



BER Assessors – Dwellings Technical Bulletin

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http://www.sei.ie/Your_Building/BER/BER_FAQ/FAQ_BER/Assessors/SEI_BER_Reports.html

1 Guidance relating to heating systems in DEAP

1.1 Identification of smokeless fuel zones

Selection of fuel type for solid fuel appliances is detailed in the DEAP Manual Section 10.3.3. This method applies to both secondary and primary solid fuel heating systems and is summarised in the following table:

Table 1: Selecting the appropriate solid fuel type for solid fuel appliances

Scenario	Wood (logs, pellets, chips)	Manufactured smokeless fuel	One of house coal; sod peat; peat briquettes or anthracite	Solid multi-fuel
Appliance can only burn wood fuels	✓	X	X	X
Appliance can only burn a particular coal or peat based product	X	✓ (select fuel type as appropriate)	✓ (select fuel type as appropriate)	X
Appliance can burn multiple solid fuels but a particular non-wood fuel is the most commonly available fuel in the area	X	✓ (Select manufactured smokeless fuel when dwelling is in "smoke control area" and the appliance can burn multiple fuels)	✓ (Select one of these fuels when dwelling is in non "smoke control area" and that fuel is clearly the most commonly available fuel in the area)	X
All other scenarios	X	X	X	✓

Notes:

Smokeless coal areas are detailed on the Department of Environment, Heritage and Local Government website under <http://www.environ.ie/en/Environment/Atmosphere/AirQuality/BituminousCoalBan/>. These areas may also be referred to as areas in which the sale of bituminous coal is banned.

Individual Local Authorities may have further details:

<http://www.environ.ie/en/LocalGovernment/LocalGovernmentAdministration/LocalAuthorities/>

1.2 Efficiency of a boiler retrofitted with a new burner unit

In cases where the burner unit in a boiler has been replaced with a different type of burner to that originally in the boiler, then a non-default efficiency value from HARP, SEDBUK or certified test data is not to be used. In this case an appropriate default efficiency value should be selected from Table 4a or Table 4b in the DEAP Manual.

When choosing the appropriate default in this case, the boiler age should be based on that of the original boiler. The fuel type is that which is used by the newly installed burner attached to the original boiler.

As an example take the following case:

- Standard, non-condensing gas boiler installed in 1995;
- Burner replaced with a new oil burner.

In this case, the boiler entered in the DEAP assessment would have "Heating Oil" selected as the fuel type with the efficiency for "Standard oil boiler 1985 to 1997" taken from Table 4b in the DEAP Manual.

1.3 Case study: data entry for a heat pump in DEAP

The following table details the relevant DEAP entries for a sample dwelling which is equipped with a heat pump. The system is summarised as having a ground source heat pump providing space heating via underfloor heating pipes in screed above insulation. The heat pump also heats water in a cylinder. In this example, as the heat pump is not designed to reach 60°C (temperature required for hot water), it is supplemented by an immersion. Assume that the Seasonal Performance Factor (SPF) for this particular heat pump is listed as 387% on www.sei.ie/harp. The only fixed secondary space heating present is in the form of a closed room heater in the fireplace.

Note that this table only shows entries which are influenced by the heat pump or heating system controls. Other entries have been omitted.

Table 2: DEAP entries for sample dwelling with heat pump

DEAP Tab	Name of entry	Value	Comment
Water heating	Are there distribution losses?	Yes	Distribution network from cylinder to hot water taps
	Are there storage losses?	Yes	Hot water cylinder present
	Is supplementary water heating used in summer?	No	See Section G1.1 of the DEAP Manual. The immersion is accounted for by reducing the main water heating efficiency
	Temperature factor unadjusted	0.6	Taken from Table 2 in DEAP
	Temperature factor multiplier	0.9	As per a boiler heating a hot water cylinder, check if there is separate time control of DHW and if there is a cylinder thermostat controlling the heat pump. "Yes" is the answer to both in this example
	Primary circuit loss type	Boiler with insulated pipework and cylinder thermostat	Individual heating system with heat pump as main water heater should have the appropriate "boiler" option selected under "primary circuit loss type"
Distribution system losses and gains	Temperature adjustment (°C)	0	Assuming programmer with 2 room thermostats present in this example. Temperature adjustment taken from Table 4e group 2 in DEAP Manual
	Heating system control category	2	Taken from Table 4e group 2
	Heating system responsiveness	2	From Table 4d
	Central heating pump	2	Assuming 2 pumps from the heat pump to the underfloor space heating system in this example
	Boiler controlled by room thermostat	yes	Heat source is controlled by room thermostats in this case
Energy requirements -> individual -> space heating	Efficiency of main (space) heating system (%)	387	SPF taken directly from HARP listing in this case. If certified data or HARP entry was not available, defaults from Table 4a would be used instead.
	Efficiency adjustment factor (space)	1	Heat pump heating underfloor heating has efficiency adjustment of 1 as per Table 4c(4) in the DEAP Manual
	Fraction of heat from secondary/supplementary system	0.1	Taken from Table 7. Main heating system is heat pump. Secondary space heater is present (closed room heater) meaning that the fraction of heat from secondary heating is not '0'.
Energy requirements -> individual -> water heating	Efficiency of main (water) heating system (%)	158.9	SPF taken from HARP listing above and, as direct electric supplementary water heating is required, the formula in Section G1.1 of the DEAP Manual applies: $Efficiency = \frac{100}{[50 + 387] + 0.5}$
	Efficiency adjustment factor (water)	1	Heat pump heating underfloor heating has efficiency adjustment of 1 as per Table 4c(4) in the DEAP Manual.*
Energy requirements -> individual -> Fuel data	Main space heating system	Electricity	Electricity powers the heat pump compressor circuit
	Secondary space heating system	Solid-multi fuel	Follow guidance in Section 10.3.3 of DEAP Manual
	Main water heating system	Electricity	Electricity powers the heat pump compressor circuit
	Supplementary water heating	None	The immersion is accounted for using G1.1 of the DEAP Manual

