EuP Water Heater Stakeholder Comments

BEAMA response to the Lot 2 ERP Consultation published on 25th June 2010

BEAMA (www.beama.org.uk) welcomes the opportunity to comment on the draft proposals.

It should first be noted that there have been significant changes to the revised text compared to the previous version and there has not been a reasonable period for us to understand the changes and carry out the tests and analysis that might have better informed this response.

BEAMA members have agreed that the following are their principal comments on the revised texts.

1 Hot Water Drinking Products

The new draft would now seem to apply to appliances producing drinking water to make hot drinks (tea, coffee, etc), significantly extending the previous scope, which related only to sanitary water. We believe that including such appliances is not the intention of the Commission; thus, we call on the Commission to clarify that appliances whose purpose is to produce hot drinks are clearly excluded. We suggest this is done by introducing in article Art 1.2 a new clause excluding appliances intended solely for hot drinking water. To prevent this exclusion becoming a way for sanitary WH appliances to circumvent regulations, we propose referring to the temperature of the water produced by the appliances. A possible solution would be the following:

"…..shall not apply to :

….

(g) water heating equipment specifically and solely intended to provide potable boiling water.

…. "

A definition of boiling water should be added to the definitions in Article 2. This will require some consultation with affected manufacturers to ensure it is consistent with practice across Europe; for information now, it is likely to be water temperatures > 90°C. This would make a very clear distinction to other water heating products.

2 Interpretation of tapping pattern flow rate

It has previously been understood that the flow rates (*f*) quoted in the tapping patterns were a minimum value. It now appears that the flow rate should now be interpreted as a single value with no option to modify it during tests. This causes a serious issue for the manufacturers of instantaneous showers, as they are designed for an essentially fixed heat input and the flow rate is intended to be varied to deliver the desired outlet flow temperature. If a specified flow rate is forced for test purposes, then, for most showers, the shower flow temperature will rise until it triggers the safety cut out switch. This switch is not designed as a temperature control switch and will give a very uneven flow temperature, as shown in Figure 1.

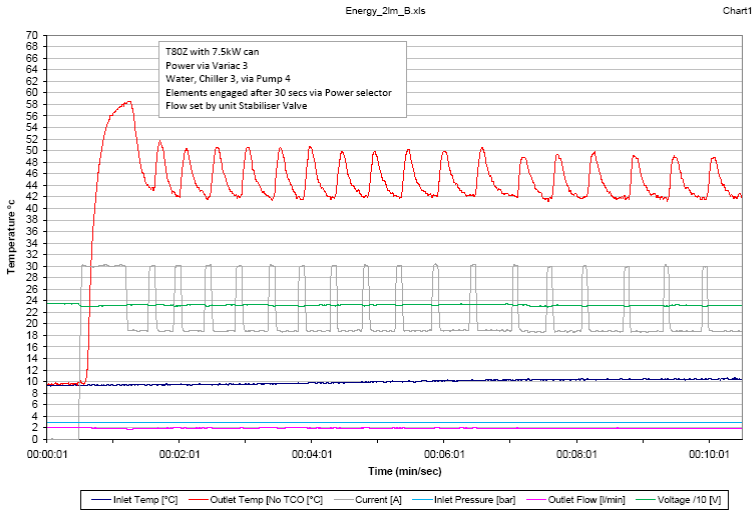


Figure 1

There is a provision in Section 6 of the Test Procedure document, "Test Procedures for Electric Instantaneous Water Heaters", to modify the value f_i specified in the tapping pattern if this is different to that specified by the manufacturer. This cannot be used to resolve this issue because it is not possible for a manufacturer to specify a flow rate for an electric shower without being in danger of causing confusion. However, it is proposed that the text of this section is revised from:

"…. if this flow rate is lower than the minimum flow rate specified by the manufacturer, the latter shall be used. "

To:

"…. if this flow rate is lower than the minimum flow rate specified by the manufacturer, the latter shall be used. Alternatively, if this flow rate is too low to allow correct operation of the water heater, then the minimum flow rate to allow correct operation of the water heater throughout the test shall be used."

3 Tapping Pattern for instantaneous electric showers

BEAMA reiterates its request that electric showers should be specifically required to use the XS tapping patterns and that the minimum flow rate for the XS tapping pattern should be changed from 4 l/min to 3 l/min to accommodate all currently available power ratings of electric showers within the XS pattern. The reasoning for this request is detailed in Annex A. It has been suggested that the text of the Implementing Measure indicates that showers that have too low a power input to meet the XS tapping pattern should instead use the XXS flow pattern. It can be observed that these tapping patterns are very different, with the XXS requiring 20 short draws of 0.105 kWh against the 3 longer draws of 0.525 and 1.05 kWh for XS. It is clear that the XS pattern is much more appropriate for an electric shower. BEAMA members have undertaken laboratory tests to determine the efficiency result of the same shower, tested under XXS and XS. For the

same shower, where the power was adjusted to 7.2 kW and 9.8 kW, it was found that the efficiency values were:

i. When operated at 7.2kW the shower tested under XXS (ignoring TCO operation) had an efficiency of 36.3% and would be in band A (35 – 44%)
ii. When operated at 9.8kW the shower tested under XS (4l/m TCO did not operate) has an efficiency of 37.7% and would be in band B (35 -38%)

This clearly demonstrates that by testing some showers under XXS and others under XS, consumers will receive misleading and contradictory information. This is manifestly not the intention of the ERP.

