Disclaimer

This is a working document supporting the discussion of the revision of REGULATION (EU) 814/2013 laying down ecodesign requirements for water heaters. It sets out a draft version of the revised legal text to support the stakeholders' consultation process, in particular the Consultation Forum meeting of 27 April 2023.

Please note that while this draft document has been prepared by DG ENER staff and its consultants, it is by no means an official document endorsed by the European Commission

DRAFT

[XXX/XXXX] Ecodesign regulation water heaters & storage tanks

COMMISSION REGULATION (EU) No [XXX/XXXX] of [date]

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and storage tanks, repealing Commission Regulation (EU) No 814/2013

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products (1) and in particular Article 15(1) thereof,

After consulting the Ecodesign Consultation Forum,

(1) …

(2) …

Proposed revised text

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter and scope

1) This Regulation establishes ecodesign requirements for the placing on the market and/or putting into service of instantaneous water heaters with a rated heat output not exceeding 400 kW, storage water heaters with a storage volume not exceeding 2000 litres, hot water storage tanks with a storage volume not exceeding 2000 litres.

2) This Regulation shall not apply to:

   a) water heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass and which cannot operate using gaseous or liquid fossil fuels;

   b) water heaters using solid fuels;

   c) water heaters within the scope of Directives 2010/75/EU[1] and (EU) 2015/2193[2] of the European Parliament and the Council;

   d) products covered by Commission Regulation (EU) 2015/1188[3] with regard to ecodesign requirements for local space heaters;

   e) combination heaters as covered by Regulation (EU) xx/xx on space and combination heaters;

   f) water heaters which cannot provide hot water at least in accordance with the load profile with the smallest reference energy as specified in Annex III, Table 11;

   g) water heaters intended for making hot drinks and/or food only;

   h) cogeneration water heaters with a maximum electrical capacity of 50 kW or above.

Article 2

Definitions

In addition to the definitions set out in Article 2 of Directive 2009/125/EC, the following definitions shall apply for the purposes of this Regulation:

1) 'instantaneous water heater' means a water heater which heats sanitary water on demand as it flows through the appliance;

2) 'water heater' means a product that:

   a) is permanently connected to a domestic distribution system as defined in Directive (EU) 2020/2184 [4];

   b) is equipped with one or more water heater heat generators,

   c) to heat water for domestic purposes such as, but not limited to, personal hygiene, washing, cleaning or cooking ;

[1] OJ L 334, 17.12.2010, p. 17–119 on industrial emissions (integrated pollution prevention and control)
[2] OJ L 313, 28.11.2015, p. 1–19 on the limitation of emissions of certain pollutants into the air from medium combustion plants
[3] OJ L 193, 21.7.2015, p. 76–99 on ecodesign requirements of local space heaters
[4] OJ L 435, 23.12.2020, p. 1–62; DIRECTIVE (EU) 2020/2184 of 16 December 2020 on the quality of water intended for human consumption [https://eur-lex.europa.eu/eli/dir/2020/2184/oj]

whereby a heat generator for a water heater and a housing designed to be equipped with such a heat generator shall, together, be considered as a water heater;

3) ‘water heater heat generator’ means the part of a water heater that generates heat using one or more of the following processes:

   a) the combustion of liquid and/or gaseous fuels;
   b) the conversion of electricity into heat, without using a thermodynamic cycle;
   c) the capture of ambient, geothermal and/or waste heat using a thermodynamic cycle, driven by combustion of fuels or electric energy;
   d) the electrochemical conversion of chemical energy from a fuel and an oxidising agent into heat and power;

4) ‘rated heat output’ ($P_{rated,wh}$) means the heat output of the water heater when providing water heating at standard rating conditions, expressed in kW;

5) ‘storage water heater’ means a water heater equipped with a hot water storage tank(s) placed on the market as one unit;

6) ‘hot water storage tank’ means a vessel for storing hot water, including any additives, for water and/or space heating purposes, which is not equipped with any heat generator except possibly one or more back-up immersion heaters;

7) back-up immersion heater’ means a joule effect electric resistance water heater heat generator in a multivalent tank which generates heat only when the main external heat source is disrupted (including during maintenance periods, or when solar irradiance is not sufficient to satisfy required comfort levels) or out of order;

8) ‘biomass’ means the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste;

9) ‘cogeneration water heater’ (CHPWH) means a water heater that simultaneously produces sanitary hot water and electric energy in a single process;

10) ‘water heater housing’ means the part of a water heater designed to have a heat generator fitted;

11) ‘storage volume’ (V) means the volume of water stored by a storage water heater or in a hot water storage tank for water and/or space heating purposes, or the 'equivalent volume' in case the storage tank contains PCM materials, expressed in litres;

12) 'PCM material' means a material that undergoes a transition between liquid and solid states at a temperature higher than the cold water inlet temperature and lower than or equal to the maximum water temperature at which the storage tank is allowed to be operated;

13) 'equivalent volume' (V_{eq}) means a representation of the volume of a hot water storage tank containing PCM material, in litres;

14) ‘standard rating conditions’ means the operating conditions for establishing the rated heat output, water heating energy efficiency, sound power level and nitrogen oxide emissions, of water heaters and for establishing the standing loss of hot water storage tanks;

15) ‘load profile’ means a sequence of water draw-offs, as specified in Annex III, Table 11;

16) ‘water draw-off’ means a given combination of useful water flow rate, useful water temperature, useful energy content and peak temperature, as specified in Annex III, Table 11;

17) ‘useful water flow rate’ (f) means the minimum flow rate, expressed in litres per minute, for which heated water is contributing to the reference energy, as specified in Annex III, Table 11;

18) ‘useful water temperature’ (Tm), means the water temperature, expressed in degrees Celsius, at which heated water starts contributing to the reference energy, as specified in Annex III, Table 11;

19) ‘useful energy content’ (Qtap) means the thermal energy content of heated water, expressed in kWh, provided at a temperature equal to, or above, the useful water temperature, and at water flow rates equal to, or above, the useful water flow rate, as specified in Annex III, Table 11;

20) ‘energy content of hot water’ means the product of the specific heat capacity of water, the average temperature difference between the heated water output and cold water input, and the total mass of the hot water delivered;

21) 'peak temperature' (Tpeak) means the water temperature, expressed in degree Celsius, to be achieved during the water draw-off, as specified in Annex III, Table 11;

22) ‘reference energy’ (Qref) means the sum of the useful energy content of water draw-offs, expressed in kWh, in a particular load profile, as specified in Annex III, Table 11;

23) ‘electric power output’ means the electric power produced by the cogeneration water heater at nominal heat input;

24) ‘electric efficiency’ means the electric power produced divided by the fuel power required by the cogeneration water heater at nominal heat input;

25) ‘water heating energy efficiency’ (η_{wh}) means the ratio between the useful heat provided by a water heater and the energy (as primary energy) required for its generation, expressed in %;

26) ‘sound power level’ (L_{WA}) means the A-weighted sound power level, indoors and/or outdoors, expressed in dB, as set out in Annex III, section 3;

27) ‘standing loss’ (S) means the heating power dissipated from a hot water storage tank at standard rating conditions expressed in W;

28) *‘conversion coefficien*t’ (CC) means the default coefficient for primary energy per kWh electricity referred to in Directive 2012/27/EU of the European Parliament and of the Council[5]. The value of the conversion coefficient is $CC = 1{,}9$.[6]

29) ‘model identifier’ means the code, usually alphanumeric, which distinguishes a specific water heater, hot water storage tank from other models with the same trade mark, supplier’s name or dealer’s name;

For the purposes of Annexes II to V, additional definitions are set out in Annex I.

