WORKING DOCUMENT ON

Possible requirements for non-household washing machines, non-household textile dryers and non-household dishwashers

DRAFT ECODESIGN REGULATION

COMMISSION WORKING DOCUMENT

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for non-household washing machines, non-household textile dryers and non-household dishwashers

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,

Whereas:

(1) Under Directive 2009/125/EC ecodesign requirements should be set by the Commission for energy-related products representing significant volumes of sales and trade, having a significant environmental impact and presenting significant potential for improvement through design in terms of their environmental impact without entailing excessive costs.

(2) Article 16(2)(a) of Directive 2009/125/EC provides, that in accordance with the procedure referred to in Article 19(3) and the criteria set out in Article 15(2), and after consulting the Ecodesign Consultation Forum, the Commission should, as appropriate, introduce implementing measures for products offering a high potential for cost-effective reduction of greenhouse gas emissions, such as for air heating products and cooling products.

(3) The Commission has carried out two preparatory studies covering the technical, environmental and economic aspects of non-household laundry equipment and non-household dishwashers typically used in the Union. The studies were devised together with stakeholders and interested parties from the Union and third countries, and the results have been made publicly available.

(4) The environmental aspects of non-household laundry equipment and non-household dishwashers that have been identified as significant for the purposes of this Regulation are energy and water consumption in the use phase.

(5) The preparatory studies show that requirements regarding the other ecodesign parameters referred to in Annex I, Part 1 to Directive 2009/125/EC are not necessary in the case of non-household laundry equipment and non-household dishwashers.

(6) The scope of this Regulation should include non-household washing machines, non-household textile dryers and non-household dishwashers designed to use gaseous fuels, liquid fuels or electricity.

(7) The annual energy consumption related to non-household laundry equipment and non-household dishwashers was estimated to have been 324 PJ (7.7 Mtoe) in the European Union in 2010 corresponding to 15.4 Mt CO_2 emissions. Unless specific measures are taken, the annual energy consumption related to non-household laundry equipment

[1] OJ L 285, 31.10.2009, p. 10.

and non-household dishwashers is expected to be 351 PJ (8.4 Mtoe) in 2020 and 377 PJ (9 Mtoe) for 2030.

(8) The annual water consumption related to non-household laundry equipment and non-household dishwashers was estimated to have been 416 million m^3 (in the European Union in 2010. Unless specific measures are taken, the annual water consumption related to non-household laundry equipment and non-household dishwashers is expected to be 449 million m^3 in 2020 and 480 million m^3 for 2030.

(9) The energy and water consumption of non-household laundry equipment and non-household dishwashers can be reduced by applying existing, non-proprietary technologies without the increase of the combined costs of purchasing and operating these products.

(10) The effect of the ecodesign requirements set out in this Regulation is expected to result by 2020 in estimated annual energy savings of about 21.3 PJ (0.5 Mtoe), with related emission reduction of CO_2 of 1 Mt emissions. Furthermore, taking into account the lifetime of the product and the replacement of the stock, it is estimated that in the year 2030 the annual savings will be approximately 37.5 PJ (0.9 Mtoe) corresponding to 1.8 Mt CO_2.

(11) The effect of the ecodesign requirements set out in this Regulation is expected to result by 2020 in estimated annual water savings of about 65.7 million m^3. Furthermore, taking into account the lifetime of the product and the replacement of the stock, it is estimated that in the year 2030 the annual savings will be approximately 96 million m^3.

(12) Ecodesign requirements should harmonise energy and water consumption requirements for non-household laundry equipment and non-household dishwashers throughout the Union, thus helping to make the internal market operate better and to improve the environmental performance of these products.

(13) The ecodesign requirements should not affect the functionality or affordability of non-household laundry equipment and non-household dishwashers from the final owner's perspective and should not negatively affect health, safety or the environment. In order to prevent such effects, this Regulation sets out requirements on washing, drying and cleaning performance.

(14) The ecodesign requirements should be introduced taking into account a sufficient timeframe for the manufacturers to redesign their products subject to this Regulation. The timing should be such that cost impact for manufacturers, in particular for small and medium-sized enterprises, is taken into account, while ensuring timely achievement of the objectives of this Regulation.

(15) Measurements of the relevant product parameters should be performed through reliable, accurate and reproducible measurement methods, which take into account the recognised state of the art measurement methods including, where available, harmonised standards adopted by the European standardisation organisations, as listed in Annex I to Regulation (EU) 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation[2].

(16) In accordance with Article 8(2) of Directive 2009/125/EC, this Regulation specifies which conformity assessment procedures apply.

[2] OJ L 316, 14.11.2012, p. 12.

(17) To facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes IV and V to Directive 2009/125/EC insofar as that information relates to the requirements laid down in this Regulation.

(18) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2009/125/EC,

HAS ADOPTED THIS REGULATION:

Chapter 1

Subject matter and scope

1. This Regulation establishes ecodesign requirements for the placing on the market and/or putting into service of:

   (a) non-household washing machines;

   (b) non-household textile dryers;

   (c) non-household dishwashers.