For these reasons we argue that the only practical option is to reduce the minimum flow rate of the XS pattern to be reduced to 3 l/min and allow all electric showers to be subject to the same test conditions.

4 Mean thermostat temperature setting

Annex II quotes a minimum thermostat temperature of 55oC, this is the maximum allowed in the safety standards for shower products (see EN60335-2-35). There must be a change to the text to either remove this requirement or to allow an exclusion from it for instantaneous heater products for which the clause is meaningless.

5 Noise measurement

Noise measurements are required but this is not appropriate for all point of use heating products, where noise generation depends on the water use much more than on the heating process. We suggest that for electric appliances without moving parts, default sound power of 35dBA is declared in the technical documentation. It should also be made clear that the noise from the water heater is related only to the noise of the water heating process and not to the noise resulting from any subsequent use of the heated water.

The requirement for noise measurement is for the determination of heat recovery parameter qrecov (Table 8 on page 13 of draft commission communication in the framework commission regulations implementing directives 2009/125/EC and 2010/30/EC). The theory behind the table appears to be that a small (<= 0.5m^3) electric water heater that is quiet (<= 35 dB[A]) can be located in the living space of a dwelling so therefore heat energy lost to air actually to an extent heats the living space (qrecov = 32%). Noisier appliances may be located inside but perhaps in a garage or basement that is not in constant use therefore have lower qrecov values of 21% for 35 – 44dB[A] and 9% for above 44dB[A]. Backing this argument up is the fact that appliances mounted outside have a qrecov of 0% regardless of noise rating.

Point of use showers by definition will be installed in the living space regardless of noise rating so should automatically qualify for a qrecov of 32%.

BEAMA request that a new entry for point of use water heaters (any energy source, any envelope volume, any noise rating) is added to the designated position column of table 8 and allowing 32% qrecov.

6 Labelling of indirectly heated water heaters

BEAMA members question the decision to now include indirectly heated water heaters in Lot 2. The Commission proposal is to measure the energy efficiency of these types of water heater solely by standing heat loss measurement. All other directly heated water heaters covered by Lot 2 have their energy efficiency measured using the "tapping pattern" methodology. As a result of this directly and indirectly heated water heaters will have a different energy label format and will not be directly comparable to the consumer.

If indirectly heated water heaters are to remain in Lot 2 we would request a reversion to the energy efficiency classifications for various heat losses proposed in the original VHK study dated 14th January 2008 (see page 27 of Addendum to preparatory study on eco-design of water heaters - Eco-design of Indirect Water Heaters). The classifications seem to have been relaxed considerably in the latest text and this seems to be in contradiction to the aims of the EUP, which are to move the market towards more efficient products. Several member companies have invested much R&D and production development in order to produce indirectly heated water heaters to meet the heat loss values in the original VHK report, the relaxation of the efficiency bandings will in many cases make much of this work un-necessary as existing models on the market can comfortably reach the proposed minimum efficiency band of C. To our knowledge there has been no debate with stakeholders on the heat loss classifications for indirect water heaters nor on the revised heat loss figures. Manufacturers support the aim of the EUP Directive to move the water heating market towards more efficient products, but the revised heat loss targets would seem to not support this aim.

7 Smart Control

BEAMA is very disappointed to see that the original Smart Control (SC) saving computation for large storage WH (from M onward) has been modified.

The revised text reduces the computation of the SC for storage WH from 10% to 7 %. Such modification would have a huge impact on industry and the investments made on this technology.

It needs to be underlined that the computation of SC should not be seen as a bonus. The introduction of the SC feature allows actual saving in energy consumption by WH, and such saving can be proved by testing energy consumption of SC WH in laboratories. Lab tests demonstrate that the SC applied to storage WH produce saving always higher than 10%. Allowing SC storage products an efficiency increase of only 7% means, in reality, imposing on SC product a penalty of -3% (or even higher) compared to savings really achieved and demonstrated.

For small WH appliances (up to S WHL), after several months of tests, it appears that it is extremely difficult to reach a 10% saving. In parallel, tests have also demonstrated the high saving potential that smart control technology can have on some products in the higher WHL; therefore, we propose avoiding artificially limiting the possible benefit of such new technology to a maximum of 10% energy saving.

For this reason, we propose to have the minimum limit of smart control computation for WHL from M and higher to 10% after test demonstration (one test giving the possibility of applying the 10% additional efficiency to the appliances range), and to reduce the limit of the bonus to 7% for appliances in WHL lower than M

In addition, manufacturers should have the possibility not to use the default computation (10% for large and 7% small) but to measure, product model by product model (with a 15 days test), the exact efficiency of the model. For loads lower or equal to S, manufactures (following the 15 days testing) should be able to declare efficiency also higher than 7% but limited to 15%. For loads from M to 4XL manufacturers should be allowed to use values higher than 10% but limited to 20%.

