

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>						<b>24</b>
		<b>Guide 7 – APPROVED DOCUMENT L2A Conservation of fuel and power – New buildings other than dwellings.</b>						
	Issued	21/01/13	Rev		Page	1	of	17

From 1<sup>st</sup> October 2010 and subsequent amendment in January 2013 there have been changes to the Building Regulations that cover the Conservation of Fuel and Power in buildings.

## Summary of Changes:

### Changes in Legal Requirements.

1. Exemption from the energy efficiency provisions of extensions consisting of a conservatory or porch has now been amended to grant exemption only where the existing walls, windows, or doors are retained or replaced if removed and where the buildings heating system is NOT extended into the conservatory or porch,
2. A new requirement is introduced where Regulation 26 applies, emission rate calculations are required to be carried out and given to Building Control, along with a list of specifications used in the calculations before the work commences. This is in addition to the CO2 emission rate calculation required to be submitted after the works completion.
3. Consideration of high-efficiency alternative systems for new buildings (new regulation 25A) comes into force 9th Jan 2013 for the purpose of new reg 25A in respect of new buildings occupied by public authorities and 9th July 2013 for the purpose of new reg 25A in respect of all new buildings.
4. Nearly zero-energy requirements for new buildings (new regulation 25B) – comes into force 1<sup>st</sup> Jan 2019 for the purpose of new reg 25B in respect of new buildings occupied by public authorities and 31<sup>st</sup> Dec 2020 for the purpose of new reg 25B in respect of all new buildings.
5. Energy Performance Certificates – some revisions come into force on the 9<sup>th</sup> January 2013.

### Changes in Technical Guidance:

1. The notional building used to determine the TER is the same size and shape as the actual building, constructed to concurrent specification and no improvement factor. Developers are still given the freedom to vary the specification, provided it achieves the same or better overall levels of CO2 emissions.
2. Revised guidance is provided on shell and core developments and first fit out work.
3. A revised procedure is provided for demonstrating that reasonable provisions have been made to limit the effects of solar gain in summer.
4. Revised guidance is provided for avoiding thermal bridging at construction joints, including the option of adopting a quality assured accreditation construction details scheme approach.
5. New provisions and guidance is introduced to limit heat loss from swimming pool basins where construction as part of the new building.
6. Appendix A is added giving guidance on the evidence that demonstrates compliance with the energy efficiency requirements and highlighting the key features that are critical in achieving the annual CO2 emission target.

### Areas covered:

1. Areas covered by this regulation construction of new buildings other than dwellings.
2. Fit out works where work is either part of the new build construction, or the first fit out of a shell and core development where the shell is sold or let before the fit out work is commenced (Approved Document L2B applies to fit out works in other circumstances).
- 3.

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>						<b>24</b>
	Issued	21/01/13	Rev	Page	2	of	17	

**Guide 7 – APPROVED DOCUMENT L2A  
Conservation of fuel and power –  
New buildings other than dwellings.**

4. **The construction of extensions to existing buildings that are not dwellings where the total useful floor area of the extension exceeds 100m<sup>2</sup> and greater than 25% of the total useful floor area of the existing building (refer to guide 6).**
5. If the proposal also contains dwellings – reference should be made to ADL1A for the dwelling works and ADL2A applying to the parts that are not dwelling, e.g. heated common areas and in mixed use developments the commercial or retail space.
6. For buildings containing both living accommodation and space used for commercial purposes (e.g. workshop or office), the whole building is treated as a dwelling as long as the commercial part could revert to domestic use.

Examples of which could be where there is direct access between the industrial or commercial space and the accommodation; and both are contained within the same thermal envelope; and the living accommodation occupies a substantial proportion of the total area of the building (e.g. a small managers flat in large non domestic development would not mean the whole building could be considered as a dwelling, similarly a room used as a office or utility space would not mean the building should not be treated as a dwelling).

### **The requirements of Building Regulation Part L Conservation of Fuel and Power:**

#### **Schedule 1 – Part L Conservation of fuel and power**

L1. Reasonable provision shall be made for the conservation of fuel and power in buildings by:

- (a) limiting heat gains and losses—
  - (i) through thermal elements and other parts of the building fabric; and
  - (ii) from pipes, ducts and vessels used for space heating, space cooling and hot water services;
- (b) providing fixed building services which—
  - (i) are energy efficient;
  - (ii) have effective controls; and
  - (iii) are commissioned by testing and adjusting as necessary to ensure they use no more fuel and power than is reasonable in the circumstances; and
- (c) providing to the owner sufficient information about the building, the fixed building services and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and power than is reasonable in the circumstances.

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>						<b>24</b>
	Issued	21/01/13	Rev	Page	3	of	17	

## **DEMONSTRATING COMPLIANCE WITH THE REGULATIONS.**

Five criteria are set that must be complied with;

- Criterion 1** – Achieving the BER.
- Criterion 2** – Limits on design flexibility.
- Criterion 3** - Limiting the Effects of Solar Gains in Summer.
- Criterion 4** – Building Performance Consistent with BER calculated under criterion 1.
- Criterion 5** – Providing information for energy efficient operation of the dwelling.

