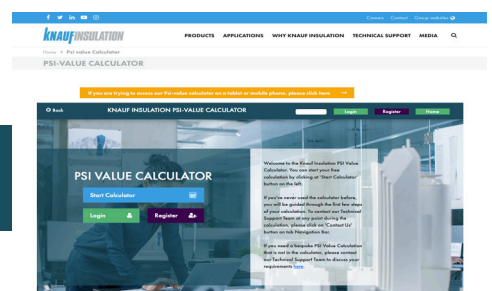
The revisions encourage more accuracy, with less reliance on assumptions and default information. This can be best achieved by working with suppliers who provide Psi-value calculations based on up-to-date, technical information, specific to the products being specified.



Help is at hand

We're actively working on tools to help housebuilders and SAP assessors calculate their Psi-values more accurately. In the meantime our free Psi-value calculator is available online and our Technical Team is on-hand to provide help and advice. You can contact the team on 01744 766 666 or alternatively by email technical.uk@knaufinsulation.com.

ONLINE PSI-VALUE CALCULATOR NOW LIVE
knaufinsulation.co.uk/psi-value-calculator



HOW KNAUF INSULATION CAN HELP



Housebuilders of every size work with us to create warm, safe and sustainable homes.

As the only UK manufacturer of both glass and rock mineral wool, we are uniquely placed to provide the right insulation solutions for both new build and refurbishment projects. Our products are made in the UK and available nationwide, so wherever our customers are based, we can help them achieve cost-effective compliance, without compromising on quality, performance, fire safety, whole-life carbon or homebuyer expectations.

High-performance products to rely on

Real world performance



Thermal



Fire Safety



Acoustic



Sustainability

With increased scrutiny of 'as-built' fabric efficiency, housebuilders need products they can rely on to deliver real world performance. Our mineral wool insulation has a flexible structure, which adapts to minor imperfections of the substrate, maintaining close contact and preserving performance.

What sets our products apart is their unique combination of thermal, fire safety, acoustic and sustainability benefits, so whatever the requirements, housebuilders know they're getting the performance they've paid for.

- The right solution for any application
- Readily adapts to site conditions
- Extensive industry certifications

Naturally non-combustible

With the current fire safety of buildings rightly in focus, housebuilders need straight-forward solutions that reduce risk and reassure homebuyers. All our glass mineral wool, wood wool boards and rock mineral wool slabs products are non-combustible, minimising risk and preserving peace of mind.



Please see page 32 for information on the recent Part B (Fire safety) updates.

Low-embodied carbon & low-VOC

Homebuyers have always asked how sustainable homes are to run. Now, they're asking how sustainably they were built. Our glass mineral wool products are made in the UK, from up to 80% recycled content, minimising the use of virgin raw materials and the energy used in their manufacture. They are also made using ECOSE® Technology, our unique bio-based binder that contains no added formaldehyde or phenol. ECOSE® Technology is made from natural raw materials that are rapidly renewable, and is 70% less energy-intensive to manufacture than traditional binders, so it is more environmentally friendly.

Products made with ECOSE® Technology are soft to touch and easy to handle. They generate low levels of dust and VOCs (volatile organic compounds), increasing the comfort for both installers and homeowners.

- Glass mineral wool has the lowest embodied carbon of any mainstream insulation material
- Products are supported by third-party green certifications and labels



Declare.



Comprehensive services for complete confidence

We understand that when it comes to a quality installation, product is only half the equation. Housebuilders need total assurance from the design stage, right through to verification, of a job well done. That's why we ensure our customers get so much more than just the products we manufacture.

Technical services and expert advice

Compliance? Carbon? Cost? Whatever the need, we'll find the right specification for the job. Our comprehensive tools and training provide all the support housebuilders need to achieve compliance, using high-performance products, and without compromising on their existing priorities.

- Whole-house compliance recipes
- SAP optimisation and modelling
- U-value and Psi-value calculations



Innovation and foresight

From new regulations to alternative technologies and zero-carbon homes, the pace of change in construction is accelerating. As a market leader, it's our responsibility to contribute to policy development initiatives, and predict the roadmap of upcoming changes for our customers.

At the same time, we are equally committed to innovation; developing new products and services to help housebuilders navigate those changes with ease.

- An active industry voice
- Supporting with upcoming changes
- Cutting-edge technology & innovation

To view our case studies, visit:

knaufinsulation.co.uk/case-studies

See page 18 for example ADL compliance recipes.

"With Knauf Insulation we have a single point of contact. That means site managers can speak to someone with the right level of competence and knowledge of legislation, who will provide the answer they need, in writing. There's no guesswork. We effectively have the type of relationship you expect from a small, local company but with a national, market leading supplier."

Stewart Hill, Taylor Wimpey North Thames

Visit our Housebuilders Hub for downloadable SAP recipes: knaufinsulation.co.uk/housebuilding

Your needs Fulfilled.

Part L compliance
Approved installers
Quality assurance
Non-combustibility
Noise absorption
Real performance
Sustainable products
Indoor air quality
BBA certification

**You need a lot from your insulation.
So choose the blown-in solution that delivers more.**

Our network of Approved Supafil® installers ensure a quality installation, and our app-based site reporting system, Kinetik®, provides assurance that the specified product has been installed.

Quality. Certainty. **Supafil®.**



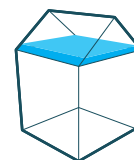
knaufinsulation.co.uk

Pitched roof - Cold roof	- 14 -
Pitched roof - Warm roof	- 15 -
Masonry Cavity Walls - Full-fill with blown-in glass mineral wool	- 16 -
Timber Framed Walls - Blown-in	- 17 -



PITCHED ROOF

COLD ROOF



RECOMMENDED PRODUCTS

- Loft Roll 40
- Loft Roll 44

BENEFITS

- Available in combi-cut, ready cut and uncut formats giving a wide range of choice to suit specific install requirements.
- Manufactured in two different options; long lengths to allow quick and simple installation maximising efficiency, and shorter lengths for ease of handling on-site.
- Compression packed and lightweight for easy handling and moving around a site.

Our recommended U-value with Approved Document L 2021

Less than or equal to 0.09 U-value (W/m²K)

TYPICAL U-VALUES

Product	Thickness (mm)			U-value (W/m²K)
	Between joists	Over joists	Total thickness	
Loft Roll 44	100	400 (2 x 200)	500	0.09
	100	350 (150 + 200)	450	0.10
	100	300 (2 x 150)	400	0.11
Loft Roll 40	100	400 (2 x 200)	500	0.08
	100	350 (150 + 200)	450	0.09
	100	300 (2 x 150)	400	0.10

Note: Joist sizes assumed to be 100 x 38mm at 600mm centres, default bridge fraction, 12.8% as per BR443. Assumed 12.5 mm standard plasterboard and cold ventilated roof with felt or sarking boards. All dimensions are nominal.

Minimum backstop U-value with Approved Document L 2021 - 0.16 U-value (W/m²K)

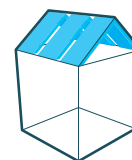


Declare.



PITCHED ROOF

WARM ROOF



RECOMMENDED PRODUCTS

- Rafter Roll 32

BENEFITS

- Rolls are provided uncut in a width of 1200mm. They are manufactured to allow cutting at varying centre dimensions, for installation, providing maximum flexibility and on-site efficiency.
- High levels of sound absorption and reduction characteristics reduce unwanted external noise such as traffic or drumming from rainfall on the roof.