Article 3

Ecodesign requirements and timetable

Water heaters shall meet the requirements set out in section 1 of Annex II as appropriate.

[5] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC. OJ L 315, 14.11.2012, p. 1–56.
[6] Commission Delegated Regulation (EU) 2022/... on revising the primary energy factor for electricity in application of Directive 2012/27/EU of the European Parliament and of the Council, 15.12.2022

Hot water storage tanks shall meet the requirements set out in section 2 of Annex II.

Compliance with ecodesign requirements shall be measured and calculated in accordance with the requirements set out in Annexes III, following transitional provisions as indicated in Annex IV as appropriate.

Article 4

Conformity assessment

1) The conformity assessment procedure referred to in Article 8(2) of Directive 2009/125/EC shall be the internal design control set out in Annex IV to that Directive or the management system set out in Annex V to that Directive.

2) For the purposes of the conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation shall contain a copy of the product information provided in accordance with point 1.6 of Annex II and the details and results of the calculations set out in Annex III and, where applicable, Annex IV to this Regulation.

Article 5

Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC to ensure compliance with the requirements set out in Annex II to this Regulation, the Member States' authorities shall apply the verification procedure set out in Annex V to this Regulation.

Article 6

Circumvention and software updates

1. Manufacturers, importers or authorised representatives shall not place on the market products designed to be able to detect they are being tested (for example by recognising the test conditions or test cycle) and to react specifically by automatically altering their performance during the test with the aim of reaching a more favourable level for any of the parameters in the technical documentation or included in any documentation provided.

2. Manufacturers, importers or authorised representatives shall not prescribe test instructions, specifically for when products are being tested, that have the effect of altering the behaviour or properties of those products in order to obtain a more favourable result for any of the declared values of the parameters set out in this Regulation.

3. Manufacturers, importers or authorised representatives shall not place on the market or put into service products designed to alter their behaviour or properties within a short period after being put into service resulting in a degrading of any of the declared values of the parameters set out in this Regulation.

4. The energy consumption of the product and any of the other declared parameters shall not deteriorate after a software or firmware update when measured with the same test standard originally used for the declaration of conformity, except with explicit consent of the end-user prior to the update. No performance change shall occur as a result of rejecting the update.

5. A software update shall never have the effect of changing the product's performance in a way that makes it non-compliant with the ecodesign requirementss set out in this Regulation applicable at the time of the placing on the market or putting into service of the appliance.

Article 7

Indicative benchmarks

The indicative benchmarks for best-performing water heaters and hot water storage tanks available on the market at the time of entry into force of this Regulation are set out in Annex VI.

Article 8

Review

1) The Commission shall review this Regulation in the light of technological progress of water heaters and hot water storage tanks and present the result of this review to the Ecodesign Consultation Forum no later than five years from the date of entry into force of this Regulation. In particular, the review shall include an assessment of the following aspects:

   a) the appropriateness of setting stricter ecodesign requirements for water heating energy efficiency, sound power level and emissions of nitrogen oxides;

   b) the appropriateness of setting stricter ecodesign requirements for the standing losses of storage tanks;

   c) the appropriateness of setting ecodesign requirements for heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass;

   d) the validity of the conversion coefficient value (CC);

   e) the appropriateness of third-party certification and monitoring.

Article 9

Repeal

Commission Regulation (EU) No 814/2013 shall be repealed.

Article 10

Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Union.

It shall apply from 1 September 2025. However, article 6 shall apply from [*OP – please insert date – entry into force of this Regulation]*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, [date].

Done at Brussels, XX Month XXXX.

For the Commission

The President

ANNEX I

Definitions applicable for Annexes II to V

For the purposes of Annexes II to V the following definitions shall apply,

1) 'electric storage water heater' (ESWH) means a storage water heater using the electric Joule effect for heating sanitary water;

2) ‘fuel storage water heater’(FSWH) is a storage water heater using the combustion of gaseous or liquid fuels for heating sanitary water, and which does not produce electric power or uses ambient energy for heating sanitary water;

3) 'electric instantaneous water heater' (EIWH) is an instantaneous water heater using the electric Joule effect for heating sanitary water;

4) ‘fuel instantaneous water heater’(FIWH) is an instantaneous water heater using the combustion of gaseous or liquid fuels for heating sanitary water ;

5) ‘|heat pump water heater’ (HPWH) means a water heater using a thermodynamic cycle capturing ambient or geothermal energy and/or waste heat for heat generation, possibly supplemented by an electric resistance back-up heater;

6) ‘electric heat pump water heater’ (eHPWH) means a heat pump water heater the thermodynamic cycle of which is driven by an electric motor;

7) ‘thermally driven heat pump water heater’ (tdHPWH) means a heat pump water heater the thermodynamic cycle of which is driven by heat from the combustion of fuels;

8) ‘conventional water heater’ means a water heater that generates heat using the combustion of fuels and/or the Joule effect in electric resistance heating elements;

9) ‘electric water heater’ means a water heater that generates heat using the Joule effect and/or a thermodynamic cycle driven by electric motors;

10) ‘reference hot water temperature’ (Θ_{wh}) means the temperature determined as the mean temperature value of the average temperatures during one single draw-off which ends when the hot water temperature is below 40 °C;

11) ‘maximum load profile’ means the load profile with the greatest reference energy that a water heater is able to provide while fulfilling the temperature and flow rate conditions and times of that load profile, as specified in Annex III, Table 11;

12) ‘declared load profile’ means the load profile used for conformity assessment when determining water heating energy efficiency;

13) ‘daily electricity consumption’ (Q_{elec}) means the consumption of electricity over 24 consecutive hours under the declared load profile, expressed in kWh in terms of final energy, as set out in Annex III, section 4, sub (a);

14) ‘daily fuel consumption’ (Q_{fuel}) means the consumption of fuels over 24 consecutive hours under the declared load profile, expressed in kWh in terms of GCV, as set out in Annex III, section 4, sub (a);

15) ‘gross calorific value’ (GCV) means the total amount of heat released by a unit quantity of fuel when it is burned completely with oxygen and when the products of combustion are returned to ambient temperature; this quantity includes the condensation heat of any water vapour

contained in the fuel and of the water vapour formed by the combustion of any hydrogen contained in the fuel;

16) ‘smart control’ means a device that automatically adapts the water heating process to individual usage conditions with the aim of reducing energy consumption;

17) ‘smart control compliance’ (*smart*) means the measure of whether a water heater equipped with smart control fulfils the criterion set out in Annex III, section 3, sub (g);

18) ‘smart control factor’ (*SCF*) means the water heating energy efficiency gain due to smart control under the conditions set out in Annex III, section 4, sub (b);

19) ‘weekly electricity consumption with smart controls’ ($Q_{elec,week,smart}$) means the weekly electricity consumption of a water heater with the smart control function enabled, [-] expressed in kWh in terms of final energy;

20) ‘weekly fuel consumption with smart controls’ ($Q_{fuel,week,smart}$) means the weekly fuel consumption of a water heater with the smart control function enabled, expressed in kWh in terms of GCV;

21) ‘weekly electricity consumption without smart controls’ ($Q_{elec,week}$) means the weekly electricity consumption of a water heater with the smart control function disabled, expressed in kWh in terms of final energy;

22) ‘weekly fuel consumption without smart controls’ ($Q_{fuel,week}$) means the weekly fuel consumption of a water heater with the smart control function disabled, expressed in kWh in terms of GCV;

23) ‘annual electricity consumption’ (AEC) means the annual electricity consumption of a water heater under the declared load profile and under given climate conditions, expressed in kWh in terms of final energy;

24) ‘annual fuel consumption’ (AFC) means the annual fossil and/or biomass fuel consumption of a water heater under the declared load profile and under given climate conditions, expressed in kWh in terms of GCV;

25) ‘ambient correction term’ (Q_{cor}) means a term which takes into account the fact that the place where the water heater is installed is not an isothermal place, expressed in kWh;

26) ‘average climate conditions’ means for heat pump water heaters the temperatures of the heat source expressed as air temperature, inlet/outlet temperatures or bath temperatures, as defined in Table 9;

27) 'off-peak water heater' means a water heater that is energised for a maximum period of 8 consecutive hours between 22:00 and 07:00 of the 24 hour tapping pattern in the load profiles, as set out in Annex III, section 3;

28) ‘equivalent model’ means a model placed on the market with the same technical parameters set out in the applicable product information requirements of Annex II as another model placed on the market by the same manufacturer.