### **Criterion 1 – Achieving the BER.**

On submission of your Building Regulation application you will be required to provide details of the buildings predicted rate of CO<sup>2</sup> emission (SBEM – Simplified Building Energy Model) [**'Building Emission Rate' (BER)**] as compared to the **Target Emission Rate (TER)**. The proposal **BER** should not exceed the calculated **TER**.

***You are also required to provide a list of specifications of the building envelope and the fixed building services used in calculating the BER to assist building control to check for the proposals compliance.*** The report will highlight any specification items that are better than the expected values and allows building control to be aware of the key features as their installation will be critical to achieving TER.

### **Target CO<sup>2</sup> Emission Rate (TER).**

**TER** is the minimum energy performance requirement for the new building(s). It is the mass of CO<sup>2</sup> in kg per m<sup>2</sup> from a notional building of the same size and shape as the actual building but with specified properties. These specified properties are set out in the 2010 NCM Modelling Guide. ***Note - the TER is no longer based on the 2002 notional building with an improvement factors. The use of the specification in the modelling guide gives flexibility and achieves a 25% overall CO2 reduction.***

### **'Building Emission Rate' (BER).**

The buildings calculated predicted rate of CO<sup>2</sup> emission '**Building Emission Rate' (BER)** should not be greater than the '**Target Emission Rate (TER)**'. This calculation will provide both the designer and builder with the key design features that are critical to achieving compliance and must be undertaken using only government approved calculation methods.

You are strongly advised to ensure that early in the design process that you check the schemes CO<sup>2</sup> emissions to avoid finding it fails to meet Target Emissions resulting in a costly re-design. Remember you are trying to achieve a minimum 25% reduction in carbon emissions from similar buildings built under the previous regulations.

After work has been completed you must notify building control of the buildings TER and BER and whether the building has been constructed in accordance with the list of specifications submitted before the work started, If not, a list of variation specifications must be given to building control. Building control are authorised to accept, as evidence of compliance, a certificate to this effect signed off by a suitably accredited energy assessor.

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>						<b>24</b>
		<b>Guide 7 – APPROVED DOCUMENT L2A</b>						
	Issued	21/01/13	Rev		Page	4	of	17

### **Achieving the TER.**

Certain management features will give improved energy efficiency and where provided they can allow the BER to be reduced – see table below:

#### **Enhanced management and control features.**

<b>Feature.</b>	<b>Adjustment Factor.</b>
Automatic monitoring and targeting with alarms for out of range values.	<b>0.050</b>
Power factor correction to achieve a whole building power factor > 0.90	<b>0.010</b>
Power factor correction to achieve a whole building power factor > 0.90	<b>0.025</b>

Provide the building satisfies the limits on design flexibility as set out in Criterion 2, the compliance process allows complete designer flexibility to achieve the TER utilising fabric and system measures and integration of low or zero carbon technologies.

### **Modular Buildings.**

Temporary buildings with a planned time of use of 2 years or less, industrial sites, workshops and non-residential agricultural buildings with low energy demands (refer to exemption note to the end of the document). ***However for the purpose of energy efficiency requirements, a temporary building with a planned time of use of 2 years or less does NOT include portable or modular buildings which have a planned service life greater than 2 years, whether on one or more sites.***

#### **Modular Buildings with a planned time of use of more than 2 years.**

The placing of an existing modular building is treated as if they was a new modular building – however it is not always appropriate to expect them to meet the new build standards, especially as the embodied energy in the existing module is retained, a benefit that compensates for the small differences in operating energy demand.

#### **At a given location.**

Compliance should be demonstrated by showing satisfactory performance has been achieved as against each of the 5 compliance criteria – however if more than 70% of the buildings external envelope is constructed of sub-assemblies manufactured prior to 1<sup>st</sup> October 2010, the TER can be adjusted in accordance with Table 3 below.

However if the units are to be refurbished as part of the process follow ADL2B guidance.

#### **At more than one location.**

Portable buildings with an intended planned time of use in a given location of less than 2 years are often 'distress purchases' (e.g. following a fire), and the building must be up and operational quickly. In such cases different arrangements showing compliance applies:

- a. In the case of a modular building or portable building intended to be sited in a given location for less than 2 years, a TER / BER calculation should be provided when the module is first built and can be based on standard generic configuration. This will indicate regulation compliance when ever the building is relocated to new site provided its intended site use is less than 2 years.

- b. In addition to the calculations details , the supplier should provided written confirmation that ;  
i) The modules as provided meet or exceed the elemental energy standards of the generic model on which the calculation was based; and ii) the activities assumed in the generic model are representative of the intended use.

The regulations recognise in situations where the planned use of time in a given location is less then 2 years, the only practical heating technology is electric resistance heating – in this case reasonable provisions are to provide energy efficiency measures that are 15% better than if using conventional fossil fuel heating. E.g. assuming that the heating in the generic configuration used for the TER/BER is provided by a gas boiler with an efficiency of 77%. Post initial construction, any work on the module should meet the standards set in ADL2B.