2. This Regulation shall not apply to:

   (a) non-household combined washer-dryers;
   (b) dry cleaning appliances;
   (c) pre- and after treatment equipment;
   (d) household washing machines currently covered by Commission Regulation (EU) No 1015/2010 of 10 November 2010 on Ecodesign requirements for household washing machines[3] and Commission Regulation (EU) No 1061/2010 of 28 September 2010 on energy labelling of household washing machines[4]
   (e) household tumble dryers currently covered by Commission Regulation (EU) No 932/2012 of 2 October 2012 on Ecodesign requirements for household tumble dryers[5] and Commission delegated Regulation (EU) No 392/2012 of 1 March 2012 on energy labelling of household tumble dryers[6]
   (f) household combined washer-dryers currently covered by Commission Directive 96/60/EC of 19 September 1996 on energy labelling of household combined washer-dryers[7]
   (g) household dishwashers currently covered by Commission Regulation (EU) No 1016/2010 of 10 November 2010 on Ecodesign requirements for household dishwashers[8] and Commission delegated Regulation (EU) No 1059/2010 of 28 September 2010 on energy labelling of household dishwashers[9]

[3] OJ L293, page 21-30, 11-11-2010
[4] OJ L 314, page 47-63, 30-11-2010
[5] OJ L 278, page 1-10, 12-10-2012
[6] OJ L123, page 1-26, 9-5-2012
[7] OJ L266 page 1-27, 18-10-1996
[8] OJ L 293, page 31-40, 11-11-2010
[9] OJ L314 page 1-16, 30-11-2010

Chapter 2

Definitions

In addition to the definitions set out in Directive 2009/125/EC, the following definitions shall apply:

1. 'washing machine', means a product that washes and rinses textiles by using water, which may have a spin drying function;
2. 'textile dryer' means a product that dries textiles by passage of air through a closed volume, which can be a rotating drum or a static cabinet; textile dryers can be condenser dryers or air-vented dryers.
3. ‘dishwasher’ means a product that cleans and rinses dishware, glassware, cutlery, or cooking utensils, pans and/or pots and may offer a drying function;
4. 'combined washer-dryer' means a product washes and rinses textiles by using water, which may have a spin drying function and a means for drying the textiles until cupboard dry, usually by heating, tumbling and ventilating;
5. 'dry cleaning appliance' means a product that uses a non-aqueous, non-polar solvent to clean textiles;
6. 'pre- and after treatment equipment' means laundry equipment providing in functions that are required preceding or following the actual washing, cleaning or drying cycles provided by washing machines and textile dryers. Such pre- and after-treatment equipment may include, but is not limited to, finishers, flat-work dryers and ironing presses;
7. 'household product' means a product intended for use in a single household;
8. 'non-household product' means a product intended for use other than in a single household;

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

Chapter 3

Ecodesign requirements and timetable

1. The ecodesign requirements for non-household washing machines, non-household textile dryers and non-household dishwashers are set out in Annex II.
2. Each ecodesign requirement shall apply in accordance with the following timetable:
    1. Two years after the entry into force of this Regulation:
        non-household washing machines, non-household textile dryers and non-household dishwashers shall comply with the product information requirements as indicated in Annex II part 1.
    2. Four years after the entry into force of this Regulation:
        non-household washing machines, non-household textile dryers and non-household dishwashers shall comply with to the energy efficiency, water consumption, washing and cleaning requirements as indicated in Annex II parts 2 to 5.
3. Compliance with ecodesign requirements shall be measured and calculated in accordance with requirements set out in Annex III.

Chapter 4

Conformity assessment

1. The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the internal design control system 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 conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation file shall contain a copy of the calculation set out in Annex III to this Regulation.
3. Where the information included in the technical documentation for a model has been obtained by calculation on the basis of design, or extrapolation from other equivalent appliances, or both, the technical documentation shall include details of such calculations or extrapolations, or both, and of tests undertaken by manufacturers to verify the accuracy of the calculations undertaken. In such cases, the technical documentation shall also include a list of all other equivalent models where the information included in the technical documentation was obtained on the same basis.

Chapter 5

Verification procedure for market surveillance purposes

Member States shall apply the verification procedure set out in Annex IV to this Regulation when performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC for compliance with requirements set out in Annex II to this Regulation.

Chapter 6

Review

The Commission shall review this Regulation in the light of technological progress no later than three years after entry into force and present the result of this review to the Ecodesign Consultation Forum. The review shall in particular include an assessment of the appropriateness of:

a) the requirements for the energy efficiency index set out in Annex II;
b) the requirements for the specific water consumption set out in Annex II;
c) the requirements for the washing and cleaning performance indices set out in Annex II;
d) introducing energy labelling of products within the scope;
e) the tolerances for verification.

Chapter 8

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 as set out in section Chapter 3.

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

Done at Brussels, etc.

Annex I

Definitions applicable for Annexes II to IV

In addition to the definitions set out in Directive 2009/125/EC, the following definitions shall apply:

Definitions related to product types

1. 'Washer-extractor' means a non-household washing machine consisting of a single drum, with means of extracting excess water from textiles, and which may be loaded and unloaded from a single side or from opposite sides;
2. 'Tunnel washer' means a non-household washing machine consisting of more than one drum, which each can perform a different stage of a washing programme, e.g. pre-washing, washing, rinsing and spin-extracting;
3. ‘condenser textile dryer’ means a textile dryer which includes a device (either using condensation or any other means) for removing moisture from the air used for the drying process;
4. 'Air vented textile dryer' means a textile dryer that dries textiles by passage of heated air which is vented to the outside;
5. ‘Tumble dryer’ means a textile dryer that dries textiles by passage of heated air in a rotating drum, which is loaded and unloaded from the same side;
6. ‘Pass-through tumble dyer’ means a textile dryer that dries textiles by passage of heated air in a rotating drum, and which is loaded from one side of the drum and unloaded from the opposite side of the drum;
7. ‘Cabinet dryer 'means a non-household textile dryer that dries textiles by passage of air through a cabinet in which textiles hang suspended and which may include a device for removing moisture from the air used for the drying process or vents the moist air into the room or outside.
8. 'Water-change dishwasher' means a non-household dishwasher that for each cleaning cycle requires input of fresh water;
9. 'Single-tank dishwasher' means a non-household dishwasher that is equipped with a single tank of water or liquid and which allows for several cleaning cycles before being replenished;
10. 'Multi-tank dishwasher' means a non-household dishwasher that is equipped with multiple tanks of water or liquid and which allows for several cleaning cycles before being replenished;

