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Contents

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([1]) Text with EEA relevance

IV

(Notices)

NOTICES FROM EUROPEAN UNION INSTITUTIONS, BODIES, OFFICES AND AGENCIES

EUROPEAN COMMISSION

Euro exchange rates [1]

2 July 2014

(2014/C 207/01)

1 euro =

	Currency	Exchange rate		Currency	Exchange rate
USD	US dollar	1,3656	CAD	Canadian dollar	1,4535
JPY	Japanese yen	138,65	HKD	Hong Kong dollar	10,5835
DKK	Danish krone	7,4563	NZD	New Zealand dollar	1,5568
GBP	Pound sterling	0,79580	SGD	Singapore dollar	1,7013
SEK	Swedish krona	9,1574	KRW	South Korean won	1 377,92
CHF	Swiss franc	1,2137	ZAR	South African rand	14,6314
ISK	Iceland króna		CNY	Chinese yuan renminbi	8,4816
NOK	Norwegian krone	8,4250	HRK	Croatian kuna	7,5865
BGN	Bulgarian lev	1,9558	IDR	Indonesian rupiah	16 272,80
CZK	Czech koruna	27,432	MYR	Malaysian ringgit	4,3706
HUF	Hungarian forint	311,10	PHP	Philippine peso	59,538
LTL	Lithuanian litas	3,4528	RUB	Russian rouble	46,7560
PLN	Polish zloty	4,1456	THB	Thai baht	44,204
RON	Romanian leu	4,3864	BRL	Brazilian real	3,0113
TRY	Turkish lira	2,9053	MXN	Mexican peso	17,6777
AUD	Australian dollar	1,4447	INR	Indian rupee	81,3283

[1] *Source*: reference exchange rate published by the ECB.

Commission communication in the framework of the implementation of Commission Regulation (EU) No 813/2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters and of Commission Delegated Regulation (EU) No 811/2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device

(2014/C 207/02)

1. Publication of titles and references of transitional methods of measurement and calculation (*) for the implementation of Regulation (EU) No 813/2013, and in particular Annexes III and IV thereof, and for the implementation of Regulation (EU) No 811/2013, and in particular Annexes VII and VIII thereof.

2. Parameters *in italics* are determined in Regulation (EU) No 813/2013 and in Regulation (EU) No 811/2013.

3. References

Parameter	Organisation	Reference/Title	Notes
Boiler space heaters and boiler combination heaters using gaseous fuel			
η, P, design types, P_{stby}, P_{ign}	CEN	EN 15502-1:2012 Gas-fired heating boilers - Part 1: General requirements and tests;	EN 15502-1:2012 is set to replace EN 297, EN 483, EN 677, EN 656, EN 13836, EN 15420.
Useful heat output at rated heat output P_4 and useful efficiency at rated heat output η_4 at 80/60 °C	CEN	§ 3.1.6 Nominal output (definition, symbol P_n); § 3.1.5.7 Useful efficiency (definition, symbol η_u); § 9.2.2 (test);	All efficiency values are expressed in gross calorific value *GCV*.
Design types, definitions	CEN	§ 3.1.10. Design types of boilers with definitions of 'combination-boiler'; 'low temperature boiler' and 'condensing boiler'. § 8.15. Formation of condensate (requirements and test);	

(*) It is intended that these transitional methods will ultimately be replaced by harmonised standard(s). When available, reference(s) to the harmonised standard(s) will be published in the *Official Journal of the European Union* in accordance with Articles 9 and 10 of Directive 2009/125/EC.

Parameter	Organisation	Reference/Title	Notes
Useful heat output at 30 % of rated heat output P_1 and useful efficiency at 30 % of rated heat output η_1 at partial heat input and low temperature regime	CEN	§ 3.1.5.7. Useful efficiency (definition, symbol η_u); § 9.3.2. Useful efficiency at part load, Tests;	1) tests are carried out at 30 % of nominal heat input, not at minimum steady state heat input; 2) test return temperatures are 30 °C (condensing boiler), 37 °C (low temperature boiler) or 50 °C (standard boiler). According to prEN 15502-1:2013, — η_4 is the useful efficiency at nominal heat input or for range rated boilers at the arithmetic mean of the maximum and minimum useful heat input. — η_1 is the useful efficiency at 30 % of the nominal heat input or for range rated boilers at 30 % of the arithmetic mean of the maximum and minimum useful heat input.
Standby heat loss P_{stby}	CEN	§ 9.3.2.3.1.3 Standby losses (test);	
Ignition burner power consumption P_{ign}	CEN	§ 9.3.2 Table 6 and 7: Q3 = permanent ignition burner.	Applies to ignition burners operating at main burner-off mode.
Emission of nitrogen oxides NO_X	CEN	EN 15502-1:2012. § 8.13. NO_X (classification, test- and calculation methods)	NO_X emission values are expressed in gross calorific value *GCV*.

Boiler space heaters and boiler combination heaters using liquid fuel

General test conditions		EN 304:1992; A1:1998; A2:2003; Heating boilers - Test code for heating boilers for atomizing oil burners; Section 5 ('Tests').	
Standby heat loss P_{stby}	CEN	EN 304 as above; § 5.7 Determination of standby loss.	P_{stby} =q × (P4/η4), with 'q' defined in EN 304. The test described in EN304 shall be done with Δ30K

Parameter	Organisation	Reference/Title	Notes
Seasonal space heating energy efficiency in active mode η_{son} with test results for useful output P	CEN	For condensing boilers: EN 15034:2006. Heating boilers - Condensing heating boilers for fuel oil; § 5.6 Useful efficiency.	EN 15034:2006 refers to condensing oil boilers.
		For standard and low temperature boilers: EN 304:1992; A1:1998; A2:2003; Heating boilers - Test code for heating boilers for atomizing oil burners; Section 5 ('Tests').	For boilers with forced draught burner similar sections apply in EN 303-1, EN 303-2 and EN 303-4. For atmospheric, not fan-assisted burners EN 1:1998 applies. Test conditions (power and temperature settings) for η_1 and η_4 are the same as for gas-fired boilers described above.
Emission of nitrogen oxides NO_X	CEN	EN 267:2009+A1:2011 Automatic forced draught burners for liquid fuels; § 4.8.5. Emission limit values for NO_X and CO; § 5. Testing. ANNEX B. Emission measurements and corrections.	NO_X emission values are expressed in *GCV*. A reference nitrogen content in the fuel of 140mg/kg shall be applied. Where another nitrogen content is measured, with the exemption of Kerosene oil only, the following correction equation shall apply: $$NO_{X(EN267)}\left[\frac{mg}{kWH}\right] = NO_{Xref}\left[\frac{mg}{kWH}\right] - (N_{meas} - N_{ref}) \times 0,2$$ $NO_{X(EN\ 267)}$ is the value of NO_X corrected to the reference conditions of nitrogen of the fuel oil chosen at 140 mg/kg; NO_{Xref} is the measured value of NO_X according to B.2; N_{meas} is the value of the nitrogen content of the fuel oil measured in mg/kg; N_{ref} = 140 mg/kg. For rating that the requirements of the standard are fulfilled the value of $NO_{X(EN\ 267)}$ shall apply.

Electric boiler space heaters and electric boiler combination heaters

Seasonal space heating energy efficiency η_s of electric boiler space heaters and electric boiler combination heaters	European Commission	Point 4 of this Communication	Additional elements for measurements and calculations related to the seasonal space heating energy efficiency of boiler space heaters, boiler combination heaters and cogeneration space heaters.

Parameter	Organisation	Reference/Title	Notes
Cogeneration space heaters			
Useful heat output at rated heat output of cogeneration space heater with supplementary heater disabled $P_{CHP100+Sup0}$, useful heat output at rated heat output of cogeneration space heater with supplementary heater enabled $P_{CHP100+Sup100,}$ Useful efficiency at rated heat output of cogeneration space heater with supplementary heater disabled $\eta_{CHP100+Sup0}$, Useful efficiency at rated heat output of cogeneration space heater with supplementary heater enabled $\eta_{CHP100+Sup100,}$ Electrical efficiency at rated heat output of cogeneration space heater with supplementary heater disabled $\eta_{el,CHP100+Sup0}$, Electrical efficiency at rated heat output of cogeneration space heater with supplementary heater enabled $\eta_{el,CHP100+Sup100}$	CEN	FprEN 50465:2013 Gas appliances – Combined Heat and Power appliance of nominal heat input inferior or equal to 70 kW. Heat outputs: 6.3 Heat input and heat and electrical output; 7.3.1 and 7.6.1; Efficiencies: 7.6.1 Efficiency (*Hi*) and 7.6.2.1. Efficiency – Seasonal space heating energy efficiency – conversion to gross calorific efficiency.	$P_{CHP100+Sup0}$ corresponds to $Q_{CHP\_100+Sup\_0} \times \eta_{th,CHP\_100+Sup\_0}$ in FprEN 50465:2013 $P_{CHP100+Sup100}$ corresponds to $Q_{CHP\_100+Sup\_100} \times \eta_{th,CHP\_100+Sup\_100}$ in FprEN 50465:2013 $\eta_{CHP100+Sup0}$ corresponds to $\eta_{Hs,th,CHP\_100+Sup\_0}$ in FprEN 50465:2013 $\eta_{CHP100+Sup100}$ corresponds to $\eta_{Hs,th,CHP\_100+Sup\_100}$ in FprEN 50465:2013 $\eta_{el,CHP100+Sup0}$ corresponds to $\eta_{Hs,el,CHP\_100+Sup\_0}$ in FprEN 50465:2013 $\eta_{el,CHP100+Sup100}$ corresponds to $\eta_{Hs,el,CHP\_100+Sup\_100}$ in FprEN 50465:2013 FprEN 50465 is the reference only for the calculation of $P_{CHP100+Sup0}$, $P_{CHP100+Sup100}$, $\eta_{CHP100+Sup0}$, $\eta_{CHP100+Sup100}$, $\eta_{el,CHP100+Sup0}$, $\eta_{el,CHP100+Sup100}$. For the calculation of η_s and η_{son} of cogeneration space heaters the methodology described in this Communication shall be used.
P_{stby}, P_{ign}	CEN	FprEN 50465:2013 Gas appliances – Combined Heat and Power appliance of nominal heat input inferior or equal to 70 kW.	
Standby heat loss P_{stby}	CEN	§ 7.6.4 Stand-by losses P_{stby} ;	

Parameter	Organisation	Reference/Title	Notes
Ignition burner power consumption P_{ign}	CEN	§ 7.6.5 Permanent ignition burner heat input Q_{pilot}	P_{ign} corresponds to Q_{pilot} in FprEN 50465:2013
Emission of nitrogen oxides NO_X	CEN	FprEN 50465:2013 § 7.8.2 NO_X (Other pollutants)	NO_X emission values shall be measured in mg/kWh fuel input and expressed in gross calorific value GCV. The electrical energy generated during the test, shall not be considered in the calculation of NO_X emission.