***If a TER/BER calculation is not available as the module was constructed prior to the 1<sup>st</sup> October 2010 a reasonable provision would be to demonstrate that the BER is not greater than the 2010 TER adjusted by the relevant factor from table 3.***

**Table 3 TER multiplying factor for modular and portable buildings.**

<b>Date of manufacture of 70% of modules making up the external envelope.</b>	<b>TER multiplying factor.</b>
After 1 Oct 2010	<b>1.0</b>
6 April 2006 – 1 Oct 2010	<b>1.33</b>
6 April 2006 – 1 Oct 2010	<b>1.75</b>
1 April 2002 – 5 April 2006	<b>1.75 [2.35<sup>(1)</sup>]</b>

**NOTES**

1. For buildings with planned use time in a given location of less than 2 years, the figures in brackets is applicable.

**Shell and Core Developments.**

Where a building is offered to the market for sale or to let for specific fit out work by the incoming occupier, the developer has to indicate via the design TER /BER submission how the building shell as offered could meet the energy efficiency requirements.

Buildings where certain systems are not installed at the time it is offered to the market, certain assumptions on services efficiencies will have to be assumed to obtain the BER. The required specification provided to Building Control with the SBEM calculation has to identify the services not provided in the base build, and the efficiency values assumed for each such system. At practical completion of the base building, the as built TER / BER calculation should be based only on the building and systems as constructed; the fit out areas should be assumed to be conditioned to temperatures appropriate to their designated use, but no associated energy demand included.

The design stage calculation will also give a predicted EPC rating to inform prospective occupiers.

When a incoming occupier does the first fit out on all or part of the building through the provision or extension of any of the fixed services for heating, hot water, air conditioning or mechanical ventilation, then the TER / BER submission has to be given to Building Control after completion to prove compliance for the part of the building covered by the fit out work.

This submission is to be based on the building shell as constructed and the fixed building services as actually installed.

If the fit out does not include any fixed building services, then reasonable provision would be to

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>						<b>24</b>
		<b>Guide 7 – APPROVED DOCUMENT L2A</b>						
	Issued	21/01/13	Rev		Page	6	of	17

demonstrate that the installed lighting systems are as efficient as those assumed in the shell developers initial submission.

***The Shell fit out will also require the provision of a new Energy Performance Certificate.***

### **Industrial sites, workshops and non-residential agricultural buildings with low energy demands.**

Special consideration may apply e.g. where a CO2 target is established though other regulatory frameworks such as the carbon reduction commitment or where it is impractical for the generic National Calculation Methodology to adequately account for the particular industrial processes or agricultural use without leading to the possibility of negative impacts on cost-effectiveness and / or increased technical risk. In such cases reasonable provision would be to provide fixed building services in accordance with ADL2B.

## **Criterion 2 – Limits on design flexibility.**

You are required to ensure that the performance of the building elements and services comply with minimum design limits. This places design flexibility limits to restrict excessive or inappropriate trade-off e.g. buildings with poor insulation standards offset by renewable energy systems with uncertain service lives.

***Note - in order to satisfy the TER, the building specification will need to be considerably better than the stated values in many aspects of the design.***

### **Fabric Standards.**

*Table 4 sets out the worst acceptable standards for fabric properties, with the U-values calculated in accordance with BR443.*

The u-value for roof windows and roof lights are based on having assessed the roof light in a vertical plane. If a particular unit has been assessed in a other plane the u-value standards should be adjusted using BR 443

**Table 4 – Limiting fabric parameters.**

<b>Roof</b>	0.25 W/m <sup>2</sup> k
<b>Wall</b>	0.35 W/m <sup>2</sup> k
<b>Floor</b>	0.25 W/m <sup>2</sup> k
<b>Windows, roof lights, roof windows <sup>(3)</sup>, curtain walling and pedestrian doors<sup>(1)</sup>, <sup>(2)</sup></b>	2.2 W/m <sup>2</sup> k
<b>Vehicle access and similar large doors</b>	1.5 W/m <sup>2</sup> k
<b>High usage Vehicle access and similar large doors</b>	3.5 W/m <sup>2</sup> k
<b>Roof ventilators (inc smoke vents).</b>	3.5 W/m <sup>2</sup> k
<b>Air Permeability</b>	10m <sup>3</sup> /(h.m <sup>2</sup> ) at 50PA.

#### **NOTES**

- (1) Excluding display windows and similar glazing, there is no limit on design flexibility for these exclusions but their impact on CO2 emissions must be taken into account in calculations.
- (2) In buildings with a high internal heat gains, a less demanding area weighted average U-value for the glazing may be appropriate way of reducing overall CO2 emissions and hence the BER. If this case can be made, then the average u-value for windows can be relaxed from the values given above. However, values should be no worse than 2.7 W/m<sup>2</sup>k.
- (3) The relevant rooflight 'U' value for checking against these limits is based on the developed area of the the rooflight, not the area of the roof aperture.

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER</b>						<b>24</b>
		<b>Guide 7 – APPROVED DOCUMENT L2A</b>						
	Issued	21/01/13	Rev		Page	7	of	17

## **Design limits for building services.**

**(Heating, Hot water services, Mechanical Ventilation, and Air Conditioning systems, Fixed internal and external lighting and Renewable Energy Systems).**

Where **'fixed building services'** are to be provided (including replacement) or extended – you must ensure that they meet enhanced minimum standards of energy efficiency.

