

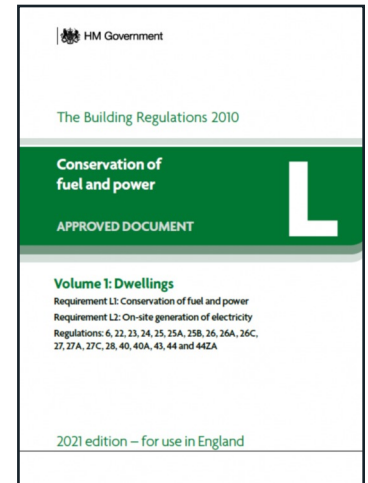
Part L 2021 (England) - New Homes and Extensions

Block Factsheet 5 - June 2023

This guide is intended to provide a very simple overview of the updated regulations and some practical u-value solutions using our range of blocks in masonry walls and suspended beam & block floors. These apply to the development of new homes and extensions to existing dwellings in England. Scotland and Wales have developed their own versions of Approved Document L (ADL).

These changes, which came into force in June 2022, will be followed by another round of significant changes in 2025 as the 'Future Homes Standard' (FHS) takes effect. The transitional arrangements for ADL 2021 only apply to homes where building work has commenced on each individual plot before 15th June 2023.

This is significant as previous ADL changes could be avoided if work had already started on a site. With ADL 2021 the new regulations apply to any plots that have not yet started.



Part L vol 1: Dwellings

Part L vol 2: Buildings other than dwellings

Key Changes

Fabric and services

- Minimum level of thermal performance of the fabric (TFEE) has improved by circa 13%;
- Overall carbon emissions from the dwelling (TER) are reduced by circa 31%;
- A new primary energy target has been added (TPER);
- Energy design (Part L) must be integrated into the early dwelling design and modelled before submitting for planning.

Overheating - Approved Document O

- Introduced in June 2022 and it is strongly recommended to fully understand the implications of ADO before developing solutions to comply with Part L.
- New requirements to ensure that homes do not overheat as a result of solar gains or inadequate ventilation;
- New Approved Document O (ADO) provides two methods for demonstrating compliance: the simplified method or dynamic thermal modelling;
- Potentially significant design implications;
- An estimated 30% of new dwellings are built in locations where opening windows at night for purge ventilation may not be desirable due to outside noise or pollution, such as in cities or near main roads;
- For ADO compliance, these homes will have to be assessed using dynamic thermal modelling and incorporate alternative methods for removing excessive heat;

Heating and hot water

- New homes need to be ready for low carbon heat;
- ADL can be met with a range of heating technologies (including gas boilers), but the new home must be able to easily switch to low carbon technology (for example, heat pumps) in the future;
- Space heating must operate at a maximum of 55°C which means larger radiators or underfloor heating.

Thermal bridges

- Thermal bridging at junctions account for 15-50% of heat losses through the fabric of a new home;
- To meet the TFEE, it is no longer feasible to use a default y-value;
- Heat losses from thermal bridges need to be accurately accounted for in SAP assessments;
- Designers must generally incorporate recognised details that have modelled thermal bridging psi values, or commission psi values to be calculated for a particular detail;
- The energy assessor must calculate the heat losses at these bridges;
- The builder must follow the construction details closely on site.
- We have a complete range of calculated y-values for our aerated and aggregate concrete blocks.

Reporting evidence of compliance – the BREL report

- ADL requires the creation of an 'as built' record of the construction and the heating and ventilation systems called the BREL report;
- Generated automatically from the SAP software and highlights any differences between the 'design' and 'as built' construction;
- Report must be signed by the SAP assessor and the developer;
- Must be submitted to the building control body and provided to the home buyer.

Photographic evidence of construction quality

- New requirement of ADL to provide geo-located photographic evidence of key construction details for each house. To be submitted alongside the BREL report;
- Examples include: foundations/ substructure and ground floor; external walls; roof; openings; airtightness; building services.

Grid infrastructure

- New developments using heat pumps, PV, and / or electric vehicle charging need to carefully consider connections to the grid infrastructure to ensure capacity is, or will be, available;
- Need to follow a process to establish which consents are needed and which network operator to approach.