Boiler space heaters, boiler combination heaters and cogeneration space heaters

Auxiliary electricity consumption at full load *elmax*, at part load *elmin* and in standby mode P_{SB}	CEN	EN 15456:2008: Heating boilers - Electrical power consumption for heat. EN 15502:2012 for gas boilers. FprEN 50465:2013 For cogeneration space heaters § 7.6.3 Electric auxiliary energy consumption for ErP	Measurement without circulator (pump). *elmax* corresponds to P_{elmax} in FprEN 50465:2013 *elmin* corresponds to P_{elmin} in FprEN 50465:2013 In the determination of *elmax*, *elmin* and P_{SB}, the electric auxiliary energy consumed by the primary heat generator shall be included.
Sound power level L_{WA}	CEN	For sound power level, indoor measured: EN 15036 - 1: Heating boilers - Test regulations for airborne noise emissions from heat generators - Part 1: Airborne noise emissions from heat generators.	For the acoustics, EN 15036 - 1 is referring to ISO 3743-1 Acoustics - Determination of sound power levels of noise sources - Engineering methods for small, movable sources in reverberant fields - Part 1: Comparison method for hard-walled test rooms, as well as to other allowable methods, each with their own accuracies.
Seasonal space heating energy efficiency η_s of boiler space heaters, boiler combination heaters and cogeneration space heaters	European Commission	Point 4 of this Communication.	Additional elements for measurements and calculations related to the seasonal space heating energy efficiency of boiler space heaters, boiler combination heaters and cogeneration space heaters.

Parameter	Organisation	Reference/Title	Notes
Heat pump space heaters and heat pump combination heaters			
Testing methods, vapour compression electrically driven heat pumps	CEN	EN 14825:2013 Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling – Testing and rating at part load conditions and calculation of seasonal performance; Section 8: Test methods for testing capacities, EERbin(Tj) and COPbin(Tj) values during active mode at part load conditions Section 9: Test methods for electric power consumption during thermostat off mode, standby mode and crankcase heater mode	
Testing methods, vapor compression liquid or gaseous fuel engine driven heat pumps	CEN	EN 14825:2013 Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling – Testing and rating at part load conditions and calculation of seasonal performance; Section 8: Test methods for testing capacities EERbin(Tj) and COPbin(Tj) values during active mode at part load conditions; Section 9: Test methods for electric power consumption during thermostat off mode, standby mode and crankcase heater mode.	Until publication of a new European Standard. A working document is in progress within the CEN/TC299 WG3 experts group

Parameter	Organisation	Reference/Title	Notes
Testing methods, liquid or gaseous fuel sorption heat pumps	CEN	prEN 12309-4:2013 Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70kW – Test methods	
Vapor compression electrically or liquid or gaseous fuel engine driven heat pumps. Test conditions for air-to-water, brine-to-water and water-to-water units for medium temperature application for average, warmer and colder climate conditions for calculation of seasonal coefficient of performance *SCOP* for electrically driven heat pumps and seasonal primary energy ratio *SPER* for liquid or gaseous fuel engine driven heat pumps.	CEN	EN 14825:2013 Section 5.4.4, Tables 18,19 and 20 (air-to-water); Section 5.5.4, Tables 30,31 and 32 (brine-to-water, water-to-water); Where the outlet temperatures set out in column 'variable outlet' are to be applied for heat pumps that control the outlet (flow) water temperature according to the heat demand. For heat pumps that do not control the outlet (flow) water temperature according to the heat demand but have a fixed outlet temperature, outlet temperature should be set according to the 'fixed outlet'.	For liquid or gaseous fuel engine driven heat pumps EN 14825:2013 applies until publication of a new European Standard. Medium temperature corresponds to high temperature in EN 14825:2013. Tests are done according to EN 14825:2013, section 8: For fixed capacity units, tests are applied as indicated in EN 14825:2013, section 8.4. Either the outlet temperatures during the tests are the ones to obtain the average outlet temperatures corresponding to the declaration points in EN 14825:2013 OR this data should be obtained by linear interpolation / extrapolation from the test points in EN 14511-2:2013, complemented with test at other outlet temperatures when necessary. For variable capacity units, EN 14825:2013 section 8.5.2 are applied. Either the conditions during the tests are the same as for the declaration points specified in that standard OR tests can be performed at other outlet temperatures and part load conditions and the results linearly interpolated, extrapolated, to determine the data for the declaration points in EN 14825:2013. Apart from test conditions A to F, 'in case the TOL is below – 20 °C, an additional calculation point has to be taken from the capacity and COP at – 15 °C conditions' (cit. EN 14825:2013 § 7.4). For the purpose of this communication, this point will be called 'G'.

Parameter	Organisation	Reference/Title	Notes
Liquid or gaseous fuel sorption heat pumps Test conditions for air-to water, brine-to-water and water-to-water units for medium temperature application for average, warmer and colder climate conditions for calculation of seasonal primary energy ratio SPER	CEN	prEN 12309-3:2012 Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70kW – Part 3: Test conditions. Section 4.2 Tables 5 and 6.	Medium temperature corresponds to high temperature in prEN 12309-3:2012
Vapor compression electrically ord liquid or gaseous fuel engine driven heat pumps. Test conditions for air-to-water, brine-to-water and water-to-water units under low temperature application for average, warmer and colder climate conditions for calculation of seasonal coefficient of performance *SCOP* for electrically driven heat pumps and seasonal primary energy ratio *SPER* for liquid or gaseous fuel engine driven heat pumps.	CEN	EN 14825:2013; Section 5.4.2, Tables 11,12 and 13 (air-to-water); Section 5.5.2, Tables 24,25 and 26 (brine-to-water, water-to-water); Where the outlet temperatures set out in column 'variable outlet' are to be applied for heat pumps that control the outlet (flow) water temperature according to the heat demand. For heat pumps that do not control the outlet (flow) water temperature according to the heat demand but have a fixed outlet temperature, outlet temperature should be set according to the 'fixed outlet'.	Same notes as for average climate and medium temperature application, except 'Medium temperature corresponds to high temperature in EN 14825:2013'.
Liquid or gaseous fuel sorption heat pumps Test conditions for air-to water, brine-to-water and water-to-water units for low temperature application for average, warmer and colder climate conditions for calculation of seasonal primary energy ratio SPER	CEN	prEN 12309-3:2012 Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70kW – Part 3: Test conditions. Section 4.2 Tables 5 and 6.	

Parameter	Organisation	Reference/Title	Notes
Vapor compression electrically driven heat pump Calculation of seasonal coefficient of performance SCOP	CEN	EN 14825:2013 Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling – Testing and rating at part load conditions and calculation of seasonal performance; Section 7: Calculation methods for reference SCOP, reference $SCOP_{on}$ and reference $SCOP_{net}$.	
Vapor compression liquid or gaseous fuel engine driven heat pump. Calculation of seasonal primary energy ratio *SPER*	CEN	New European Standards under development	The SPER formulae will be established in analogy to the SCOP formulae for vapor compression electrically driven heat pumps: *COP*, $SCOP_{net}$, $SCOP_{on}$ and *SCOP* will be replaced by GUE_{GCV}, *PER*, $SPER_{net}$, $SPER_{on}$ and *SPER*.
Liquid or gaseous fuel sorption heat pumps Calculation of seasonal primary energy ratio *SPER*	CEN	prEN12309-6:2012 Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70kW – Part 6: Calculation of seasonal performances	*SPER* corresponds to $SPER_h$ in prEN12309-6:2012
Seasonal space heating energy efficiency η_s of heat pump space heaters and heat pump combination heaters	European Commission	Point 5 of this Communication	Additional elements for calculations related to the seasonal space heating energy efficiency of heat pump space heaters and heat pump combination heaters.

Parameter	Organisation	Reference/Title	Notes
Vapour compression liquid or gaseous fuel engine driven heat pumps, Emission of nitrogen oxides NO_X	CEN	New European Standard under development within the CEN/TC299 WG3 experts group	For variable capacity unit only, NO_X emissions shall be measured at standard rating conditions as defined in table 3 Annex III of Commission Regulation 813/2013, using 'Engine rpm equivalent ($Erpm_{equivalent}$)'. $Erpm_{equivalen}$ shall be calculated as follow: $Erpm_{equivalent} = X_1 \times F_{p1} + X_2 \times F_{p2} + X_3 \times F_{p3} + X_4 \times F_{p4}$ X_I = Engine rpm at 70 %, 60 %, 40 %, 20 % of the nominal heat input, respectively. X_1, X_2, X_3, X_4 = Engine rpm respectively at 70 %, 60 %, 40 %, 20 % of the nominal heat input. F_{pi} = weighting factors as defined in EN15502-1:2012, section 8.13.2.2 If X_i is less than the minimum Engine rpm (E_{min}) of the equipment, $X_I = X_{min}$
Liquid or gaseous fuel sorption heat pumps Emission of nitrogen oxides NO_X	CEN	New European Standard under development within the CEN/TC299 WG2 experts group prEN 12309-2:2013 Section 7.3.13 'NO_X Measurements'	NO_X emission values shall be measured in mg/kWh fuel input and expressed in gross calorific value GCV. No alternative methods to express NO_X in mg/kWh output shall be used.
Sound power level (L_{WA}) of heat pump space heaters and heat pump combination heaters	CEN	For sound power level indoor measured and outdoor measured: EN 12102:2013 Air conditioners, liquid chilling packages, heat pumps and dehumidifiers with electrically driven compressors for space heating and cooling - Measurement of airborne noise - Determination of the sound power	To be used also for liquid or gaseous fuel sorption heat pumps

Parameter	Organisation	Reference/Title	Notes
Temperature controls			
Definition of temperature controls classes, contribution of temperature controls to seasonal space heating energy efficiency η_s of packages of space heater, temperature control and solar device or of packages of combination heater, temperature control and solar device	European Commission	Point 6 of this Communication	Additional elements for calculations related to the contribution of temperature controls to the seasonal space heating energy efficiency of packages of space heater, temperature control and solar device or of packages of combination heater, temperature control and solar device.
Combination heaters			
Water heating energy efficiency η_{wh} of combination water heaters, Q_{elec} and Q_{fuel}	European Commission	Commission Regulation No 814/2013, Annex IV §3.a Communication 2014/C 207/03 in the framework of the implementation of Commission Regulation No 814/2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks, and of the implementation of Commission Delegate Regulation (EU) No 812/2013 implementing Directive 2010/30/EU of the European Parliament and of the Council with regards to energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device.	For the measurement and calculation of Q_{fuel} and Q_{elec} refer to Communication 2014/C 207/03 for the same water heater type and energy source(s)

4. Additional elements for measurements and calculations related to the seasonal space heating energy efficiency of boiler space heaters, boiler combination heaters and cogeneration space heaters

4.1. Test points

boiler space heaters and boiler combination heaters: the useful efficiency values η_4, η_1 and the useful heat output values P_4, P_1 are measured;

cogeneration space heaters:

— cogeneration space heaters not equipped with supplementary heaters: the useful efficiency value $\eta_{CHP100+Sup0}$, the useful heat output value $P_{CHP100+Sup0}$ and the electrical efficiency value $\eta_{el,CHP100+Sup0}$ is measured;

— cogeneration space heaters equipped with supplementary heaters: the useful efficiency values $\eta_{CHP100+Sup0}$, $\eta_{CHP100+Sup100}$, the useful heat output values $P_{CHP100+Sup0}$, $P_{CHP100+Sup100}$ and the electrical efficiency values $\eta_{el,CHP100+Sup0}$, $\eta_{el,CHP100+Sup100}$ are measured.