**'Fixed Building Services'** means: any part of, or any controls associated with:

- (a) Fixed internal or external lighting systems, but not emergency escape lighting or specialist process lighting: or
- (b) Fixed systems for heating, hot water service, air conditioning and Air Handling Mechanical cooling or ventilation).
- (c) Any combination of systems of the kinds referred to in paragraph (a) or (b).

## **Controls.**

Systems to have appropriate controls to enable reasonable standards of energy efficiency in use.

In normal circumstance the following would be appropriate:

- a. The system should be sub divided into separate control zones to correspond to each area of the building that has a significantly different solar exposure, or pattern or type of use; and
- b. Each separate control zone should be capable of independent timing and temperature control and, where appropriate, ventilation and air recirculation rate; and
- c. The provision of the service should respond to the space requirements it serves, if both heating and cooling are provided, they should be controlled so as not to operate simultaneously; and
- d. Central plant should operate only as and when the zone systems require it. The default condition should be off.

***In addition to these each fixed building service must have efficiencies as indicated in the Non-Domestic Building Services Compliance Guide. Evidence must be provided that the efficiency claimed is achievable in the form of certified test data.***

## **Energy Meters.**

Energy metering systems should be installed to enable at least 90% of the estimated annual energy consumption of each fuel to the various end-use categories (heating, lighting etc.)

Reasonable provision in existing buildings is to install energy metering systems in the building services provided as part of the building works in accordance with recommendations in CIBSE TM39.

In addition to this:

- (a) Meters should be provided to enable performance of any renewable energy system provided as part of the works to be separately monitored: and
- (b) in buildings with a total useful floor area of more than 1000m<sup>2</sup>, the metering system should enable automatic meter reading and data collection.
- (c) The metering provisions should be designed so as to facilitate the benchmarking of energy performance as set out in TM46 – Energy Benchmarks (CIBSE)

<b>Building Control Guidance Note.</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>						<b>24</b>
		<b>Guide 7 – APPROVED DOCUMENT L2A</b>						
	Issued	21/01/13	Rev		Page	8	of	17

**Centralised switching of appliances.**

Consideration should be given to the provision of centralised switches to allow the facilities manager to switch off appliances when not needed – preferably these should be automated to maximise energy savings.

**Criterion 3 – Limiting the Effects of Solar Gains in Summer.**

Provisions must be taken to limit internal temperature rise due to solar gain, by countering excessive internal temperature rise in summer this will reduce or eliminate the need for air conditioning / mechanical cooling which uses energy resources.

Consider window size and orientation, solar protection through shading and other solar control measures, ventilation (day and night) and high thermal capacity. If balanced mechanical system is used, consider providing a summer bypass function during warm weather (for allowing the dwelling to operate via natural ventilation) so that the ventilation is more effective in reducing overheating.

The regulations give some guidance to limit solar gains and reference should also be made to CIBSE TM37 and for schools BB101.

**Criterion 4 – Building Performance Consistent with BER.**

**Quality of construction and commissioning.**

Dwellings should be constructed and equipped so that their performance is consistent with the predicted BER and the design specification assumptions. The specification information provided at design stages will assist Building Control in checking the key features of the design are included during the construction process.

**A final ‘BER’ SBEM calculation must be carried out** reflecting any adjustment in performance between design and construction and to demonstrate that the building as constructed meets the TER.

The final calculation produced must be based on the building as constructed; incorporating:

- a. Any changes made to the performance specifications and construction carried out during the build process.
- b. The measured air permeability, ductwork leakage and fan performances as commissioned and determined from the air test carried out on completion.

**The ‘As Built’ ‘BER’ CO<sup>2</sup> Emission Rate Calculation** – must be prepared by a suitably qualified person and provided to Building Control **NMT 7 days** after the final Air Test was carried out or where no air testing is required 7 days before the final completion inspection is carried out.

The notice is to be in the form of a Certificate together with a supporting list of any specifications changes made during construction – this will check the design assumed is actually built accompanying list of specifications.

**Note: if your ‘suitably qualified person’ is registered by FAERO Ltd or BRE Certification Ltd, they are only required to provide a certificate and list of specifications.**



<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>							<b>24</b>
		<b>Guide 7 – APPROVED DOCUMENT L2A</b>							
	Issued	21/01/13	Rev		Page	9	of	17	

## **Building fabric.**

The building fabric should be constructed to a reasonable quality so that the insulation is reasonably continuous over the whole building and that the air permeability is within reasonable limits.

### **Continuity of Insulation.**

The building fabric should be constructed so that there are no reasonably avoidable thermal bridges in the insulation layers caused by gaps within the various elements, at joints between elements and the edges of elements such as around window and door openings.

Reductions in thermal performance can occur where the air barrier and the insulation layer are not contiguous and the cavity between them is subject to air movement. To avoid this problem, either the insulation layer should be contiguous with the air barrier at all points in the building envelope, or space between them should be filled with solid material such as a masonry wall.

