



SLOVENSKI STANDARD
SIST EN IEC 62512:2021/A11:2021

01-februar-2021

Električni pralno-sušilni stroji za uporabo v gospodinjstvu - Metode za merjenje funkcionalnosti - Dopolnilo A11

Electric clothes washer-dryers for household use - Methods for measuring the performance

Elektrische Wasch-Trockner für den Hausgebrauch - Prüfverfahren zur Bestimmung der Gebrauchseigenschaften

Lavantes-séchantes électriques à usage domestique - Méthodes de mesure de l'aptitude à la fonction

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97.060 Aparati za nego perila Laundry appliances

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EUROPEAN STANDARD

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Electric clothes washer-dryers for household use - Methods for measuring the performance

Lavantes-séchantes électriques à usage domestique -
Méthodes de mesure de l'aptitude à la fonction

Elektrische Wasch-Trockner für den Hausgebrauch -
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Gebrauchseigenschaften

This amendment A11 modifies the European Standard EN IEC 62512:2020; it was approved by CENELEC on 2020-10-21. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (EN IEC 62512:2020/A11:2020) consists of the text of IEC 62512:2012 prepared by IEC/SD 59, "Home laundry appliances", together with the common modifications prepared by CLC/TC 59X "Performance of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2021-07-21
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2023-10-21

This document supersedes EN 50229:2015.

Significant technical differences are:

- a the definition of the loads to be tested in continuous, segmented and **interrupted operation cycles**;
- b the method for testing automatic and not automatic **operation** of the **drying cycles**;
- c the way to handle the load for **interrupted operation cycles**;
- d the correction to be applied to test results for continuous and **interrupted operation cycles**;
- e the definition of a procedure for a **segmented operation cycle** to simulate a continuous **wash and dry cycle**, if the machine does not offer those **programme setting**;
- f the test procedure for the performance measurements for **multi-drum** washer dryers according to EU energy label regulation.

This document also specifies, as far as necessary, the test method for household washing machines in accordance with the COMMISSION DELEGATED REGULATION (EU) 2019/2014 of 11 March 2019 supplementing Regulation 2017/1369 of the European Parliament and of the Council with regard to energy labelling of household washing machines and household **washer-dryers** and repealing Commission Regulation (EU) No 1061/2010 and Commission Directive 96/60/EC and in accordance with the COMMISSION REGULATION (EU) 2019/2023 of 1 October 2019 laying down ecodesign requirements for household washing machines and household **washer-dryers** pursuant to Directive 2009/125/EC of the European Parliament and of the Council, amending Commission Regulation (EC) No 1275/2008 and repealing Commission regulation (EU) No 1015/2010.

Clauses, notes, tables, figures and annexes which are additional to those in IEC 62512:2012 are prefixed "Z".

Annex ZA sets out the procedure to be applied for testing according to Commission Regulations with regard to energy labelling and ecodesign and provides all necessary links to all relevant clauses of this document.

This document has been prepared in view of the upcoming Standardization Request which will be given to CENELEC by the European Commission and the European Free Trade Association and supports Commission Delegated Regulation (EU) 2019/2014 and Commission Regulation (EU) 2019/2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

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For the relationship with Commission Delegated Regulation (EU) 2019/2014 and Commission Regulation (EU) 2019/2023 informative Annex ZZA and Annex ZZB will be published following the adoption of the Standardization Request.

Endorsement notice

The text of the International Standard IEC 62512:2012 was approved by CENELEC as a European Standard with agreed common modifications.

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1 Modifications to Clause 1, “Scope”

Add after the second paragraph of the Scope the following:

"This document provides a measurement procedure for EU regulations on ecodesign and energy labelling on household combined washer-dryers in their function to wash and dry textiles"

Replace the Note in the Scope with:

"NOTE Washer-dryers for communal use in blocks of flats or in laundrettes are also included within the scope of this document. It does not apply to washer-dryers for commercial laundries."

2 Modifications to Clause 2, “Normative references”

In Clause 2, delete IEC 60704-2-4 and IEC 60704-2-6.