Definitions related to ecodesign requirements and measurement & calculation

11. ‘Standard Rating Conditions’ means the conditions under which the parameters of non-household washing machines, textile driers and dishwasher shall be tested.
12. ‘Load type’ means the load of textiles which shall be washed during the test of a non-household washing machine.
13. ’Energy Efficiency Index Washer Extractor’ means the Energy Efficiency Index of a non-household washer-extractor calculated in accordance with Annex III.
14. ’Standard Energy Consumption Washer Extractor’ means the Standard Energy Consumption of a non-household washer-extractor, calculated in accordance with III.
15. ’Energy Consumption Washer Extractor’ means the Energy Consumption of non-household washer-extractor under standard rating conditions.
16. ‘Equivalent primary energy input’ means the total energy consumption of a non-household washing machine, dryer or dishwasher, expressed in the equivalent primary energy, calculated according to Annex III

17. ‘Electric Energy Input’ is the total amount of electric energy necessary for performance of a cycle of non-household washing machine, textile dryer or dishwasher, calculated according to Annex III
18. ‘Fuel Energy Input’ is the total amount of gas and oil necessary for performance of a cycle of non-household washing machine, textile dryer or dishwasher, calculated according to Annex III
19. ‘Heat Energy Input’ is the total amount of heat for performance of a cycle of non-household washing machine, textile dryer or dishwasher, calculated according to Annex III
20. ’Rated Capacity Washer Extractor’ means the rated capacity of a non-household washer extractor as declared by the manufacturer under standard rating conditions.
21. ’Energy Efficiency Index Tunnel Washer’ means the Energy Efficiency Index of a non-household tunnel washer calculated in accordance with Annex III.
22. ‘Standard Energy Consumption Tunnel Washer’ means the Standard Energy Consumption of a non-household tunnel washer in kWh/kg (final energy), calculated in accordance with Annex III.
23. ’Energy Consumption Tunnel-Washer’ means the Energy Consumption of non-household tunnel-washer in final energy measured under standard rating conditions.
24. ’Rated Capacity Tunnel Washer’ means the rated capacity of a non-household tunnel washer as declared by the manufacturer under standard rating conditions.
25. ‘Washing Performance Index’ means the washing performance index of non-household washing machines calculated in accordance with Annex III
26. ‘Washing Performance’ means the washing performance of non-household washing machine measured under standard rating conditions.
27. ‘Reference Washing Performance’ means the washing performance of a non-household washing machines calculated in accordance with Annex III
28. ‘Specific Water Consumption for non-household washing machines’ means the water used by non-household washing machines for the washing process and the rinsing process, calculated in accordance with Annex III
29. ‘Specific Washing Water Consumption’ means the water used by non-household washing machines for the washing process, calculated in accordance with Annex III
30. ‘Specific Rinsing Water Consumption’ means the water used by non-household washing machines for the rinsing process, calculated in accordance with Annex III
31. ‘Main Washing Process’ means the part of the operations during the cycle of a non-household washing machine during which textiles are cleaned by using water, detergents and agitation at a set temperature.
32. ‘Rinsing Process’ means the part of the operations during the cycle of a non-household washing machine during which the detergents are rinsed from the washed textiles.
33. ’Minimum washing temperature’ means the minimum peak temperature of the washing water which shall be reached during the washing process.
34. ‘Cycle Duration’ means the period in which a complete washing, rinsing and spinning process is performed by a non-household washing machine.
35. ’Energy Efficiency Index Non-household Textile Dryer’ means the Energy Efficiency Index of a non-household textile dryer calculated in accordance with Annex III.
36. ’Standard Energy Consumption Non-household Textile Dryer’ means the Standard Energy Consumption of a non-household textile dryer in kWh/kg (final energy), calculated in accordance with III.
37. ’Specifc Energy Consumption Non-household Textile Dryer’ means the energy consumption of non-household textile dryer under standard rating conditions.

38. ’Cycle Time’ means the duration of the drying programme of a non-household textile dryer, calculated in accordance with Annex III.
39. ‘Initial Moisture Content’ means the moister content of textiles before they are dried in a non-household tumble dryer.
40. ‘Maximum Drying Cycle Temperature’ is the maximum temperature of textiles during the drying programme of a non-household textile dryer.
41. ‘Final Moisture Content’ means the moisture content of textiles after a completed drying cycle of a non-household textile dryer.
42. ’Energy Efficiency Index Water Change Dishwasher’ means the Energy Efficiency Index of a non-household water change dishwasher calculated in accordance with Annex III.
43. ’Standard Energy Consumption Water Change Dishwasher’ means the Standard Energy Consumption of a non-household water-change dishwasher, calculated in accordance with III.
44. ‘Cleaning Performance Index Dishwasher’ means the cleaning performance index of a non-household dishwasher calculated in accordance with Annex III.
45. ’Energy Efficiency Index One Tank Dishwasher’ means the Energy Efficiency Index of a non-household one tank dishwasher calculated in accordance with Annex III.
46. ’Standard Energy Consumption One Tank Dishwasher’ means the Standard Energy Consumption of a non-household one tank dishwasher, calculated in accordance with Annex III.
47. ’Energy Efficiency Index Multiple-Tank Dishwasher’ means the Energy Efficiency Index of a non-household multiple-tank dishwasher calculated in accordance with Annex III.
48. ’Standard Energy Consumption Multiple-Tank Dishwasher’ means the Standard Energy Consumption of a non-household multiple-tank dishwasher, calculated in accordance with Annex III.
49. ’Dishwasher capacity’ is the rated load of a non-household one tank or multiple-tank dishwasher as declared by the manufacturer.
50. ‘Cleaning load’ means the load of plates which shall be used during the test of a non-household dishwasher.
51. ’Cleaning Temperature’ means the temperature of the load of a non-household dishwasher during a cleaning cycle, calculated in accordance with Annex III.
52. ’Cleaning Cycle Duration’ is the duration of a complete cleaning cycle of a non-household dishwasher under standard rating conditions.
53. ‘Specific Water Consumption for a non-household dishwasher’ means the water used by non-household dishwasher machines for the complete cleaning process, calculated in accordance with Annex III.