#### **Reasonable provisions would be to:**

- a. Adopt quality assured accredited construction details – where utilised the calculated linear thermal transmittance can then be used directly in the BER calculation.
- b. To demonstrate that the specified details deliver an equivalent level of performance using Information Paper IP01/06 – Assessing the effects of thermal bridging at junctions and around openings in the elements of building (BRE 2006).

To confirm that continuity of insulation have been met on site – you are required to have a suitably qualified person (agreed with Building Control on the works commencement) to monitor the works and complete a '**DECLARATION OF CONTINUITY OF INSULATION**'.

For new buildings other than dwellings, such schemes provide independent third party checking of the calculation of linear transmittance and buildability of construction details.

Where accredited details are not used then adjustments are made in the BER calculations to account for the likely poor performing construction detailing.

### **Air permeability and pressure testing.**

Prior to occupation, a building 'Pressure Test' must be carried out in accordance with Measuring Air Permeability of Building Envelopes – ATTMA 2010 by a Secretary of State approved person or body.

Copies of the Pressure Air Test must be provided to Building Control, not later than 7 days after the final test is carried out. Alternatively Building Control can accept a 'Certificate of Compliance' from a person who is registered by the British Institute of Non-destructive Testing **or the Air Tightness and Testing and Measurement Association** in respect of pressure testing for the air tightness of buildings.

The air permeability value would then be used in the final BER calculation to determine carbon emissions comply with the TER – particularly important to prove compliance where a low value has been assumed in the BER design calculations.

In all cases the maximum air permeability of **10m<sup>3</sup>/(h.m<sup>2</sup>) at 50PA should not be exceeded.**

**Evidence should also be provided that the test equipment used has been calibrated within 12 months using a UKAS accredited test facility.**

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>						<b>24</b>
		<b>Guide 7 – APPROVED DOCUMENT L2A</b>						
	Issued	21/01/13	Rev		Page	10	of	17

## Consequences of failing a pressure test.

Pressure testing compliance is achieved:

- a. If the measured air permeability is not worse than  $10\text{m}^3/(\text{h.m}^2)$  at 50PA: and
- b. The BER calculated using the measured air permeability is not worse than the TER.

This means that if a design adopted low design air permeability in order to achieve a performance better than the TER. It would not fail Part L if the pressure test achieved the limit value and the TER was achieved.

## Where building fails to come upto the required standards.

If a satisfactory test result is not achieved, then remedial measures should be carried out until the required value is achieved.

If the measured air permeability on retest is greater than the design air permeability but less than the limiting  $10\text{m}^3/(\text{h.m}^2)$  at 50PA then other improvements may be required to achieve the TER. This means it is unwise to claim a design air permeability better than 10 unless they are confident of achieving the improved value.

## Alternative to pressure testing.

**You do not have to pressure test if:**

- a. The building is less than  $500\text{m}^2$  total useful floor area and a value of  $15\text{m}^3/(\text{h.m}^2)$  at 50PA is used for air permeability when calculating the BER. As a result additional compensatory features / construction will be required elsewhere in the buildings design to ensure the BER is met.
- b. A factory made modular building of less than  $500\text{m}^2$ , with a planned time of use of more than 2 years at more than one location, and where no site assembly work is needed other than making linkages between the modules. Compliance can be demonstrated by giving notice to building control that the building conforms to one of the standard configurations of modules and link details already air tested (minimum 5 insitu measurements incorporating the same module types and link details used in the actual building), the results must indicate the average test result is better than the design air permeability as specified in the BER calculation by not less than  $1\text{m}^3/(\text{h.m}^2)$  at 50PA.
- c. Large extensions (whose compliance with Part L is being assessed under ADL1A) where sealing off the extension from the existing building is impractical. The ATTMA publication gives guidance both on how extensions can be tested and on situations where pressure testing is inappropriate. Where agreed with building control that testing is impracticable, the extension is treated as a large, complex building with the guidance in item d) to be followed.
- d. A large, complex building where due to its size or complexity it is impracticable to carryout pressure testing of the whole building – the ATTMA publication provides guidance. Before adopting this approach developers must produce in advance of construction work in accordance with the approved procedure a detailed justification why pressure testing cannot be done. This has to be endorsed by a suitably qualified person such as a competent person approved for pressure testing. Usually you will have to appoint a suitably qualified person to undertake a detailed programme of design development, component testing and site supervision to give confidence that a continuous air barrier will be achieved. It would not be reasonable to claim air permeability better than  $5.0\text{m}^3/(\text{h.m}^2)$  at 50PA has been achieved.

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>							<b>24</b>
		<b>Guide 7 – APPROVED DOCUMENT L2A</b>							
	Issued	21/01/13	Rev		Page	11	of	17	

- e. Compartmentalised buildings: where buildings are compartmentalised into self contained units with no internal connections it may be impracticable to pressure test the whole building. In such circumstances a representative pressure test should be carried out as detailed in the ATTMA guidance. In event of a test failure it would be carryout a further test on another representative area to confirm that the expected standard is achieved in all parts of the building.