Add the following standards:

"EN IEC 60704-2-16:2019 + A11:2020, Household and similar electrical appliances — Test code for the determination of airborne acoustical noise — Part 2-16: Particular requirements for washer-dryers

EN 60335-2-7:2010, Household and similar electrical appliances — Safety — Part 2-7: Particular requirements for washing machines

CLC/TS 50677, Clothes washing machines and washer-dryers for household and similar use — Method for the determination of rinsing effectiveness by measurement of the surfactant content at textile materials

CLC/TS 50707:2020, Clothes washing machines and washer-dryers for household and similar use — Method for the determination of the maximum temperature inside the load"

3 Modifications to Clause 3, “Terms, definitions and symbols”

Add table before 3.1.1

Table 3.1 – Reference table for terms and definition in alphabetical order

terms and definition	sub-clause
automatic drying	3.1.9
combined cycle time	3.1.Z10
combined programme time	3.1.Z9
combined rated capacity	3.1.Z8
complete operation cycle	3.1.4
continuous operation cycle	3.1.5
drying cycle	3.1.8
eco 40-60	3.1.Z11
end of programme	3.1.10
final moisture content	3.1.Z2

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terms and definition	sub-clause
full load	3.1.Z13
half load	3.1.Z14
interrupted operation cycle	3.1.6
multi-drum mode washer-dryer	3.1.Z5
multi-drum washer-dryer	3.1.Z4
part A	3.1.Z15
part B	3.1.Z16
rated drying capacity	3.1.2
rated washing capacity	3.1.1
rated washing-drying capacity	3.1.3
segmented operation cycle	3.1.Z3
simultaneous cycle	3.1.Z7
simultaneous programme	3.1.Z6
treatment	3.1.Z17
treatment full	3.1.Z18
treatment half	3.1.Z19
wash and dry cycle	3.1.Z12
washer-dryer	3.1.Z1
washing cycle	3.1.7

In Clause 3, replace the terms 3.1.1, 3.1.2, 3.1.3, 3.1.5 and 3.1.8 with the following:

3.1.1

rated washing capacity

maximum mass of conditioned textiles which the manufacturer declares can be treated in one complete **washing cycle**; for **multi-drum mode washer-dryers** the **rated washing capacities** are for each individual drum

Note 1 to entry: For different textile types, the **rated washing capacity** of a **multi-drum washer-dryer** is usually different.

3.1.2

rated drying capacity

maximum mass of conditioned textiles which the manufacturer declares can be treated in one complete **drying cycle**; for **multi-drum mode washer-dryers** the **rated drying capacities** are for each individual drum

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Note 1 to entry: For different textile types, the **rated drying capacity** of a **multi-drum washer-dryer** is usually different.

3.1.3**rated washing-drying capacity**

maximum mass of conditioned textiles which the manufacturer declares can be treated in one **continuous operation cycle**; for **multi-drum mode washer-dryers** the **rated washing-drying capacities** are for each individual drum

Note 1 to entry: For different textile types, the **rated washing-drying capacity** of a **multi-drum washer-dryer** is usually different.

3.1.5**continuous operation cycle**

complete operation cycle without interruption of the process or additional action by an operator

3.1.8**drying cycle**

complete drying process, as defined by the required **programme**, consisting of a series of different **operations** (heat, spin, cool down, ...)

In Clause 3, add the following items:

3.1.Z1**washer-dryer**

washing machine which, in addition to the functions of an automatic washing machine, in the same drum includes a means for drying the textiles by heating and tumbling

3.1.Z2**final moisture content**

moisture content of a base load at the end of a drying cycle

3.1.Z3**segmented operation cycle**

interrupted operation cycle where the whole load remains in the drum after the **washing cycle** and is used for the **drying cycle**

3.1.Z4**multi-drum washer-dryer**

washer-dryer equipped with more than one drum whether in separate units or in the same casing offering the washing and drying function for all of these drums

3.1.Z5**multi-drum mode washer-dryer**

program where some or all of the drums are operated simultaneously in the washing and **drying cycle**

Note Z1 to entry: A **washer-dryer** with more than one drum for the **treatment** of the textiles, where drums cannot be operated simultaneously is not regarded as having a **multi-drum mode**. In this case each drum shall be tested separately.

Note Z2 to entry: A **washer-dryer** with more than one drum for the **treatment** of the textiles where **multi-drum mode** is only available for the **washing cycle** but not for the **drying cycle** is not regarded as a **multi-drum washer-dryer**. Only the **washing cycle** is regarded and evaluated as a multi-drum appliance while for the **wash and dry cycle**, this appliance is regarded as a single drum unit.