Annex II

Ecodesign requirements

1. REQUIREMENTS FOR PRODUCT INFORMATION

Two years after entry into force, the following product information on non-household washing machines, non-household textile dryers and non-household dishwashers shall be provided:

1. The instruction manuals for installers and end-users, and free access websites of manufacturers, their authorised representatives and importers shall contain the following elements:

(a) for non-household washing machines, the technical parameters set out in Table 1.a, b and c , measured and calculated in accordance with Annex III;
(b) for non-household textile dryers, the technical parameters set out in Table 2.a, b and c, measured and calculated in accordance with Annex III;
(c) for non-household dishwashers, the technical parameters set out in Table 3.a, b and c, measured and calculated in accordance with Annex III;
(d) any specific precautions that shall be taken when the product is assembled, installed or maintained;
(e) information relevant for disassembly, recycling and/or disposal at end-of-life;

2. The technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

(a) the elements specified in point 1.;
(b) for products where the information relating to a specific model has been obtained by calculation on the basis of design and/or extrapolation from other combinations, the details of such calculations and/or extrapolations, and of any tests undertaken to verify the accuracy of the calculations, including details of the mathematical model for calculating the performance of such combinations and details of the measurements taken to verify this model.

Table 1.a – Information for non-household washer-extractors with a rated capacity below 40 kg

Model(s): [information identifying the model(s) to which the information relates]			
Heat or energy sources: [electricity, gaseous fuel, liquid fuel or steam]			
	Symbol	**Value**	**Unit**
Rated capacity	C	X	kg/cycle
Wash cycle duration acc. standard rating conditions		X	min
Productivity			kg/h
Average wash temperature acc. standard rating		X	ºC

conditions			
Energy consumption acc. standard rating conditions	$SEC_{WE<40}$	X.XX	kWh/kg
Energy Efficiency Index Washer-Extractor	$EEI_{WE<40}$	X.X	-
Specific water consumption of the wash cycle	$WC_{WM,w}$		
Specific water consumption of the rinse cycle	$WC_{WM.R}$		
Washing performance index	WPI	X	-

Table 1.b – Information for non-household washer-extractors with a rated capacity equal to or above 40 kg

Model(s): [information identifying the model(s) to which the information relates]			
Heat or energy sources: [electricity, gaseous fuel, liquid fuel or steam]			
	Symbol	**Value**	**Unit**
Rated capacity	C	X	kg/cycle
Wash cycle duration acc. standard rating conditions		X	min
Productivity			kg/h
Average wash temperature acc. standard rating conditions		X	ºC
Energy consumption acc. standard rating conditions	$SEC_{WE>40}$	X.XX	kWh/kg
Energy Efficiency Index Washer-Extractor	$EEI_{WE>40}$	X.X	-
Specific water consumption of the wash cycle	$WC_{WM,w}$		
Specific water consumption of the rinse cycle	$WC_{WM.R}$		
Washing performance index	WPI	X	-

Table 1.c – Information for non-household tunnel washers

Model identification:			
Heat or energy sources: [electricity, gaseous fuel, liquid fuel or steam]			
	Symbol	**Value**	**Unit**

Rated capacity	C	X	kg/h
Wash cycle duration acc. standard rating conditions	-	X	min
Productivity	-	X	kg/h
Average wash temperature acc. standard rating conditions	-	X	ºC
Energy consumption acc. standard rating conditions	EC_{TW}	X	kWh/kg
Energy Efficiency Index Tunnel Washer	EEI_{TW}	X	-
Specific water consumption of the wash cycle	$WC_{WM,w}$	X	l/kg
Specific water consumption of the rinse cycle	$WC_{WM.R}$	X	l/kg
Washing performance index	WPI	X	-

Table 2.a – Information for non-household tumble dryers

Model identification:			
Heat or energy sources: [electricity, gaseous fuel, liquid fuel or steam]			
Registration of drying cycle average temperature: (by air / from laundry surface temperature)			
Type of tumble dryer: (condenser / air vented)			
	Symbol	**Value**	**Unit**
Rated capacity	C	X	kg/batch
Initial moisture content acc. standard rating conditions		X	%
Final moisture content (related to bone dry) acc. standard rating conditions		X	%
Average drying cycle temperature acc. standard rating conditions		X	ºC
Drying cycle duration acc. standard rating conditions		X	min
Productivity			kg/h
Specific energy consumption acc. standard rating conditions	EC	X	kWh/kg (primary)
Energy Efficiency Index Tumble Dryer	EEI_{TD}	X	

Table 2.b – Information for non-household cabinet dryers

Model identification:			
Heat or energy sources: [electricity, gaseous fuel, liquid fuel or steam]			
	Symbol	**Value**	**Unit**
Cabinet volume	V	X.XX	m^3
Rated capacity	C	X	kg/batch
Initial moisture content acc. standard rating conditions		X	%
Final moisture content (related to bone dry) acc. standard rating conditions		X	%
Drying cycle duration acc. standard rating		X	min

conditions			
Productivity			
Energy consumption acc. standard rating conditions	EC	X	kWh/kg (primary)
Energy Efficiency Index Cabinet Dryer	EEI_{CD}	X	

Table 2.c – Information for non-household pass-through tumble dryers

Model identification:			
Heat or energy sources: [electricity, gaseous fuel, liquid fuel or steam]			
	Symbol	**Value**	**Unit**
Rated Capacity	C	X	kg/h
Initial moisture content acc. standard rating conditions		X	%
Final moisture content (related to bone dry) acc. standard rating conditions		X	%
Drying cycle duration acc. standard rating conditions		X	min
Productivity			
Energy consumption acc. standard rating conditions	EC	X	kWh/kg (primary)
Energy Efficiency Index Pass-through tumble dryer	EEI_{PD}	X	