### **Commissioning and Providing Information.**

On completion all fixed building services should be properly commissioned with all parts and controls working adequately – Regulation 44 requires that the installer provides a notice to building control (within 5 days of commissioning completion) confirming that the fixed building services have been commissioned in accordance with the CIBSE Commissioning Code M on Commissioning Management and for ductwork air leakage testing, this should be tested in accordance with Heating & Ventilation Contractor's Association guide DW/143 – A Practical Guide to Ductwork Leakage Testing. (Note for schemes covered by competent person's schemes this can be 30 days max)

Requirement only applies to the work that was actually carried out e.g. if it was a window replacement scheme there is no obligation to provided details of the heating system.

The commissioning notice should include a declaration signed by a suitably qualified person confirming that:

- (a) a commissioning plan has been followed so that every system has been inspected and commissioned in an appropriate sequence and to reasonable standard.
- (b) The results of tests confirm that the performance is reasonably in accordance with the proposed building designs, including written commentaries where excursions are proposed to be accepted.

### **Air leakage testing of ductwork.**

Ductwork air leakage testing, this should be tested in accordance with Heating & Ventilation Contractor's Association guide DW/143 – A Practical Guide to Ductwork Leakage Testing on systems served by fans with a design flow rate greater than 1m<sup>3</sup>/s and for those sections of ductwork where:

- a. The pressure class is such that DW/143 recommends testing; or
- b. The BER calculation assumes a leakage rate for a given section of ductwork better than the standard for its particular pressure class. In such cases, any low pressure ductwork should be tested using the DW/143 testing provisions for medium-pressure ductwork. The pressure classes are set out below in Table 5.

DW/143 does not call for any testing of low-pressure ductwork – but if you are claiming that the low- pressure ductwork will be less leaky than the normal low-pressure class allowance to achieve an improved BER, this better standard has to be demonstrated by testing using the procedures set out for medium pressure ductwork.

If a ductwork system fails to meet the leakage standard, remedial work should be carried out as necessary to achieve satisfactory performance in retests and further ductwork sections should be tested as set out in DW/143.

**Table 5 Ductwork pressure classes**

Pressure class	Design static pressure (Pa)		Maximum air velocity (m/s)	Air leakage limit (l/(s.m <sup>2</sup> ) of duct surface area)
	Maximum positive	Maximum negative		
Low pressure (class A)	500	500	10	0.027 $\Delta P^{0.65}$
Low pressure (class B)	1000	750	20	0.009 $\Delta P^{0.65}$
Low pressure (class C)	200	750	40	0.003 $\Delta P^{0.65}$

## Commissioning specialists:

**HVCA Systems** - Membership of the Commissioning Specialists Association or the Commissioning group of the HVCA

**Lighting Control Systems** – persons accredited under the Lighting Industry Commissioning Scheme.

**Ductwork leakage testing** - Membership of the HVCA specialist ductwork group or the Association of Ductwork Contractors and Allied Services. Testing to be carried out in accordance with the procedures set out in Heating & Ventilation Contractor's Association guide - DW/143.

## Providing Information.

On completion of the works, you must ensure contractors provides the owner with sufficient information about the building, the fixed building services and their maintenance requirements is that the building can be operated to achieve the intended fuel and power conservation provisions (e.g. provide a Building Log-Book).

### Building Log-Book.

Provide a building log-book in accordance with CIBSIE TM31 Building Log-book Toolkit or amend any existing log books that may exist (provided its format is compatible with the TM31 format).

If you decide to use a different form of log-book, then the information contained and formatting must be equivalent to TM31.

A simple summary format suitable for day to day use must also be provided and it can cross reference to other documents e.g. Operation & Maintenance Manuals / Health & Safety files etc.

It should also contain details of the data used to calculate the TER and BER for the building.

Also the owner should be provided with the recommendations report generated in parallel with the on construction 'Energy Performance Certificate', which informs them how they can further improve the buildings energy efficiency.

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013.</b>						<b>24</b>
	Issued	21/01/13	Rev		Page	13	of	17

## **Buildings Exempt from the Energy Efficiency Requirements.**

### **Historic Buildings / Listed Buildings.**

AD L2B will have an impact on renovation and conservation works to historic buildings, as a result special considerations can be applied. Seek conservation officer advice in assessing the works and reference should be made to the English Heritage guidance note on regulations and historic buildings *Building Regulations and Historic Buildings*.

Buildings which are:

1. Listed in accordance with the Planning (Listed Buildings and Conservation Areas) Act 1990;
2. Buildings in 'Conservation Areas' designated in accordance with section 69 of that Act; or
3. Included in the schedule of monuments maintained under section 1 of the Ancient Monuments and Archaeological Areas Act 1979.

Are exempt having to comply with the energy efficiency requirements, ***but only where the works would unacceptability alter the character or appearance of the existing building.***

### **Historic and traditional building where special consideration may apply:**

There are 3 further classes of building where special consideration in making reasonable provision for the conservation of fuel and power may apply:

1. Buildings which are of architectural and historical interest and are referred to as such in the Local Authorities development plan or local development framework;
2. Buildings which are of architectural and historical interest within national parks, areas of outstanding natural beauty, registered battlefields, registered historic parks and gardens, the curtilage of scheduled ancient monuments, and world heritage sites;
3. Buildings of traditional construction with permeable fabric that absorbs and readily allows the evaporation of moisture.