TYPICAL U-VALUES

USING BATTEN AND COUNTER BATTEN WITH RAFTER ROLL 32 (BETWEEN RAFTERS) AND KNAUF PIR LAMINATE* INTERNALLY – with LR underlay pulled taught and insulation to full depth of rafters

Product	Thickness (mm)	U-value (W/m ² K) with Knauf PIR Laminate* (mm)				
		None	35	50	65	75
Rafter Roll 32	250 (100 + 2 x 75)	0.16	0.12	0.12	0.11	0.11
	225 (3 x 75)	0.17	0.13	0.13	0.12	0.11
	200 (2 x 100)	–	0.15	0.14	0.13	0.12
	175 (100 + 75)	–	0.17	0.16	0.14	0.14
	150 (2 x 75)	–	–	0.17	0.16	0.15

Note: Rafter sizes assumed to be 38mm wide at 600mm centres (6.3% bridging and the same depth as the insulation). 12.5mm Plasterboard internal finish (λ0.190) where no laminate board exists. Where Knauf PIR Laminate is used this consists of PIR of λ0.023 Lambda where the remainder of the thickness is 9.5mm plasterboard at 0.190 W/mK *Available from Knauf UK.

Minimum backstop U-value with Approved Document L 2021 - 0.16 U-value (W/m²K)



Declare.



MASONRY CAVITY WALLS

FULL-FILL WITH BLOWN-IN GLASS MINERAL WOOL



RECOMMENDED PRODUCTS

- Supafil® 34

BENEFITS

- Water repellant and BBA certified for use in all exposure zones, including those in very severe areas.
- Installed by approved technicians who bring product to site meaning no storage is required on site before installation, and no waste is left on-site post-installation.
- Awarded the DECLARE 'Red List Free' label. Allows product transparency disclosure that identifies where a product comes from, what it's made of, and where it goes at the end of its life.

Our recommended U-value with Approved Document L 2021

Less than or equal to 0.24 U-value (W/m²K)

TYPICAL U-VALUES

U-value (W/m²K)

Product	Insulation thickness (mm)	Medium block (0.45 W/mK)	High strength aircrete (0.28 W/mK)	High strength aircrete (0.19 W/mK)	Standard aircrete (0.15 W/mK)	Lightweight aircrete (0.11 W/mK)
Supafil® 34	175	0.18	0.18	0.17	0.17	0.16
	150	0.20	0.19	0.19	0.18	0.18
	125	0.23	0.22	0.22	0.21	0.20
	100	0.27	0.27	0.26	0.25	0.24

Note: The U-values have been calculated assuming that all walls are lined with 12.5mm standard plasterboard on dabs on standard blocks with 10mm mortar joints. Wall ties assumed to be stainless steel at 2.5 per m² with a cross-sectional area of no more than 12.5mm² for structural cavities up to 100mm wide. For cavities greater than 100mm up to 150mm, the cross sectional area of wall ties is assumed to be 24mm². For cavities above 150mm, the cross sectional area of wall ties is assumed to be 60mm². Air gap correction level is zero.

Minimum backstop U-value with Approved Document L 2021 - 0.26 U-value (W/m²K)

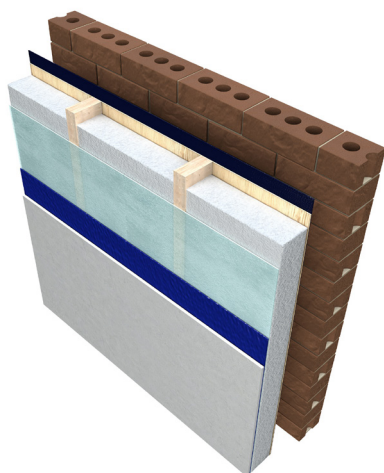
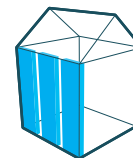


Declare.



TIMBER FRAMED WALLS

BLOWN-IN



RECOMMENDED PRODUCTS

- Supafil® Frame

BENEFITS

- Awarded the DECLARE 'Red List Free' label. Allows product transparency disclosure that identifies where a product comes from, what it's made of, and where it goes at the end of its life.
- Multi-purpose product which can insulate a variety of timber frame applications, maximising efficiency.
- Provides intimate contact between frames, offering a full-fill solution for a wide range of stud depths, centres and void shapes.

Our recommended U-value with Approved Document L 2021

Less than or equal to 0.24 U-value (W/m²K)

TYPICAL U-VALUES

Product	Stud thickness (mm)	Vapour permeable membrane	U-value (W/m²K)
			Standard clay brick outer leaf (0.77W/mK)
Supafil® Frame	200	Standard	0.20
	140	Standard	0.27
	200	Low E	0.17
	140	Low E	0.23

Note: Low E membrane used in the above calculations = Protect TF200 Thermo. U-values calculated assuming Supafil Frame installed density of 30kg/m³ and having thermal conductivity of 0.033W/mK. The above values are for guidance only, please contact our Technical Services Team direct for specific values.

Minimum backstop U-value with Approved Document L 2021 - 0.26 U-value (W/m²K)



Declare.



WHOLE HOUSE RECIPES




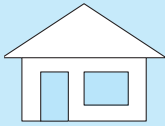

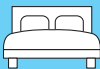
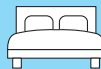
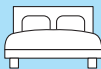
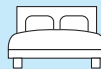
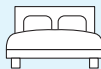





SUPAFIL® RECIPES

5 Bed detached with 3 wet rooms	- 20 -
4 Bed detached with 2 wet rooms and integral garage	- 22 -
3 Bed semi-detached with 2 wet rooms	- 24 -
2 Bed bungalow with 1 wet room	- 28 -
1 Bed apartment with 1 wet room (ground floor)	- 29 -
1 Bed apartment with 1 wet room (middle floor)	- 30 -
1 Bed apartment with 1 wet room (top floor)	- 31 -

COMPLIANCE RECIPES FOR APPROVED DOCUMENT L: 2021

There are a number of ways to achieve compliance to the updated Approved Document L.

Every project is unique, so we have some tailor-made recipes which help you choose from an extensive array of options, for a variety of property types.

5 BED DETACHED	4 BED DETACHED	3 BED SEMI-DETACHED	2 BED BUNGALOW	1 BED APARTMENT
				
192m ²	110m ²	78m ²	59m ²	44m ²
				
5	4	3	2	1
				

Achieving compliance is possible through making changes to your building fabric, openings, heating, ventilation, or renewables. Our solutions have made it easy to find a recipe that works for you.