4.2. Calculation of the seasonal space heating energy efficiency

The seasonal space heating energy efficiency η_s is defined as

$$\eta_s = \eta_{son} - \sum F(i)$$

Where:

η_{son} is the seasonal space heating energy efficiency in active mode, calculated according to point 4.3 and expressed in %;

F(i) are corrections calculated according to point 4.4 and expressed in %.

4.3. Calculation of the seasonal space heating energy efficiency in active mode

The seasonal space heating energy efficiency in active mode η_{son} is calculated as follows:

(a) for fuel boiler space heaters and fuel boiler combination heaters:

$$\eta_{son} = 0{,}85 \times \eta_1 + 0{,}15 \times \eta_4$$

(b) for electric boiler space heaters and electric boiler combination heaters:

$$\eta_{son} = \eta_4$$

Where:

$\eta_4 = P_4 / (EC \times CC)$, with

EC = electricity consumption to produce useful heat output P_4

(c) for cogeneration space heaters not equipped with supplementary heaters:

$$\eta_{son} = \eta_{CHP100+Sup0}$$

(d) for cogeneration space heaters equipped with supplementary heaters:

$$\eta_{son} = 0{,}85 \times \eta_{CHP100+Sup0} + 0{,}15 \times \eta_{CHP100+Sup100}$$

4.4. Calculation of F(i)

(a) The correction F(1) accounts for a negative contribution to the seasonal space heating energy efficiency of heaters due to adjusted contributions of temperature controls to seasonal space heating energy efficiency of packages of space heater, temperature control and solar device or of packages of combination heater, temperature control and solar device, as set out in point 6.2. For boiler space heaters, boiler combination heaters and cogeneration space heaters, the correction is F(1) = 3 %.

(b) The correction F(2) accounts for a negative contribution to the seasonal space heating energy efficiency by auxiliary electricity consumption, expressed in %, and is given as follows:

— for fuel boiler space heaters and fuel boiler combination heaters:

$$F(2) = 2{,}5 \times (0{,}15 \times elmax + 0{,}85 \times elmin + 1{,}3 \times P_{SB}) \; / \; (0{,}15 \times P_4 + 0{,}85 \times P_1)$$

— for electric boiler space heaters and electric boiler combination heaters:

$$F(2) = 1{,}3 \times P_{SB} \; / \; (P_4 \times CC)$$

— for cogeneration space heaters not equipped with supplementary heaters:

$$F(2) = 2{,}5 \times (elmax + 1{,}3 \times P_{SB}) \; / \; P_{CHP100+Sup0}$$

— for cogeneration space heaters equipped with supplementary heaters:

$$F(2) = 2{,}5 \times (0{,}15 \times elmax + 0{,}85 \times elmin + 1{,}3 \times P_{SB}) \; / \; (0{,}15 \times P_{CHP100+Sup100} + 0{,}85 \times P_{CHP100+Sup0})$$

OR a default value as set out in EN 15316-4-1 may be applied.

(c) The correction F(3) accounts for a negative contribution to the seasonal space heating energy efficiency by standby heat loss and is given as follows:

— for fuel boiler space heaters and fuel boiler combination heaters:

$$F(3) = 0{,}5 \times P_{stby} \; / \; P_4$$

— for electric boiler space heaters and electric boiler combination heaters:

$F(3) = 0,5 \times P_{stby} / (P_4 \times CC)$

— for cogeneration space heaters not equipped with supplementary heaters:

$F(3) = 0,5 \times P_{stby} / P_{CHP100+Sup0}$

— for cogeneration space heaters equipped with supplementary heaters:

$F(3) = 0,5 \times P_{stby} / P_{CHP100+Sup100}$

OR a default value as set out in EN 15316-4-1 may be applied.

(d) The correction F(4) accounts for a negative contribution to the seasonal space heating energy efficiency by ignition burner power consumption and is given as follows:

— for fuel boiler space heaters and fuel boiler combination heaters:

$F(4) = 1,3 \times P_{ign} / P_4$

— for cogeneration space heaters not equipped with supplementary heaters:

$F(4) = 1,3 \times P_{ign} / P_{CHP100+Sup0}$

— for cogeneration space heaters equipped with supplementary heaters:

$F(4) = 1,3 \times P_{ign} / P_{CHP100+Sup100}$

(e) For cogeneration space heaters, the correction F(5) accounts for a positive contribution to the seasonal space heating energy efficiency by the electrical efficiency and is given as follows:

— for cogeneration space heaters not equipped with supplementary heaters:

$F(5) = - 2,5 \times \eta_{el,CHP100+Sup0}$

— for cogeneration space heaters equipped with supplementary heaters:

$F(5) = - 2,5 \times (0,85 \times \eta_{el,CHP100+Sup0} + 0,15 \times \eta_{el,CHP100+Sup100})$

5. Additional elements for calculations related to the seasonal space heating energy efficiency of heat pump space heaters and heat pump combination heaters

5.1. Calculation of the seasonal space heating energy efficiency

The seasonal space heating energy efficiency η_s is defined as

(a) for heat pump space heaters and heat pump combination heaters using electricity:

$\eta_s = (100/CC) \times SCOP - \Sigma F(i)$

(b) for heat pump space heaters and heat pump combination heaters using fuels:

$\eta_s = SPER - \Sigma F(i)$

F(i) are corrections calculated according to point 5.2 and expressed in %. SCOP and SPER shall be calculated according to the tables in 5.3, and are expressed in %.

5.2. Calculation of F(i)

(a) The correction F(1) accounts for a negative contribution to the seasonal space heating energy efficiency of heaters due to adjusted contributions of temperature controls to seasonal space heating energy efficiency of packages of space heater, temperature control and solar device or of packages of combination heater, temperature control and solar device, as set out in point 6.2. For heat pump space heaters and heat pump combination heaters, the correction is F(1) = 3 %.

(b) The correction F(2) accounts for a negative contribution to the seasonal space heating energy efficiency by electricity consumption of ground water pump(s) expressed in %. For water-/brine-to-water heat pump space heaters and heat pump combination heaters, the correction is F(2) = 5 %.

5.3 Hours for the calculation of SCOP or SPER

For the calculation of SCOP or SPER the following reference number of hours that the units work in active mode, thermostat off mode, standby mode, off more and crankcase heater mode shall be used:

Table 1

Number of hours used for heating only

	on mode	thermostat-off mode	standby mode	Off mode	crankcase heater mode
	H_{HE}	**H_{TO}**	**H_{SB}**	**H_{OFF}**	**H_{CK}**
Average climate (h/y)	2 066	178	0	3 672	3 850
Warmer climate (h/y)	1 336	754	0	4 416	5 170
Colder climate (h/y)	2 465	106	0	2 208	2 314

Table 2

Number of hours used for reversible heat pumps

	on mode	thermostat-off mode	standby mode	Off mode	crankcase heater mode
	H_{HE}	**H_{TO}**	**H_{SB}**	**H_{OFF}**	**H_{CK}**
Average climate (h/y)	2 066	178	0	0	178
Warmer climate (h/y)	1 336	754	0	0	754
Colder climate (h/y)	2 465	106	0	0	106

H_{HE}, **H_{TO}**, **H_{SB}**, **H_{CK}**, **H_{OFF}**= Number of hours the unit is considered to work in respectively, active mode, thermostat off mode, standby mode, crankcase heater mode and off mode.

6. Additional elements for calculations related to the contribution of temperature controls to the seasonal space heating energy efficiency of packages of space heater, temperature control and solar device or of packages of combination heater, temperature control and solar device

6.1. Definitions

In addition to the definitions set out in Commission Regulation (EU) No 813/2013, and Commission Delegated Regulation (EU) No 811/2013, the following definitions apply:

— 'modulating heater' means a heater with the capability of vary power output whilst maintaining continuous operation;

Definition of temperature controls classes

— Class I - On/off Room Thermostat: A room thermostat that controls the on/off operation of a heater. Performance parameters, including switching differential and room temperature control accuracy are determined by the thermostat's mechanical construction.

— Class II - Weather compensator control, for use with modulating heaters: A heater flow temperature control that varies the set point of the flow temperature of water leaving the heater dependant upon prevailing outside temperature and selected weather compensation curve. Control is achieved by modulating the output of the heater.

— Class III - Weather compensator control, for use with on/off output heaters: A heater flow temperature control that varies the set point of the flow temperature of water leaving the heater dependant upon prevailing outside temperature and selected weather compensation curve. Heater flow temperature is varied by controlling the on/off operation of the heater.

— Class IV - TPI room thermostat, for use with on/off output heaters: An electronic room thermostat that controls both thermostat cycle rate and in-cycle on/off ratio of the heater proportional to room temperature. TPI control strategy reduces mean water temperature, improves room temperature control accuracy and enhances system efficiency.

— Class V - Modulating room thermostat, for use with modulating heaters: An electronic room thermostat that varies the flow temperature of the water leaving the heater dependant upon measured room temperature deviation from room thermostat set point. Control is achieved by modulating the output of the heater.

— Class VI - Weather compensator and room sensor, for use with modulating heaters: A heater flow temperature control that varies the flow temperature of water leaving the heater dependant upon prevailing outside temperature and selected weather compensation curve. A room temperature sensor monitors room temperature and adjusts the compensation curve parallel displacement to improve room comfort. Control is achieved by modulating the output of the heater.

— Class VII - Weather compensator and room sensor, for use with on/off output heaters: A heater flow temperature control that varies the flow temperature of water leaving the heater dependant upon prevailing outside temperature and selected weather compensation curve. A room temperature sensor monitors room temperature and adjusts the compensation curve parallel displacement to improve room comfort. Heater flow temperature is varied by controlling the on/off operation of the heater.

— Class VIII - Multi-sensor room temperature control, for use with modulating heaters: An electronic control, equipped with 3 or more room sensors that varies the flow temperature of the water leaving the heater dependant upon the aggregated measured room temperature deviation from room sensor set points. Control is achieved by modulating the output of the heater.