29) ‘air flow rate’ (q_v) means the volumetric flow rate of air over the evaporator of outdoor air-to-water / indoor air-to-water / exhaust air-to-water heat pump water heaters as used to establish its water heating energy efficiency, at standard rating conditions as presented in Table 9;

30) ‘maximum ventilation exhaust air flow rate’ ($q_{v,maxw}$) is the maximum volumetric flow rate of exhaust air at temperature conditions set out in Annex III, Table 10, that is available to heat pump water heaters when establishing its water heating energy efficiency;

31) 'temperature/flow dependency factor' (F_{ctrl}) means a correction factor in the calculation of the water heater energy efficiency to account for the capability of the water heater to maintain a set water temperature independent of the water volume flow rate, as set out in Annex III, section 4, sub (a);

Definitions related to heat pump water heaters

32) ‘outdoor air-to-water’ means a heat pump water heater which captures aerothermal heat from outdoor air.;

33) ‘indoor air-to-water’ means a heat pump water heater which captures aerothermal heat from indoor air, including heated spaces;

34) ‘exhaust air-to-water’ means a heat pump water heater which captures aerothermal heat from ventilation exhaust air;

35) ‘brine-to-water’ means a heat pump water heater which captures geothermal heat using a fluid the temperature of which can be below 1°C;

36) ‘water-to-water’ means a heat pump water heater which captures geothermal or hydrothermal heat using a fluid the temperature of which cannot be below 1°C;

37) ‘direct exchange-to-water’ means a heat pump water heater which captures geothermal heat by direct heat exchange with the refrigerant;

Definitions related to hot water storage tanks

38) ‘standing loss’ (S) means the heating power dissipated from a hot water storage tank at standard rating conditions, expressed in W;

39) 'multivalent tank' means a hot water storage tank that allows heating its contents using at least two or more different heat exchangers or heat generators ;

40) ‘mixed water at 40 °C’ (V_{40}) means the quantity of water at 40 °C, which has the same heat content (enthalpy) as the heated water which is delivered above 40 °C by a hot water storage tank or storage water heater, measured using the same settings used for establishing the water heating efficiency of a water heater or standing losses of a storage tank, expressed in litres, as set out in Annex III, section 3, sub (k) and section 4, sub (d);

41) ‘reference hot water temperature’ (Θwh) means the temperature determined as the mean temperature value of the average temperatures during one single draw-off which ends when the hot water temperature is below 40 °C, measured simultaneously with the 'mixed water at 40°C, expressed in °C;

42) ‘commonly available tool’ means a tool that is available to professional repairers and/or end-users through multiple distribution channels;

ANNEX II

Ecodesign requirements

1. ECODESIGN REQUIREMENTS FOR WATER HEATERS

1.1. Minimum water heating energy efficiency

The water heating energy efficiency of water heaters shall not be less than the following values per declared load profile;

Table 1 Minimum water heating energy efficiency 3XS to XXL

Water heater type	**Load profile**				
	3XS to S	**M**	**L**	**XL**	**XXL**
Electric instantaneous water heater	46.4%	49.7%			
Electric storage water heater	42.0%	47.5%	48.6%	48.6%	49.7%
Electric heat pump water heater	94%	94%	116%	116%	133%
Fuel instantaneous water heater	70%	70%	75%	80%	80%
Fuel storage water heater	45%	56%	67%	78%	83%
Thermally driven heat pump water heater	55%	66%	77%	88%	93%
Cogeneration water heater	45%	56%	67%	78%	100%

Table 2 Minimum water heating energy efficiency 3XL & 4XL

Water heater type	**Load profile**
	3XL and 4XL
Electric water heaters	144%
Fuel instantaneous water heaters	80%
Fuel storage water heaters	88%
Thermally driven heat pump water heaters	98%
Cogeneration water heaters	105%

1.3. Requirements for sound power level

The sound power level of heat pump water heaters shall not exceed the following values.

Table 3 Maximum sound power levels

Rated heat output, as set out in Annex IV	**Sound power level (L_{WA}), indoors**	**Sound power level (L_{WA}), outdoors**
≤ 6 kW	60 dB	65 dB
> 6 kW and ≤ 12 kW	65 dB	70 dB
> 12 kW and ≤ 30 kW	70 dB	78 dB

> 30 kW	80 dB	88 dB

1.3. Requirements related to emissions

(a) The emissions of nitrogen oxides, expressed in mg nitrogen dioxide per kWh fuel input, of water heaters using gaseous or liquid fuels shall not exceed the following values, when tested with respectively G20, G25, G30 or G31 reference gas or liquid fuels.

Table 4 Maximum NOx emissions

Water heater type	**Fuel type**			
	gas G20 or G25	**gas G30**	**gas G31**	**liquid fuels**
Fuel instantaneous water heater or fuel storage water heater	56	73	67	120
Thermally driven heat pump water heater or cogeneration water heater				
- using external combustion	70	91	84	120
- using internal combustion	240	312	288	420

1.4. Functional requirements

For water heaters declared for load profile 3XS to S

a) the storage volume of storage water heaters with declared load profile 3XS shall not exceed 7 litres;

b) the storage volume of storage water heaters with declared load profiles XXS and XS, the storage volume shall not exceed 15 litres;

c) the storage volume of storage water heaters with declared load profile S the storage volume shall not exceed 36 litres.

2) For water heaters declared for load profile M to 4XL

a) the amount of mixed water at 40 °C that can be provided by storage water heater shall not fall below the following values:

Table 5 Maximum amount of mixed water at 40ºC

Mixed water at 40ºC (litres)	**Load profile**					
	M	**L**	**XL**	**XXL**	**3XL**	**4XL**
	65	130	210	300	520	1040

3) Electric heat pump water heaters that are tested using 'indoor air' shall:

a) be functional when supplied with an air temperature of 7°C or higher;

b) have an average electric input power of 300 Watt or smaller when tested to establish its water heating energy efficiency in accordance with in Annex III ;

c) not be equipped with a 4-way reversing valve and/or a hot gas bypass valve;

d) have a storage volume of 140 litres or less.