Table 3.a – Information for non-household water-change dishwashers

Model identification:			
Optimised for: glassware / dishes / cutlery / utensils-pots-pans / mixed items			
Heat or energy sources: [electricity, gaseous fuel, liquid fuel or steam]			
Suitable for hot-fill: (yes/no)			
	Symbol	**Value**	**Unit**
Rated capacity	C	X	#
Cycle duration	t_{cycle}	X	min
Energy consumption per cycle acc. standard rating conditions	EC_{WCWW}	X	kWh/100 dishes
Energy Efficiency Index	EEI_{WCWW}	X	-
Specific water consumption acc. standard rating conditions	WPI_{WW}	X	l/100 dishes
Cleaning performance acc. standard rating conditions	x_{res}	X	%

Table 3.b – Information for non-household single-tank dishwashers

Model identification:			
Type of non-household dishwasher: (water change / one tank / multiple tank)			
Loading mechanism with conveyor belt: (yes/no)			
Optimised for: glassware / dishes / cutlery / utensils-pots-pans / mixed items			
Heat or energy sources: [electricity, gaseous fuel, liquid fuel or steam]			
Suitable for hot-fill: (yes/no)			
	Symbol	**Value**	**Unit**
Rated capacity	C	XX	#
Cycle time	t_{cycle}	XX	min
Energy consumption per cycle acc. standard rating conditions	EC_{STWW}	XX.X	kWh/100 dishes
Energy Efficiency Index	EEI_{OCWW}	X.X	-

Specific water consumption acc. standard rating conditions	WPI_{WW}		l/100 dishes
Cleaning performance acc. standard rating conditions	CPI		-

Table 3.c – Information for non-household multi-tank dishwashers

Model identification:			
Type of non-household dishwasher: (water change / one tank / multiple tank)			
Loading mechanism with conveyor belt: (yes/no)			
Optimised for: glassware / dishes / cutlery / utensils-pots-pans / mixed items			
Heat or energy sources: [electricity, gaseous fuel, liquid fuel or steam]			
Suitable for hot-fill: (yes/no)			
	Symbol	**Value**	**Unit**
Rated capacity	C	XX	#
Cycle time	t_{cycle}	XX	min
Energy consumption per cycle acc. standard rating conditions	EC_{MTWW}	XX.X	kWh/100 dishes
Energy Efficiency Index	EEI_{MTWW}	X.X	-
Specific water consumption acc. standard rating conditions	WPI_{WW}	XX.X	l/100 dishes
Cleaning performance acc. standard rating conditions	CPI		-

2. REQUIREMENTS FOR THE ENERGY EFFICIENCY INDEX

Four years after entry into force, the energy efficiency index of the products listed shall not be less than the following values:

(a) The $EEI_{WE<40}$ for a non-household washer extractor of a rated capacity of less than 40 kg shall not be less than 100;

(b) The $EEI_{WE>40}$ for a non-household washer extractor of a rated capacity of 40 kg or more shall not be less than 100;

(c) The EEI_{TW} for non-household tunnel washers shall not be less than 100;

(d) The EEI_{TD} for non-household textile dryers shall be:

i. For condenser tumble dryers: ≥ 100

ii. For air-vented tumble dryers: ≥ 100
iii. For pass-through tumble dryers: ≥ 100

(e) The EEI_{WCWW} for non-household water-change dishwashers shall be no less than 100;

(f) The EEI_{OTWW} for non-household one-tank dishwashers shall be no less than 100;

(g) The EEI_{MTWW} for non-household multi-tank dishwashers shall be no less than 100.

3. REQUIREMENTS FOR THE SPECIFIC WATER CONSUMPTION

Four years after entry into force,

(a) the specific water consumption (WC_{WM}) for washer-extractors shall be no more than 10 l/kg.

(b) the specific water consumption (WC_{WM}) for tunnel washers shall be no more than 6 l/kg

(c) the specific water consumption (WPI_{WW}) for water change dishwashers shall be no more than 76 l/100 dishes.

(d) the specific water consumption (WPIww) for one tank dishwashers shall be no more than 14.9 l/100 dishes

(e) the specific water consumption (WPIww) for multi-tank dishwashers shall be no more than 10.2 l/100 dishes

4. REQUIREMENTS FOR THE WASHING PERFORMANCE

Four years after entry into force, the minimum washing performance index (WPI) for non-household washing machines shall be no less than 100.

5. REQUIREMENTS FOR THE CLEANING PERFORMANCE

Four years after entry into force, the minimum cleaning performance index (CPI) for non-household dishwashers shall be no less than 100.

Annex III

Measurement and Calculation

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, or using other reliable, accurate and reproducible methods that take into account the generally recognised state-of-the-art methods. They shall meet the conditions and technical parameters set out in this Annex.

For the purposes of the calculations set out in this Annex, the consumption of electricity shall be multiplied by a conversion coefficient CC of 2,5.

