

© Copyright SEK. Reproduction in any form without permission is prohibited.

Torktumlare för hushållsbruk – Funktionsprovning

*Tumble dryers for household use –
Methods for measuring the performance*

Som svensk standard gäller europastandarden EN 61121:2013. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61121:2013.

Nationellt förord

Europastandarden EN 61121:2013

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61121, Fourth edition, 2012 - Tumble dryers for household use -
Methods for measuring the performance**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61121, utgåva 3, 2005, gäller ej fr o m 2015-12-31.

ICS 97.060.00

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: SEK, Box 1284, 164 29 KISTA
Telefon: 08 - 444 14 00. Telefax: 08 - 444 14 30
E-post: sek@elstandard.se. Internet: www.elstandard.se

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

English version

**Tumble dryers for household use -
Methods for measuring the performance**
(IEC 61121:2012, modified)

Sèche-linge à tambour à usage
domestique -
Méthodes de mesure de l'aptitude à la
fonction
(CEI 61121:2012, modifiée)

Wäschetrockner für den Hausgebrauch -
Verfahren zur Messung der
Gebrauchseigenschaften
(IEC 61121:2012, modifiziert)

This European Standard was approved by CENELEC on 2012-12-31. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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 European Standard 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

This document (EN 61121:2013) consists of the text of IEC 61121:2012 prepared by IEC/SC 59D "Home laundry appliances" of IEC/TC 59 "Performance of household and similar electrical 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 (dop) 2013-12-31
at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting (dow) 2015-12-31
with this document have to be withdrawn

This document supersedes EN 61121:2005.

EN 61121:2013 includes the following significant technical changes with respect to EN 61121:2005:

- a) a test procedure for a combined test sequence of full and **partial load** was introduced;
- b) a test procedure for measuring power consumption in low power modes is introduced;
- c) a formula to calculate the energy consumption of **tumble dryers** including low power modes was added;
- d) control procedures for checking measured values in comparison to values declared by the manufacturer under consideration of permitted tolerances are updated.

Clauses, subclauses, notes, tables and figures which are additional to those in IEC 61121:2012 are prefixed "Z".

Words in **bold** in the text are defined in Clause 3.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

This European Standard specifies, as far as necessary, the test methods which shall be applied in accordance with the COMMISSION DELEGATED REGULATION (EU) No 392/2012 implementing Directive 2010/30/EU the European Parliament and of the Council with regard to energy labelling of household **tumble dryers** and in accordance with the COMMISSION REGULATION (EU) No 932/2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household **tumble dryers**.

The procedures described in this European Standard were modified substantially compared to the previous version, e.g. with regard to **partial load**. Therefore, results of tests according to this standard cannot and shall not be directly compared to results of similar procedures of previous versions. In addition, results based on a specific reference **programme** shall not be compared to results based on other reference programs.

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 European Standard.

Annex ZB provides control procedures for checking measured values in comparison to values declared by the manufacturer under consideration of permitted tolerances.

Annex ZC lists normative references.

Endorsement notice

The text of the International Standard IEC 61121:2012 was approved by CENELEC as a European Standard with agreed common modifications

Annex ZC
(normative)

**Normative references to international publications
with their corresponding European publications**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60335-2-11 (mod)	2008	Household and similar electrical appliances - Safety - Part 2-11: Particular requirements for tumble dryers	EN 60335-2-11	2010
IEC 60456 (mod) + corr. September	2010 2011	Clothes washing machines for household use - Methods for measuring the performance	EN 60456 + AC	2011 2011
IEC 60704-1	-	Household and similar electrical appliances – Test code for the determination of airborne noise - Part 1: General requirements	EN 60704-1	-
IEC 60704-2-6	-	Household and similar electrical appliances – Test code for the determination of airborne acoustical noise - Part 2-6: Particular requirements for tumble dryers	EN 60704-2-6	-
IEC 60704-3	-	Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 3: Procedure for determining and verifying declared noise emission values	EN 60704-3	-
IEC 60734	2012	Household electrical appliances - Performance - Water for testing	EN 60734	2012
IEC 62053-21	2003	Electricity metering equipment (a.c.) - Part 21: Static meters for active energy (classes 1 and 2)	EN 62053-21	2003
IEC 62301 (mod)	2011	Electrical and electronic Household and office equipment - Measurement of low power consumption	EN 50564	2011
ISO 5167-1	2003	Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 1: General principles and requirements	EN ISO 5167-1	2003

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 80000-1 + corr. 1	2009 2011	Quantities and units - Part 1: General	EN ISO 80000-1	- 1)

1) To be published.