1.5 Material efficiency requirements

1) Availability of spare parts:

   a) For all models of water heaters and storage tanks for which units are placed on the market on , manufacturers, importers or authorised representatives of water heaters shall make available to professional repairers spare parts and software of the unit for they placed on the market, when applicable for the respective product:
      - sacrificial (anode) rods,
      - fans or fan assemblies,
      - pumps,
      - printed circuit boards,
      - displays,
      - valves and actuators,
      - sensors for temperature or pressure,
      - switches,
      - gaskets and seals.

   b) Availability of spare parts or compatible parts referred to in point (a), shall be ensured for a minimum period starting at the latest on date of application or three months after the placing on the market of the first unit of the model, whichever is the latest, and ending at least, 10 years after placing the last unit of the concerned model on the market. For this purpose, the list of spare parts, the procedure for ordering them and the repair and maintenance information shall be publicly available on the free access website of the manufacturer, importer or authorised representative, at least during the minimum period indicated above;

   c) manufacturers, importers or authorised representatives shall ensure that the spare parts concerned by point (a) can be replaced with the use of commonly available tools and without permanent damage to the water heater or storage tank;

2) Maximum delivery time of spare parts:

   a) manufacturers, importers or authorised representatives of water heaters during the time period mentioned under (1)(b), the delivery of the spare parts within 10 working days after having received the order;

   b) in the case of spare parts concerned by point (1)(a), limit the availability of spare parts to professional repairers registered in accordance with point (3)(a) and (b);

3) regarding access to repair and maintenance information

   During the period mentioned under point 1(b), the manufacturer, importer or authorised representative shall provide access to the water heater repair and maintenance information to professional repairers in the following conditions:

   a) the manufacturer's, importer's or authorised representative's website shall indicate the process for professional repairers to register for access to information; to accept such a request, the manufacturers, importers or authorised representatives may require the professional repairer to demonstrate that

      i) the professional repairer has the technical competence to repair relevant water heaters and storage tanks and complies with the applicable regulations for repairers of such products in the Member States where it operates. Reference to an official registration system as

professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;

ii) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State.

b) The manufacturers, importers or authorised representatives shall accept or refuse the registration within 5 working days from the date of request;

c) Manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates. A fee is reasonable if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information.

d) Once registered, a professional repairer shall have access, within one working day after requesting it, to the requested repair and maintenance information. The information may be provided for an equivalent model or model of the same family, if relevant.

e) The water heater repair and maintenance information shall include:

- the unequivocal water heater identification;
- a disassembly map or exploded view;
- technical manual of instructions for repair;
- list of necessary repair and test equipment;
- component and diagnosis information (such as minimum and maximum theoretical values for measurements);
- wiring and connection diagrams;
- diagnostic fault and error codes (including manufacturer-specific codes, where applicable); and
- instructions for installation of relevant software and firmware including reset software.
- information on how to access data records of reported failure incidents stored on the central hydronic heating appliance (where applicable).

f) The repair and maintenance information for storage tanks shall include the information referred to under (e) insofar applicable (e.g. replacement of anode rod, etc.);

4) regarding requirements for dismantling for material recovery and recycling while avoiding pollution

- ensure that water heaters and storage tanks are designed in such a way that the materials and components referred to in Annex VII to Directive 2012/19/EU can be removed with the use of commonly available tools.
- provide information free of charge about preparation for re-use and treatment in respect of each type of water heater or storage tank placed for the first time on the Union market within one year after the equipment is placed on the market. This information shall identify, as far as it is needed by centres which prepare for re-use and treatment and recycling facilities in order to comply with the provisions of Directive 2012/19/EU, the different components and materials mentioned in Annex VII of that Directive, as well as the location of dangerous substances and mixtures in water heaters. It shall be made available to centres which prepare for re-use and

treatment and recycling facilities by producers of water heaters or storage tanks in the form of manuals or by means of electronic media (e.g. CD-ROM, online services);

5) If the option for remote monitoring for improved maintenance and repair exists, this option shall be indicated in the instruction manuals of the product.

1.6 Product information requirements

The instruction manuals for installers and end-users, free access websites of manufacturers, their authorised representatives and importers and technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

(a) The information referred to in Table 6 for the respective products;

(b) any specific precautions that shall be taken when the water heater or storage tank is assembled, installed or maintained;

(c) for heat generators designed for water heaters and water heater housings to be equipped with such heat generators, their characteristics, the requirements for assembly, to ensure compliance with the ecodesign requirements for water heaters and, where appropriate, the list of combinations recommended by the manufacturer;

(d) information relevant for disassembly, recycling and/or disposal at end-of-life.

Table 6 Product information water heaters

Supplier's name or trademark:							
Model identifier:							
Declared load profile: [3XS / XXS / XS / S / M / L / XL / XXL / 3XL / 4XL]							
Parameters for water heater types	**EIWH**	**ESWH**	**FIWH**	**FSWH**	**mCHPWH**	**eHPWH**	**tdHPWH**
Energy label class (Average climate)	[A..G]	[A..G]	[A..G]	[A..G]	[A..G]	[A..G]	[A..G]
Water heater energy efficiency (Average climate, %)	x,x	x,x	x,x	x,x	x,x	x,x	x,x
Rated heat output (kW)	x,x	x,x	x,x	x,x	x,x	x,x	x,x
Storage volume (litres)	-	x	-	x	x	x	x
Mixed water at 40ºC (litres)	-	x,x	-	x,x	x,x	x,x	x,x
Daily electricity consumption (Qelec, kWhe/d)	x,x	x,x	x,x	x,x	x,x	x,x	x,x
Daily fuel consumption (Qfuel, kWh GCV/d)	-	-	x,x	x,x	x,x	-	x,x
Annual electricity consumption (AEC, kWh/y)	x	x	x	x	x	x	x
Annual fuel consumption (AEF, kWh/y in GCV)			x	x	x		x
Off-peak water heater	-	[y/n]	-	-	-	[y/n]	-
Smart control	-	[y/n]	-	-	-	[y/n]	-
Smart control factor (SCF)	x,xxx	x,xxx	x,xxx	x,xxx	x,xxx	x,xxx	x,xxx
For heat pumps, heat source type	-	-	-	-	-	[indicate]	[indicate]
	[outdoor air-to-water / indoor air-to-water / exhaust air-to-water / brine-to-water / water-to-water / direct exchange-to-water]						
Sound power level, in dB(A), indoor	-	-	x/x	x/x	x/x	x/x	x/x
Sound power level, in dB(A), outdoor	-	-	-	-	x/x	x/x	x/x
Ventilation air flow rate (m^3/h)*	-	-	-	-	-	x	x
*= *if ventilation air source heat pump*							

Electric power output (kW)	-	-	-	-	x,x	-	-
Electric efficiency (%)	-	-	-	-	x,x	-	-

2. ECODESIGN REQUIREMENTS FOR HOT WATER STORAGE TANKS

2.1. Requirement for standing loss

From [date] the standing loss S of hot water storage tanks (in Watts) shall not exceed the following limit:

Table 7 Maximum standing loss of hot water storage tanks

Maximum standing loss S in Watts, with storage volume V in litres	
hot water storage tanks except multivalent tanks with a volume ≥ 80 L	multivalent tanks with a volume ≥ 80 L
$12 + 5{,}93*V^{0,4} \leq S$	$12 + 6.43*V^{0,4} \leq S$

Where:

— V is tank storage volume or equivalent volume V_{eq}, expressed in litres;

— *mvc* is the multivalent tank correction;

2.2. Product information requirements related to hot water storage tanks

From [date] the instruction manuals for installers and end-users, free access websites of manufacturers, their authorised representatives and importers and technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

(a) The information referred to in Table 8;

(b) the results of the measurements for, or statements concerning, the technical parameters specified in Annex III, section 3, sub j) and k) as well as section 4, sub d) and e) as appropriate;

(c) any specific precautions that shall be taken when the storage tank is assembled, installed or maintained;

(d) information relevant for disassembly, recycling and/or disposal at end-of-life.