Note Z3 to entry: This definition may apply only for specific **programmes**. In this case only, these **programmes** can be tested in **multi-drum mode**.

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3.1.Z6

simultaneous programme

series of **operations** which are pre-defined within the **multi-drum washer-dryer** and which are declared by the manufacturer as suitable for washing and drying certain textile types in two or more drums at the same time

3.1.Z7

simultaneous cycle

complete **wash and dry cycle**, started at the same time for two or more drums, as defined by the **programme** selected, consisting of a series of **operations** (wash, rinse, spin, etc.) and including any **operations** that occur after the completion of the **programme**

Note Z1 to entry: Examples of **operations** that could occur after the completion of the **programme** are pumping, monitoring and anti-creasing (where applicable).

3.1.Z8

combined rated capacity

sum of **rated capacities** of all drums suitable for running a **simultaneous programme**

3.1.Z9

combined programme time

the time from the simultaneous initiation of the **programme** for two or more drums (excluding any user programmed delay) until the end of the **simultaneous programme**; if the **end of programme** is not indicated, the **combined programme time is equal to the combined cycle time**

3.1.Z10

combined cycle time

time from the simultaneous initiation of the **programme** for two or more drums (excluding any user programmed delay) until all activity ceases; activity is considered to have ceased when the power consumption reverts to a steady state condition that persists indefinitely without user intervention; if there is no activity after the end of the **programme**, the **combined cycle time is equal to the combined programme time**

Note Z1 to entry: **Cycle time** includes any activity that could occur after the **programme** is completed. This could include any electronic activity or any additional mechanical activity that occurs for a limited period after any **end of programme** indicator. Any cyclic event that occurs indefinitely is considered to be steady-state

3.1.Z.11

eco 40-60

name of the **programme** to be able to clean normally soiled cotton laundry declared to be washable at 40 °C or 60°C, together in the same **washing cycle**

3.1.Z12

Wash and dry cycle

complete operation cycle consisting of the **eco 40-60 programme** for the **washing cycle**, and of a **drying cycle** achieving cupboard dry status

3.1.Z13

full load

test load to be used for a **test series** according to Annex ZA, having a nominal mass that is equal to the **rated washing-drying capacity**

3.1.Z14

half load

test load, part A or **part B**, to be used for a **test series** according to Annex ZA, having a nominal mass that is approximately equal to a half of the **rated washing-drying capacity**

3.1.Z15

part A

one half of the **full load**

3.1.Z16**part B**remaining part of the **full load** excluding **part A****3.1.Z17****treatment**combination of **test load** and **programme** to be used for a **test run** within a **test series****3.1.Z18****treatment full****wash and dry cycle** with **full load****3.1.Z19****treatment half****wash and dry cycle** with **half load**

In 3.2, replace Table 1 as follows:

Table 3.2 — Symbols for application in this document

Symbol in this document	Symbol in IEC 62512:2012	Unit	Definition	Clause (first appearance)
C_k			reflectance value after wash and dry for the test run (equal to $C_{z,i}$)	ZA.6.3
C_{ref}			average sum of the reflectance values for the reference machine out of all 5 test runs	ZA.5.3
C_z			average value for the sum of the reflectance values for treatment z ($z = full, 1/2$)	ZA.5.3
$C_{z,i}$			sum of the average reflectance values (Y-values) of test run i for treatment z ($z = full, 1/2$)	ZA.5.3
DL_i		g/kg	ratio of mass of detergent per kg of load of test run	ZA.6.3
EEI			Energy Efficiency Index of a test machine for the wash and dry cycle	ZA.5.8
i		-	number of test run	ZA.4.4
I_W			Washing Efficiency Index for the test series	ZA.5.3
$I_{W,z}$			Washing Efficiency Index for treatment z ($z = full, 1/2$)	ZA.5.3
m_0	W_0	g	mass of the conditioned base load	8.3.3.1
m_{0c}	W_{0c}	g	total conditioned mass of the base load for the continuous operation cycle	9.1
m_{0p}	W_{0p}	g	total conditioned mass of the first partial load p of the base load	8.3.3.2
m_{det}		g	Mass of detergent used for the test run	ZA.6.3