Part L 2021 Requirements

There are now four separate targets for Part L 2021 supported by the new SAP 10 method of assessment:

1. Primary energy target
2. CO₂ emission rate
3. Fabric Energy Efficiency Standard (FEES)
4. Minimum standards for fabric and fixed building services

Fabric Energy Efficiency Standard (FEES)

The FEES requirement is where our masonry wall and floor solutions can make a difference. Getting the fabric of the building right at the design stage will make achieving compliance easier. There are two u-value categories to be taken into account:

1. Notional u-values (aka Nominal u-values)
2. Limiting u-values (aka Backstop u-values)

The new SAP 10 method of assessment software creates a 'notional' dwelling based on the inputted information and calculates how much energy the proposed construction will use. By achieving the notional u-values, your dwelling should meet the requirements for CO₂ emissions and comply with the requirements.

In cases where notional building element u-values values cannot be achieved, the limiting / backstop u-values can be used. This will however make compliance more difficult to achieve and must be offset elsewhere in the dwelling thereby adding cost and complexity to the overall design.



New Dwellings

Building Element	Notional Value	Limiting Value	FHS Indicative Spec 2025
External Walls	0.18 W/m ² K	0.26 W/m ² K	0.15 W/m ² K
Floors	0.13 W/m ² K	0.18 W/m ² K	0.11 W/m ² K
Party Walls	0.00 W/m ² K	0.20 W/m ² K	0.00 W/m ² K
Roofs	0.11 W/m ² K	0.16 W/m ² K	0.11 W/m ² K
Air Permeability	5.0 m ³ /hr/m ²	8.0 m ³ /hr/m ²	5.0 m ³ /hr/m ²

Notes:

Party wall compliance is achieved by fully-filling the cavity and ensuring effective edge-sealing.

Air permeability testing must be carried out on each and every dwelling. A sampling approach is no longer allowed.

The Future Homes Standard (FHS) indicative specification is based on current guidance from the Department for Levelling Up, Housing and Communities but is subject to change.

Achieving the 'Limiting Value' targets will pass Building Regulations but SAP compliance will be extremely unlikely. Aiming for the Notional Targets is strongly advised!

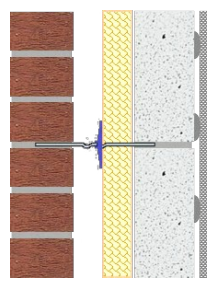
Existing Buildings (Extensions)

Building Element	Limiting Value
External Walls	0.18 W/m ² K
Floors	0.18 W/m ² K
Roofs	0.15 W/m ² K

There are no backstop values for existing buildings / extensions and the limiting values shown in this table must be met!

Example U-Value Solutions to Meet Part L 2021 and Potential FHS Requirements

Indicative examples for guidance only and will require verification.

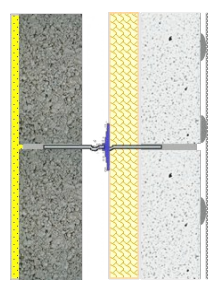


Partial Fill Cavity

- Brick outer leaf
- 50mm (min) clear cavity
- 100mm block
- Drylining on dabs / skim

Note: The thickness of insulation quoted is the minimum amount required to meet the target but may not be available. Therefore the next available size up should be used. Correction level 0 batt joints sealed is assumed.

