BNW18: EC energy labelling of domestic tumble dryers

Version 1.2

This Briefing Note and referenced information is a public consultation document and will be used to inform Government decisions. The information and analysis form part of the Evidence Base created by Defra's Market Transformation Programme.

1 Summary

Changes to the tumble dryer test standard parameters have been made to reflect dryer wash loads which are more representative of today's faster spin speeds. These changes, if used for the EU Energy Label test, would directly affect the label in that most A-G Energy Label ratings would be uplifted by one class. To avoid changes to the displayed A-G ratings, the European Committee of Domestic Equipment Manufacturers (CECED)[1] proposed to amend the energy index by means of correction factors for vented and condenser dryers. The European Commission refused to revise the Energy Label Directive to include new correction factors so these were incorporated in the test standard. If the label is revised and the issue of long programme times considered, then the label could be modified to display the duration of the programme on which the energy label rating is based.

2 Scope

This Briefing Note provides a summary of proposed revisions to and recommendations regarding the mandatory labelling[2] of household tumble dryers (Directive 1995/13/EC). The energy efficiency classes and total kWh per cycle for vented and condenser dryers are included.

The Briefing Note mainly discusses the changes to the test methodology and the effect this has on energy labelling.

3 UK position

Ideally, test standards should reflect real use, so changing the initial moisture content of the test load from 70% to 60% is welcome. However, as this leads to a step up in A-G ratings without any improvement in technology or performance of the appliance, this move would not contribute to UK environment policy objectives and any switch could be confusing to consumers.

The correction factors proposed, along with the revised test methodology, make it more difficult for vented dryers with a very long-duration programme to achieve a

[1] CECED - European Committee of Domestic Equipment Manufacturers: www.ceced.org
[2] http://www.opsi.gov.uk/si/si1996/Uksi_19960601_en_1.htm

good energy rating, such as those which run a lower temperature programme to reduce overall energy consumption. It is appreciated that there is a potential issue about textile fatigue when tumbled for a long time, but all clothes suffer thermal and mechanical stress in any tumble dryer cycle.

The Energy Label indexes are already slightly biased towards condenser dryers, and it is not clear whether the UK could support the new correction factors which continue this, along with the penalties for longer drying times.

The Energy Label should be modified to display the duration of each drying cycle. Consumers can then be aware at the point of purchase and this helps to avoid the risk that the consumer may not obtain the energy efficiency as indicated by the Energy Label rating.

4 Test methodology and energy labelling

Test Standard EN 61121
Electric tumble dryer performance for the Energy Label can be measured in accordance with either the test standard EN 61121:1999 incorporating Amendment 1 or EN 61121:2005.
EN 61121:1999 will be withdrawn in December 2007.
BS EN 61121 was published in February 2006.

Further information can be found in MTP Briefing Note BNW09[3].

Moisture content
EN 61121 Clause 9 defines the initial wetness of the test load as a proportion of conditioned dry weight. One difference between the 1999 and 2005 standards is that the initial moisture content has been reduced from 70% to 60%. This reflects the generally better spinning efficiencies of today's washing machines in European households. According to a report from the Öko Institut[4], the spin speed of the average 'stock' washing machine in domestic use is 1,000 rpm which corresponds to a final moisture content of about 60%.

Vented versus condenser dryers
By the nature of their operation, vented dryers draw air from the warm test room and will gain a small, unearned advantage over condenser dryers. They are therefore required to use less energy in the standard test than comparable condenser dryers. Tables 1 and 2 below show the energy consumption for each Energy Label class.

Energy label
From test runs, the mean of five corrected energy results is divided by the load size and compared against Tables 1 and 2 below, depending upon the type of dryers, to give an energy class rating.