6.2. Contribution of temperature controls to seasonal space heating energy efficiency of packages of space heater, temperature control and solar device or of packages of combination heater, temperature control and solar device

Class No.	I	II	III	IV	V	VI	VII	VIII
Value in %	1	2	1,5	2	3	4	3,5	5

7. Energy inputs

Definitions

— 'uncertainty of measurement (accuracy)' is the precision with which an instrument or a chain of instruments is capable to represent an actual value as established by a highly-calibrated measurement reference;

— 'permissible deviation (average over test period)' is the maximum difference, negatively or positively, allowed between a measured parameter, averaged over the test period, and a set value;

— 'permissible deviations of individual measured values from average values' is the maximum difference, negatively or positively, allowed between a measured parameter and the average value of that parameter over the test period;

(a) Electricity and fossil fuels

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Uncertainty of measurement (accuracy)
Electricity				
Power	W			± 2 %
Energy	kWh			± 2 %
Voltage, test-period > 48 h	V	230 / 400	± 4 %	± 0,5 %
Voltage, test-period < 48h	V	230 / 400	± 4 %	± 0,5 %
Voltage, test-period < 1 h	V	230 / 400	± 4 %	± 0,5 %
Electric current	A			± 0,5 %
Frequency	Hz	50	± 1 %	
Gas				
Types	—	Test gases EN 437		
Net calorific value (NCV) and Gross calorific value (GCV)	MJ/m^3	Test gases EN 437		± 1 %
Temperature	K	288,15		± 0,5
Pressure	mbar	1 013,25		± 1 %
Density	dm^3/kg			± 0,5 %
Flow rate	m^3/s or l/min			± 1 %

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Uncertainty of measurement (accuracy)
Oil				
Heating gas oil				
Composition, Carbon/ Hydrogen/ Sulfur	kg/kg	86/13,6/0,2 %		
N-fraction	mg/kg	140	± 70	
Net calorific value (NCV, Hi)	MJ/kg	42,689 (**)		
Gross calorific value (*GCV*, Hs)	MJ/kg	45,55		
Density ρ15 at 15 °C	kg/dm³	0,85		
Kerosene				
Composition, Carbon/ Hydrogen/ Sulfur	kg/kg	85/14,1/0,4 %		
Net calorific value (NCV, Hi)	MJ/kg	43,3 (**)		
Gross calorific value (*GCV*, Hs)	MJ/kg	46,2		
density ρ15 at 15 °C	kg/dm³	0,79		

Notes:
(**) Default value, if value is not determined calorimetrically. Alternatively, if volumetric mass and sulphur content are known (e.g. by basic analysis) the net heating value (Hi) may be determined with:
$Hi = 52{,}92 - (11{,}93 \times \rho 15) - (0{,}3 - S)$ in MJ/kg

(b) Solar energy for solar collector tests

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Uncertainty of measurement (accuracy)
Test solar irradiance (global G, short wave)	W/m²	> 700 W/m²	± 50 W/m² (test)	± 10 W/m² (indoors)
Diffuse solar irradiance (fraction of total G)	%	< 30 %		
Thermal irradiance variation (indoors)	W/m²			± 10 W/m²
Fluid temperature at collector inlet/outlet	°C/ K	range 0-99 °C	± 0,1 K	± 0,1 K
Fluid temperature difference inlet/outlet				± 0,05 K
Incidence angle (to normal)	°	< 20°	± 2 % (<20°)	
Air speed parallel to collector	m/s	3 ± 1 m/s		0,5 m/s
Fluid flow rate (also for simulator)	kg/s	0,02 kg/s per m² collector aperture area	± 10 % between tests	
Pipe heat loss of loop in test	W/K	<0,2 W/K		

(c) Ambient heat energy

Measured parameter	Unit	Permissible deviation (average over test period)	Permissible deviations (individual tests)	Uncertainty of measurement (accuracy)
Brine or water heat source				
Water/brine inlet temperature	°C	± 0,2	± 0,5	± 0,1
Volume flow	m^3/s or l/min	± 2 %	± 5 %	± 2 %
Static pressure difference	Pa	—	± 10 %	± 5 Pa/ 5 %
Air heat source				
Outdoor air temperature (dry bulb) T_j	°C	± 0,3	± 1	± 0,2
Vent exhaust air temperature	°C	± 0,3	± 1	± 0,2
Indoor air temperature	°C	± 0,3	± 1	± 0,2
Volume flow	dm^3/s	± 5 %	± 10 %	± 5 %
Static pressure difference	Pa	—	± 10 %	± 5 Pa/ 5 %

(d) Test conditions and tolerances on outputs

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Permissible deviations (individual tests)	Uncertainty of measurement (accuracy)
Ambient					
Ambient temperature indoors	°C or K	20 °C	± 1 K	± 2 K	± 1 K
Air speed heat pump (at water heater off)	m/s	< 1,5 m/s			
Air speed other	m/s	< 0,5 m/s			
Sanitary water					
Cold water temperature solar	°C or K	10 °C	± 1 K	± 2 K	± 0,2 K
Cold water temperature other	°C or K	10 °C	± 1 K	± 2 K	± 0,2 K

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Permissible deviations (individual tests)	Uncertainty of measurement (accuracy)
Cold water pressure gas-fired water heaters	bar	2 bar		± 0,1 bar	
Cold water pressure other (except electric instantaneous water heaters)	bar	3 bar			± 5 %
Hot water temperature gas-fired water heaters	°C or K				± 0,5 K
Hot water temperature electric instantaneous	°C or K				± 1 K
Water temperature (in-/outlet) other	°C or K				± 0,5 K
Volume flow rate heat pump water heaters	dm^3/s		± 5 %	± 10 %	± 2 %
Volume flow rate Electric Instantaneous Water Heaters	dm^3/s				≥10 l/min: ± 1 % < 10 l/min: ± 0,1 l/min
Volume flow rate other water heaters	dm^3/s				± 1 %

Commission communication in the framework of the implementation of Commission Regulation (EU) No 814/2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks and of Commission Delegated Regulation (EU) No 812/2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device

(2014/C 207/03)

1. Publication of titles and references of transitional methods of measurement and calculation [1] for the implementation of Regulation (EU) No 814/2013, and in particular Annexes III, IV and V thereof, and for the implementation of Delegated Regulation (EU) No 812/2013, and in particular Annexes VII, VIII and IX thereof.

2. Parameters *in italics* are determined in Regulation (EU) No 814/2013 and in Delegated Regulation (EU) No 812/2013.

3. References

Measured/calculated parameter	Organisation	Reference	Title
Test procedure for A_{sol}, *IAM* and additional elements of collector efficiency testing of parameters η_0, a_1, a_2, *IAM*	CEN	EN 12975-2:2006	Thermal solar systems and components — Solar collectors — Part 2: Test methods
Sound power level of heat pump water heaters	CEN	EN 12102:2013	Air conditioners, liquid chilling packages, heat pumps and dehumidifiers with electrically driven compressors for space heating and cooling — Measurement of airborne noise — Determination of the sound power. The standard EN12102:2013 is applicable with the following modifications: Clause 3.3 of EN12102:2013. Replace the 2nd paragraph by: The 'standard operating conditions' shall be defined as the conditions for the operating points of the unit in accordance with Regulation (EU) No 814/2013, Annex III, Table 4. The definitions given in EN16147 also apply. Clause 5: Replace the 2nd paragraph 'The unit …' by: The unit shall be installed and connected (e.g. shape and dimension of air ducts, water pipes connection, etc.) for the test as recommended by the manufacturer in its installation and operation manual and tested in the rated conditions indicated in Regulation (EU) No 814/2013, Annex III, Table 4. The accessories provided by option (e. g. heating element) shall not be included in the test.

[1] It is intended that these transitional methods will ultimately be replaced by harmonised standard(s). When available, reference(s) to the harmonised standard(s) will be published in the *Official Journal of the European Union* in accordance with Articles 9 and 10 of Directive 2009/125/EC.

Measured/calculated parameter	Organisation	Reference	Title
			The unit is kept at ambient conditions of operation for at least 12 h; The temp. at the top of the tank of the water heater is monitored; The electric consumption of the compressor, the fan (if present), the circulation pump (if present), are monitored (to know the period of defrosting). The product is filled with cold water at 10 °C ± 5 °C. Clause 5: Replace the 4th paragraph 'The noise measurement …' by: The measurement points shall be performed in steady state conditions at the following water temperatures at the top of the tank: 1st point at 25 ± 3 °C, 2nd point at (Tset+25)/2 ± 3 °C, 3rd point at Tset +0/- 6 °C (Tset is water temperature in 'out of the box-mode'). During the measurement of noise: the water temp. at the top of the tank should be included in the tolerance range (e.g. included between 25 °C ± 3 °C for the first measurement); the periods of defrosting are excluded (zero electric consumption of the compressor, the fan or the circulation's pump).
Sound power level of gas-fired instantaneous and storage water heaters	CEN	EN 15036-1:2006	Heating boilers. Test regulations for airborne noise emissions from heat generators. Airborne noise emissions from heat generators
		ISO EN 3741:2010	Acoustics — Determination of Sound Power Levels of Noise Sources Using Sound Pressure — Precision Methods for Reverberation Room
		ISO EN 3745:2012	Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Precision methods for anechoic rooms and hemi-anechoic rooms
Sound power level of electric instantaneous and storage water heaters	Cenelec	Considering that no procedure is available for the time being it is assumed that water heaters without moving parts have a noise of 15 dB	

Measured/calculated parameter	Organisation	Reference	Title
Test gases	CEN	EN 437:2003/A1:2009	Test gases — Test pressures — Appliance categories
Standby power consumption solsb	CLC	EN 62301:2005	Household Electrical Appliances: Measurement of standby power
Test-rig for Q_{elec} of electric storage water heaters	CLC	prEN 50440:2014	Efficiency of domestic electrical storage water heaters and testing methods
Test-rig for Q_{elec} of electric instantaneous water heaters	CLC	EN 50193-1:2013	Closed electrical instantaneous water heaters, Methods for measuring performance.
Test-rig for Q_{fuel} and Q_{elec} of gas-fired instantaneous water heaters	CEN	EN 26:1997/A3:2006, Clause 7.1, except clause 7.1.5.4.	Gas-fired instantaneous water heaters for sanitary uses production, fitted with atmospheric burners
Test-rig for Q_{fuel} and Q_{elec} of gas-fired storage water heaters	CEN	EN 89:1999/A4:2006, Clause 7.1, except clause 7.1.5.4.	Gas-fired storage water heaters for the production of domestic hot water
Test-preparation for Q_{fuel} of gas-fired instantaneous water heaters and gas-fired storage water heaters	CEN	EN 13203-2: 2006, Annex B 'Test rig and measurement devices'	Gas-fired domestic appliances producing hot water — Appliances not exceeding 70 kW heat input and 300 litres water storage capacity — Part 2: Assessment of energy consumption
Test-preparation for Q_{fuel} of heat pump water heaters using fuel	CEN	EN 13203-2: 2006, Annex B 'Test rig and measurement devices'	Gas-fired domestic appliances producing hot water — Appliances not exceeding 70 kW heat input and 300 litres water storage capacity — Part 2: Assessment of energy consumption
Test-rig for heat pump water heaters	CEN	EN 16147:2011	Heat pumps with electrically driven compressors — Testing and requirements for marking for domestic hot water units
Standing loss *S* of storage tanks	CEN	EN 12897: 2006, clause 6.2.7, Annex B and Annex A (for the correct positioning of the heater)	Water Supply – Specification for indirectly heated unvented (closed) storage water heaters.