1. NON-HOUSEHOLD WASHING MACHINES

1.1. Method of calculation of the energy efficiency index

1.1.1. Washer-extractors with a rated capacity of less than 40 kg

The energy efficiency index ($EEI_{WE<40}$) shall be calculated as:

$$EEI_{WE<40} = \frac{EC_{WE<40}}{SEC_{WE<40}} \; x \; 100$$

Where:

- $EEI_{WE<40}$ is the Energy Efficiency Index of a non-household washer-extractor with a rated capacity of less than 40 kg
- $SEC_{WE<40}$ is the Standard Energy Consumption of a non-household washer-extractor in kWh/kg (final energy)
- $EC_{WE<40}$ is the Energy Consumption of a non-household washer-extractor as declared by manufacturer for standard rating conditions in kWh/kg (kWh in final energy)

And:

$$SEC_{WE<40} = 0.15 - (c_{WE} * F)$$

Where:

- c_{WE} is the rated capacity of the washer extractor in kg/cycle
  F is a constant = 0.00015

1.1.2. Washer-extractors with a rated capacity of 40 kg or more

The energy efficiency index ($EEI_{WE>40}$) shall be calculated as:

$$EEI_{WE>40} = \frac{EC_{WE>40}}{SEC_{WE>40}} \; x \; 100$$

Where:

- $EEI_{WE>40}$ is the Energy Efficiency Index of a non-household washer-extractor with a rated capacity of 40 kg or more
- $SEC_{WE>40}$ is the Standard Energy Consumption of a non-household washer-extractor in kWh/kg (final energy)
- $EC_{WE>40}$ is the Energy Consumption of a non-household washer-extractor as declared by manufacturer for standard rating conditions in kWh/kg (kWh in final energy)

And:

$$SEC_{WE>40} = 0.20 - c_{WE} * F$$

Where:

- c_{WE} is the rated capacity of the washer extractor
- F is a constant = 0.00015

1.1.3. Tunnel washers

The energy efficiency index (EEI_{TW}) shall be calculated as:

$$EEI_{TW} = \frac{EC_{TW}}{SEC_{TW}} \; x \; 100$$

Where:

- EEI_{TW} is the Energy Efficiency Index of a tunnel washer
- EC_{TW} is the Energy Consumption of a non-household tunnel washer as declared by manufacturer for standard rating conditions in kWh/hr (final energy)
- SEC_{TW} is the Standard Energy Consumption of a non-household tunnel washer in kWh/hr (final energy)

And:

$$SEC_{TW} = 0.20 - c_{TW} * F$$

Where:

- c_{TW} is the rated capacity of the tunnel washer (kg/hr)
- F is a constant = 0.00025

1.2. Method of calculation of the specific water consumption

The specific water consumption (WC_{WM}) shall be calculated as the sum of the specific washing water consumption ($WC_{WM,W}$) and of the specific rinsing water consumption ($WC_{WM,R}$).

1.2.1. Specific washing water consumption

The specific washing water consumption ($WC_{WM,W}$) shall be calculated as:

$$WC_{WM} = \frac{W_{WM,w}}{C} \; x \; 100$$

Where:

- $W_{WM,w}$ is the water consumption of the washing cycle[10]
- c is the rated capacity of the washing machine, being either c_{WE} or c_{TW} (kg/cycle)

1.2.2. Specific rinsing water consumption

The specific rinsing water consumption ($WC_{WM,R}$) shall be calculated as:

$$WC_{WM} = \frac{W_{WM,r}}{C} \; x \; 100$$

Where:

- $W_{WM,r}$ is the water consumption of the rinsing cycle
- c is the rated capacity of the washing machine, being either c_{WE} or c_{TW} (kg/cycle)

1.3. Method of calculation of the washing performance index

The washing performance index (WPI) shall be calculated as:

$$WPI = \frac{WP}{WP_{ref}}$$

Where:

- WPI = Washing Performance Index of a non-household washing machine

[10] Whether this includes 'pre-wash' should be discussed together with relevant industries and technical committees for standardisation.

- *WP* is the measured Washing Performance, which is the average of the reflectance values of the test strips after completion of the test cycle.
- WP_{ref} is the reference washing performance, ie. a reference reflectance value.

1.4. Standard rating conditions for non-household washing machines

The standard rating conditions that apply to the measurement of the energy efficiency index, the specific washing water consumption, the specific rinsing water consumption and the washing performance index of non-household washing are described in the table below.

Table 1 - Standard rating conditions of non-household washing machines

Non-household washer extractor	Minimum washing temperature	Cycle duration	Capacity	Load type
washer extractor with a rated capacity below 40 kg	60°C	45 minutes or as defined by manufacturer	rated	100% cotton
washer extractor with a rated capacity of 40 kg or more	70°C	20 minutes	rated	100% cotton
tunnel washer	70°C	30 minutes	rated	100% cotton

The test method shall, in addition to the above parameters, also specify the following parameters:

- Ambient temperature;
- Water inlet temperature;
- Drum temperature at start of test;
- Rated capacity (load size): given by the manufacturer (for cotton washing), if not specified: load ratio 10 l drum volume per kg dry textiles (related to bone dry cotton textiles);

Barrier washers mainly have divided drums (compartments) if they are side loaded machines; load per compartment given by the manufacturer

- Program: Normal drum agitation (not gentle), Minimum temperature, Time at minimum temperature, 3 rinses with intermediate spin, final spinning;

if a recommended program by manufacturer meeting the standard rating conditions exists: selection of program;

- Productivity (kg/h);
- program duration (min);
- Water hardness;
- Type and dosage of detergent;

The minimum washing temperature shall be measured as described in the test method. [11]

The energy consumption at standard rating conditions shall be expressed as the equivalent primary energy input:

- For products heated by electricity the equivalent primary energy input is equal to: electric energy input * conversion factor CC;
- for products with a fuel driven heat generator, the equivalent primary energy input is equal to: fuel energy input plus any auxiliary electric energy input *CC;
- for products without heat generator and thus receiving heat from an external heat source the equivalent primary energy input is equal to: heat energy input * 1.25 plus any auxiliary electric energy input *CC;
  The factor 1,25 (equal to dividing by 80%) refers to an average assumed heat generation efficiency for water heating.

The values for the energy efficiency index, the specific washing water consumption, the specific rinsing water consumption and the washing performance index to be declared by the manufacturer shall be the average values over the number of test runs required. The number of test runs shall be as defined in the test method.