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m ² K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m ² K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
GARAGE SOFFIT		Weather Compensator		7 (1.89 kWp)
200mm OmniFit® Roll 34		Delayed Start Thermostat		10 (2.70 kWp)
PARTY WALL INSULATION				15 (4.05 kWp)
None				20 (5.50 kWp)
100mm Supafil® Party Wall				WASTE WATER HEAT RECOVERY
FLOOR INSULATION				None
0.11W/m ² K				1 system (2 showers)
LINTELS				
Thermally broken				

5 BED DETACHED

3 WET ROOMS



192m²



RECIPE 1

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m ² K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 2

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m ² K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 3

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 4

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

4 BED DETACHED

2 WET ROOMS + INTEGRAL GARAGE



110m²



RECIPE 1

Fabric

ROOF INSULATION

500mm Loft Roll 44

EXTERNAL WALLS

100mm Supafil® 34

125mm Supafil® 34

150mm Supafil® 34

GARAGE SOFFIT

200mm OmniFit® Roll 34

PARTY WALL INSULATION

None

100mm Supafil® Party Wall

FLOOR INSULATION

0.11W/m²K

LINTELS

Thermally broken

Openings

WINDOWS

Double Glazed
U=1.3 g=0.47

Triple Glazed
U=0.98 g=0.39

DOORS

1.09W/m²K

1.00W/m²K

Heating

HEATING TYPE

Gas + Cylinder
Ideal System Boiler

Gas Combi
Ideal ESP1 38 Combi

Air Source Heat Pump

HEATING CONTROLS

Time & Temperature
Zone Control

Weather Compensator

Delayed Start
Thermostat

Ventilation

AIR PERMEABILITY

1.00 2.25 2.5 **4.00**

VENTILATION SYSTEM

System 1
Intermittent extract fans
& background vents

System 3
Mechanical extract
Ventilation (MEV)

System 4
Mechanical Ventilation with
Heat Recovery (MVHR)

Renewables

PHOTOVOLTAIC PANELS

None

2 (0.54 kWp)

3 (0.81 kWp)

4 (1.08 kWp)

5 (1.35 kWp)

7 (1.89 kWp)

10 (2.70 kWp)

15 (4.05 kWp)

20 (5.50 kWp)

WASTE WATER
HEAT RECOVERY

None

1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 2

Fabric

ROOF INSULATION

500mm Loft Roll 44

EXTERNAL WALLS

100mm Supafil® 34

125mm Supafil® 34

150mm Supafil® 34

GARAGE SOFFIT

200mm OmniFit® Roll 34

PARTY WALL INSULATION

None

100mm Supafil® Party Wall

FLOOR INSULATION

0.11W/m²K

LINTELS

Thermally broken

Openings

WINDOWS

Double Glazed
U=1.3 g=0.47

Triple Glazed
U=0.98 g=0.39

DOORS

1.09W/m²K

1.00W/m²K

Heating

HEATING TYPE

Gas + Cylinder
Ideal System Boiler

Gas Combi
Ideal ESP1 38 Combi

Air Source Heat Pump

HEATING CONTROLS

Time & Temperature
Zone Control

Weather Compensator

Delayed Start
Thermostat

Ventilation

AIR PERMEABILITY

1.00 2.25 2.5 **4.00**

VENTILATION SYSTEM

System 1
Intermittent extract fans &
background vents

System 3
Mechanical extract
Ventilation (MEV)

System 4
Mechanical Ventilation with
Heat Recovery (MVHR)

Renewables

PHOTOVOLTAIC PANELS

None

2 (0.54 kWp)

3 (0.81 kWp)

4 (1.08 kWp)

5 (1.35 kWp)

7 (1.89 kWp)

10 (2.70 kWp)

15 (4.05 kWp)

20 (5.50 kWp)

WASTE WATER
HEAT RECOVERY

None

1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 3

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
GARAGE SOFFIT		Weather Compensator		7 (1.89 kWp)
200mm OmniFit® Roll 34		Delayed Start Thermostat		10 (2.70 kWp)
PARTY WALL INSULATION				15 (4.05 kWp)
None				20 (5.50 kWp)
100mm Supafil® Party Wall				WASTE WATER HEAT RECOVERY
FLOOR INSULATION				None
0.11W/m²K				1 system (2 showers)
LINTELS				
Thermally broken				

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 4

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
GARAGE SOFFIT		Weather Compensator		7 (1.89 kWp)
200mm OmniFit® Roll 34		Delayed Start Thermostat		10 (2.70 kWp)
PARTY WALL INSULATION				15 (4.05 kWp)
None				20 (5.50 kWp)
100mm Supafil® Party Wall				WASTE WATER HEAT RECOVERY
FLOOR INSULATION				None
0.11W/m²K				1 system (2 showers)
LINTELS				
Thermally broken				

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

3 BED SEMI-DETACHED

2 WET ROOMS



78m²



3



RECIPE 1

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 2

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 3

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 4

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

3 BED SEMI-DETACHED

2 WET ROOMS



78m²



3



RECIPE 5

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 6

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 7

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
PARTY WALL INSULATION		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
100mm Supafil® Party Wall				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (2 showers)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

2 BED BUNGALOW

1 WET ROOM



59m²



2



RECIPE 1

Fabric

ROOF INSULATION

500mm Loft Roll 44

EXTERNAL WALLS

100mm Supafil® 34

125mm Supafil® 34

150mm Supafil® 34

PARTY WALL INSULATION

None

100mm Supafil® Party Wall

FLOOR INSULATION

0.11W/m²K

LINTELS

Thermally broken

Openings

WINDOWS

Double Glazed
U=1.3 g=0.47

Triple Glazed
U=0.98 g=0.39

DOORS

1.09W/m²K

1.00W/m²K

Heating

HEATING TYPE

Gas + Cylinder
Ideal System Boiler

Gas Combi
Ideal ESP1 38 Combi

Air Source Heat Pump

HEATING CONTROLS

Time & Temperature
Zone Control

Weather Compensator

Delayed Start Thermostat

Ventilation

AIR PERMEABILITY

1.00 2.25 2.5 **4.00**

VENTILATION SYSTEM

System 1
Intermittent extract fans
& background vents

System 3
Mechanical extract
Ventilation (MEV)

System 4
Mechanical Ventilation with
Heat Recovery (MVHR)

Renewables

PHOTOVOLTAIC PANELS

None

2 (0.54 kWp)

3 (0.81 kWp)

4 (1.08 kWp)

5 (1.35 kWp)

7 (1.89 kWp)

10 (2.70 kWp)

15 (4.05 kWp)

20 (5.50 kWp)

WASTE WATER
HEAT RECOVERY

None

1 system (1 shower)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 2

Fabric

ROOF INSULATION

500mm Loft Roll 44

EXTERNAL WALLS

100mm Supafil® 34

125mm Supafil® 34

150mm Supafil® 34

PARTY WALL INSULATION

None

100mm Supafil® Party Wall

FLOOR INSULATION

0.11W/m²K

LINTELS

Thermally broken

Openings

WINDOWS

Double Glazed
U=1.3 g=0.47

Triple Glazed
U=0.98 g=0.39

DOORS

1.09W/m²K

1.00W/m²K

Heating

HEATING TYPE

Gas + Cylinder
Ideal System Boiler

Gas Combi
Ideal ESP1 38 Combi

Air Source Heat Pump

HEATING CONTROLS

Time & Temperature
Zone Control

Weather Compensator

Delayed Start Thermostat

Ventilation

AIR PERMEABILITY

1.00 2.25 2.5 **4.00**

VENTILATION SYSTEM

System 1
Intermittent extract fans
& background vents

System 3
Mechanical extract
Ventilation (MEV)

System 4
Mechanical Ventilation with
Heat Recovery (MVHR)

Renewables

PHOTOVOLTAIC PANELS

None

2 (0.54 kWp)

3 (0.81 kWp)

4 (1.08 kWp)

5 (1.35 kWp)

7 (1.89 kWp)

10 (2.70 kWp)

15 (4.05 kWp)

20 (5.50 kWp)

WASTE WATER
HEAT RECOVERY

None

1 system (1 shower)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

1 BED APARTMENT

1 WET ROOM (GROUND FLOOR)



RECIPE 1

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
CORRIDOR WALLS		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
0.20 W/m²K				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (1 shower)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 2

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
CORRIDOR WALLS		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
0.20 W/m²K				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (1 shower)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

1 BED APARTMENT

1 WET ROOM (MIDDLE FLOOR)



RECIPE 1

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
CORRIDOR WALLS		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
0.20 W/m²K				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (1 Shower)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 2