Measured/calculated parameter	Organisation	Reference	Title
Standing loss *S* and psbsol of storage tanks	CEN	EN 12977-3:2012	Thermal solar systems and components — Custom built systems — Part 3: Performance test methods for solar water heater stores
Standing loss *S* of storage tanks	CEN	EN 15332:2007, Clauses 5.1 and 5.4 (Measurement of standby-loss).	Heating boilers – Energy assessment of hot water storage tanks
Standing loss *S* of storage tanks	CLC	EN 60379: 2004, clauses 9, 10, 11, 12 and 14	Methods for measuring the performance of electric storage water-heaters for household purposes
Emission of nitrogen oxides NO_x for gas-fired storage water heaters	CEN	prEN 89:2012, clause 6.18 Nitrogen oxides	Gas-fired storage water heaters for the production of domestic hot water
Emission of nitrogen oxides NO_x for gas-fired instantaneous water heaters	CEN	prEN 26, clause 6.9.3 Nitrogen oxides emissions	Gas-fired instantaneous water heaters for the production of domestic hot water
Water heating energy efficiency η_{wh} of water heaters and standing loss *S* of storage tanks	European Commission	Point 4 of this Communication	Additional elements for measurements and calculations related to the energy efficiency of water heaters and storage tanks

4. Additional elements for measurements and calculations related to the energy efficiency of water heaters and storage tanks

For the purpose of Delegated Regulation (EU) No 812/2013 and Regulation (EU) No 814/2013 each water heater shall be tested in the 'out of the box-mode'.

The 'out of the box-mode' is the standard operating condition, setting or mode set by the manufacturer at factory level, to be active immediately after the appliance installation, suitable for normal use by the end-user according to the water tapping pattern for which the product has been designed and placed on the market. Any change to a different operating condition, setting or mode, if applicable, shall be the result of an intentional intervention by the end-user, and cannot be automatically modified by the water heater at any time, except for smart control function adapting the water heating process to individual usage conditions with the aim of reducing energy consumption.

In case of combination water heaters, no weighting factors taking into account differences between summer and winter mode shall be considered for the measurement/calculation of Q_{elec} and Q_{fuel}.

In case of conventional water heaters using fuels, in the calculation formula for the Annual Electricity Consumption (AEC) only (see Delegated Regulation (EU) No 812/2013, Annex VIII, point 4.a), the ambient correction Q_{cor} is set equal to zero.

4.1. Definitions

— 'uncertainty of measurement (accuracy)' is the precision with which an instrument or a chain of instruments is capable to represent an actual value as established by a highly-calibrated measurement reference;

— 'permissible deviation (average over test period)' is the maximum difference, negatively or positively, allowed between a measured parameter, averaged over the test period, and a set value;

— 'permissible deviations of individual measured values from average values' is the maximum difference, negatively or positively, allowed between a measured parameter and the average value of that parameter over the test period;

4.2. Energy inputs

(a) Electricity and fossil fuels

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Uncertainty of measurement (accuracy)
Electricity				
Power	W			± 2 %
Energy	kWh			± 2 %
Voltage, test-period > 48 h	V	230/400	± 4 %	± 0,5 %
Voltage, test-period < 48 h	V	230/400	± 4 %	± 0,5 %
Voltage, test-period < 1 h	V	230/400	± 4 %	± 0,5 %
Electric current	A			± 0,5 %
Frequency	Hz	50	± 1 %	
Gas				
Types	—	Test gases EN 437		
Net calorific value (NCV) and Gross calorific value (GCV)	MJ/m^3	Test gases EN 437		± 1 %
Temperature	K	288,15		± 0,5
Pressure	mbar	1 013,25		± 1 %
Density	dm^3/kg			± 0,5 %
Flow rate	m^3/s or l/min			± 1 %
Oil				
Heating gas oil				
Composition, Carbon/Hydrogen/Sulphur	kg/kg	86/13,6/0,2 %		
N-fraction	mg/kg	140	± 70	

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Uncertainty of measurement (accuracy)
Net calorific value (NCV, Hi)	MJ/kg	42,689 (**)		
Gross calorific value (*GCV*, Hs)	MJ/kg	45,55		
Density ρ15 at 15 °C	kg/dm³	0,85		
Kerosene				
composition, Carbon/Hydrogen/ Sulfur	kg/kg	85/14,1/0,4 %		
Net calorific value (NCV, Hi)	MJ/kg	43,3 (**)		
Gross calorific value (*GCV*, Hs)	MJ/kg	46,2		
density ρ15 at 15 °C	kg/dm³	0,79		

Notes:
(**) Default value, if value is not determined calorimetrically. Alternatively, if volumetric mass and sulphur content are known (e.g. by basic analysis) the net heating value (Hi) may be determined with:
$Hi = 52{,}92 - (11{,}93 \times \rho 15) - (0{,}3 - S)$ in MJ/kg

(b) Solar energy for solar collector tests

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Uncertainty of measurement (accuracy)
Test solar irradiance (global G, short wave)	W/m²	> 700 W/m²	± 50 W/m² (test)	± 10 W/m² (indoors)
Diffuse solar irradiance (fraction of total G)	%	< 30 %		
Thermal irradiance variation (indoors)	W/m²			± 10 W/m²
Fluid temperature at collector inlet/outlet	°C/K	range 0– 99 °C	± 0,1 K	± 0,1 K
Fluid temperature difference inlet/ outlet				± 0,05 K
Incidence angle (to normal)	°	< 20°	± 2 % (< 20°)	
Air speed parallel to collector	m/s	3 ± 1 m/s		0,5 m/s
Fluid flow rate (also for simulator)	kg/s	0,02 kg/s per m² collector aperture area	± 10 % between tests	
Pipe heat loss of loop in test	W/K	< 0,2 W/K		

(c) Ambient heat energy

Measured parameter	Unit	Permissible deviation (average over test period)	Permissible deviations (individual tests)	Uncertainty of measurement (accuracy)
Brine or water heat source				
Water/brine inlet temperature	°C	± 0,2	± 0,5	± 0,1
Volume flow	m^3/s or l/min	± 2 %	± 5 %	± 2 %
Static pressure difference	Pa	—	± 10 %	± 5 Pa/5 %
Air heat source				
Outdoor air temperature (dry bulb) T_j	°C	± 0,3	± 1	± 0,2
Vent exhaust air temperature	°C	± 0,3	± 1	± 0,2
Indoor air temperature	°C	± 0,3	± 1	± 0,2
Volume flow	dm^3/s	± 5 %	± 10 %	± 5 %
Static pressure difference	Pa	—	± 10 %	± 5 Pa/5 %

(d) Test conditions and tolerances on outputs

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Permissible deviations (individual tests)	Uncertainty of measurement (accuracy)
Ambient					
Ambient temperature indoors	°C or K	20 °C	± 1 K	± 2 K	± 1 K
Air speed heat pump (at water heater off)	m/s	< 1,5 m/s			
Air speed other	m/s	< 0,5 m/s			
Sanitary water					
Cold water temperature solar	°C or K	10 °C	± 1 K	± 2 K	± 0,2 K
Cold water temperature other	°C or K	10 °C	± 1 K	± 2 K	± 0,2 K
Cold water pressure gas-fired water heaters	bar	2 bar		± 0,1 bar	

Measured parameter	Unit	Value	Permissible deviation (average over test period)	Permissible deviations (individual tests)	Uncertainty of measurement (accuracy)
Cold water pressure other (except electric instantaneous water heaters)	bar	3 bar			± 5 %
Hot water temperature gas-fired water heaters	°C or K				± 0,5 K
Hot water temperature electric instantaneous	°C or K				± 1 K
Water temperature (in-/outlet) other	°C or K				± 0,5 K
Volume flow rate heat pump water heaters	dm^3/s		± 5 %	± 10 %	± 2 %
Volume flow rate Electric Instantaneous Water Heaters	dm^3/s				≥10 l/min: ± 1 % < 10 l/min: ± 0,1 l/min
Volume flow rate other water heaters	dm^3/s				± 1 %

4.3. Test procedure for storage water heaters

The test procedure for storage water heaters to establish the daily electricity consumption Q_{elec} and the daily fuel consumption Q_{fuel} fuel during a 24-hour measurement cycle is the following:

(a) Installation

The product is installed in test environment according to manufacturer's instructions. Designated floor-standing appliances may be placed on the floor, on a stand supplied with the product, or on a platform for easy access. Wall-mounted products are mounted on a panel at least 150 mm from any structural wall with a free space of at least 250 mm above and below the product and at least 700 mm to the sides. Products designated to be built-in are mounted according to manufacturer's instructions. The product is shielded from direct solar radiation, except solar collectors.

(b) Stabilisation

The product is kept at ambient conditions until all parts of the product have reached ambient conditions ± 2 K, at least 24 hours for storage type products.

(c) Filling and heat-up

The product is filled with cold water. Filling stops at the applicable cold water pressure.

The product is energized in 'out of the box-mode' to reach its operating temperature, controlled by the product's own means of control (thermostat).The next stage starts at thermostat cut out.

(d) Stabilisation at zero-load

The product is kept at this condition, without draw-offs during at least 12 hours.

Subject to a control cycle this stage ends — and next stage starts — at the first thermostat cut-out after 12 hours.

During this stage the total fuel consumption in kWh in terms of *GCV*, the total electricity consumption in kWh in terms of final energy and the exact time elapsed in h are recorded.

(e) Water draw-offs

For the declared *load profile*, draw-offs are made in accordance with the specifications of the appropriate 24 h tapping pattern. This stage starts directly after thermostat cut out from stabilisation part with the first tapping at the time-value according to the appropriate tapping load profile (see Regulation (EU) No 814/2013, Annex III point 2 and Delegated Regulation (EU) No 812/2013, Annex VII point (2). From end of last water draw-off until 24:00, no water is tapped.

During the water draw-offs relevant technical parameters (power, temperature, etc.) are established. For dynamic parameters the overall sample rate is 60 s or less. During draw-offs the recommended sample rate is 5 s or less.

The fossil fuel and electricity consumption over the 24-hour measurement cycle, $Q_{testfuel}$ and $Q_{testelec}$, are corrected as specified in point (h).

(f) Re-stabilisation at zero-load

The product is kept at nominal operating conditions without draw-offs during at least 12 hours.

Subject to a control cycle this stage ends at the first thermostat cut-out after 12 hours.

During this stage the total fuel consumption in kWh in terms of *GCV*, the total electricity consumption in kWh final energy and the exact time elapsed in hours are recorded.

(g) Mixed water at 40 °C (V40)

Mixed water at 40 °C (V40) is the quantity of water at 40 °C, which has the same heat content (enthalpy) as the hot water which is delivered above 40 °C at the output of the water heater, expressed in litres.

Immediately following measurement according to point (f) a quantity of water is withdrawn through the outlet by supplying cold water. The flow of water from open outlet water heaters is controlled by the inlet valve. The flow in any other type of water heaters is controlled by means of a valve fitted in the outlet or the inlet. The measurement is ended when the outlet temperature drops below 40 °C.