Block Type	Notional Target 0.18 W/m ² K	Backstop Limit 0.26 W/m ² K	FHS Indicative Spec 0.15 W/m ² K
Airtec XL 2.9N	65mm PIR/PU @ 0.018 80mm PIR/PU @ 0.022	35mm PIR/PU @ 0.018 45mm PIR/PU @ 0.022	85mm PIR/PU @ 0.018 100mm PIR/PU @ 0.022
Airtec Standard 3.6N	65mm PIR/PU @ 0.018 80mm PIR/PU @ 0.022	40mm PIR/PU @ 0.018 50mm PIR/PU @ 0.022	85mm PIR/PU @ 0.018 105mm PIR/PU @ 0.022
Airtec Seven 7.3N	70mm PIR/PU @ 0.018 85mm PIR/PU @ 0.022	45mm PIR/PU @ 0.018 55mm PIR/PU @ 0.022	90mm PIR/PU @ 0.018 110mm PIR/PU @ 0.022
Ultralite	75mm PIR/PU @ 0.018 90mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022	95mm PIR/PU @ 0.018 115mm PIR/PU @ 0.022
Insulite	75mm PIR/PU @ 0.018 95mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022	95mm PIR/PU @ 0.018 115mm PIR/PU @ 0.022
Solid Dense	80mm PIR/PU @ 0.018 95mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 65mm PIR/PU @ 0.022	100mm PIR/PU @ 0.018 120mm PIR/PU @ 0.022

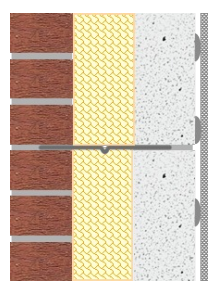


Partial Fill Cavity

- Rendered block outer leaf
- 50mm (min) clear cavity
- 100mm block
- Drylining on dabs / skim

Note: The thickness of insulation quoted is the minimum amount required to meet the target but may not be available. Therefore the next available size up should be used. Correction level 0 batt joints sealed is assumed.

Block Type	Notional Target 0.18 W/m ² K	Backstop Limit 0.26 W/m ² K	FHS Indicative Spec 0.15 W/m ² K
Airtec XL 2.9N	65mm PIR/PU @ 0.018 75mm PIR/PU @ 0.022	35mm PIR/PU @ 0.018 45mm PIR/PU @ 0.022	80mm PIR/PU @ 0.018 100mm PIR/PU @ 0.022
Airtec Standard 3.6N	65mm PIR/PU @ 0.018 80mm PIR/PU @ 0.022	40mm PIR/PU @ 0.018 45mm PIR/PU @ 0.022	85mm PIR/PU @ 0.018 105mm PIR/PU @ 0.022
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Ultralite	75mm PIR/PU @ 0.018 90mm PIR/PU @ 0.022	45mm PIR/PU @ 0.018 55mm PIR/PU @ 0.022	95mm PIR/PU @ 0.018 115mm PIR/PU @ 0.022
Insulite	75mm PIR/PU @ 0.018 90mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022	95mm PIR/PU @ 0.018 115mm PIR/PU @ 0.022
Solid Dense	80mm PIR/PU @ 0.018 95mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022	95mm PIR/PU @ 0.018 120mm PIR/PU @ 0.022



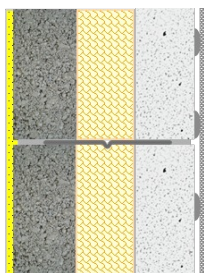
Full Fill Cavity

- Brick outer leaf
- 100mm block
- Drylining on dabs / skim

Correction level 0 batt joints sealed is assumed.

Block Type	Notional Target 0.18 W/m ² K	Backstop Limit 0.26 W/m ² K	FHS Indicative Spec 0.15 W/m ² K
Airtec XL 2.9N	95 (+5mm) batt @ 0.021 125mm batt @ 0.032	100mm batt @ 0.037	95 (+5mm) batt @ 0.021 + 27mm insulated drylining
Airtec Standard 3.6N	95 (+5mm) batt @ 0.021	100mm batt @ 0.034	95 (+5mm) batt @ 0.021 + 35mm insulated drylining
Airtec Seven 7.3N	95 (+5mm) batt @ 0.021	100mm batt @ 0.032	95 (+5mm) batt @ 0.021 + 40mm insulated drylining
Ultralite	150mm batt @ 0.032	100mm batt @ 0.030 125mm batt @ 0.037	95 (+5mm) batt @ 0.021 + 48mm insulated drylining
Insulite	150mm batt @ 0.030	100mm batt @ 0.030 125mm batt @ 0.037	95 (+5mm) batt @ 0.021 + 48mm insulated drylining
Solid Dense	150mm batt @ 0.030	125mm batt @ 0.034	95 (+5mm) batt @ 0.021 + 56mm insulated drylining