* Further detail available under the BER FAQ:

[http://www.sei.ie/Your_Building/BER/BER_FAQ/FAQ_DEAP/Energy_Requirements/Where_a_Heat_Pump_is_used_to_provide_both_space_and_domestic_hot_water_DHW , why is the "Adjusted Efficiency" of the DHW system less than that of the space heating system .html](http://www.sei.ie/Your_Building/BER/BER_FAQ/FAQ_DEAP/Energy_Requirements/Where_a_Heat_Pump_is_used_to_provide_both_space_and_domestic_hot_water_DHW,_why_is_the_"Adjusted_Efficiency"_of_the_DHW_system_less_than_that_of_the_space_heating_system.html)

1.4 Ratings which are better than expected

In general it is unlikely that a typical dwelling designed to comply with Building Regulations 2008 TGD L or earlier would achieve an A2 or A1 rating. If this result is achieved in a BER assessment it is possible that one or more errors have been made in the assessment. Errors must be corrected prior to publication of the assessment on NAS. The most common cause of a BER assessment showing a better than expected energy rating for the dwelling is that the heating system has not been entered correctly in DEAP. In terms of an SEI audit, all errors are taken into consideration regardless of whether they improve or disimprove the rating.

For individual heating systems, all of the following parameters must be present in the BER assessment at a minimum:

- Energy requirements -> Space heating:
 - Efficiency of main heating system (not less than 20%);
 - Efficiency adjustment factor (may be a value of 1, unless adjustments in DEAP Table 4c apply);
- Energy requirements -> Water heating:
 - Efficiency of main water heating (not less than 20%);
 - Efficiency adjustment factor (may be a value of 1, unless adjustments in DEAP Table 4c apply);
- Energy requirements -> Fuel data:
 - Main space heating system fuel (value other than “none” must be selected);
 - Main water heating system fuel (value other than “none” must be selected).

For group heating systems, the September 2009 Technical Bulletin provides examples of data entry in DEAP. In particular, for group heating systems all of the following parameters must be present in the BER assessment at a minimum:

- Energy requirements -> Space heating:
 - Distribution loss factor taken from Table 9 in the DEAP Manual;
 - For at least one of Heating System 1, 2 or 3:
 - A fuel type other than “none”;
 - An efficiency value (not less than 20%);
 - “Percentage of heat” value greater than 0%

1.5 Ratings which are worse than expected

Both new and existing dwellings would typically achieve a BER of less than 1000kWh/m²/yr. Where the BER primary energy usage is higher than this, there may be an error in the assessment. Any errors in the assessment must be corrected prior to publication on the NAS database. In terms of an SEI audit, all errors are taken into consideration regardless of whether they improve or disimprove the rating. The most common cause of this issue is that heating system efficiency is incorrectly expressed as a fraction (between 0 and 1). Main space heating, water heating and secondary heating system efficiencies should be expressed as a percentage (not less than 20%). This issue is also detailed in the April 2009 Technical Bulletin.

2 Guidance relating to dwellings survey for BER purposes

2.1 Recording low energy lighting during survey

When collecting data relating to the percentage of low energy lighting on site, a room by room record of all fixed lighting and low energy lighting must be retained as part of the BER assessment records. The room by room record in the DEAP Survey Form details all fixed lighting and fixed low energy lighting in each room of the dwelling. Please refer to the May 2009 Technical Bulletin for a sample low energy lighting calculation.

2.2 Identifying works carried out on site

When performing a BER assessment of an existing dwelling, Assessors should always ask the homeowner if they know of any works which have been carried out on the dwelling which are liable to impact on the BER rating. While the homeowner's word is not sufficient proof to use non-default data in the BER, it will help the Assessor to gain a better understanding of what non-defaults might apply to the dwelling and to collate the necessary supporting evidence.

The DEAP Survey Guide (Section 1) provides further details on the use of invasive survey methods. These are not required under the DEAP methodology, but may be used as an acceptable source of evidence as outlined in the DEAP Survey Guide if the homeowner chooses this route to prove that certain insulation measures have been taken.

The BER Assessor should make it clear to the homeowner that proof, such as that outlined in the DEAP Survey Guide, is needed if non-default data is to be included in the BER assessment. Otherwise the default values apply.