The rate of flow is adjusted to the maximum value according to the declared load profile

The normalised value of the average temperature is calculated according to the following equation:

$$\vartheta_p[°C] = (T_{set} - 10) \times \frac{(\vartheta'_p - \vartheta_c)}{(T_{set} - \vartheta_c)} + 10$$

Where:

— T_{set} in °C is the water temperature, without withdrawal of water, measured with a thermocouple placed inside the upper section of the tank. For metal tanks the thermocouple may be placed on the outer surface of the tank as well. This value is the water temperature measured after the last cut-out of the thermostat during the step set out in point (f),

— ϑc in °C is the average temperature of inlet cold water during the test,

— ϑ'p in °C is the average temperature of outlet water and its normalized value is named ϑp in °C.

Temperature readings are preferable taken continuously. Alternatively, they may be taken at equal intervals evenly spread over the discharge, for example every 5 litres (maximum). If there is a sharp drop in temperature, additional readings may be necessary in order to correctly calculate the average value ϑ'p.

Outlet water temperature is always ≥ 40 °C which is to be taken into account for the calculation of ϑp.

Quantity of hot water V_{40} in litres delivered with a temperature of at least 40 °C will be calculated by the following equation:

$$V_{40}[litres] = V_{40exp} \times \frac{(\vartheta_p - 10)}{30}$$

Where:

— the volume V_{40_exp} in litres corresponds to the quantity of water delivered at least 40 °C.

(h) Reporting of Q_{fuel} and Q_{elec}

$Q_{testfuel}$ and $Q_{testelec}$ are corrected for any energy surplus or deficit outside the strict 24-hour measurement cycle, i.e. a possible energy difference before and after is taken into account. Furthermore, any surplus or deficit in the delivered useful energy content of the hot water is taken into account in the following equations for Q_{fuel} and Q_{elec}:

$$Q_{fuel} = \left(\frac{Q_{ref}}{Q_{H_2O}}\right) \times \left\{Q_{test\,fuel} + \frac{1{,}163 \times C_{act} \times (T_3(t_3) - T_5(t_5))}{1000}\right\}$$

$$Q_{elec} = \left(\frac{Q_{ref}}{Q_{H_2O}}\right) \times \left\{Q_{testelec} + \frac{1{,}163 \times C_{act} \times (T_3(t_3) - T_5(t_5))}{1000}\right\}$$

Where:

— Q_{H_2O} in kWh is the useful energy content of the hot water drawn-off,

— T_3 and T_5 are water temperatures measured at the dome of water heater, respectively at the beginning (t_3) and at the end (t_5) of the 24 h measurement cycle.

— C_{act} in litres is the actual capacity of water heater. C_{act} is measured as stated in paragraph 4.5.c

4.4. Test procedure for fuel instantaneous water heaters

The test procedure for fuel instantaneous water heaters to establish the daily fuel consumption Q_{fuel} and the daily electricity consumption Q_{elec} during a 24-hour measurement cycle is the following:

(a) Installation

The product is installed in test environment according to manufacturer's instructions. Designated floor-standing appliances may be placed on the floor, on a stand supplied with the product, or on a platform for easy access. Wall-mounted products are mounted on a panel at least 150 mm from any structural wall with a free space of at least 250 mm above and below the product and at least 700 mm to the sides. Products designated to be built-in are mounted according to manufacturer's instructions. The product is shielded from direct solar radiation, except solar collectors.

(b) Stabilisation

The product is kept at ambient conditions until all parts of the product have reached ambient conditions ± 2 K;.

(c) Water draw-offs

For the declared *load profile*, draw-offs are made in accordance with the specifications of the appropriate 24 h tapping pattern. This stage starts directly after thermostat cut out from stabilisation part with the first tapping at the time-value according to the appropriate tapping load profile (see Regulation (EU) No 814/2013, Annex III point 2 and Delegated Regulation (EU) No 812/2013, Annex VII point (2). From end of last water draw-off until 24:00, no water is tapped

During the water draw-offs relevant technical parameters (power, temperature, etc.) are established. For dynamic parameters the overall sample rate is 60 s or less. During draw-offs the recommended sample rate is 5 s or less.

(d) Reporting of Q_{fuel} and Q_{elec}

$Q_{testfuel}$ and $Q_{testelec}$ shall be corrected in the following equations for Q_{fuel} and Q_{elec} by taking into account any surplus or deficit in the delivered useful energy content of the hot water.

$$Q_{fuel} = \left(\frac{Q_{ref}}{Q_{H_2O}} \right) \times Q_{test\,fuel}$$

$$Q_{elec} = \left(\frac{Q_{ref}}{Q_{H_2O}} \right) \times Q_{testelec}$$

Where:

— Q_{H_2O} in kWh is the useful energy content of the hot water drawn-off.

4.5. Test procedure for heat pump water heaters using electricity

(a) Installation

The product is installed in test environment according to manufacturer's instructions. Designated floor-standing appliances may be placed on the floor, on a stand supplied with the product, or on a platform for easy access. Wall-mounted products are mounted on a panel at least 150 mm from any structural wall with a free space of at least 250 mm above and below the product and at least 700 mm to the sides. Products designated to be built-in are mounted according to manufacturer's instructions.

Products with declared load profiles 3XL or 4XL may be tested on-site, provided test conditions are equivalent, possibly with correction factors, to the ones referenced here.

The installation requirements described in clauses 5.2, 5.4 and 5.5 of EN 16147 are respected.

(b) Stabilisation

The product is kept at ambient conditions until all parts of the product have reached ambient conditions ± 2 K (at least 24 h for storage heat pump water heater).

The purpose is to verify that the product is working at normal temperature after transport.

(c) Filling and storage volume (actual capacity C_{act})

The volume of the tank is measured as follows.

The empty water heater is to be weighted; the weight of taps on inlet and/or outlet pipes shall be considered.

Then the storage water heater is filled with cold water in accordance with the manufacturer's instruction at cold water pressure. The water supply is then cut off.

The filled water heater is to be weighted.

The difference of the two weights (m_{act}) is to be converted into the volume in litres (C_{act}).

$$C_{act} = \frac{m_{act}}{0,9997}$$

This volume is to be reported in litres to the nearest one-tenth litres. The measured value (C_{act}) shall not be more than 2 % lower than the rated value.

(d) Filling and heat-up

Products with storage-facilities are filled with cold water (10 ± 2 °C). Filling stops are at the applicable cold water pressure.

The product is energized to reach 'out of the box-mode' e.g. for storage temperature. The product's own means of control (thermostat) are used. The step is performed following the procedure of clause 6.3 of EN 16147. The next step starts at thermostat cut out.

(e) Standby power input

The standby power input is determined by measuring the electrical power input over an integral number of on-off cycles of the heat pump, initiated by the thermostat situated in the tank, when no hot water is drawn off.

The step is performed following the procedure of clause 6.4 of EN 16147 and the value of P_{stby} *[kW]* is determined as equal to

$$P_{stby}[kW] = CC \times P_{es}[kW]$$

(f) Water draw-offs

For the declared *load profile*, draw-offs are made in accordance with the specifications of the appropriate 24 h tapping pattern. This stage starts directly after thermostat cut out from stabilisation part with the first tapping at the time-value according to the appropriate tapping load profile (see Regulation (EU) No 814/2013, Annex III point 2 and Delegated Regulation (EU) No 812/2013, Annex VII point (2). From end of last water draw-off until 24:00, no water is tapped. The required useful energy content of the hot water is the total Q_{ref} [in kWh].

The step is performed following the procedure of clauses 6.5.2 to 6.5.3.5 of EN 16147. The $\Delta T_{desired}$ in the EN 16147 is defined using the value of T_p:

$\Delta T_{desired} = T_p - 10$

At the end of the step Q_{elec} [kWh] is determined as equal to

$$Q_{elec} = \frac{Q_{ref}}{Q_{TC}} \times W_{EL-TC}$$

W_{EL-TC} value is defined in the EN16147.

Products to be classified as off-peak products are energized for a maximum period of 8 consecutive hours between 22:00 and 07:00 of the 24 h tapping pattern. At the end of the 24 h tapping pattern the products are energized till the end of the step.

(g) Mixed water at 40 °C (V40)

The step is performed following the procedure of clause 6.6 of EN 16147, but avoiding compressor switching off at the end of the last measurement period for the tapping cycles; the value of *V40 [L]* is determined as equal to Vmax.

4.6. Test procedure for electric instantaneous water heaters

Thermal losses from heat transfer processes during operation and standby losses are neglected.

(a) Set points

User adjustable selectors are set as follows:

— If the appliance has a power selector, the selector shall be adjusted to the highest value.

— If the appliance has a flow independent temperature selector, the selector shall be adjusted to the highest value.

All non-user adjustable setpoints and other selectors shall be in the 'out of the box-mode'.

The prescribed minimum flow rate f_i of each individual draw off i of the tapping profile has to be used as defined in load profiles of water heaters. If the minimum flow rate f_i is not achievable, the flow rate is increased until the appliance is switching on and is able to run continuously at or above T_m. This increased flow rate has to be used for the individual draw off instead of the prescribed minimum flow rate f_i.

(b) Static efficiency

The static loss of the appliance P_{loss} at nominal load P_{nom} under steady state conditions is determined. The value of P_{loss} is the sum of all internal power losses (product of current and voltage losses between the terminals and heating elements) of the appliance after a minimum of 30 minutes of operation at nominal conditions.

This test result is in wide ranges independent from the water inlet temperature. This test can be carried out with a cold water inlet temperature in the range of 10 to 25 °C.

For electronically controlled instantaneous water heaters with semiconductor power switches, the voltage across the semiconductor power terminals is subtracted from the measured voltage losses, if the semiconductor power switches are thermally connected to the water. In this case, the heat developed by the semiconductor power switches is transferred to useful energy to heat up the water.

The static efficiency is calculated as:

$$\eta_{static} = \frac{P_{nom} - P_{loss}}{P_{nom}}$$

Where:

— η_{static} is the static efficiency factor of the appliance,

— P_{nom} is the nominal power consumption of the product in kW,

— P_{loss} are the measured internal static losses of the product in kW.

(c) Start up losses

This test determines the time $t_{start\ i}$ which elapses between energizing the heating elements and the delivery of useable water for each draw off of the declared load profile. The test method assumes that the power consumption of the appliance during the start-up period is equal to the power consumed in static mode. $P_{static\ i}$ is the static power consumption in steady state conditions of the appliance for the specific draw off *i*.

Three measurements are done for each different draw off *i*. The result is the mean value from these three measurements.

The start up losses $Q_{start\ i}$ are calculated as:

$$Q_{start_i} = P_{static_i} \times \frac{t_{start_i}}{3600}$$

Where:

— $Q_{start\ i}$ are the start-up losses in *kWh* for a specific draw off *i*.