[3] MTP Briefing Note BNW09:
http://www.mtprog.com/ApprovedBriefingNotes/PDF.aspx?intBriefingNoteID=224
[4] Energy demand of tumble driers with respect to differences in technology and ambient conditions. Ina Rüdenauer & Carl-Otto Gensch, Öko Institut. http://www.oeko.de/oekodoc/202/2004-009-en.pdf

It can be seen that the energy classes are already more generous to condenser-type than vented-type tumble dryers. This cannot be transparent to the purchaser although the actual energy consumption per cycle in kWh is displayed on the label below the energy class arrow.

Table 1 Energy efficiency classes for air-vented dryers

Energy efficiency class	Energy consumption in kWh/kg (C)
A	C <= 0.51
B	0.51 < C <= 0.59
C	0.59 < C <= 0.67
D	0.67 < C <= 0.75
E	0.75 < C <= 0.83
F	0.83 < C <= 0.91
G	C > 0.91

Table 2 Energy efficiency classes for condensing dryers

Energy efficiency class	Energy consumption in kWh/kg (C)
A	C <= 0.55
B	0.55 < C <= 0.64
C	0.64 < C <= 0.73
D	0.73 < C <= 0.82
E	0.82 < C <= 0.91
F	0.91 < C <= 1.00
G	C > 1.00

Tables 3 and 4 give the energy consumption in kWh by dryer capacity calculated from the Energy Label classes.

Table 3 Vented dryers' maximum energy consumption, kWh per class

Class	4.5 kg	5 kg	5.5 kg	6 kg	6.5 kg	7 kg	7.5 kg
A	2.3	2.6	2.8	3.1	3.3	3.6	3.8
B	2.7	3.0	3.2	3.5	3.8	4.1	4.4
C	3.0	3.4	3.7	4.0	4.4	4.7	5.0
D	3.4	3.8	4.1	4.5	4.9	5.3	5.6
E	3.7	4.2	4.6	5.0	5.4	5.8	6.2
F	4.1	4.6	5.0	5.5	5.9	6.4	6.8
G	Anything higher than the figure above						

Table 4 Condenser dryers' maximum energy consumption, kWh per class

Class	4.5 kg	5 kg	5.5 kg	6 kg	6.5 kg	7 kg	7.5 kg
A	2.5	2.8	3.0	3.3	3.6	3.9	4.1
B	2.9	3.2	3.5	3.8	4.2	4.5	4.8
C	3.3	3.7	4.0	4.4	4.7	5.1	5.5
D	3.7	4.1	4.5	4.9	5.3	5.7	6.2
E	4.1	4.6	5.0	5.5	5.9	6.4	6.8
F	4.5	5.0	5.5	6.0	6.5	7.0	7.5
G	Anything higher than the figure above						

The Energy Label also displays cotton load capacity and whether the appliance is air-vented or condenser type. A noise measurement at the bottom of the label is optional. Programme duration is not displayed on the label, which is an issue for some commentators (see MTP Briefing Note BNW09[5]) because some low energy programmes are excessively long.

5 Committee deliberations

In 2003, the European Committee for Electrotechnical Standardization (CENELEC)[6] Technical Board, the BT committee, decided not to ratify this change to the standard but await the outcome of the debate of CENELEC and the Officers of CLC/TC 59X[7] with the European Commission (EC) regarding the influence of the draft on the provisions of Directive 95/13/EC (tumble dryer energy label directive) prior to considering its ratification at the BT.

In June 2004, a document from CECED was circulated to address this issue by means of applying correction factors to the final test result energy figures[8].

In this document CECED also states that to enhance tumble dryer energy labelling classes without technical improvement to the appliance is not acceptable. It suggests that energy performance will be improved by about 14% and so 'correction factors' (see below) have been suggested to re-align these apparent improved energy indexes.

The EC has consulted internally, leading to the view that it would not be inclined to publish these correction factors in the Official Journal of the European Union (OJ), which means they would not become European Law.

CENELEC has addressed CECED, pointing out that this would lead the topic back to the original position (ie a proposal for a new standard which would conflict with the current test for the Energy Label). Therefore, the correction factors have been written into the new test standard which was published in the OJ in December 2005.