Table 8 Product information storage tanks

Supplier's name or trademark:			
Model identifier:			
Parameter	**Unit**	**Decimals**	
Storage volume (or 'equivalent volume')	L	x	
Volume of mixed water at 40°C	L	x	
Standing loss	W	x,x	
Multivalent tank		[y/n]	

Energy label class		[A..D]	
Information relevant for waste treatment			
Tank material (of the volume(s) that contain(s) drinking and/or system water)	(state material(s))		
Thermal insulation (the type of the materials used for thermal insulation)	(state material(s))		

ANNEX III

Measurements and calculations

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements (and calculations) shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, and in line with the following provisions.

2. In the absence of standards the reference numbers of which are published in the Official Journal, measurement and calculation methods set out in Annex IV or other reliable, accurate and reproducible methods that take into account the generally recognised state-of-the-art, shall be used.

3. TEST CONDITIONS

   (a) For all water heaters, the measurements shall be carried out for the load profile with the largest reference energy (Q_{ref}) that can be supplied by the water heater, or the load profile with a reference energy just below the largest that can be supplied, as set out in Table 11, taking into account the functional requirements in Annex II, section 1.4;

   (b) for measurements under (a), the cold sanitary water inlet temperature is +10 °C and the ambient temperature is +20 °C if the water heater is designated for use in a heated space. If the water heater is designated for use in an unheated space then it shall be tested at +7ºC .

   (c) The tests to determine energy efficiency and performance are subject to the following conditions:

      – measurements shall be carried out using the load profiles set out in Table 11;
      – measurements shall be carried out using a 24-hour measurement cycle as follows:
         - 00:00 to 06:59: no water draw-off;
         - from 07:00: water draw-offs according to the declared load profile;
         - from end of last water draw-off until 24:00: no water draw-off;

   (d) heat pump water heaters shall be tested under the conditions set out in Table 9, whereby indoor air shall only be used as a rating condition for electric heat pump water heaters if they are functional when supplied with an air temperature of 7°C or higher and have a rated electric input power of 300 Watt or smaller, have a maximum tank volume of 140 L, and for a Q*ref* not exceeding that for load profile M. Heat pump water heaters not fulfilling any of these conditions shall not be tested under the 'indoor air' condition.;;

   (e) Exhaust air-to-water heat pump water heaters shall be tested under the conditions set out in Table 10, whereby if the ventilation exhaust air flow rate does not suffice to fulfill the requirements of the declared load profile a supplementary outdoor air heat source can used and declared;

   (f) water heaters classified as off-peak water heaters are energised for a maximum period of 8 consecutive hours between 22:00 and 07:00 of the 24-hour tapping pattern. At the end of the 24-hour tapping pattern the water heaters are energised till the end of the step;

Table 9 Standard rating conditions for heat pump water heaters

Heat source	Outdoor air (dry/wet)	Indoor air (dry/wet)	Ventilation exhaust air (dry/wet)	Brine (inlet/outlet)	Water (inlet/outlet)	Direct exchange (bath)
Temperature	+7 °C / +6 °C	+20 °C / maximum +15 °C	+20 °C / +15 °C	+5 °C/ +2 °C	+10 °C / +7 °C	+4°C

Table 10 Maximum ventilation exhaust air flow rate

Declared tapping profile	S	M	L	XL	XXL	3XL	4XL
Ventilation exhaust air flow rate available $q_{v,max\ w}$ in m³/h	80	160	190	600	900	1700	3500

(g) Where the manufacturer deems it appropriate to declare the value of smart as being '1', measurements of the weekly electricity and/or fuel consumption with or without smart controls shall be carried out using a two-week measurement cycle as follows:

- days 1 to 5: random sequence of load profiles chosen from the declared load profile and the load profile one below the declared load profile, and smart control disabled,
- days 6 and 7: no water draw-offs, and smart control disabled,
- days 8 to 12: repetition of the same sequence applied for days 1 to 5, and smart control enabled,
- days 13 and 14: no water draw-offs, and smart control enabled,
- the difference between the useful energy content measured during days 1 to 7 and the useful energy content measured during days 8 to 14 shall not exceed 2 % of Q_{ref} of the declared load profile.

(h) The sound power level of heat pump water heaters is to be measured at rated heat output.;

(i) Standing loss of hot water storage tanks shall be measured at ambient temperature of 20 °C and a water storage temperature of 65 °C to be achieved and maintained during the test;

(j) The mixed water at 40°C (*V40*) of a storage water heater or storage tank shall be assessed using methods laid down in the relevant standards identified in Annex IV. These shall take into account a temperature setpoint of 65°C of the storage water heater or storage tank and a cold water inlet temperature of 10°C.

(k) For tests and test conditions not mentioned here the transitional methods mentioned in Annex IV apply, as appropriate.

4. WATER HEATING ENERGY EFFICIENCY

(a) The water heating energy efficiency η_{wh}, in %, of a water heater shall be calculated as the ratio between the reference energy Q_{ref} of the declared tapping load profile and the (primary) energy required for its generation, for fuels based on their GCV, and including primary energy for electricity:

$$\eta_{wh} = \frac{Q_{ref}}{\left(Q_{fuel} + CC \cdot Q_{elec}\right) \cdot (1 - SCF \cdot smart) + Q_{cor}} \cdot F_{ctrl} \cdot 100$$

where

- Q_{ref} is the total energy delivered by the load profile used, value from Table 11, in kWh;
- Q_{elec} is the consumption of electricity for water heating over 24 consecutive hours under the declared load profile, expressed in kWh, in terms of final energy, corrected also for electricity use of auxiliary components that are necessary for testing the load profile but not delivered with the product;
- Q_{fuel} is the daily fuel consumption for hot water over 24 consecutive hours at the declared load profile, expressed in kWh, in terms of GCV;
- SCF smart control factor (*SCF*) means the water heating energy efficiency gain due to smart control, as set out in point (b) hereafter;
- *smart* is the smart control coefficient, is equal to 0 without smart control or 1 with smart control;
- Q_{cor} is the ambient correction term and is equal to 0 for load profiles XXL to 4XL, and for load profiles S to XL calculated as:
  - conventional water heaters using fuels:

$$Q_{cor} = -0{,}23 \cdot (Q_{fuel} \cdot (1 - SCF \cdot smart) - Q_{ref} \ ;$$

  - conventional water heaters using electricty:

$$Q_{cor} = -0{,}23 \cdot (CC \cdot Q_{elec} \cdot (1 - SCF \cdot smart) - Q_{ref} \ ;$$

  - heat pump water heaters:

$$Q_{cor} = -0.23 \times 24h \times \ P_{stby}$$

- F_{ctrl} is 1.00 if the water heater can maintain a constant water temperature independent of the water volume flow rate supplied by the water heater, to be determined using methods described in Annex IV, and 0.95 if it cannot;

(b) For heat pump water heaters, if during a tapping the Tpeak of 55 °C in the load profiles of Table 11 cannot be achieved, the average of the measured hot water temperature over the tapping shall not be lower than 52 ºC and the water heating efficiency ηwh shall be lowered by 2 percentage points;

(c) Where the manufacturer deems it appropriate to declare the value of ***smart*** as being '1', measurements of the weekly electricity and/or fuel consumption with or without smart controls shall be carried out using a two-week measurement cycle as indicated in section 3, sub (g) of this Annex.

The smart control factor (SCF) is calculated as follows

$$SCF = 1 - \frac{Q_{fuel,week,smart} + CC \times \ Q_{elec,week,smart}}{Q_{fuel,week} + CC \times \ Q_{elec,week}}$$

If SCF ≥ 0,07 the value of smart shall be 1. If SCF < 0,07 the value of smart shall be 0.