2.3 Arranging access to the heating system prior to the BER assessment

Prior to performing a site survey for a BER assessment of an existing dwelling, BER Assessors should contact the client to ensure that access will be granted to the heating system at the time of the survey. In particular, access to group heating system boilers may be restricted unless it has been arranged prior to the site visit. If access still cannot be gained at the time of the site survey then the defaults listed in the DEAP Manual (Appendix S and Table 4) should be used.

2.4 Accessing documentary evidence to determine dwelling age

Documentary evidence of the dwelling age should be researched when determining the year of dwelling construction. This would typically include planning applications, planning permissions or commencement notices. In preparation for a Survey, the BER Assessor should check planning records prior to visiting the dwelling. Relevant planning records may be accessible by searching www.pleanala.ie or the relevant Local Authority website as listed under <http://www.environ.ie/en/LocalGovernment/LocalGovernmentAdministration/LocalAuthorities/>.

The Ordnance Survey website also has a limited amount of information on its free map viewer under <http://shop.osi.ie/Shop/MapView.aspx>, indicating dwellings which were constructed prior to 2005, 2000, 1995.

As per the DEAP Survey Guide, if the documentation outlined above is not available to indicate the age of a dwelling or dwelling extension, then at least two of the following should be used to indicate the relevant year of construction:

- Stylistic evidence;
- Dwelling or development age plates or plaque indicating year of construction;
- Electricity meter age;
- Glazing age printed within double or triple glazing;
- Homeowner knowledge.

3 Identifying sealed or unsealed suspended floors

As per the DEAP Manual Section 2.3: "A suspended wooden floor is considered sealed if all joints in the floor (at the edges and the floor itself) are draught sealed using membranes or adhesives".

In the case of a carpet on a suspended floor, while the carpet itself is unlikely to be airtight, a carpet underlay if present may or may not be airtight. Proof that a carpet underlay has been installed may be determined from receipts or invoices. However, determining whether the underlay extends to the edges, and whether there is continuous coverage may be problematic.

Details of the material used in the linoleum or carpet underlay may be available from receipts, invoices or manufacturer's literature. However, this documentation may be of limited use in helping an Assessor determine if the product is airtight.

As is always the case with data substantiation in DEAP, if a BER Assessor does not have evidence that a suspended floor is sealed or unsealed then the more conservative option is chosen as the default (it must be assumed that the floor is unsealed).

Note that air vents under the level of the suspended floor, should not be included in the DEAP assessment under "intermittent fans and passive vents" in the Ventilation tab. The effect of these vents is already accounted for either by an air permeability test or by answering "Yes" to "Is there a suspended wooden ground floor?".

4 Achieving MPEPC and MPCPC compliance

DEAP checks several facets of the dwelling for compliance with Building Regulations 2008 TGD L. Included in these checks are the Energy Performance Coefficient (EPC) and Carbon Performance Coefficient (CPC). The Maximum Permissible Energy Performance Coefficient (MPEPC) is 0.6 of the value which would be achieved by a reference dwelling that is similar to the actual dwelling but with the characteristics described in Appendix C of Building Regulations 2008 TGD L. Likewise, the Maximum Permissible Carbon Performance Coefficient (MPCPC) is 0.69 of the value which would be achieved by the Appendix C house. DEAP indicates if the EPC and CPC exceed the values of the MPEPC and MPCPC outlined above.

Any aspect of the dwelling which affects the BER result is likely to have an impact on the EPC and CPC values. Consequently, dwelling designers should consider making improvements in a number of areas if the MPEPC and MPCPC values are not being complied with. Appendix E in Building Regulations 2008 TGD L gives a sample dwelling which meets the MPEPC and MPCPC requirements. Note that the Appendix E dwelling needs to significantly exceed some of the other TGD L requirements in order to meet the MPEPC and MPCPC values outlined above. For example, the floor U-value of 0.2W/m²K is substantially lower than the value of 0.25W/m²K outlined in Table 1 of TGD L.

5 The Window Energy Rating

The March 2009 BER Technical Bulletin provides details on sources of acceptable window U-values and solar transmittance data. In addition to this, the U-values and solar transmittance values listed under the Window Energy Performance (WEP) scheme are acceptable for DEAP assessments.

The scheme is accessible under the following link:

http://www.nsai.ie/index.cfm/area/page/information/window_energy_application_scheme

The U-value shown on the WEP certificate is for the entire window (including glazing and frame) so can be input directly into DEAP. The solar transmittance factor (g_{window}) is also for the entire window, and must be converted to g_{glass} using the formula in the DEAP Manual Table 6(b) note 2 prior to use in DEAP:

$$g_{\text{glass}} = g_{\text{window}} / \text{Frame Factor}$$

Note that when entering U-values and solar transmittance for windows in DEAP, both values must be defaults or both values must be non-defaults. For example, do not use a non-default solar transmittance value with a default U-value.

As stated in the March Technical Bulletin, window data from the British Fenestration Rating Council (www.bfrc.org) is also acceptable for DEAP assessments.