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
CORRIDOR WALLS		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
0.20 W/m²K				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (1 shower)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

1 BED APARTMENT

1 WET ROOM (TOP FLOOR)



RECIPE 1

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
CORRIDOR WALLS		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
0.20 W/m²K				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (1 shower)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

RECIPE 2

Fabric	Openings	Heating	Ventilation	Renewables
ROOF INSULATION	WINDOWS	HEATING TYPE	AIR PERMEABILITY	PHOTOVOLTAIC PANELS
500mm Loft Roll 44	Double Glazed U=1.3 g=0.47	Gas + Cylinder Ideal System Boiler	1.00 2.25 2.5 4.00	None
EXTERNAL WALLS	Triple Glazed U=0.98 g=0.39	Gas Combi Ideal ESP1 38 Combi	VENTILATION SYSTEM	2 (0.54 kWp)
100mm Supafil® 34	DOORS	Air Source Heat Pump	System 1 Intermittent extract fans & background vents	3 (0.81 kWp)
125mm Supafil® 34	1.09W/m²K	HEATING CONTROLS	System 3 Mechanical extract Ventilation (MEV)	4 (1.08 kWp)
150mm Supafil® 34	1.00W/m²K	Time & Temperature Zone Control	System 4 Mechanical Ventilation with Heat Recovery (MVHR)	5 (1.35 kWp)
CORRIDOR WALLS		Weather Compensator		7 (1.89 kWp)
None		Delayed Start Thermostat		10 (2.70 kWp)
0.20 W/m²K				15 (4.05 kWp)
FLOOR INSULATION				20 (5.50 kWp)
0.11W/m²K				WASTE WATER HEAT RECOVERY
LINTELS				None
Thermally broken				1 system (1 shower)

Example recipes have been produced using SAP 2012 software and are intended for illustrative purposes only.

PART B AND INSULATION: WHAT'S NEW FOR HOUSEBUILDERS?

UPDATES TO PART B 'FIRE SAFETY' OF BUILDING REGULATIONS FOR ENGLAND TOOK EFFECT 1st DECEMBER 2022

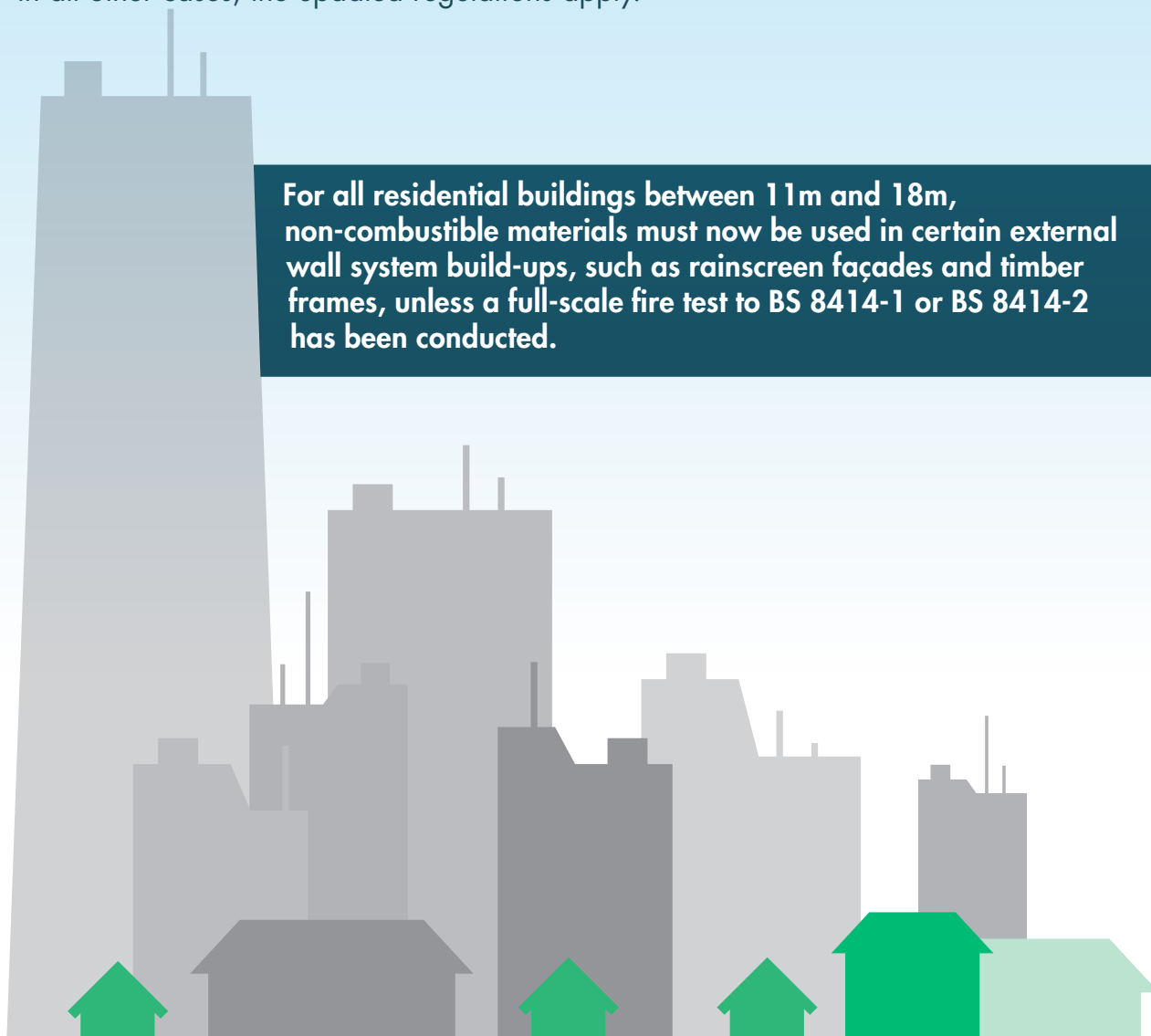
Previous regulations apply if both:

1. Building notice, initial notice or full plans given to local authority before this date
2. Work has started before or within six months of this date

In all other cases, the updated regulations apply.



For all residential buildings between 11m and 18m, non-combustible materials must now be used in certain external wall system build-ups, such as rainscreen façades and timber frames, unless a full-scale fire test to BS 8414-1 or BS 8414-2 has been conducted.





WHEN IT COMES TO SPECIFYING INSULATION, THE SIMPLEST WAY TO REDUCE FIRE RISK IS TO USE NON-COMBUSTIBLE MATERIALS WHATEVER THE HEIGHT OR USE OF THE BUILDING.

