

Changes to Technical Booklet F2 of the Building Regulations Northern Ireland

Important changes have been made to Technical Booklet F2 of the Building Regulations Northern Ireland, which take effect from 30th November 2006. Technical Booklet F2 details guidance on conservation of fuel and power in buildings other than dwellings.

New buildings other than dwellings

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) and extensions (greater than 1000m² and greater than 25% of the useful floor area of the existing building) other than domestic dwellings (dwelling houses) and dwelling spaces (including extensions to existing domestic dwellings and self contained dwelling spaces such as flats and commercial buildings which contain dwelling spaces and are built to enable the non-dwelling parts to be able to revert to domestic use are covered by Technical Booklet F1), to reduce overall building CO₂ emissions via control of and limitations to fabric losses, air leakage and infiltration, solar gains, heating, hot water and air conditioning plant equipment and systems, installation, commissioning and provision of information to owners to achieve efficient usage of same.

Technical Booklet F2 gives five separate criteria for a new building which when all met are deemed to demonstrate compliance as follows:

1 The BER (Building Emission Rate) shall be calculated using the same approved software used to calculate the TER (Target Emission Rate). To demonstrate compliance two calculations of the BER will be required, one at plan submission and one on



completion. The BER must be equal to or less than the TER.

- 2 The U Values of the building fabric must not exceed the stated U Values contained in Table 2.4 of Technical Booklet F2. The heating services are required to be zoned with time, temperature and plant interlock controls following the guidance contained in the Non-Domestic Heating Compliance Guide (available from the Communities and Local Government's website www.communities.gov.uk).
- 3 Limitation of solar gains in summer via

window size and orientation, solar protection by shading or any other solar control means.

4 It must be built to be consistent with the predicted BER.

5 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 Finance and Personnel (www.dfpni.gov.uk)), a notional rate of CO₂ emission is calculated (utilising a notional building of the same shape and size as the proposed building) from which a TER (units = kg/m² floor area) is calculated which includes an “improvement factor” (dependant on services strategy to be adopted from table 2.2 of Technical Booklet F2) for the proposed notional building design. This TER is the target of CO₂ (units = kg/m² floor area) emissions which must not be exceeded (by the completed building) to achieve compliance.

The 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 CO₂ Emission Rate (BER) (units = kg/m² 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 Compliance Guide) to achieve compliance for the particular building design.

Non-domestic heating compliance guide



The Non-Domestic Heating Compliance Guide contains information and minimum specifications for building services required for non-domestic new build (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. This document 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:

A < 100kW = Time & temperature demand control per 150m² of floor area + weather compensation

B 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).

C > 500 kW (individual boilers) = A + B + Multistage / Modulating Burners.

Any variation from the given technical

Work in existing buildings other than dwellings



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 therefore 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.

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 Technical Booklet F2, section 2 & self contained dwelling spaces such as flats see Technical Booklet F1) again to limit building CO₂ emissions with particular guidance in relation to the following activities:

- Extensions
- The provision or extension of a controlled fitting
- The provision of a new thermal element
- The replacement 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 of the Non-Domestic Heating Compliance Guide as detailed below. The minimum system time, temperature and demand control requirements are specified with minimum zoning per 150m² of floor area to achieve a compliant installation.

Non-Domestic Heating Compliance Guide

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 practical 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 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 EHGSE 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%.

Work Notification

Changes to the Building Regulations mean that from 30th November 2006, Local Authority Building Control must be notified of any oil firing, storage, installation and commissioning works (including replacement works) undertaken. Local Authority Building Control should be contacted before commencement of works for either a Building Notice or full Building Regulations approval.