5. STANDING LOSS OF HOT WATER STORAGE TANKS

1) The standing loss of a hot water storage tank shall be determined with the store temperature set and stabilised at 65ºC and an ambient temperature of 20ºC.

2) Heat exchangers shall be filled with system or sanitary water (whichever applies) where it can be assumed that the filled condition contributes significantly to standing loss measured, such as heat exchangers located on the perimeter of the hot water storage tank.

3) The standing loss S of storage tanks shall be the energy required to keep the storage tank contents at the required temperature divided by the test duration.

4) The equivalent volume of a storage tank containing PCM material Veq is calculated as:

$$Veq = V40 * \frac{30}{\Theta_{wh} - 10} \div 0.85$$

Where:

- V40 is the volume of mixed water, established in accordance with methods identified in Annex IV
- Θ_{wh} is the reference hot water temperature, established in accordance with methods identified in Annex IV

Table 11 Tapping (load) profiles

h	3XS			XXS			XS			S				M				h	L				XL				XXL				h	3XL			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p		Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	Q_{tap}	f	T_m	f	T_m		Q_{tap}	f	T_m	T_p
	kWh	l/ min	°C	kWh	l/ min	°C	kWh	l/ min	°C	kWh	l/ min	°C	°C	kWh	l/ min	°C	°C		kWh	l/ min	°C	°C	kWh	l/ min	°C	°C	kWh	l/ min	°C	°C		kWh	l/ min	°C	°C
07:00	**0,015**	2	25	**0,105**	**2**	**25**				**0,105**	3	25		**0,105**	3	25		07:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		07:00	**11,2**	48	40	
07:05	**0,015**	2	25											**1,4**	6	40		07:05	**1,4**	6	40										08:01	**5,04**	24	25	
07:15	**0,015**	2	25															07:15					**1,82**	6	40		**1,82**	6	40		09:00	**1,68**	24	25	
07:26	**0,015**	2	25															07:26					**0,105**	3	25		**0,105**	3	25		10:30	**0,84**	24	10	40
07:30	**0,015**	2	25	**0,105**	**2**	**25**	**0,525**	3	35	**0,105**	3	25		**0,105**	3	25		07:30	**0,105**	3	25										11:45	**1,68**	24	25	
08:01														**0,105**	3	25		07:45	**0,105**	3	25		**4,42**	10	10	40	**6,24**	16	10	40	12:45	**2,52**	32	10	55
08:15														**0,105**	3	25		08:01					**0,105**	3	25		**0,105**	3	25		15:30	**2,52**	24	25	
08:30				**0,105**	2	25				**0,105**	3	25		**0,105**	3	25		08:05	**3,605**	10	10	40									18:30	**3,36**	24	25	
08:45														**0,105**	3	25		08:15					**0,105**	3	25		**0,105**	3	25		20:30	**5,88**	32	10	55
09:00	**0,015**	2	25											**0,105**	3	25		08:25	**0,105**	3	25										21:30	**12,04**	48	40	
09:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25		**0,105**	3	25		08:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		Q_{ref}	**46,76**			
11:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25		**0,105**	3	10	40	08:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25						
11:45	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25		**0,105**	3	25		09:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25						
12:00	**0,015**	2	25	**0,105**	2	25								**0,105**	3	25		09:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		h	**4XL**			
12:30	**0,015**	2	25	**0,105**	2	25												10:00					**0,105**	3	25		**0,105**	3	25			Q_{tap}	f	T_m	T_p
12:45	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,315**	4	10	55	**0,315**	4	10	55	10:30	**0,105**	3	10	40	**0,105**	3	10	40	**0,105**	3	10	40		kWh	l/ min	°C	°C
14:30	**0,015**	2	25											**0,105**	3	25		11:00					**0,105**	3	25		**0,105**	3	25		07:00	**22,4**	96	40	
15:00	**0,015**	2	25															11:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		08:01	**10,08**	48	25	
15:30	**0,015**	2	25											**0,105**	3	25		11:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		09:00	**3,36**	48	25	
16:00	**0,015**	2	25															12:45	**0,315**	4	10	55	**0,735**	4	10	55	**0,735**	4	10	55	10:30	**1,68**	48	10	40
16:30														**0,105**	3	25		14:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		11:45	**3,36**	48	25	
18:00				**0,105**	2	25				**0,105**	3	25		**0,105**	3	25		15:00					**0,105**	3	25		**0,105**	3	25		12:45	**5,04**	64	10	55
18:15				**0,105**	2	25				**0,105**	3	40		**0,105**	3	40		15:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		15:30	**5,04**	48	25	
18:30	**0,015**	2	25	**0,105**	2	25								**0,105**	3	40		16:00					**0,105**	3	25		**0,105**	3	25		18:30	**6,72**	48	25	
19:00	**0,015**	2	25	**0,105**	2	25								**0,105**	3	25		16:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		20:30	**11,76**	64	10	55
19:30	**0,015**	2	25	**0,105**	2	25												17:00					**0,105**	3	25		**0,105**	3	25		21:30	**24,08**	96	40	
20:00				**0,105**	2	25												18:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		Q_{ref}	**93,52**			
20:30							**1,05**	3	35	**0,42**	4	10	55	**0,735**	4	10	55	18:15	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40						
20:45				**0,105**	2	25												18:30	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40		*Legend:*				
21:00				**0,105**	2	25												19:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25		*Qtap:* energy content				
21:15	**0,015**	2	25	**0,105**	2	25								**0,105**	3	25		20:30	**0,735**	4	10	55	**0,735**	4	10	55	**0,735**	4	10	55	*f :* flow rate				
21:30	**0,015**	2	25							**0,525**	5	45		**1,4**	6	40		20:46					**4,42**	10	10	40	**6,24**	16	10	40	*Tm:* minimum temperature				
21:35	**0,015**	2	25	**0,105**	2	25												21:00	**3,605**	10	10	40									*Tp:* peak temperature				
21:45	**0,015**	2	25	**0,105**	2	25												21:15					**0,105**	3	25		**0,105**	3	25						
																		21:30	**0,105**	3	25		**4,42**	10	10	40	**6,24**	16	10	40					
Q_{ref}	**0,345**			**2,100**			**2,100**			**2,100**				**5,845**				Q_{ref}	**11,655**				**19,07**				**24,53**								

ANNEX IV

Transitional Methods

Table 12 References and qualifying notes for water heaters and hot water storage tanks

Parameter	Sou	Reference Test Method / Title	Notes
Electric instantaneous water heaters			
Rated heat output, Prated		EN 50193-1:2016/A1:2020 Clause 5.1.2	The value of Pnom is the power consumption of the appliance measured after a minimum of 30 minutes of operation under full load conditions
Water heating energy efficiency η_{wh}		EN 50193-1:2016/A1:2020 Electric instantaneous water heaters - Methods for measuring the Performance - Part 1: General requirements 5.2.4	
Sound power level (L_{WA})			It is assumed that values are not significant
Daily electricity consumption Qelec		5.2.2	
Weekly electricity consumption Qelec,week		5.1.4	By default the standard assumes SCF=0 (as there are no efficiency gains to be achieved for smart control)
Weekly electricity consumption 'smart' enabled Qelec,week,smart		5.1.4	
SCF		5.1.4	
Electric storage water heater			
Rated heat output, Prated			EN 50440 does not present a method for determining Prated. EN 16147:2017 Clause 7.14.1 determines the effective thermal capacity (when fully charged) divided by the time required to charge the product as in EN 16147:2017 Clause 7.7. $P_{rated} = \frac{1{,}163 \times 3600 \times V_{40}(40-10)}{t_h \times 1000}$ where P_{rated} is the rated heat output in kW; V_{40} is the maximum volume of mixed water at 40 °C in l; t_h is the heating up time in s;
Water heating energy efficiency η_{wh}		EN 50440:2015+A1:2020 Efficiency of domestic	