2. NON-HOUSEHOLD TEXTILE DRYERS

2.1. Method of calculation of the energy efficiency index

The energy efficiency index for non-household textile dryers (EEI_{TD}) shall be calculated as:

$$EEI_{TD} = \frac{EC}{SEC_{TD}} \; x \; 100$$

Where:

- EEI_{TD} is the energy efficiency index of a non-household textile dryer
- EC is the specific energy consumption for standard rating conditions (in kWh/kg, final energy)
- SEC_{TD} is the standard energy consumption of a non-household textile dryer (in kWh/kg)

And:

$$SEC_{TD} = \{0{,}6 * C^{0.8}\} - \{F * \left(30 * \frac{t_{cycle}}{60}\right)\}$$

Where

C = the rated capacity of the drier, expressed in kg/cycle;

[11] Several methods for establishing the average washing temperature exist, such as determine the average of measurements by washing temperature sensing devices or as the average temperature established on the basis of extraction of washing liquid over the whole main washing process.

F = 1 for air vented driers, cabinet driers or pass through driers and F= 0 for condenser driers;

t_{cycle} = for air vented driers, cabinet driers or condenser dryers: the drying programme duration, expressed in min;

t_{cycle} =for pass-through tumble driers: the drying programme duration, expressed in min;:

$$t_{cycle} = \frac{60}{C_p}$$

Where

C*p* = the throughput of the pass through drier, expressed in kg/h

2.2. Standard rating conditions for non-household textile dryers

The standard rating conditions that apply to measurement of the energy efficiency index of non-household textile dryers are described in the table below. The temperature of the process air is fixed as it affects textile wear/damage.

Table 5 - Standard rating conditions for non-household textile dryers

non-household tumble dryer type	initial moisture content	maximum temperature of process air*	final moisture content (related to bone dry)	Load	Type
condenser dryer	50%	70°C	8%	rated capacity	100% cotton, terry towels
air vented dryer	50%	70°C	8%		
pass through dryer	50%	70°C	8%		
cabinet dryer	50%	70°C	8%		

* The requirement for the maximum temperature of the process air applies only to dryers that are not automatically (through textile surface temperature) controlled.

The relevant test method to be used for the test shall in addition to the above parameters also specify the following parameters:

- Ambient temperature;
- Air humidity;
- Filling mode;
- Machine temperature at start of test;

– Selection of program;
– Rated capacity;
– Productivity (kg/h);
– Program duration / cycle time;
– Load (material, types, etc.).

Values for moisture content relate to a reference ambient temperature of 20ºC and a relative humidity of ambient air of 65%.

The energy consumption at standard rating conditions shall be expressed as the equivalent primary energy input:

- For products heated by electricity the equivalent primary energy input is equal to: electric energy input * conversion factor CC;
- for products with an integrated heat generator, the equivalent primary energy input is equal to: fuel energy input plus any auxiliary electric energy input *CC;
- for products without heat generator and thus receiving heat from an external heat source the equivalent primary energy input is equal to: heat energy input * 1.25 plus any auxiliary electric energy input *CC;

The values for the energy efficiency index to be declared by the manufacturer shall be the average of values over the number of test runs required. The number of test runs shall be as defined in the test method.

3. NON-HOUSEHOLD DISHWASHERS

3.1. Method of calculation of the energy efficiency index

3.1.1. Water change dishwashers

The energy efficiency index for water change dishwashers (EEI_{WCWW}) shall be calculated as:

$$EEI_{WCWW} = \frac{EC_{WCWW}}{SEC_{WCWW}} \times 100$$

Where:

– EEI_{WCWW} is the Energy Efficiency Index of a water change dishwasher
– EC_{WCWW} is the energy consumption for standard rating conditions in kWh/100 dishes (final energy)
– SEC_{WCWW} is the Standard Energy Consumption of a water change dishwasher in kWh/100 dishes (final energy)

And:

$$SEC_{WCWW} = 4 - C * F$$

Where:

- C = the rated capacity of the water change dishwasher, equal to 100 dishes
- F = a constant = 0.04

3.1.2. One tank dishwashers

The energy efficiency index for one tank dishwashers (EEI_{OTWW}) shall be calculated as:

$$EEI_{OTWW} = \frac{EC_{OTWW}}{SEC_{OTWW}} \; x \; 100$$

Where:

- EEI_{OTWW} is the Energy Efficiency Index of a one tank dishwasher
- EC_{OTWW} is the Energy Consumption for standard rating conditions in kWh/100 dishes(final energy)
- SEC_{OTWW} is the Standard Energy Consumption of a one tank dishwasher in kWh/100 dishes

And:

$$SEC_{OTWW} = \{(a * C) + b\} * F$$

Where:

- *C*= the rated capacity of the one tank dishwasher based on the number of plates per m^2 rack, equal to 100 dishes;
- *a* and *b* are constants [these need to be defined on the basis of forthcoming tests of the standard]
- F = a constant to correct for extra high pressure (pot/utensil washer) F=1.05 or low pressure (glass washers) F=0.95

3.1.3. Multi-tank dishwashers

The energy efficiency index for multi-tank dishwashers (EEI_{MTWW}) shall be calculated as:

$$EEI_{MTWW} = \frac{EC_{MTWW}}{SEC_{MTWW}} \; x \; 100$$

Where:

- EEI_{MTWW} is the Energy Efficiency Index of a multi-tank dishwasher
- EC_{MTWW} is the Energy Consumption for standard rating conditions in kWh/100 dishes(final energy)
- SEC_{MTWW} is the Standard Energy Consumption of a multi-tank dishwasher in kWh/100 dishes

And:

$$SEC_{OTWW} = \{(a * C) + b\} * F$$

Where:

- *C*= the rated capacity of the one tank dishwasher based on the number of plates per m^2 rack, equal to 100 dishes;
- *a* and *b* are constants [these need to be defined on the basis of forthcoming tests of the standard]
- F = a constant to correct for extra high pressure (pot/utensil washer) F=1.05 or low pressure (glass washers) F=0.95