Glass mineral wool, wood wool boards and rock mineral wool slabs:

- ✓ Non-combustible
- ✓ Highest Euroclass A1 or A2-s1,d0 reaction to fire classification



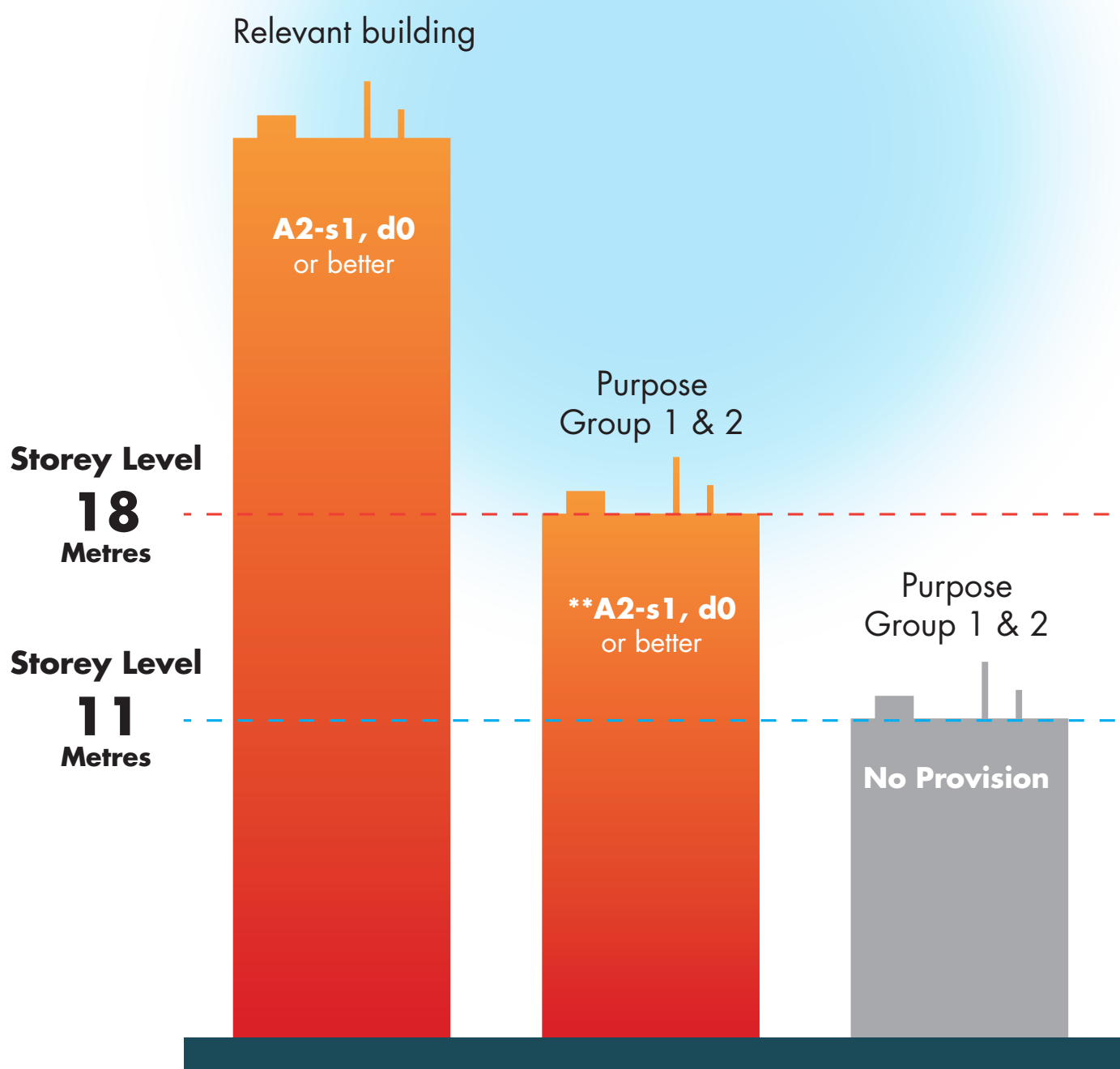
See Approved Document B for full regulation updates, including fire detection and alarms, means of escape and solar shading devices:

gov.uk/government/publications/fire-safety-approved-document-b

REACTION TO FIRE REGULATORY REQUIREMENTS

INSULATION PERFORMANCE REQUIREMENTS

RESIDENTIAL BUILDINGS**

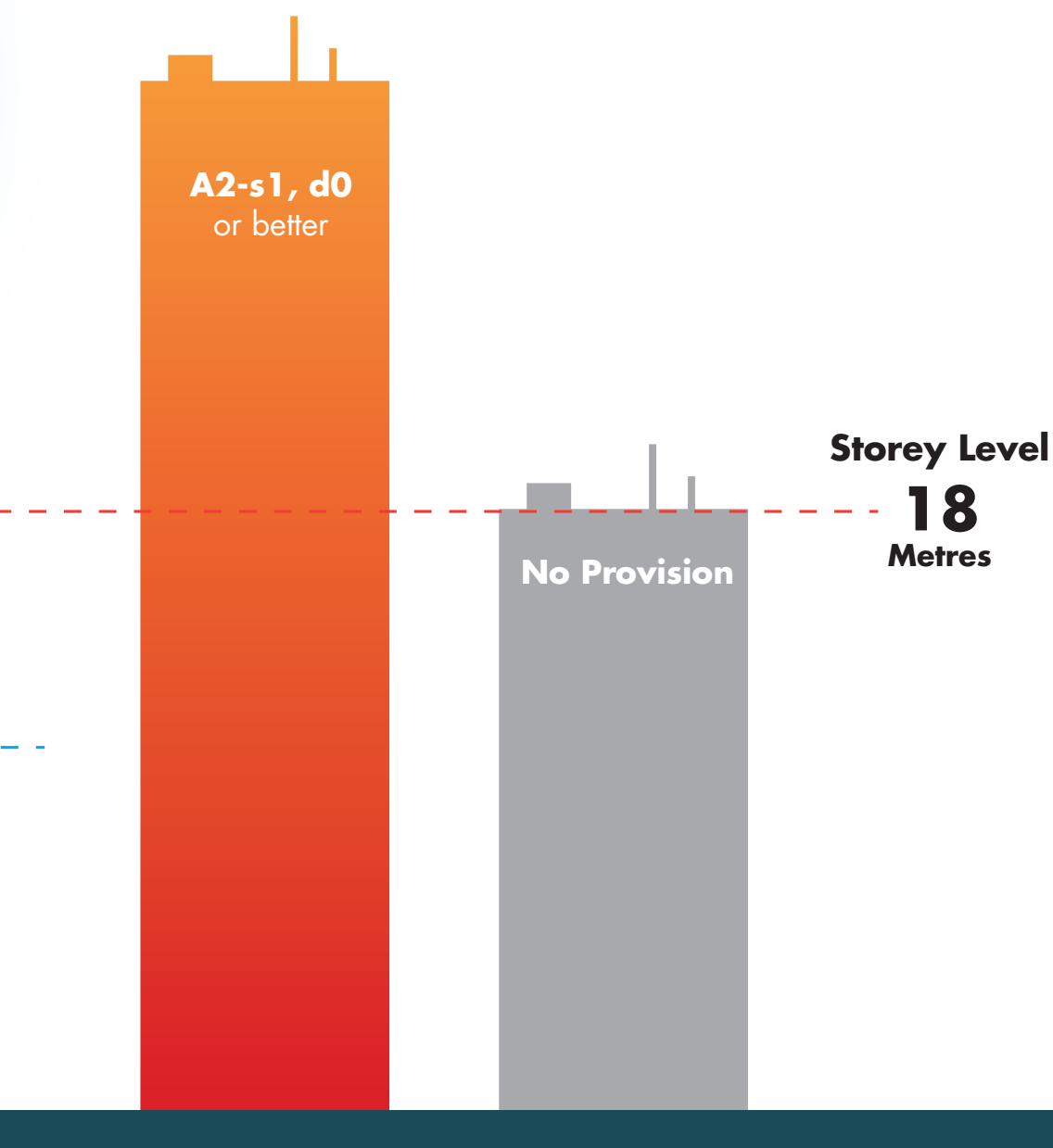


* Required performance for insulation within the construction

** Dwellings (ADB 1), now including any room in a hostel, hotel or boarding house

(ENGLAND & WALES)
(OTHER THAN MASONRY CAVITY WALL)*

ALL OTHER BUILDINGS



PART O: WHAT'S NEW FOR HOUSEBUILDERS?