— $t_{start\ i}$ is the mean value of the measured start up times in sec for draw off *i*,

— $P_{static\ i}$ is the measured steady state power consumption in kW for specific draw off *i*,

(d) Calculation of energy demand

The daily energy demand Q_{elec} is the sum of losses and useful energy of all individual draw off *i* per day in kWh. The daily energy demand is calculated as:

$$Q_{elec} = \sum_{i=1}^{n} \left(Q_{start_i} + \frac{Q_{tap_i}}{\eta_{static}} \right)$$

Where:

— $Q_{start\ i}$ are the start-up losses for the specific draw off *i* in kWh,

— $Q_{tap\ i}$ is the predefined useful energy per draw off *i* in kWh,

— η_{static} is the static efficiency of the appliance.

4.7. Smart control test procedure for water heaters

Smart control factor SCF and of smart control compliance smart shall be determined according to Annex IV point 4 of Regulation (EU) No 814/2013 and Annex VIII point 5 of Delegated Regulation (EU) No 812/2013. The condition for testing the smart control compliance (*smart*) of water heaters are indicated in Annex III point 3 of Regulation (EU) No 814/2013 and Annex VII point 3 of Delegated Regulation (EU) No 812/2013.

The parameters for determining SCF shall be based on real measurements of the energy consumption with the smart control enabled and disabled.

'smart control disabled' means the state, when the smart is activated, where the smart control function of the water heater is in the learning period.

'smart control enabled' means the state, when the smart is activated, where the smart control function of the water heater is modulating the outlet temperature in order to save energy.

(a) Electric storage water heaters

For Electric storage water heaters use the test methodology described in prEN 50440:2014

(b) Heat pump water heaters

For HPs WH, SCF is defined using the test methodology proposed by TC59X/WG4, this procedure follows the requirements of prEN 50440:2014 (paragraph 9.2) and shall be applied in conjunction with EN 16147:2011.

In particular:

— the value of $Q_{testelec}^{reference}[i]$ will be determined following the procedure of the EN16147 paragraphs from. §6.5.2 to § 6.5.3.4 and the time length of test cycle (t_{TTC}) shall be equal to 24 h. The value of $Q_{testelec}^{reference}[i]$ is:

$$Q_{testelec}^{reference}[i] = W_{EL-HP-TC} + Q_{EL-TC}$$

where $W_{EL-HP-TC}$ and Q_{EL-TC} are defined in EN16147.

— the value of $Q_{H_2O}^{reference}[i]$ will be determined as equal to Q_{TC} [kWh] described in §6.5.2 of the EN 16147.

— the value of $Q_{testelec}^{smart}[i]$ will be determined following the procedure of the EN16147 paragraphs from. §6.5.2 to § 6.5.3.4 and the time length of test cycle (t_{TTC}) shall be equal to 24h The value of $Q_{testelec}^{smart}[i]$ is:

$$Q_{testelec}^{smart}[i] = W_{EL-HP-TC} + Q_{EL-TC}$$

where $W_{EL-HP-TC}$ and Q_{EL-TC} are defined in EN16147.

— the value of $Q_{H_2O}^{smart}[i]$ will be determined as equal to Q_{TC} [kWh] described in §6.5.2 of the EN 16147.

4.8. Solar water heaters and solar-only systems, testing and calculation methods

For the assessment of the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy and/or kWh in terms of *GCV* the following methods are applicable:

— The SOLCAL method ([1])

— The SOLICS method ([2])

The SOLCAL method requires that the efficiency parameters of the solar collector are assessed separately and that the overall system performance is determined on the basis of the non-solar heat contribution to the solar system and the specific efficiency of a stand-alone water heater.

(a) Solar collector testing

For solar collectors at least 4 × 4 tests apply, with 4 different collector inlet temperatures t_{in} evenly spaced over the operating range and 4 test samples per collector inlet temperature are measured to obtain test values for the water outlet temperature t_e, the ambient temperature t_a, the solar irradiance G and the measured collector efficiency at the test point η_{col}. If possible, one inlet temperature is selected with $t_m = t_a \pm 3$ K to obtain an accurate assessment of the zero-load efficiency $\eta_{0.}$ With fixed collector (no automatic tracking) and test conditions permitting, two test samples are done before solar noon and 2 after. Maximum temperature of the heat transfer fluid should be chosen so that it reflects the maximum of the collectors operating range and results in a temperature difference between the inlet and the outlet collector $\Delta T > 1{,}0$ K.

For the instantaneous collector efficiency η_{col} a continuous efficiency curve of the format as in the following equation is obtained by statistical curve fitting of the test point results, using the least square method:

$$\eta_{col} = \eta_0 - a_1 \times T^*_m - a_2 \times G\ (T^*_m)^2$$

Where:

— T^*_m is the reduced temperature difference in m^2KW^{-1}, with

$$T^*_m = (t_m - t_a)/G$$

Where:

— t_a is the ambient or surrounding air temperature;

— t_m is the mean temperature of the heat transfer fluid:

$$t_m = t_{in} + 0{,}5 \times \Delta T$$

Where:

— t_{in} is the collector inlet temperature;

— ΔT is temperature difference between fluid outlet and inlet ($=t_e - t_{in}$).

All tests are performed according to EN 12975-2, EN 12977-2 and EN 12977-3. Converting so-called quasi-dynamic model parameters to a steady-state reference case to arrive at the parameters above is permitted. The Incidence Angle Modifier *IAM* is determined in accordance with EN 12975-2, from a test at 50° incidence angle to the collector.

(b) SOLCAL method

The SOLCAL method requires

— The solar collector parameters A_{sol}, η_0, a_1, a_2 and *IAM*;

([1]) EN15316-4-3, B based method
([2]) ISO 9459-5 based method

— The nominal volume of the storage tank volume (Vnom) in litres, the volume of the non-solar heat storage (Vbu) in litres and the specific standing loss (psbsol) in W/K (K expresses the difference between store and ambient temperature);

— The auxiliary electricity consumption at stabilised operating conditions Q_{aux};

— The standby power consumption *solstandby*;

— The pump power consumption *solpump*, according to EN 16297-1:2012.

The calculation assumes default values for the specific insulation of the collector loop pipes (= 6 + 0,3 W/Km²) and the heat capacity of the heat exchanger (100×W/Km²). m² stands for the collector aperture area. Furthermore, it is assumed that the solar heat store periods are less than one month.

For the purpose of establishing the total energy efficiency performance of solar-only system and conventional water heater or of a solar water heater, the SOLCAL method determines the annual non-solar heat contribution Q_{nonsol} in kWh with

Q_{nonsol} = SUM ($Qnonsol_{tm}$) in kWh/a

Where:

— SUM ($Qnonsol_{tm}$) is the sum of the all monthly non-solar heat contribution of the conventional water heater or the conventional heat generator being part of a solar water heater; with

$Qnonsol_{tm} = Lwh_{tm} - LsolW_{tm} + psbSol \times Vbu/Vnom \times (60 - Ta) \times 0{,}732$

The monthly heat demand for the solar thermal system is defined as:

$Lwh_{tm} = 30{,}5 \times 0{,}6 \times (Q_{ref} + 1{,}09)$

Where:

— 0,6 represents a factor to calculate the average heat demand from the load profile;

— 1,09 represents the average distribution losses.

The following calculations are performed:

$LsolW1_{tm} = Lwh_{tm} \times (1{,}029 \times Y_{tm} - 0{,}065 \times X_{tm} - 0{,}245 \times Y_{tm}^2 + 0{,}0018 \times X_{tm}^2 + 0{,}0215 \times Y_{tm}^3)$

$LsolW_{tm} = LsolW1_{tm} - Qbuf_{tm}$

The minimum value of $LsolW_{tm}$ is 0 and the maximum value is $Lwh_{tm.}$

Where:

— $Qbuf_{tm}$ is the solar storage tank correction in kWh/month; with

$$Qbuf_{tm} = 0{,}732 \times Psbsol \times \left(\frac{Vnom - Vbu}{Vnom}\right) \times \left(10 + \frac{50 \times LsolW1_{tm}}{Lwh_{tm}} - Ta\right)$$

Where:

— 0,732 is a factor that takes into account the average monthly hours (24 × 30,5);

— Psbsol is the specific standing loss of the solar heat store in W/K as determined in accordance with point 4.8(a);

— Ta is the monthly average air temperature surrounding the heat store in °C; with

— T_a = 20 when the heat store is inside the building envelope;

— T_a = $Tout_{tm}$ when the heat store is outside the building envelope;

— $Tout_{tm}$ is the average daytime temperature in °C for average, colder and warmer climate conditions.

X_{tm} and Y_{tm} are aggregated coefficients:

$X_{tm} = A_{sol} \times (Ac + UL) \times etaloop \times (Trefw — Tout_{tm}) \times ccap \times 0{,}732/Lwh_{tm}$

The minimum value of X_{tm} is 0 and the maximum value is 18.

Where:

— $Ac = a_1 + a_2 \times 40$;

— $UL = (6 + 0{,}3 \times A_{sol})/A_{sol}$ is loop losses in W/(m²K);

— etaloop is loop efficiency with $etaloop = 1 - (\eta_0 \times a_1)/100$;

— $Trefw = 11{,}6 + 1{,}18 \times 40 + 3{,}86 \times Tcold - 1{,}32 \times Tout_{tm;}$

— Tcold is the cold water temperature, default 10 °C;

— $Tout_{tm}$ is the *average daytime temperature in °C for average, colder and warmer climate conditions*;

— ccap is storage coefficient with $ccap = (75 \times A_{sol}/Vsol)^{0{,}25}$;

— Vsol is the solar storage tank volume, as defined in EN 15316-4-3;

$Y_{tm} = A_{sol} \times IAM \times \eta_0 \times etaloop \times QsolM_{tm} \times 0{,}732/Lwh_{tm}$

The minimum value of Y_{tm} is 0 and the maximum value is 3.

Where:

— $QsolM_{tm}$ is the *average global solar irradiance in W/m² for average, colder and warmer climate conditions.*

The auxiliary electricity consumption Q_{aux} is calculated as follows:

$Q_{aux} = (solpump \times solhrs + solstandby \times 24 \times 365)/1000$

Where:

— solhrs is the number of active solar hours in h; with

— solhrs = 2 000 for solar water heaters.

(c) SOLICS Method

The SOLICS method is based on the test method described in ISO 9459-5:2007. The procedure to determine the solar output is referenced as follows:

— Terms and definitions according to ISO 9459-5:2007, chapter 3;

— Symbols, units and nomenclature according to ISO 9459-5:2007, chapter 4;

— The system is mounted according to ISO 9459-5:2007, paragraph 5.1;

— The test facility, instrumentation and sensor locations are according to ISO 9459-5:2007, chapter 5;

— The tests are performed according to ISO 9459-5:2007, chapter 6;

— Based on the test results the system parameters are identified according to ISO 9459-5:2007, chapter 7. The dynamic fitting algorithm and simulation model as described in ISO 9459-5:2007, Annex A, are used;

— The annual performance is calculated with the simulation model as described in ISO 9459-5:2007, Annex A, the identified parameters and the following settings:

— *Average daytime temperature in °C for average, colder and warmer climate conditions and average global solar irradiance in W/m² for average, colder and warmer climate conditions*;

— Hourly values for global solar irradiance according to an appropriate CEC test reference year;

— Mains water temperature: 10 °C;

— Ambient temperature of the store (buffer inside: 20 °C, buffer outside: ambient temperature);

— Auxiliary electricity consumption: by declaration;

— Auxiliary set temperature: by declaration and with a minimum value of 60 °C;

— Auxiliary heater time control: by declaration.