3.2. Method of calculation of the specific water consumption

The specific water consumption for non-household dishwashers (WC_{WW}) shall be calculated as:

$$WC_{WW} = \frac{W_{WW}}{C} \, x \, 100$$

Where:

- W_{WW} is the water consumption of the dishwasher for cleaning 100 dishes
- *c* is the rated capacity of the washing machine (equal to 100 dishes)

3.3. Method of calculation of the cleaning performance index

The cleaning performance index for non-household dishwashers (CPI_{WW}) shall be calculated as:

$$CPI_{WW} = \frac{CP_{WW}}{SCP_{WW}}$$

Where:

CPI_{WW} = Cleaning Performance Index of a non-household dishwasher

CP_{WW} = Cleaning Performance of a non-household dishwasher for standard rating conditions, in %

SCP_{WW} = Standard Cleaning Performance of a non-household dishwasher, in %

The cleaning Performance (CP_{WW}) is the average percentage of cleaned plates over the complete test.

3.4. Standard rating conditions for non-household dishwashers

The standard rating conditions that apply to the measurement of the energy efficiency index, specific water consumption and cleaning performance are described in the table below.

Table 6 - Standard rating conditions for non-household dishwashers

non-household dishwasher type	cleaning temperature	cleaning cycle duration	last fresh water rinse temperature
water change	65°C	15 minutes or as defined by manufacturer	80°C
single tank	65°C	2 minutes	80°C
multi-tank	65°C	2 minutes	80°C

The test method to be used for the test shall, in addition to the above parameters, also specify the following parameters:

- Ambient temperature;
- Air humidity;
- Water inlet temperature and hardness;
- Filling mode;
- Machine temperature at start of test;
- Selection of program;
- Rated capacity;
- Productivity (kg/h);
- Program duration / cycle time;
- Type and dosage of detergent;
- Load (material, types, etc.).

The productivity of dishwashers with a conveyor belt shall be calculated as:

productivity = $V_{transport} * \frac{number\ of \frac{plates}{items}}{m\ length\ of\ conveyor\ band} * 0{,}8$ (in washed items/hour)

Where:

$V_{transport}$: velocity of band to achieve a contact time of 2 min (in m/hour)

For conveyer belt dishwashers the capacity shall be 18 plates per m conveyer band

The energy consumption at standard rating conditions shall be expressed as the equivalent primary energy input:

- For products heated by electricity the equivalent primary energy input is equal to: electric energy input * conversion factor CC;
- for products with an integrated heat generator, the equivalent primary energy input is equal to: fuel energy input plus any auxiliary electric energy input *CC;
- for products without heat generator and thus receiving heat from an external heat source the equivalent primary energy input is equal to: heat energy input * 1.25 plus any auxiliary electric energy input *CC;

For each test run the energy efficiency index, specific water consumption and cleaning performance shall be measured, simultaneously where possible. The number of test runs shall be as specified in the test method.

The values for the energy efficiency index, specific water consumption and cleaning performance to be declared by the manufacturer shall be the average values over the number of test runs required.

Annex IV

Verification procedures for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of 2009/125/EC, the authorities of the Member States shall apply the following verification procedure for the requirements set out in Article 3 and Annex I, using the measurement and calculation methods set out in Annex III.

1. PRODUCTS NOT MADE-TO-ORDER ON THE BASIS OF CUSTOMER SPECIFICATIONS

1. The Member State authorities shall test one single unit per model.
2. The model shall be considered to comply with the applicable requirements set out in Annex I to this Regulation if the values in the technical documentation comply with the requirements set out in that Annex and if testing of the relevant model parameters listed in Annex I and Table 7 shows compliance for all of those parameters.
3. If the result referred to in point 2 is not achieved, the Member State authorities shall randomly 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 models which, in accordance with Article 4, have been listed as equivalent model in the manufacturer's technical documentation.
4. The model shall be considered to comply with the applicable requirements set out in Annex I to this Regulation if testing of the relevant model parameters listed in Annex I and Table 7 shows compliance for all of those parameters.
5. If the results referred to in point 4 are not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.

2. PRODUCTS MADE-TO-ORDER ON THE BASIS OF CUSTOMER SPECIFICATIONS

If the product does not come into existence before it is installed at the customers' site, surveillance authorities may request the technical file as mentioned in Annex II.1.2. regarding the technical documentation for the purposes of conformity assessment pursuant to Article 4.

For such products where this information relating to a specific model has been obtained by calculation on the basis of design and/or extrapolation from other combinations, the details of such calculations and/or extrapolations, and of any tests undertaken to verify the accuracy of the calculations, including details of the mathematical model for calculating the performance of such combinations and details of the measurements taken to verify this model shall be assessed by the authorities.

Upon request of these authorities a test may be performed at the customers' site. The test shall follow the standard developed for 'in situ' testing and the authorities shall ensure that the burden and possible downtime for the customer shall be kept as small as possible.

If the product fails to meet the required values within given tolerances, the manufacturer shall be allowed to modify the product at no expense of the customer, after which a second test shall be performed. If the product fails this second test as well, the product shall be considered not to comply with this Regulation.

3. VERIFICATION TOLERANCES

The verification tolerances defined in this Annex relate only to the verification of the measured parameters by Member State authorities and shall not be used by the manufacturer or the importer as an allowed tolerance to establish the values in the technical documentation.

Table 7 - Verification tolerances

Measured parameters*	Verification tolerances
Energy efficiency index non-household washing machines, textile dryers and dishwashers	The determined value shall not exceed the declared value by more than 5 %.
Washing performance index of washing machines	
Cleaning performance index of washing machines	
Specific water consumption	

(*) The arithmetic average of the values determined in the case of three additional units tested as prescribed in paragraph 1.3 of this Annex.