NEW PART O 'OVERHEATING' INTRODUCED TO BUILDING REGULATIONS FOR ENGLAND

Applies to **NEW RESIDENTIAL DWELLINGS**

Implemented on a per-plot basis:

Plans submitted after

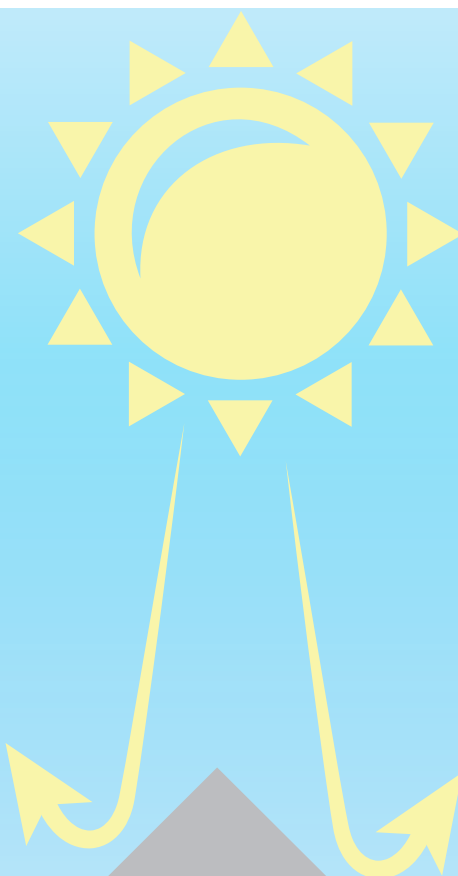


On-site work started after

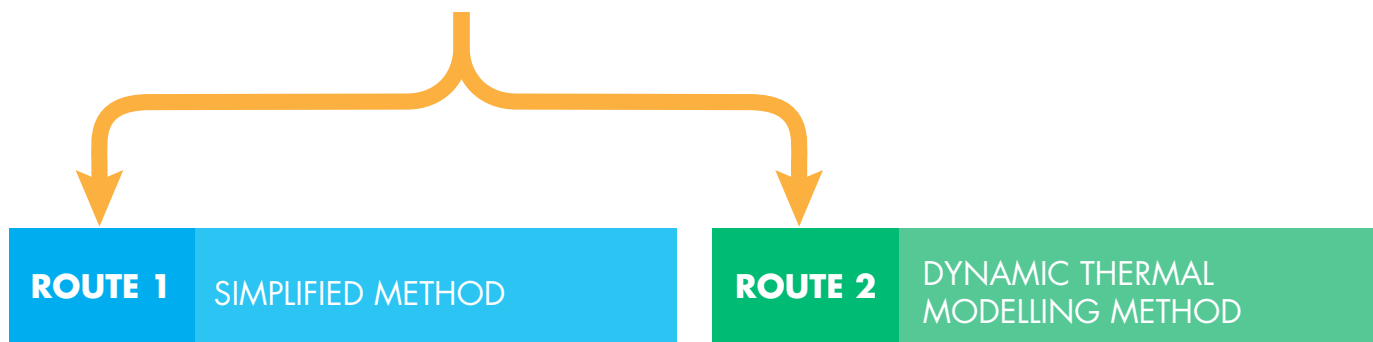


Aims to mitigate overheating by:

- Limiting unwanted solar gains in summer
- Providing means of removing excess heat



HOUSEBUILDERS CAN CHOOSE BETWEEN TWO METHODS



APPROVED DOCUMENT O (ADO) PROVIDES GUIDANCE ON:

- Maximum glazing areas
- Minimum opening areas

GUIDANCE IS DETERMINED BY WHETHER THE BUILDING:

- Is in a 'high' or 'moderate' risk location
- Has cross-ventilation



Building must pass a CIBSE's TM59 assessment, completed by a specialist consultant.

Assessment must incorporate limits set out in ADO for factors like internal temperatures and occupied hours.

NOTE

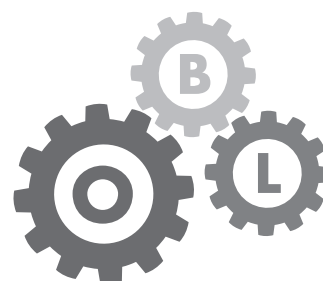
The simplified method is not suitable for certain types of building, for example those with more than one residential unit, using a communal heating or hot water system with significant horizontal heating or hot water pipework. Due to the requirements of Part Q (Security in dwellings), it is also unsuitable for dwellings with ground floor bedrooms, such as bungalows.



DESIGNS FOR PART O MUST ALSO CONSIDER:

- Noise and pollution
- Protection from falling
- Security
- Protection from entrapment

Part O interacts with several other parts of the Building Regulations, for example Part L: Conservation of Fuel and Power. It is advisable to assess Part O before assessing Part L.



See ADO for more info:

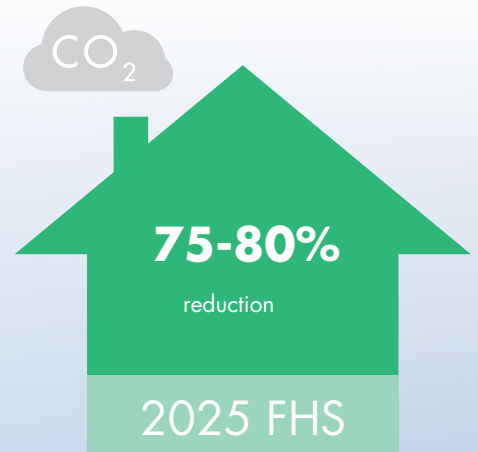
[gov.uk/government/publications/overheating-approved-document-o](https://www.gov.uk/government/publications/overheating-approved-document-o)

A LOOK AHEAD

The pace of change within the housebuilding industry is accelerating and with regulations updating across the board, it's worth keeping an eye on what's coming next.

Future Homes Standard

- Due to come into force in 2025
- Updates to Parts L and F of England's Building Regulations
- New homes must produce 75-80% less carbon emissions
- Likely to encourage low carbon heating systems
- Smart meter enabled thermal efficiency ratings data (measuring in-use energy performance of occupied homes) may be introduced within SAP software
- Proposed 'Smart Mandate' requiring minimum levels of smart functionality for an initial group of electric heating appliances
- Many homes likely to be built with wider cavities



Building Safety Act

- Achieved Royal Assent April 2022
- Legislation currently coming into force
- Due to introduce new requirements for construction products to be safe
- Overseen by the National Construction Products Regulator.