For these types the aim should be to improve energy efficiency as far as is reasonably practicable. The work should not prejudice the character of the host building or increase the risk of long-term deterioration of the building fabric or fittings.

Extensions to these buildings should however comply with the energy efficiency requirements – the only exemption is where there is a need to match the external appearance or character of the host building

### **Places of Worship.**

Buildings which are used primary or solely as places of worship.

Places of worship - means those buildings or parts of a building that are used for formal worship, including adjoining spaces whose function is directly linked to that use.

***Other parts of the building that are to be used separately, such as offices, catering facilities, day centres and meeting halls are not exempt.***

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013. Guide 7 – APPROVED DOCUMENT L2A.</b>						<b>24</b>
	Issued	21/01/13	Rev		Page	14	of	17

### Temporary Buildings.

Temporary buildings with a planned time of use of 2 years or less, industrial sites, workshops and non-residential agricultural buildings with low energy demands. ***However for the purpose of energy efficiency requirements, a temporary building with a planned time of use of 2 years or less does NOT include portable or modular buildings which have a planned service life greater than 2 years, whether on one or more sites.***

### Industrial Sites, Workshops and Non-Residential Agricultural Buildings with Low Energy Demand.

In this exemption category, the low energy demand relates only to the energy used by fixed heating or cooling systems (*Not the energy used by the process needs*). Examples of these types include – a) buildings or parts of buildings where the space is not generally heated, other than by process heat; or cooled; b) buildings or parts of buildings that requires heating or cooling only for short periods each year, such as during critical periods in the production cycle (e.g. plant germination, egg hatching) or in very severe weather conditions.

If these types of building fail to meet the low energy demand criterion, then they must comply with the energy efficiency requirements. Similarly, other buildings (e.g. some warehouse types) may have low energy demands but are not exempt because they do not meet the above requirements.

### **Non-Exempt Buildings with Low Energy Demand;**

This are where :

- a) fixed building services are used to heat or cool only localised area rather than the entire enclosed volume of space concerned (e.g. Localised radiant heaters at a workstation in a generally unheated space); or
- b) fixed building services are used to heat spaces in the building to temperatures substantially lower than those normally provided for human comfort (e.g. to provide condensation or frost protection in a warehouse).

For these types of buildings it is not reasonable to ask for full compliance - therefore if an existing building with low levels of heating are to be extended or the fabric is to be renovated, the new building or renovated building envelope should be insulated to the degree which is reasonable in each particular case. (Agreed with Building Control).

If some general heating is provided (case b above) the external fabric must have minimum u-value of 0.7 W/m<sup>2</sup>.K, in addition every fixed building service must meet the requirements of the Non-Domestic Building Services Compliance Guide.

If part of a low energy demand building is partitioned off and heated normally (e.g. heated office area off an unheated warehouse) the separated heated part of the building needs to meet the energy efficiency requirements.

If a building with low energy demands subsequently changes so the space is conditioned, then this is likely to involve the initial provision or an increase in the installed capacity of a fixed building service and as a result regulation 17D would require the building envelope to be upgraded and **consequential improvements** to be made.

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013. Guide 7 – APPROVED DOCUMENT L2A.</b>							<b>24</b>
	Issued	21/01/13	Rev		Page	15	of	17	

### **Stand-Alone Buildings.**

Stand alone buildings other than dwellings with a total useful floor area of ***less than 50m2 are exempt the energy efficiency requirements.***

### **Exempt Conservatories and Porches.**

*Conservatory is defined as having N.L.T three quarters of its roof area and N.L.T one half of its external wall area made of translucent material.*

There have been some changes to the exemption rules for these types of extension, **they still remain exempt if :**

- They are constructed at ground level and the internal floor area does not exceed 30m2
- Safety Glazing complies with Approved Document N
- Where there are existing doors and windows between the conservatory and dwelling that these are retained or, if removed are replaced by walls, windows and doors that meet the energy efficiency requirements; and
- **This is the big change - Where the heating system is not extended into the conservatory or porch. So if you heat the conservatory or porch the exemption ceases to apply and a building regulation application will be required.**

Where conservatories are not exempt as a result of the above the following will have to be undertaken:

### **Non- Exempt Conservatories and Porches.**

Where constructed at the same time as new build follow the guidance in ADL2B - extracted below

#### **REQUIREMENTS:**

- a. There is to be effective thermal separation between the dwelling and conservatory, i.e. walls, doors and windows to be insulated to at least the standard of the existing dwelling, doors and windows to be fully draught sealed.
- b. Provide independent temperature and on/off controls to any heating system (refer to previous controlled services notes for the system compliance requirements).
- c. Glazed elements to comply with the thermal performance set out in Table 3 in 'Controlled Fittings' above (however the limitations on total area of windows and doors set out in Table 2 do not apply).
- d. Thermal Elements must comply with the thermal performances as set out in Table 4 above discussed previously.