Annual heat demand: $0,6 \times 366 \times (Q_{ref} + 1,09)$

Where:

— 0,6 represents a factor to calculate the average heat demand from the load profile;

— 1,09 represents the average distribution losses.

The auxiliary electricity consumption Q_{aux} is calculated as follows:

$Q_{aux} = (solpump \times \text{solhrs} + solstandby \times 24 \times 365)/1000$

Where

— solhrs is the number of active solar hours in h; with

— solhrs = 2 000 for solar water heaters.

For the purpose of establishing the total energy efficiency performance of solar-only system and conventional water heater or of a solar water heater, the SOLICS method determines the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy and/or kWh in terms of *GCV* as follows:

— For solar-only systems:

$Q_{nonsol} = 0,6 \times 366 \times (Q_{ref} + 1,09) - QL$

Where:

— QL is the heat delivered by the solar heating system in kWh/a.

— For solar water heater:

$Q_{nonsol} = Q_{aux,net}$

Where:

— $Q_{aux,net}$ is the net non-solar energy demand in kWh/a.

4.9. Storage tank test procedures

(a) Standing loss

The standing loss *S* of storage tanks can be assessed using any of the methods referenced in point 3, including the standing loss of the solar storage tank psbsol. Where the measurement results from the applicable standards are expressed in kWh/24 hours, the result will be multiplied by (1 000/24) to arrive at values for *S* in W. For the specific standing loss – per degree of temperature difference between store and ambient — of solar storage tanks psbsol, the heat loss can be determined in W/K directly by using EN 12977-3 or it can be found indirectly by dividing the heat loss in W by 45 (Tstore = 65 °C, Tambient = 20 °C) to arrive at a value in W/K. Where the results of EN 12977-3, expressed in W/K, are used for the assessment of *S* they are multiplied by 45.

(b) Storage volume

The volume of the tank in a storage electric water heater is measured as stated in paragraph 4.5.c.

4.10. Solar pump power test procedure

The solar pump power is rated as the electrical consumption under nominal operating conditions. Start-up effects under 5 minutes are disregarded. Solar pumps that are continuously controlled, or controlled in at least three steps, are rated as 50 % of the rated electrical power of the solar pump.

COURT OF AUDITORS

Special Report No 5/2014 'European banking supervision taking shape — EBA and its changing context'

(2014/C 207/04)

The European Court of Auditors hereby informs you that Special Report No 5/2014 'European banking supervision taking shape — EBA and its changing context' has just been published.

The report can be accessed for consultation or downloading on the European Court of Auditors' website: http://eca.europa.eu

A hard copy version of the report may be obtained free of charge on request to the Court of Auditors:

European Court of Auditors
Publications (PUB)
12, rue Alcide De Gasperi
1615 Luxembourg
LUXEMBOURG

Tel. +352 4398-1
e-mail: eca-info@eca.europa.eu

or by filling in an electronic order form on EU-Bookshop.

NOTICES CONCERNING THE EUROPEAN ECONOMIC AREA

EFTA SURVEILLANCE AUTHORITY

State aid — Decision to raise no objections

(2014/C 207/05)

The EFTA Surveillance Authority raises no objections to the following State aid measure:

Date of adoption of the decision:	12 March 2014
Case number:	74081
Decision number:	111/14/COL
EFTA State:	Iceland
Region:	Norðurþing Municipality in north-east Iceland
Title:	Construction of PCC Silicon Metal Plant at Bakki
Legal basis:	Act No 52/2013 which authorises the Minister of Industry and Innovation in Iceland, on behalf of the Treasury, to enter into an Investment Agreement with the company PCC on measures for the construction of a silicon metal plant
Objective:	Regional development
Form of aid:	Direct cash grant for site preparation Fixed land lease for 10 years Exemptions and discounts from taxes and charges
Budget:	EUR 23,3 million in nominal terms
Duration:	1 January 2014-27 September 2027
Economic sector:	Silicon Metal
Name and address of the granting authority:	Ministry of Industry and Innovation Skúlagötu 4 101 Reykjavík ICELAND and Norðurþing Municipality Ketilsbraut 7-9 640 Húsavík ICELAND

The authentic text of the decision, from which all confidential information has been removed, can be found on the EFTA Surveillance Authority's website:

http://www.eftasurv.int/state-aid/state-aid-register/

State aid — Decision to raise no objections

(2014/C 207/06)

The EFTA Surveillance Authority raises no objections to the following state aid measure:

Date of adoption of the decision:	12 March 2014
Case number:	75005
Decision number:	114/14/COL
EFTA State:	Norway
Name of the beneficiary:	BE Varme AS
Type of measure:	Individual aid under the Energy Fund Scheme, subject to a detailed assessment under Article 61(3)(c) of the EEA agreement
Scheme:	The Energy Fund Scheme approved by the EFTA Surveillance Authority by Decision No 248/11/COL
Objective:	Environmental protection
Form of aid:	Grant
Aid amount:	NOK 88,53 million
Economic sectors:	District heating
Name and address of the granting authority:	Enova SF Professor Brochsgt. 2 N-7030 Trondheim NORWAY

The authentic text of the decision, from which all confidential information has been removed, can be found on the EFTA Surveillance Authority's website:

http://www.eftasurv.int/state-aid/state-aid-register/

State aid — Decision to raise no objections

(2014/C 207/07)

The EFTA Surveillance Authority raises no objections to the following state aid measure:

Date of adoption of the decision:	12 March 2014
Case number:	74036
Decision number:	112/14/COL
EFTA State:	Norway
Title (and/or name of the beneficiary):	Production grant scheme for news and current affairs media
Legal basis:	Article 61(3)(c) of the EEA Agreement
Type of measure:	Aid to news and current affairs media
Objective:	Promotion of media plurality and diversity
Form of aid:	Grant
Budget:	Approx. NOK 290 million p.a.
Duration:	Until 2020
Economic sectors:	News and current affairs media
Name and address of the granting authority:	Norwegian Media Authority Nygata 4 N-1607 Fredrikstad NORWAY

The authentic text of the decision, from which all confidential information has been removed, can be found on the EFTA Surveillance Authority's website:

http://www.eftasurv.int/state-aid/state-aid-register/

V

(Announcements)

ADMINISTRATIVE PROCEDURES

EUROPEAN PERSONNEL SELECTION OFFICE (EPSO)

NOTICE OF OPEN COMPETITIONS

(2014/C 207/08)

The European Personnel Selection Office (EPSO) is organising the following open competitions:

EPSO/AD/284/14 — GERMAN-LANGUAGE (DE) TRANSLATORS

EPSO/AD/285/14 — GREEK-LANGUAGE (EL) TRANSLATORS

EPSO/AD/286/14 — SPANISH-LANGUAGE (ES) TRANSLATORS

EPSO/AD/287/14 — SWEDISH-LANGUAGE (SV) TRANSLATORS

The competition notice is published in 24 languages in Official Journal **C 207 A of 3 July 2014**.

Further information can be found on the EPSO website: http://blogs.ec.europa.eu/eu-careers.info/

PROCEDURES RELATING TO THE IMPLEMENTATION OF COMPETITION POLICY

EUROPEAN COMMISSION

Prior notification of a concentration

(Case M.7230 — Bekaert/Pirelli Steel Tyre Cord Business)

(Text with EEA relevance)

(2014/C 207/09)

1. On 24 June 2014, the Commission received a notification of a proposed concentration pursuant to Article 4 and following a referral pursuant to Article 4(5) of Council Regulation (EC) No 139/2004 [1] by which the undertaking NV Bekaert SA ('Bekaert', Belgium) acquires within the meaning of Article 3(1)(b) of the Merger Regulation sole control of the steel tyre cord business of Pirelli Tyre SpA ('Pirelli's steel tyre cord business', Italy) by way of purchase of shares.

2. The business activities of the undertakings concerned are:

— for Bekaert: production and marketing of a wide range of products in the areas of drawn steel wire products, advanced metal transformation, advanced materials and coatings,

— for Pirelli's steel tyre cord business: supply of steel tyre cord.

3. On preliminary examination, the Commission finds that the notified transaction could fall within the scope of the Merger Regulation. However, the final decision on this point is reserved.

4. The Commission invites interested third parties to submit their possible observations on the proposed operation to the Commission.

Observations must reach the Commission not later than 10 days following the date of this publication. Observations can be sent to the Commission by fax (+32 22964301), by e-mail to COMP-MERGER-REGISTRY@ec.europa.eu or by post, under reference number M.7230 — Bekaert/Pirelli Steel Tyre Cord Business, to the following address:

European Commission
Directorate-General for Competition
Merger Registry
1049 Bruxelles/Brussel
BELGIQUE/BELGIË

[1] OJ L 24, 29.1.2004, p. 1 (the 'Merger Regulation').

Prior notification of a concentration

(Case M.7132 — INEOS/Doeflex)

(Text with EEA relevance)

(2014/C 207/10)

1. On 24 June 2014, the Commission received a notification of a proposed concentration pursuant to Article 4 and following a referral pursuant to Article 4(5) of Council Regulation (EC) No 139/2004 [1] by which the undertaking INEOS AG ('INEOS', Switzerland) acquires within the meaning of Article 3(1)(b) of the Merger Regulation control of businesses and assets of Doeflex Compounding Limited ('Doeflex', the United Kingdom) by way of purchase of shares in a newly created holding company ('Newco').

2. The business activities of the undertakings concerned are:

— for INEOS: manufacturing of petrochemicals, speciality chemicals and oil products, production and sale of S-PVC, E-PVC, plasticisers and S-PVC compounds, globally,

— for Doeflex: production of dry blend and gelled S-PVC compounds, with a single manufacturing facility located in the United Kingdom.

3. On preliminary examination, the Commission finds that the notified transaction could fall within the scope of the Merger Regulation. However, the final decision on this point is reserved.

4. The Commission invites interested third parties to submit their possible observations on the proposed operation to the Commission.

Observations must reach the Commission not later than 10 days following the date of this publication. Observations can be sent to the Commission by fax (+32 22964301), by e-mail to COMP-MERGER-REGISTRY@ec.europa.eu or by post, under reference number Case M.7132 — INEOS/Doeflex to the following address:

European Commission
Directorate-General for Competition
Merger Registry
1049 Bruxelles/Brussel
BELGIQUE/BELGIË

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[1] OJ L 24, 29.1.2004, p. 1 (the 'Merger Regulation').

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