Embodied carbon

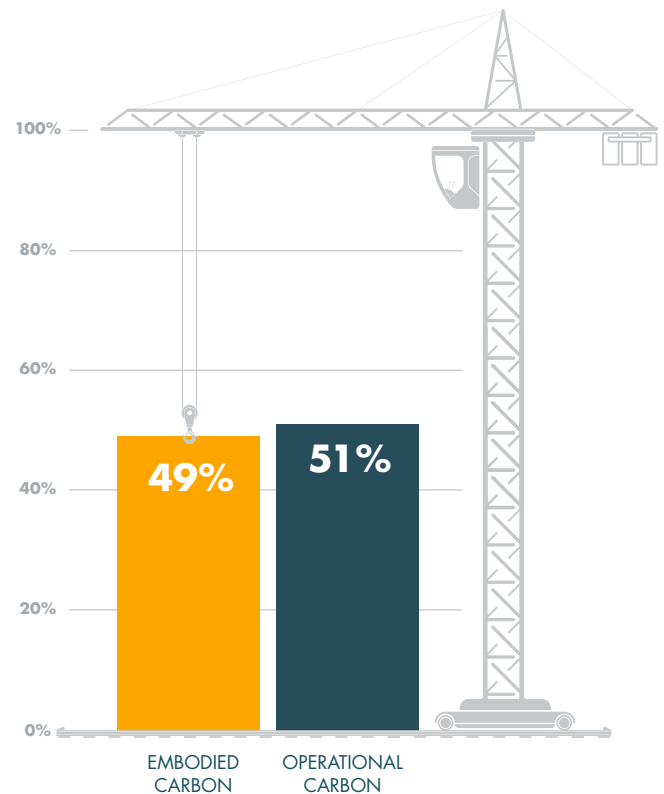
Embodied carbon¹ is the total greenhouse gas emissions (often simplified to “carbon”) generated to produce a built asset. This includes emissions caused by extraction, manufacture/processing, transportation and assembly of every product and element in an asset.

If left unchecked, embodied carbon emissions are projected to make up 49%² of all carbon emissions from new construction projects over the next thirty years. Current Building Regulations don't yet address embodied carbon, but that looks set to change...

- RIBA recommends embodied carbon target of 800 KgCO₂ e/m², 'as a minimum' for new builds in design today
- UK Climate Change Committee called for mandatory disclosure of whole-life carbon in buildings
- Industry proposed 'Part Z' Building Regulations for the regulation of embodied carbon



TOTAL CARBON EMISSIONS OF GLOBAL NEW CONSTRUCTION
from 2020-2050 - business as usual projection



The embodied carbon of a given amount of a material can be expressed as its GWP – its Global Warming Potential. This gives a standardised measure that allows direct comparison between materials, and therefore, informed materials procurement choices.

The GWP, multiplied by the specified amount of that material used in construction, indicates that material's total embodied carbon contribution to a building.

Did you know?

A product's GWP can be found within its Environmental Product Declaration – a document that carbon-conscious manufacturers produce to provide peer-reviewed information on a product's make-up and environmental impact. EPDs for all Knauf Insulation products can be found on our website.

Long-term thinking

To specify strategically, housebuilders should choose products which meet their current needs whilst also setting their builds up for success in the future.

Mineral wool by its nature is non-combustible, easier to install correctly (therefore maximising thermal performance) and can be used in larger and smaller cavities, in buildings of any height. Glass mineral wool also has the lowest embodied carbon of any mainstream insulation material.

Products like mineral wool insulation help homes achieve compliance with Part L 2021 as well as the broader suite of current regulations, and the changes which we expect to see in the coming years.

¹ 'Embodied Carbon: Developing a client brief' – UK Green Building Council, March 2017

² UN Environment Global Status Report 2017

ABOUT KNAUF INSULATION

Drawing on 40 years of experience in the industry, we are leading the change in smarter insulation solutions, for a better world.

Our mission is to challenge conventional thinking and create innovative insulation solutions that shape the way we live and build in the future, with care for the people who make them, the people who use them and the world we all depend on.

Knauf Insulation in numbers:



Knauf Insulation

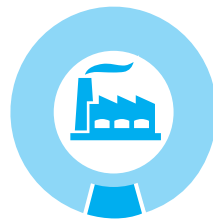
2022 figures



€2.5 bn
turnover



+6000
employees worldwide



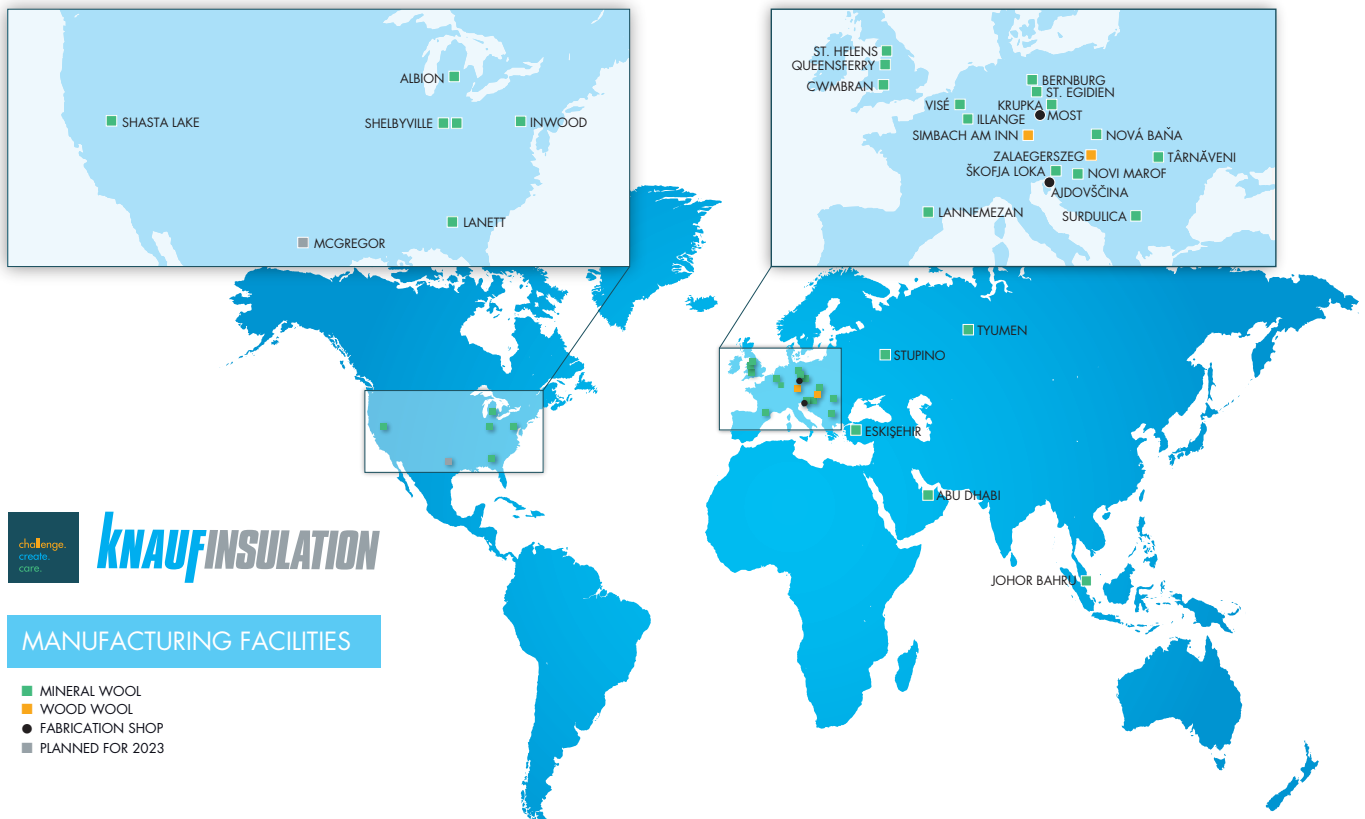
28
manufacturing sites



+15
countries

We are part of the Knauf Group, a family-owned, multi-national manufacturer of building materials and construction systems.

To learn more, visit: knaufinsulation.co.uk



OUR ACCREDITATIONS

We're proud to have gained a number of accreditations and be able to provide our customers the assurance that our products are manufactured to the highest level of quality, having passed a series of comprehensive and rigorous assessments which ensures they're fit for purpose.