If a highly glazed extension is not thermally separated from the heated area of the building – it will be considered to be a conventional extension and must therefore fully comply with the regulations requirements.

***IMPORTANT NOTE - Removing and not replacing any or all of the thermal separation between the heated part of the building and existing exempt extension, or extending the buildings heating system into the exempt extension means the exemption ceases. This constitutes a change to the buildings energy use and reasonable provisions would have to be taken as to the building energy efficiency as if it was a conventional extension and make you must make a Building Regulation application.***

<b>Building Control Guidance Note</b>	Subject	<b>CONSERVATION OF FUEL AND POWER 2013. Guide 7 – APPROVED DOCUMENT L2A.</b>							<b>24</b>
	Issued	21/01/13	Rev		Page	16	of	17	

## Energy Performance Certificates.

Where a building is erected or a building is modified so that it has a greater or fewer number of parts designed or altered for separate use than it previously had, where the modification includes the provision or extension of any of the fixed building services for heating, hot water, air conditioning or mechanical ventilation.

The person carrying out the work must give an energy performance certificate for the building to the building owner; and give the local authority notice to that effect, including the reference number under which the energy performance certificate has been registered in accordance with the Building Regulations. The certificate must be prepared by a registered assessor and must also include a recommendation report, where the assessor makes recommendations for the cost-effective improvement of the energy performance of the building.

*Improving the energy efficiency of our buildings - a guide to EPC; for construction sale and let of buildings (CLG December 2012) offers further guidance.*

## Consideration of high- efficiency alternative systems for new buildings – regulation 25A(

*This a new regulation coming to into force as follows -9th Jan 2013 in respect of new buildings occupied by public authorities and 9th July 2013 in respect of all new buildings.*

Before construction of a new building starts, the person who is undertaking the work must analyse and take into account the technical, environmental and economic feasibility of using high-efficiency alternative systems in the construction, if available.

The following high efficiency alternative systems may be considered if available, but other low and zero carbon systems may also be considered if available:

- a. decentralised energy supply systems based on energy from renewable sources;
- b. cogeneration;
- c. district or block heating or cooling, particularly where it is based entirely or partially on energy from renewable sources; and
- d. heat pumps.

### Definitions

(a) “cogeneration” means simultaneous generation in one process of thermal energy and one or both of the following—

(i) electrical energy; (ii) mechanical energy;

(b) “district or block heating or cooling” means the distribution of thermal energy in the form of steam, hot water or chilled liquids, from a central source of production through a network of multiple buildings or sites, for the use of space or process heating or cooling;

(c) “energy from renewable sources” means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases; and

(d) “heat pump” means a machine, a device or installation that transfers heat from natural surroundings such as air, water or ground to buildings or industrial applications by reversing the natural flow of heat such that it flows from a lower to a higher temperature. (For reversible heat pumps, it may also move heat from the building to the natural surroundings.)



# Building Control Guidance Note

Subject

**CONSERVATION OF FUEL AND POWER  
2013.**

**24**

**Guide 7 – APPROVED DOCUMENT L2A.**

Issued

21/01/13

Rev

Page

17

of

17

The analysis should state whether high-efficiency alternative systems have or have not been included in the building design. The requirement relates to considering, taking into account, documenting and making available for verification purposes the analysis of high-efficiency alternative systems.

*The Building Regulations are technology neutral and do not mandate the installation of high efficiency alternative systems or other low and zero carbon systems. However, the design and construction of new dwellings often features such systems to meet local planning conditions that require energy performance standards exceeding those of Building Regulations and/or require a proportion of energy used in development to be from renewable and/or low carbon sources.*

The person carrying out the work **must before work starts**, give building control a notice which states that the analysis has been undertaken; is documented and is available for verification purposes. The results of the analysis must be documented and retained for inspection by building control upon request.

*Although the analysis of high efficiency alternative systems is not an explicit requirement of the CO2 emission rate calculation, a facility within calculation software output reporting (the design stage BRUKL report) may be available to the builder to declare that the analysis has been carried out, is documented and where it is available for verification purposes.*

The analysis may be carried out for individual buildings, groups of similar buildings or for common typologies of buildings in the same area. Where a number of buildings are connected to a community energy system, a single analysis may be carried out for all of the buildings connected to the system in the same area as the building to be constructed.

## **Nearly zero-energy requirements for new buildings.**

Nearly zero-energy requirements for new buildings (new regulation 25B) – comes into force 1st Jan 2019 for the purpose of new reg 25B in respect of new buildings occupied by public authorities and 31st Dec 2020 for the purpose of new reg 25B in respect of all new buildings.

25B. Where a building is erected, it must be a nearly zero-energy building.

© Crown copyright material is reproduced with the permission of the Controller of HMSO. Information is extracted from Approved Document K 2013. Further information can be obtained from the Building Regulations Approved Documents or from your Building Control Surveyor. All views expressed in this document are those of the Council and do not necessarily reflect those of the Department for Communities and Local Government or any other Local Authority. In the event of any dispute arising, reference should be made to the relevant Statutory Document, which contains a full statement of the Law. <http://www.nationalarchives.gov.uk/doc/open-government-licence/>