CONTENTS

INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and symbols	8
3.1 Terms and definitions	8
3.2 List of symbols	12
4 Requirements	13
4.1 General	13
4.2 Rated capacity	13
4.3 Dimensions	14
5 Test conditions, materials, equipment and instrumentation	14
5.1 General	14
5.2 Ambient conditions	14
5.2.1 Electricity supply	14
5.2.2 Water supply	15
5.2.3 Ambient temperature and humidity	16
5.3 Test materials	16
5.3.1 General	16
5.3.2 Test loads	16
5.3.3 Detergents.....	17
5.4 Equipment	17
5.4.1 Equipment for normalization	17
5.4.2 Equipment for conditioning the test load	17
5.4.3 Equipment for wetting the test load prior to a test	17
5.4.4 Other equipment.....	17
5.5 Instrumentation and accuracy.....	18
6 Preparation for testing	18
6.1 General	18
6.2 Installation of the tumble dryer	18
6.3 Preparation of the tumble dryer for a test series	19
6.4 Preparation of the tumble dryer for a test run	19
6.5 Preparation of test loads	19
6.5.1 General	19
6.5.2 Pre-treatment of new test load items prior to use	20
6.5.3 Requirements regarding the age of test load items	20
6.5.4 Normalization of test load items	20
6.5.5 Conditioning of test load items.....	21
6.5.6 Test load composition.....	22
6.5.7 Wetting.....	24
7 Performance measurements – General requirements	24
8 Tests for performance	25
8.1 General	25
8.2 Test procedure for performance tests	25
8.2.1 Test conditions, materials and preparation for testing	25
8.2.2 Programme.....	25

8.2.3	Test load	26
8.2.4	Test procedure	26
8.2.5	Validity of a test run.....	26
8.2.6	Validity of a test series	27
8.3	Measurements to determine water and energy consumption and programme time.....	27
8.3.1	General	27
8.3.2	Procedure.....	28
8.4	Measurements to determine condensation efficiency	28
8.4.1	General	28
8.4.2	Procedure.....	28
8.5	Measurements to determine evenness of drying	28
8.5.1	General	28
8.5.2	Procedure.....	28
8.6	Measurements to determine exhaust air volume	29
9	Assessment of performance	29
9.1	General	29
9.2	Final moisture content of the load.....	29
9.3	Corrected electrical energy consumption	30
9.4	Corrected water consumption	30
9.5	Corrected programme time	31
9.6	Condensation efficiency	32
9.7	Evenness of drying.....	32
9.8	Exhaust air volume.....	33
10	Data to be reported	33
Annex A (normative)	Reference list.....	34
Annex B (normative)	Nominal and standard exhaust duct for tumble dryer testing.....	35
Annex C (informative)	Flow diagrams.....	38
Annex D (normative)	Test report – data to be reported.....	40
Annex E (normative)	Procedure to determine test load size where rated capacity is not declared	44
Annex F (normative)	Flexible initial moisture content method	45
Annex G (informative)	Assessment of evenness of drying	47
Annex H (informative)	Measurement of exhaust air volume	48
Bibliography.....		50
Figure B.1	– Pressure/volumetric air flow curve	35
Figure B.2	– Standard exhaust duct (dimensions are in millimetres).....	36
Figure B.3	– Standard exhaust simulator (dimensions are in millimetres).....	37
Figure C.1	– Decision chart illustrating the requirements for a valid test series for automatic tumble dryers.....	38
Figure C.2	– Decision chart illustrating the requirements for a valid test series for non automatic tumble dryers.....	39
Figure H.1	– Suction chamber setup	49
Table 1	– List of symbols	12
Table 2	– Specification of instruments	18

Table 3 – Number of items in the cotton test load for various test load masses	22
Table 4 – Number of items in the synthetic/blends test load for various test load masses	23
Table 5 – Specifications for initial moisture content in the test load.....	24
Table 6 – Specification for final moisture content of the test load after drying	26
Table D.1 – Identification data	40
Table D.2 – Test measurements	41
Table D.3 – Test conditions and materials	43
Table D.4 – Weighted average age – Cotton load	43

INTRODUCTION

This fourth edition has been developed in light of experience with use of the third edition of IEC 61121. The structure has been revised to ensure that this remains harmonised with the IEC 60456:2010 for clothes washers.

TUMBLE DRYERS FOR HOUSEHOLD USE – METHODS FOR MEASURING THE PERFORMANCE

1 Scope

This International Standard is applicable to household electric **tumble dryers** of the **automatic** and **non-automatic** type, with or without a cold water supply and incorporating a heating device. This excludes **tumble dryers** which use gas or other fuels as a heating source.

The object is to state and define the principal performance characteristics of household electric **tumble dryers** of interest to users and to describe standard methods for measuring these characteristics.

NOTE This International Standard applies also to **tumble dryers** for communal use in blocks of flats or in launderettes. It does not apply to **tumble dryers** for commercial laundries.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60335-2-11:2008, *Household and similar electrical appliances – Safety – Part 2-11: Particular requirements for tumble dryers*

IEC 60456:2010, *Clothes washing machines for household use – Methods for measuring the performance*

IEC 60734:-1, *Household electrical appliances – Performance – Water for testing*

IEC 62053-21:2003, *Electricity metering equipment (a.c.) – Particular requirements – Part 21: Static meters for active energy (classes 1 and 2)*

IEC 62301:2011, *Household electrical appliances – Measurement of standby power*

ISO 5167-1:2003, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full – Part 1: General principles and requirements*

ISO 80000-1:2009, *Quantities and units – Part 1: General*

¹ To be published.