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Symbol in this document	Symbol in IEC 62512:2012	Unit	Definition	Clause (first appearance)
m_{dry}		g	Mass of base load for before the test run (without test strips)	ZA.6.3
m_f	W_f	g	mass of the load at the end of the test run (either W_{fp} or W_{fc})	9.1
m_{fc}	W_{fc}	g	mass of the load at the end of the test run for complete operational cycle	9.1
m_{fp}	W_{fp}	g	mass of the load at the end of the test run for partial load	7.3.3.3
$m_{\text{full},0}$		g	mass of the conditioned full load	ZA.5.4
$m_{\text{full},i}$		g	mass of the full load at the end of the test run i ($i = 1, 2, 3$)	ZA.5.4
m_i	W_i	g	mean value of the initial mass	Annex B
m_{ip}	W_{ip}	g	actual initial mass of the first partial load p of the base load after the washing cycle	8.3.3.2
$m_{\text{part},0}$		g	mass of the conditioned half load ($\text{part} = \text{part A, part B}$)	ZA.5.4
$m_{\text{part},i}$		g	mass of the half load part ($\text{part} = \text{part A, part B}$) at the end of the test run i ($i = 1, 2, 3, 4$)	ZA.5.4
n_z			number of test runs for treatment z ($z = \text{full, 1/2}$)	ZA.5.2
p_c		kPa	laboratory supply water pressure cold for the test run	ZA.6.3
p_h		kPa	laboratory supply water pressure hot for the test run	ZA.6.3
R_{max}		g/kg	rinsing effectiveness for the test series	ZA.5.9
R_z		g/kg	average ratio of mass of detergent per kg of load for treatment z ($z = \text{full, 1/2}$)	ZA.5.9
s			weighted pooled standard deviation for test series	ZA.5.2
s_z			standard deviation for treatment z ($z = \text{full, 1/2}$)	ZA.5.2
SCE_c		kWh	standard energy consumption	ZA.5.8
t_d	t_d	min	(corrected) programme duration drying	Annex B
t_{dp}	t_{dp}	min	drying time	Annex B
t_m		min	main wash duration for the test run	ZA.6.3
t_t		min	programme time for the test run	ZA.6.3
t_w	t_w	min	programme duration washing	Annex B
t_{wd}	t_{wd}	min	(corrected) programme duration of the complete operation cycle	Annex B
t_z		min	average value for the programme time for treatment z ($z = \text{full, 1/2}$)	ZA.5.6

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Symbol in this document	Symbol in IEC 62512:2012	Unit	Definition	Clause (first appearance)
$t_{z,i}$		min	programme time of test run i for treatment z ($z = full, 1/2$)	ZA.5.6
V		L	weighted average value for the total water consumption for the test series	ZA.5.5
V_{cm}		L	cold water consumption during main wash for the test run	ZA.6.3
V_{ct}		L	total cold water consumption for the test run	ZA.6.3
V_d	L_d	L	(corrected) water consumption drying	Annex B
V_{hm}		L	hot water consumption during main wash for the test run	ZA.6.3
V_{ht}		L	total hot water consumption for the test run	ZA.6.3
V_t		L	total water consumption (cold + hot) for the test run	ZA.6.3
V_w	L_w	L	water consumption washing	Annex B
V_{wd}	L_{wd}	L	(corrected) water consumption of the complete operation cycle	Annex B
V_z		L	average value for the total water consumption for treatment z ($z = full, 1/2$)	ZA.5.5
$V_{z,i}$		L	total water consumption of test run i for treatment z ($z = full, 1/2$)	ZA.5.5
W		kWh	weighted average value for the total energy consumption for the test series	ZA.5.7
W_d	E_d	kWh	corrected energy consumption of the drying cycle	9.1
W_{et}		kWh	total electrical energy metered for the test run	ZA.6.3
W_{ht}		kWh	calculated total hot water energy determined for the test run	ZA.6.3
W_m	E_m	kWh	measured energy consumption	9.1
W_{total}		kWh	total electrical energy consumption for the test run (equal to $W_{z,i}$)	ZA.6.3
W_w	E_w	kWh	corrected energy consumption washing	Annex B
W_{wd}	E_{wd}	kWh	corrected energy consumption of the complete operation cycle	Annex B
W_z		kWh	average value for the total energy consumption for treatment z ($z = full, 1/2$)	ZA.5.7
$W_{z,i}$		kWh	total energy consumption of test run i for treatment z ($z = full, 1/2$)	ZA.5.7