8 One year period to comply

Given the lack of stability in the draft texts the one year period to test all products within a manufacturer's range is too short and should be extended to 18(?) months.

ANNEX A

TEHVA Proposal to amend the minimum flow rate for Lot 2 Annex 4 XS Tapping Pattern

Background

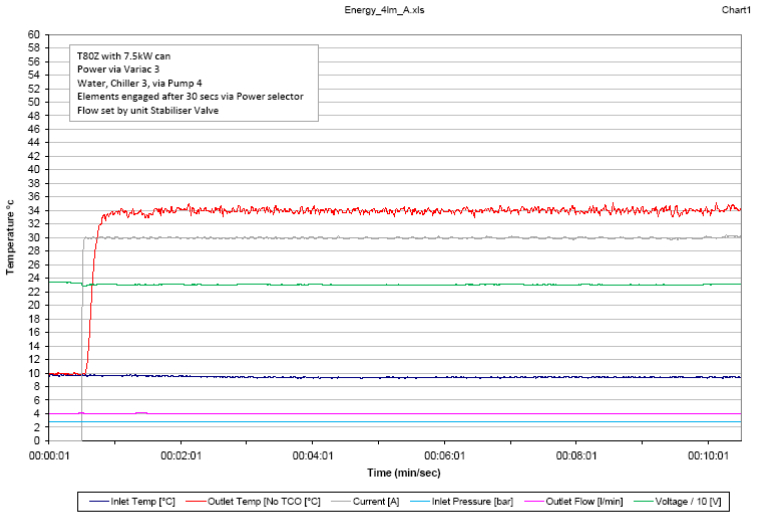
Open Outlet, electrically heated, instantaneous showers (electric showers) fall within the scope of Lot 2 of the EuP. The original consultant identified that electric showers should be tested according to the XS tapping pattern within Annex 4. Industry has accepted this and has carried out laboratory tests to ascertain the performance of existing products against the Annex 4 tests. These tests have identified one issue that requires a minor modification to Annex 4. Also, during revisions to the draft Implementing Measure, the text relating to electric showers being treated under XS has been lost, leading to potential confusion in the market place.

Technical Issue

The XS tapping pattern specifies a flow rate (f) of 4 l/min. There are a range of electric showers on the market in the UK rated at 7kW electrical input. Tests have shown that these products are unable to reliably achieve the necessary outlet temperature of 35°C as they have insufficient heating capacity. Although a simple analysis would suggest that, with a heat input of 7kW, it should be possible to just raise a flow rate of 4 l/min of water from 10°C to 35°C (the theoretical outlet temperature would be 35.08°C) there are two reasons why this cannot be achieved:

- It is normal industry practice in the UK to specify the heat output of electric heaters at a reference voltage of 240V. However, the Implementing Measure specifies that all tests should be carried out at a voltage of 230V. This means that a 7kW heater rated at 240V will in fact only provide 6.42kW at 230V. This is insufficient heat input to achieve an outlet temperate of 35°C at a flow rate of 4 l/min.
- Normal product variation can see the heat output of individual showers vary by as much as minus 10%. As a consequence, even if the manufacturer showed that a representative electric shower could achieve 7kW heat output at 230V and complete the full XS test, many samples of these electric showers will not be able to complete the test. This would cause problems with market surveillance.

As a result of these two issues, manufacturers will be unable to reliably meet the XS tapping pattern so that, if the Implementing Measure proceeds as written, manufacturers would be unable to affix an energy label to these products. This is shown in the graph below where the temperature never reaches 35°C.



Possible use of XXS tapping pattern

If the 7kW showers cannot meet the requirements of the XS tapping pattern then the correct response within the draft Implementing Measures would seem to be to drop down to the XXS tapping pattern. This requires a flow rate of 2 l/min and an outlet temperature of 25°C; easily within the range of the 7kW shower. There are a number of reasons why this is not possible:

- When testing these products under XXS tapping pattern, it is likely that the safety cut-out would operate due to the low (and fixed) flow rate of 2l/m (see Figure 1). This would affect the efficiency measurement. The safety cut-outs that are normally used have a nominal opening temperature of between 48°C and 52°C, but this nominal figure can have a negative tolerance in the order of 5%. As a result, the shower would control its outlet temperature by cycling the safety cut-out, giving unpredictable, unrepeatable and inaccurate results. This will be misleading to consumer and will cause many problems during market surveillance testing.

- The XXS tapping pattern also features 20 small draws (0.105 kWh). This is highly unrealistic for an electric, point of use shower and would represent a draw of approximately 1 minute. In this respect the XS tapping patterns is much more appropriate. The shortness of the XXS tappings means that the effect of the cut-out cycling will be very unpredictable and could result in efficiency ratings that could be either too high or too low.