		electrical storage water heaters and testing methods A.2	
Sound power level (L_{WA})			It is assumed that values are not significant
Storage volume		EN 50440:2015+A1:2020, Clause 9.1.4	
Mixed water at 40 °C		EN 50440:2015+A1:2020, Clause 9.1.10	
Daily electricity consumption Qelec		EN 50440:2015+A1:2020, Clause 9.1.8.	
Weekly electricity consumption Qelec,week		EN 50440:2015+A1:2020, Clause 9.2	
Weekly electricity consumption 'smart' enabled Qelec,week,smart		EN 50440:2015+A1:2020, Clause 9.2	
SCF		EN 50440:2015+A1:2020, Clause 9.2.	
Fuel instantaneous water heater			
Rated heat output, Prated			Prated is called nominal useful output Pn in EN26 but that standard does not describe a measurement method. Proposed is to define Prated as the nominal fuel input multiplied by the nominal efficiency from EN26:2017 Clause 7.3.2 corrected for GCV of the fuel.
Water heating energy efficiency η_{wh}		gaseous fuels: prEN13203:2017 Clause 7.1 liquid fuels: prEN 303-6:2017 Clause 10.1	
Sound power level (L_{WA})		FprEN 26:2021 Clause 11.	
NOx emissions / gaseous		FprEN 26:2021 Clause 10.	
NOx emissions / liquid		EN 267:2020 Automatic forced draught burners for liquid fuels; Clause 5. Testing. ANNEX B	Tests to be performed at nominal conditions (80/60 supply/return and maximum capacity)
Daily electricity consumption Qelec		prEN13203:2017 Clause 5.5	
Daily fuel consumption Qfuel		prEN13203:2017 Clause 7.1	
Weekly electricity consumption Qelec,week			Smart control is not covered by standards for fuel fired appliances
Weekly electricity consumption 'smart' enabled Qelec,week,smart			

Weekly fuel consumption Qfuel,week			
Weekly fuel consumption 'smart' enabled Qfuel,week,smart			
SCF			
Fuel storage water heater			
Rated heat output, Prated			Prated is called nominal useful output Pn in EN89 but that standard does not describe a measurement method. Proposed is to define Prated as the nominal fuel input multiplied by the nominal efficiency from EN89:2015 Clause 7.1.2.2 corrected for GCV of the fuel.
Water heating energy efficiency η_{wh}		gaseous fuels: EN 89:2015 Gas-fired storage water heaters for the production of domestic hot water liquid fuels: prEN 303-6:2017 Clause 10.1	refers to prEN13203:2017 Clause 7.1
Sound power level (L_{WA})		EN 89:2015 Gas-fired storage water heaters for the production of domestic hot water Clause 11.	
NOx emissions / gaseous		EN 89:2015 Clause 10	
NOx emissions / liquid		EN 267:2020 Automatic forced draught burners for liquid fuels; § 5. Testing. ANNEX B	Tests to be performed at nominal conditions (80/60 supply/return and maximum capacity)
Storage volume		EN 89:2015 Clause 6.11	Referred to as nominal capacity
mixed water at 40 °C		EN 89:2015 Clause 7.4	
Daily electricity consumption Qelec		prEN13203:2017 Clause 5.5	
Daily fuel consumption Qfuel		prEN13203:2017 Clause 7.1	
Weekly electricity consumption Qelec,week			Smart control is not covered by standards for fuel fired appliances
Weekly electricity consumption 'smart' enabled Qelec,week,smart			
Weekly fuel consumption Qfuel,week			
Weekly fuel consumption 'smart' enabled Qfuel,week,smart			
SCF			

Electric heat pump water heater			
Rated heat output / water heating (Prated)		EN 16147:2017 Clause 7.14.1	With V40 as established using the same settings as during the tests for water heating energy efficiency
Water heating energy efficiency η_{wh}		EN 16147:2017 Heat pumps with electrically driven compressors - Testing, performance rating and requirements for marking of domestic hot water units Clause 7.13	
Sound power level (L_{WA})		EN 12102-2:xx	
Storage volume		EN 16147:2017 Clause 7.6	"Rated volume"
mixed water at 40 °C		EN 16147:2017 Clause 7.10	
Electric input power			Use electrical energy consumption W_{EL-LP} (Clause 7.9.2) divided by 24h
Daily electricity consumption Qelec		EN 16147:2017 Clause 7.13.1	
Weekly electricity consumption Qelec,week		EN 16147:2017 Clause 7.11.2	
Weekly electricity consumption 'smart' enabled Qelec,week,smart			
SCF			
Pstby		EN 16147:2017 Clause 7.8	
Thermally driven heat pump water heater			
Rated heat output / water heating (Prated)			There is currently no procedure described in existing standards for establishing the Prated for tdHPWH (only for space heating). The same calculation method as in EN 16147:2017 Clause 7.14.1 shall be applied.
Water heating energy efficiency η_{wh}		prEN 13203-6:2020 Clause 7.1	
Sound power level (L_{WA})		prEN 12102-2:2016 Clause 10.1.3.2	
NOx emissions / gaseous		EN12309-2:2015 Clause 7.3.13	Important! No correction for 3rd family gases shall be applied whatsoever (this is already taken into account in the ecodesign requirements)
NOx emissions / liquid		EN 267:2020 Automatic forced draught burners for liquid fuels; § 5. Testing. ANNEX B	Tests to be performed at nominal conditions (80/60 supply/return and maximum capacity)
Storage volume		prEN 13203-6:2020 Clause 5.1.1	

mixed water at 40 °C		prEN13203-4:2020 Clause 7.5	
Daily electricity consumption Qelec		prEN 13203-6:2020 Clause 5.7	Refers to prEN13203-2:2020 Clause 5.7
Daily fuel consumption Qfuel		prEN13203-6:2012 Clause 7.1	
Weekly electricity consumption Qelec,week		prEN13203-6:2012 Clause 7.1	
Weekly electricity consumption 'smart' enabled Qelec,week,smart			
Weekly fuel consumption Qfuel,week			
Weekly fuel consumption 'smart' enabled Qfuel,week,smart			
SCF			
Pstby			Determination of Pstby is not covered in prEN13203-6:2020. A procedure similar to EN 16147:2017 Clause 7.8 can be applied.
Cogeneration water heater			
Rated heat output, Prated		EN 50465:2015+A1:2019 Clause 6.3.4	This clause does not describe actual measurement but a verification that the fuel input multiplied by overall efficiency is not less than the nominal overall thermal and electric output. In this regulation the Prated of cogeneration water heaters shall be the product of nominal heat input and the water heating energy efficiency.
Water heating energy efficiency η_{wh}		prEN 13203-4:2020	The standard prEN 13203-4:2020 describes the correct test set-up but in Clause 7.1 the net delivered electrical energy is subtracted from the fuel input, whereas the Regulation requires consideration of electric output in the numerator using a factor 2.65
Sound power level (L_{WA})		EN 15036 - 1:2006 Heating boilers - Test regulations for airborne noise emissions from heat generators	
NOx emissions / gaseous		EN 50465:2015 Clause 7.8.2 NOx (Other pollutants)	The clause describes the correct measurement set-up and calculations for NOx