Euroclass reaction to fire classification

All of our glass mineral wool, wood wool boards and rock mineral wool slabs are non-combustible and achieve the best Euroclass A1 or A2-s1,d0 reaction to fire classification.



BBA Certification

The British Board of Agreement offers third party certification for the use of building products and systems in critical applications. We have a number of products certified, and are always seeking to increase our portfolio.



BES 6001

The BES6001 accreditation shows that our products have been made with constituent materials that have been responsibly sourced. Our BES6001 rating level is 'Very Good'.



ISO

All of our manufacturing plants are certified to ISO standards.



BRE Green Guide Rating A+

We have received the BRE Green Guide Rating A+ for the best environmental performance for the majority of our products.



EUCB

An independent certification authority that guarantees our mineral wool products are made of certified bio-soluble fibres.



Constructzero

Knauf Insulation has been selected as a net zero 'Business Champion' by the Construction Leadership Council and Department for Business, Energy and Industrial Strategy (BEIS) for the CO2nstructZero initiative.



EN 15804

Our product specific Environmental Product Declarations (EPD) are in line with the BRE and European standard EN 15804.



Supply chain sustainability school

We have been awarded Gold status from the Supply Chain Sustainability School.



DECLARE 'Red List' Free

Our entire glass mineral wool range of products has been awarded the DECLARE 'Red List Free' label. 'Red List Free' means that our products contain no harmful chemicals from the 'Red List'. This allows product transparency disclosure that identifies where a product comes from and what it is made of.



CE Marking

All our products are CE marked where required.



Made in Britain

As a member of the Made in Britain organisation, it helps customers identify that our mineral wool products are manufactured in the UK.



Eurofins Indoor Air Comfort Gold Certified

The Eurofins Gold certification for Indoor Air Comfort means our glass and rock mineral wool products are the best-in-class low VOC emissions and are therefore the ideal solution for indoor air quality.

GLOSSARY

ASHP – Air Source Heat Pump

Air source heat pumps (ASHPs) absorb heat from the outside air to heat your home and hot water. They can still extract heat when air temperatures are as low as -15°C. Air source heat pumps need electricity to run, but because they are extracting renewable heat from the environment, the heat output is greater than the electricity input. This makes them an energy efficient method of heating your home.

BREL

Building Regulations England Part L.

Delayed Start Thermostat

The Delayed Start feature delays the start-up of the heating, depending on how warm the room temperature is at the time when the central heating is due to come on. The heating start can be delayed for up to 45 minutes if the room is already relatively warm, when the weather is milder for example.

DER – Dwelling Emission Rates

Estimated CO₂ emissions per m² of the floor area.

DFEE – Dwelling Fabric Energy Efficiency

The actual achieved energy demand in Kw hours per m² per year (kWh/yr) of a property.

DLUHC

Department for Levelling Up, Housing and Communities.

FGHR – Flue Gas Heat Recovery

This is a device that sits neatly between boiler and flue. It collects any remaining heat in the flue gas which would normally go through the flue, into the atmosphere and be wasted.

Future Homes Standard

The Future Homes Standard is a set of standards that will complement the Building Regulations to ensure new homes built from 2025 will produce 75-80% less carbon emissions than homes delivered under current regulations.

G value (glazing)

The g value of the glass simply tells us how well the glass transmits heat from the sun. It is expressed either as a percentage, or simple decimal. A g value of 1.0 (100%) would tell us that all solar heat could enter the building (so without any glass), and of 0 (0%) would be for an opaque material.

GSHP – Ground Source Heat Pump

Heat from the ground is absorbed at low temperatures into a fluid inside a loop of pipe (a ground loop) buried underground. The fluid then passes through a compressor that raises it to a higher temperature, which can then heat water for the heating and hot water circuits of the house. The cooled ground-loop fluid passes back into the ground where it absorbs further energy from the ground in a continuous process as long as heating is required.

Heating Zones

A zoned heating and cooling system breaks your home into different areas or “zones”, each controlled separately by a thermostat. Zoning your home allows for several benefits including elimination of hot and cold spots and individual control of different rooms’ temperatures.

Part L/ADL

This approved document sets the standards for the energy performance of both new and existing buildings. Part L of the Building Regulations is split into four documents, each of which covers the conservation of fuel and power for different building types (new build or existing).

PV – Photovoltaic panels

Solar panels – conversion of light into electricity.

TER – Target Emission Rate

The target CO₂ emission rate sets a minimum allowable standard for the energy performance of a building and is defined by the annual CO₂ emissions of a notional building of same type, size and shape to the proposed building.

TREE – Target Fabric Energy Efficiency

The target energy demand of a property measured in kWh/yr per m².

VENTILATION:

System 1

Intermittent fans and background ventilation.

System 2

Passive Stack ventilation (PSV) This utilises a mixture of the air flowing across the ceiling and the natural buoyancy of hot humid air to raise the humid, stale air from the kitchen bathroom, cloakroom, etc. up to the point of the roof ridge where it flows into the atmosphere.

System 3

Continuous Mechanical Extraction Ventilation (MEV) continuous mechanical extract ventilation system designed with multiple extract points to simultaneously draw moisture laden air out of the wet rooms (bathrooms and kitchen) providing a quieter and more efficient system compared to separate fans.

System 4

Continuous mechanical supply and extract ventilation with heat recovery (MVHR) works quite simply by extracting the air from the polluted sources e.g. kitchen, bathroom, toilets and utility rooms and supplying air to the ‘living’ rooms e.g. bedrooms, living rooms, studies etc. The extracted air is taken through a central heat exchanger and the heat recovered into the supply air. This works both ways, if the air temperature inside the building is colder than the outside air temperature then the cool air is maintained in the building.

Weather Compensator

WC mechanisms monitor both the internal and external temperatures and adjust the boiler’s operation accordingly. Instead of the boiler firing up or turning off when a house is too cold or too hot, weather compensation monitors and maintains correct flow and return temperatures which can help reduce fluctuations in the boiler’s operation.

WWHR – Waste Water Heat Recovery

This works by extracting heat out of the water from your bathtub or shower that goes down the drain pipe. The extracted heat is then used to heat the incoming mains water, so reducing the energy needed to warm your water up to temperature and reducing the workload of your boiler.(e.g. Showersave).

Specification perfection. Not as hard as it looks.



Insulation advice, tools and guidance are just a click away.

Part L 2021 is now in force for all new homes in England, but achieving compliance might not be the challenge you're expecting it to be.

The Knauf Insulation Housebuilders Hub is full of free, useful resources on Part L and the wider housebuilding sector, to help you build your ideal specification.

Scan the QR code to get started.



knaufinsulation.co.uk

CONTACTS

Technical Services Team

01744 766 666

technical.uk@knaufinsulation.com

Find your local sales representative

knaufinsulation.co.uk/contact-finder



Knauf Insulation Ltd PO Box 10, Stafford Road, St.Helens, Merseyside, WA10 3NS. UK

For more information please visit knaufinsulation.co.uk

All rights reserved, including those of photomechanical reproduction and storage in electronic media. Extreme caution was observed when putting together and processing the information, text and illustrations in this document. Nevertheless, errors cannot be completely ruled out. The publisher and editors cannot assume legal responsibility or any liability for incorrect information and consequences thereof. The publisher and editors will be grateful for improvement suggestions and details of possible errors pointed out. For the most up-to-date document versions and product information, please always refer to our website.