OFTEC INFORMATION SHEET

Approved Document L2a and L2b (England and Wales) April 2006

The Building Regulations England and Wales Approved Document L2a and L2b (as amended with effect from 1st April 2005) gives detailed guidance on conservation of fuel and power in new and existing non-domestic buildings.

New Buildings Other than Dwellings.

These regulations cover new design requirements and limitations for new buildings (including common areas of buildings containing self contained flats and other buildings which contain rooms for residential purposes) other than domestic dwellings (for information on domestic dwellings see PUB 32).

Approved Document L2a gives 5 separate criteria for a new building which when all met are deemed to demonstrate compliance as follows:

- The predicted BER (Building Emission Rate) should not exceed the calculated TER (Target Emission Rate)
- The performance of the building fabric must not exceed stated limits contained within Approved Document L2a and the heating services zoned with time, temperature and plant interlock controls following the guidance in the Non-Domestic Heating, Cooling and Ventilation Compliance Guide (available from the Communities and Local Government's website www.communities.gov.uk).
- Limitation of solar gains in summer via comfort cooling systems or passive control measures.
- It must be built to be consistent with the predicted BER.
- The building logbook must include plant equipment and controls operating and maintenance instructions and record the TER and BER calculation data.

Using the Simplified Building Energy Model (SBEM) or equivalent approved software (approved by The Department of Communities and Local Government) a notional rate of CO_2 emission is calculated (utilising a notional building of the same shape and size as the proposed building) from which a TER (units = kg/m^2 floor area) is calculated this includes an "improvement factor" (dependant on services strategy to be adopted from table 1 of Approved Document L2a) for the proposed notional building design. This TER is the target of CO_2 (units = kg/m^2 floor area) emissions which must not be exceeded (by the completed building) to achieve compliance.

The building and building services are then designed with this and the guidance contained in this and other documents. Once this design process is complete the proposed design specification is submitted for SBEM calculations to ascertain the Building CO_2 Emission Rate (BER) (units = kg/m^2 floor area).

For Building Regulations approval it will be necessary for the designer to show evidence that the calculated BER does not exceed the notional TER.

As a result of this, those installing building services will need to be advised by the building services (designer) of any design limitations and details of plant and equipment required with respect to the 2nd tier documentation (Non-Domestic Heating, Cooling and Ventilation Compliance Guide) to achieve compliance for the particular building design.

PUB/36
ISSUE 01
26•04•2007

OFTEC
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Non-Domestic Heating, Cooling and Ventilation Compliance Guide requirements for Work in New Buildings other than Dwellings.

The above document contains information and minimum specifications for building services required for non-domestic new builds (and where it is provided in an existing building) projects such as central heating/hot water plant is required to meet minimum boiler seasonal efficiency and control levels. It also contains a Seasonal Boiler Efficiency calculation for multiple boiler systems which contain non-identical boilers. System and controls packages required are specified based on boiler plant outputs (in the case of multiple appliance installations = total output of appliances) of:

- < 100kW = Time & temperature demand control per 150m^2 of floor area + weather compensation
- 100kW to 500kW = A + Optimal start/stop night setback control two stage (high/low) firing burners or multiple boilers (+ sequential firing control for multiple appliance installations).
- > 500 kW (individual boilers) = A + B + Multistage / Modulating Burners.

Any variation from the given technical specification by the building services/installing company(s) will require approval from the designer as the BER may have to be recalculated to check that it (the new BER from the amended specification) still does not exceed the TER. If however it is found that the BER exceeds the TER due to a change in specification then the original design specification of the building will need revision to reduce the BER to below that of the TER accordingly.

It is vitally important that there is good two way communication between the building (services) designer and the Building Services (heating/hot water/AC) contractor/installer.

If any changes to the specification, have been necessary and applied during construction, upon completion of build the BER will have to be recalculated to satisfy Building Control that even though changes in design have taken place the TER has still not been exceeded.

Work in Existing Buildings Other than Dwellings

New requirements and limitations for the provision of building services (including space heating and/or hot water boilers and systems) including: installation, commissioning and provision of information to owners to achieve efficient usage of same. This document also covers the provision of windows, doors and roof lights, etc. to the existing building (excluding works carried out as part of an extension to a new property see Approved Document L1a and self contained dwelling spaces such as flats see Approved Document L1b) again to limit building CO_2 emissions with particular guidance in relation to the following activities:

- Extensions
- The provision or extension of a controlled fitting
- The provision or renovation of a thermal element
- The provision or extension of a controlled service
- A material change of use
- Consequential improvements

The proposed service or fitting to be replaced in an existing building should comply with the minimum specifications as detailed below. The minimum system time, temperature and demand control requirements are specified with minimum zoning per 150m^2 of floor area to achieve a compliant installation.

Non-Domestic Heating, Cooling and Ventilation Compliance Guide requirements for Work in Existing Buildings Other than Dwellings

This document contains information and minimum specifications for replacement building services in existing buildings such as when existing boiler plant is replaced. This requires that a minimum Effective Heat Generating Seasonal Efficiency as well as a minimum Boiler Seasonal Efficiency is met. As it may not always be possible or practicable to replace a standard efficiency non-domestic appliance with a high efficiency (condensing) appliance in an existing non-domestic building it is possible to utilise additional efficiency measures (over the minimum time, temperature, demand and zoning control requirements) to achieve Heating Efficiency Credits (% points) to achieve compliance with the minimum Effective Heat Generating Seasonal Efficiency as follows:

- Minimum Effective Heat Generating Seasonal Efficiency (EHGSE) for Oil = 86%
- Minimum Oil Boiler Seasonal Efficiency = 82%

Therefore if a boiler with a BSE of 82% was proposed to be used a minimum of four additional percentage points of Efficiency Credits would be required to meet the minimum figure of 86%. This guide contains examples of ten different ways of achieving additional credits with varying credit values from 0.5% to 4%. Continuing the example, the 82% (BSE) boiler could be installed with:

- Thermostatic Radiator Valves throughout = 1 Credit
- Weather (int./ext temp) compensation system = 1.5 Credits
- Optimised Start/Stop controls = 2 Credits

When totalled the Effective Heat Generating Seasonal Efficiency =

82+1+1.5+2 = 86.5% (exceeds minimum HGSE of 86%).

OR

For example the 82% BSE appliance installed in conjunction with the following:

- Full building management system (BMS) = 4 Credits;

would also achieve the minimum EHGSE figure of 86%.