			emissions for space heating, but prescribes output capacities relevant for space heating. For water heating the conditions in Clause 7.3.1 shall apply.
NOx emissions / liquid		EN 267	
Storage volume		prEN 13203-4:2020 Clause 5.1	
mixed water at 40 °C		EN 89:2015 Clause 6.11	There is no determination of storage volume in prEN13203-4:2020 not its 'mother' standard prEN13203-2:2020. Instead reference is made to EN 89:2015
Daily electricity consumption Qelec		prEN 13203-4:2020 Clause 5.5	Referred to as Eelecco
Daily fuel consumption Qfuel		prEN 13203-4:2020 Clause 7.1	
Weekly electricity consumption Qelec,week		prEN 13203-4:2020 Clause 7.2	
Weekly electricity consumption 'smart' enabled Qelec,week,smart			
Weekly fuel consumption Qfuel,week			
Weekly fuel consumption 'smart' enabled Qfuel,week,smart			
SCF			
Hot water storage tanks			
Storage volume		FprEN 15332:2019 Clause 5.4 EN 12897:2016+A1:2020 Clause 6.2.2	All volumes relevant for providing the effective thermal capacity (here: for water heating) and relevant for determining the standing loss must be included in the measurement, for example: If the tank is filled with primary water only, and uses a heat exchanger to extract heat for domestic hot water (DE: Hygiene-speicher), the primary side has to be filled as well.
Mixed water at 40 °C		EN 12897:2016+A1:2020 Clause 6.2.2 Annex A.4.3	
Reference temperature ϕp		EN 12897:2016+A1:2020 Clause xx FprEN 15332:2019, Clause xx	

Standing loss		FprEN 15332:2019 Clause 5.3 EN 12897:2016+A1:2020 Clause 6.2.2 Annex B EN 12977-3:2018 Annex F.2	When determining standing losses using EN 12897 all relevant volumes, for both/either system water side and domestic hot water side should be filled and heated to required storage temperatures as prescribed in EN 15332.
Equivalent storage volume OR thermal capacity			See calculation in Annex III, point 7

ANNEX V

Verification procedure for market surveillance purposes

The verification tolerances defined in this Annex relate only to the verification by Member State authorities of the declared values and shall not be used by the manufacturer, importer or authorised representative as an allowed tolerance to establish the values in the technical documentation or in interpreting these values with a view to achieving compliance or to communicate better performance by any means.

As part of verifying the compliance of a product with the requirements laid down in this Regulation pursuant to Article 3(2) of Directive 2009/125/EC, for the requirements referred to in this Annex, the authorities of the Member States shall apply the following procedure:

(1) The Member State authorities shall verify one single unit of the model.

(2) The model shall be considered to comply with the applicable requirements if:

(a) the values given in the technical documentation pursuant to point 2 of Annex IV to Directive 2009/125/EC (declared values), and, where applicable, the values used to calculate these values, are not more favourable for the manufacturer or importer than the results of the corresponding measurements carried out pursuant to paragraph (g) thereof; and

(b) the declared values meet any requirements laid down in this Regulation, and any required product information published by the manufacturer or importer does not contain values that are more favourable for the manufacturer or importer than the declared values; and

(c) when the Member State authorities test the unit of the model, the determined values (the values of the relevant parameters as measured in testing and the values calculated from these measurements) comply with the respective verification tolerances as given in Table 13.

(3) If the results referred to in point 2(a) or (b) are not achieved, the model and all other equivalent models shall be considered not to comply with this Regulation.

(4) If the result referred to in point 2(c) is not achieved, the Member State authorities shall select three additional units of the same model for testing. As an alternative, the three additional units selected may be of one or more different equivalent models.

(5) The model shall be considered to comply with the applicable requirements if, for these three units, the arithmetical mean of the determined values complies with the respective verification tolerances given in Table 13.

(6) If the result referred to in point 5 is not achieved, the model and all other equivalent models shall be considered not to comply with this Regulation.

(7) The Member State authorities shall provide all relevant information to the authorities of the other Member States and to the Commission without delay after a decision being taken on the non-compliance of the model according to points 3 and 6.

The Member State authorities shall use the measurement and calculation methods set out in Annex III.

The Member State authorities shall only apply the verification tolerances that are set out in Table 13 and shall only use the procedure described in points 1 to 7 for the requirements referred to in this Annex. No other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

Table 13 Verification tolerances

Parameters	Verification tolerances
Water-heating energy efficiency, η_{wh}	The determined value shall not be more than 8 % lower than the declared value.
Sound power level, L_{WA}	The determined value shall not exceed the declared value by more than 2 dB(A).
Daily electricity consumption, Q_{elec}	The determined value shall not exceed the declared value by more than 5 %
Daily fuel consumption, Q_{fuel}	The determined value shall not exceed the declared value by more than 5 %
Weekly fuel consumption without smart controls, $Q_{fuel,week}$	The determined value shall not exceed the declared value by more than 5 %
Weekly fuel consumption with smart controls, $Q_{fuel,week,smart}$	The determined value shall not exceed the declared value by more than 5 %
Weekly electricity consumption without smart controls, $Q_{elec,week}$	The determined value shall not exceed the declared value by more than 5 %
Weekly electricity consumption with smart controls, $Q_{elec,week,smart}$	The determined value shall not exceed the declared value by more than 5 %
Storage volume, V	The determined value shall not be lower than the declared value by more than 2 %.
Mixed water at 40 °C, $V40$	The determined value shall not be lower than the declared value by more than 3 %.
Standing loss, S	The determined value shall not exceed the declared value by more than 5 %
Emissions of nitrogen oxides	The determined value shall not exceed the declared value by more than 20 %.

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ANNEX VI

Indicative benchmarks

At the time of entry into force of this Regulation, the best available technology on the market for water heaters and hot water storage tanks in terms of water heating energy efficiency, sound power level, standing loss and emissions of nitrogen oxides was identified as follows:

1) BENCHMARKS FOR WATER HEATING ENERGY EFFICIENCY OF WATER HEATERS

Table 14 Benchmarks for water heating energy efficiency

Water heater type	**Declared tapping profiles**						
	3XS to S	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
Electric instantaneous or storage water heater	42.0%	47.5%	48.6%	49.7%	49.7%	49.7%	49.7%
Fuel instantaneous water heater	70%	80%	85%	90%	94%	94%	94%
Fuel storage water heater	60%	75%	80%	86%	90%	90%	90%
Electric heat pump water heater(*)	-	110.5%	215.5%	215.5%	210.0%	210.0%	210.0%
Thermally driven heat pump water heater	-	100%	110%	120%	120%	125%	125%
Cogeneration water heater	-	80%	85%	90%	170%	170%	170%

2. BENCHMARKS FOR SOUND POWER LEVEL (LWA), OUTDOORS, OF HEAT PUMP WATER HEATERS WITH:

a) rated heat output ≤ 6 kW: 39 dB;

b) rated heat output > 6 kW and ≤ 12 kW: 40 dB;

c) rated heat output > 12 kW and ≤ 30 kW: 41 dB;

d) rated heat output > 30 kW and ≤ 70 kW: 67 dB

3. BENCHMARK FOR EMISSIONS OF NITROGEN OXIDES, EXPRESSED IN NITROGEN OXIDE, OF CONVENTIONAL WATER HEATERS USING GASEOUS FUELS:

e) of water heaters using gaseous fuels: 14 mg/kWh fuel input in terms of GCV;

f) of water heaters using liquid fuels: 50 mg/kWh fuel input in terms of GCV.

4. BENCHMARK FOR STANDING LOSS, IN WATTS, OF HOT WATER STORAGE TANKS

$$S < 5.5+3.16*V^{0.4}$$

The benchmarks specified in points 1, 2 and 3 do not necessarily imply that a combination of these values is achievable for a single water heater.