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Symbol in this document	Symbol in IEC 62512:2012	Unit	Definition	Clause (first appearance)
x_i			the average reflectance value of the 4 individual readings for each of the 5 soil types on a stain test strip	ZA.6.3
$x_{i,z}$			is the value of test run i for treatment z ($z = full, 1/2$)	ZA.5.2
\bar{x}_z			average value for treatment z ($z = full, 1/2$)	ZA.5.2
z		-	treatment z ($z = full, 1/2$)	ZA.5.2
ϑ_a		°C	ambient temperature (test room) for the test run	ZA.6.3
ϑ_c		°C	laboratory supply cold water inlet temperature for the test run	ZA.6.3
ϑ_h		°C	laboratory supply hot water inlet temperature for the test run	ZA.6.3
ϑ_{max}		°C	Average maximum temperature for the test run	ZA.6.3
$\vartheta_{max,z}$		°C	Average maximum temperature of the washing cycle for treatment z ($z = full, 1/2$)	ZA.6.3
$\mu_{1/2}$		%	average value for final moisture content for treatment half	ZA.5.4
μ_f	μ_f	%	final moisture content	9.1
μ_{f0}	μ_{f0}	%	target final moisture content (given as 0 % in EU regulations)	8.3.3.1
μ_{full}		%	average value for final moisture content for treatment full	ZA.5.4
$\mu_{full,i}$		%	final moisture content for single test run i ($i = 1, 2, 3$) with full load	ZA.5.4
μ_{ip}	μ_{ip}	%	actual initial moisture content of the first partial load p of the base load after the washing cycle	8.3.3.2
μ		%	value for the final moisture content for the test series	ZA.5.4
$\mu_{part,i}$		%	final moisture content for single test run i ($i = 1, 2, 3, 4$) with half load (part = part A , part B)	ZA.5.4

4 Modifications to Clause 4, “Requirements”

In Clause 4, replace the entire text as follows:

4.1 General

The requirements shall be in accordance with Clause 4 of EN 60456:2016+A11:2020 and of EN 61121:2013+A11:2019 as appropriate.

4.2 Rated Capacity

The **rated washing-drying capacity** shall be declared by the manufacturer or supplier as the maximum mass of cotton textiles, to be washed and dried in a **wash and dry cycle** without interruption in kg at 0,5 kg intervals given in any user information.

The **rated washing-drying capacity** for any textile type shall not exceed the maximum mass of dry laundry, in kg, to be used in the **washer-dryer** in accordance with 3.1.9 of EN 60335-2-11:2010.

If the **rated washing-drying capacity** is not declared, it shall be deduced from the volume of the drum according to EN 61121:2013+A11:2019, Annex E.

If the household **washer-dryer** does not provide **continuous operation cycles**, the **rated washing-drying capacity** shall be the lowest value between the **rated washing capacity** and the **rated drying capacity**.

If the **rated drying capacity** in kg at 0,5 kg intervals is not declared, it shall be deduced from the volume of the drum according to EN 61121:2013 + A11:2019, Annex E.

If the **rated washing capacity** in kg at 0,5 kg intervals is not declared, it shall be deduced from the volume of the drum according to EN 60456:2016 + A11:2020, Annex N.

5 Modifications to Clause 5, “Test conditions, materials, equipment and instrumentation”

In 5.1, replace the entire text as follows:

"Test conditions, materials, equipment and instrumentation shall be in accordance with Clause 5 of EN 60456:2016 + A11:2020; however, 5.2.2 and 5.2.3 of the same standard are modified as follows."

In Clause 5, add the following subclauses:

5.2 Water supply

The water supply shall be in accordance with 5.2.2 of EN 60456:2016 + A11:2020.

5.3 Ambient temperature and humidity

Ambient temperature and humidity shall be in accordance with 5.2.3 of EN 61121:2013 + A11:2019.

5.4 Test materials

The specifications for base loads, stain test strips and detergent used for testing **washer-dryers** shall be in accordance with 5.3 of EN 60456:2016 + A11:2020.