[5] MTP Briefing Note BNW09: Energy and performance test methodologies for domestic tumble driers, http://www.mtprog.com/ApprovedBriefingNotes/PDF.aspx?intBriefingNoteID=224
[6] CENELEC: (CLC) European Committee for Electrotechnical Standardization - a subsidiary of CEN.
[7] CLC/TC 59X: European technical committee responsible for consumer information relating to household electrical appliances attended by representatives of each national committee.
[8] CECED, Proposal of correction factors for labelling caused by the change of EN 61121 (2004). C Wendker.

Testing to the old or new standard should not make any difference to the Energy Label rating but the number of kWh per cycle will be less when tested to EN 61121:2005. Energy Label declarations to EN 61121:1999 are still legal until December 2007, but it is likely that some appliances will be retested to enhance the lower number of kWh per drying cycle as a marketing tool.

6 CECED correction factors

These correction factors apply only to the results from the measurement standard for the energy class declaration (A - G), but not for the energy consumption (kWh per cycle) declared on the label.

The following correction factors compensate for the changes to the standard, including an additional time-dependent correction for vented dryers only, because the new test ambients of 23°C and 55% relative humidity (previously 20°C and 65% relative humidity) enhance the performance of the vented dryer. The longer the drying time, the more energy is taken from the heated room and the less electrical energy is required.

The correction factors are:

- Condenser dryer energy consumption to be multiplied by 1.14
  (ie corrected energy for Energy Label =
  Energy measured according to EN 61121 x 1.14).

- Vented dryer energy consumption to be multiplied by 1.14 plus a 0.08 factor times the programme time
  (ie corrected energy for Energy Label =
  Energy measured according to EN 61121 x 1.14+ (0.08 x programme time)).

The corrected energies are divided by the load size and compared against the existing separate tables for vented and condenser type dryers (see Tables 1 and 2).

CECED maintains that these correction factors will transform the new measured energy consumption into the old labelling scheme without noticeable changes to the declared class. No studies have been published to show that testing to the old standard and to the new standard plus correction will always give the same energy rating.

CECED states that the additional benefit for the vented dryers with long drying times given by the new standard is eliminated by the introduction of a drying time-dependent correction factor for vented dryers (i.e. vented dryers with longer programmes will be penalised).

7 Issues

Clarity and enforcement
From the Energy Label displayed on the tumble dryer, there is no indication which test standard has been used for the declaration. This subtlety may not be important for the purchaser but could have been useful to the retailer and to law enforcement authorities (TSO), which may wish to check conformance.

Programme duration
When the EC Energy Label Regulatory Committee meets next to discuss a revision of the tumble dryer Energy Label, duration of each programme/cycle and also water consumption, if applicable, should be considered for display on the label since this can affect consumers' choice of product.

More changes?
The changes to the test standard and associated correction factors account for, at least in part, the lower initial moisture content of the spun load. According to a report from the Öko Institut, the moisture content is 70% for an 800 rpm spin, 60% for a 1,000 rpm spin and 50% for a 1,400 rpm spin. The average spin for the current washing machine stock is estimated to be 1,000 rpm, but 1,400, 1,600 and even 1,800 rpm models are already available. At some future date there could be a call to revise the test standard to reflect even dryer initial weights and there could be further disputes about adjusting energy ratings.

Related MTP information

- Briefing Note BNW06: Assumptions underlying the energy projections for domestic tumble dryers
  http://www.mtprog.com/ApprovedBriefingNotes/pdf.aspx?intBriefingNoteID=207
- Briefing Note BNW09: Energy and performance test methodologies for domestic tumble dryers
  http://www.mtprog.com/ApprovedBriefingNotes/pdf.aspx?intBriefingNoteID=224

Changes from version 1.1

Typographical changes following internal review.

Consultation and further information

Stakeholders are encouraged to review this document and provide suggestions that may improve the quality of information provided, email **info@mtprog.com** quoting the document reference, or call the MTP enquiry line on +44 (0) 845 600 8951.

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