Insulated Drylining: Overall thickness is quoted, based on extruded polystyrene insulation @ 0.030 W/mK



Full Fill Cavity

Rendered block outer leaf

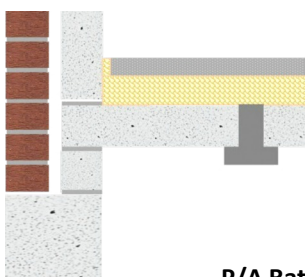
100mm block

Drylining on dabs / skim

Correction level 0 batt joints sealed is assumed.

Block Type	Notional Target 0.18 W/m²K	Backstop Limit 0.26 W/m²K	FHS Indicative Spec 0.15 W/m²K
Airtec XL 2.9N	95 (+5mm) batt @ 0.021 125mm batt @ 0.030	100mm blown @ 0.039	95 (+5mm) batt @ 0.021 + 27mm insulated drylining
Airtec Standard 3.6N	95 (+5mm) batt @ 0.021	100mm batt @ 0.037	95 (+5mm) batt @ 0.021 + 35mm insulated drylining
Airtec Seven 7.3N	95 (+5mm) batt @ 0.021	100mm blown @ 0.032	95 (+5mm) batt @ 0.021 + 40mm insulated drylining
Ultralite	95 (+5mm) batt @ 0.021	100mm batt @ 0.032	95 (+5mm) batt @ 0.021 + 48mm insulated drylining
Insulite	95 (+5mm) batt @ 0.021 + 27mm insulated drylining	100mm batt @ 0.030 125mm batt @ 0.037	95 (+5mm) batt @ 0.021 + 48mm insulated drylining
Solid Dense	95 (+5mm) batt @ 0.021 + 27mm insulated drylining	125mm batt @ 0.034	95 (+5mm) batt @ 0.021 + 56mm insulated drylining

Insulated Drylining: Overall thickness is quoted, based on extruded polystyrene insulation @ 0.030 W/mK



Suspended Beam & Block Floor

150mm T-beam with 100mm thick block infill | Insulation slabs | Standard Screed, 65mm

Note: The thickness of insulation quoted is the minimum amount required to meet the target but may not be available. Therefore the next available size up should be used.

		Notional Target 0.13 W/m²K					Backstop Limit 0.18 W/m²K					FHS Indicative Spec 0.11 W/m²K				
		0.70	0.60	0.50	0.40	0.30	0.70	0.60	0.50	0.40	0.30	0.70	0.60	0.50	0.40	0.30
Airtec Large Format Block	Expanded Polystyrene (0.038)	210	210	205	195	180	135	130	125	115	100	260	255	250	245	230
	Extruded Polystyrene (0.033)	185	180	175	170	160	115	110	105	100	90	225	225	220	210	200
	Low-k Expanded Polystyrene (0.030)	170	165	160	155	145	105	100	100	85	80	205	205	200	195	185
	Polyurethane / PIR (0.022)	125	120	120	115	105	80	75	70	70	60	150	150	145	140	135
Insulite 7.3N	Expanded Polystyrene (0.038)	225	220	215	210	195	150	145	140	130	120	275	270	265	260	245
	Extruded Polystyrene (0.033)	195	195	190	180	170	130	125	120	115	105	240	235	230	225	215
	Low-k Expanded Polystyrene (0.030)	180	175	170	165	155	120	115	110	105	95	220	215	210	205	195
	Polyurethane / PIR (0.022)	130	130	125	120	115	90	85	80	80	70	160	160	155	150	145
Solid Dense 7.3N	Expanded Polystyrene (0.038)	230	225	220	210	233	155	150	145	135	125	280	275	270	260	250
	Extruded Polystyrene (0.033)	200	195	190	185	175	135	130	125	120	110	240	240	230	225	215
	Low-k Expanded Polystyrene (0.030)	180	180	170	170	160	120	120	115	110	100	220	215	215	205	195
	Polyurethane / PIR (0.022)	135	130	130	125	115	90	90	85	80	75	160	160	155	150	145