

**Kodumajapidamises ja sarnastes oludes kasutatavad elektriseadmed. Katsenormid õhumüra määramiseks. Osa 2-4: Erinõuded pesumasinadele ja tsentrifuugidele**

**Household and similar electrical appliances - Test code for the determination of airborne acoustical noise - Part 2-4: Particular requirements for washing machines and spin extractors**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 60704-2-4:2012 sisaldab Euroopa standardi EN 60704-2-4:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 60704-2-4:2012 consists of the English text of the European standard EN 60704-2-4:2012.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 01.06.2012.	Date of Availability of the European standard is 01.06.2012.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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English version

**Household and similar electrical appliances -  
Test code for the determination of airborne acoustical noise -  
Part 2-4: Particular requirements for washing machines and spin  
extractors  
(IEC 60704-2-4:2011, modified)**

Appareils électrodomestiques et  
analogues -  
Code d'essai pour la détermination du  
bruit aérien -  
Partie 2-4: Exigences particulières pour  
les machines à laver le linge et les  
essoreuses centrifuges  
(CEI 60704-2-4:2011, modifiée)

Elektrische Geräte für den Hausgebrauch  
und ähnliche Zwecke -  
Prüfvorschrift für die Bestimmung der  
Luftschallemission -  
Teil 2-4: Besondere Anforderungen an  
Waschmaschinen und Wäscheschleudern  
(IEC 60704-2-4:2011, modifiziert)

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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.

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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 59D/379/CDV, future edition 3 of IEC 60704-2-4, prepared by IEC/SC 59D, "Home laundry appliances", of IEC TC 59, "Performance of household electrical appliances", was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60704-2-4:2012.

A draft amendment, which covers common modifications to IEC 60704-2-4 (59D/379/CDV), was prepared by CLC/TC 59X "Performance of household and similar electrical appliances" and approved by CENELEC.

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) 2013-04-13
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2015-04-13

This document supersedes EN 60704-2-4:2001.

EN 60704-2-4:2012 includes the following significant technical changes with respect to EN 60704-2-4:2001:

- measurement uncertainty and standard deviations are taken into account,
- definitions of standard test load and standard test program are modified,
- test enclosure was replaced by common test enclosure defined in Part 1,
- information to be reported is modified.

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

EN 60704-2-4 is intended to be used in conjunction with EN 60704-1:2010, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 1: General requirements*.

NOTE When "Part 1" is mentioned in this standard, it refers to EN 60704-1.

The relevant text of Part 1 as amended by this publication establishes the test code for washing machines and spin extractors.

EN 60704-2-4 supplements or modifies the corresponding clauses in EN 60704-1. When a particular subclause of Part 1 is not mentioned in EN 60704-2-4, that subclause is applicable as far as reasonable. Where this standard states "addition", "modification" or "replacement", the relevant requirements, test specifications or explanatory matter in Part 1 should be adapted accordingly.

Subclauses, tables and figures that are additional to those in Part 1 are numbered starting from 101. Additional annexes are lettered AA, BB, etc.

Unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause.

### **Endorsement notice**

The text of the International Standard IEC 60704-2-4:2011 was approved by CENELEC as a European Standard with agreed common modifications.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

*Addition to EN 60704-1:2010:*

IEC 60704-2-6      NOTE    Harmonized as EN 60704-2-6.

## COMMON MODIFICATIONS

### 6 Operation and location of appliance under test

#### 6.101 Standard test programme for noise measurements

*Replace this clause by the following:*

The standard test programme for noise measurements is the standard 60 °C cotton programme for normally soiled load provided by the manufacturer in the instruction manual.

If this programme is not available, then the most efficient 60 °C cotton programme for normally soiled load without pre-wash according to the manufacturer's instructions shall be used. Other special options shall be deselected.

Highest available spin speed is to be chosen.

The standard test programme for noise measurements is carried out without detergent.

#### 6.102.1 General

*Replace this clause by the following:*

The standard test load for noise measurements of washing machines consist of conditioned cotton test load at a weight close to, but in any case not more than, the rated capacity.

To minimize the influence of changes in the characteristics of the cotton test load items with increasing age, the standard test load shall consist of cotton test load items which are well distributed in age to give an average age of the standard test load between 30 and 50 runs of the standard test programme. The number of items or average age shall not be adjusted during a test series.

The average age of the standard test load is calculated as follows:

$$\bar{A} = \frac{1}{\sum n_i} \times \sum n_i \times a_i$$

where

$a_i$  is the age of a single cotton test load item as the number of test runs after pre-treatment as defined in 6.102.2;

$n_i$  is the number of cotton test load items of the same age;

$\bar{A}$  is the average age of the standard test load expressed as the number of test runs.

Cotton test load items shall undergo normalisation as defined in 6.102.3 at least after have been used 10 runs of the standard test programme.

No test load item shall be used for more than 80 runs of the standard test programme, excluding pre-treatment runs prior to initial use and normalisation runs.

## Annex ZA (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.

*Addition to EN 60704-1:2010 :*

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60456 (mod)	2010	Clothes washing machines for household	EN 60456	2011
+ corr. September	2011	use - Methods for measuring the performance	+ AC	2011

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## INTRODUCTION

The measuring conditions specified in this Part 2-4 provide for sufficient accuracy in determining the noise emitted and comparing the results of measurements taken by different laboratories, whilst simulating as far as possible the practical use of household washing machines and spin extractors.

It is recommended to consider the determination of noise levels as part of a comprehensive testing procedure covering many aspects of the properties and performance of household washing machines and spin extractors.

NOTE As stated in the introduction to IEC 60704-1, this test code is concerned with airborne noise only.

# HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – TEST CODE FOR THE DETERMINATION OF AIRBORNE ACOUSTICAL NOISE –

## Part 2-4: Particular requirements for washing machines and spin extractors

### 1 Scope and object

This clause of Part 1 is applicable except as follows:

#### 1.1 Scope

##### 1.1.1 General

*Addition:*

These particular requirements apply to single unit electrical washing machines and the washing and spinning function of combined appliances for household and similar use and to spin extractors for household and similar use.

NOTE 101 For drying function, see IEC 60704-2-6.

##### 1.1.2 Types of noise

*Replacement:*

The methods specified in ISO 3743-1, ISO 3743-2 and ISO 3744 can be used for measuring noise emitted by washing machines and spin extractors.

##### 1.1.3 Size of the source

*Replacement:*

The method specified in ISO 3744 is applicable to noise sources of any size. When applying ISO 3743-1 and ISO 3743-2, care should be taken that the maximum size of the washing machine or spin extractor under test fulfils the requirements specified in 1.3 of ISO 3743-1 and ISO 3743-2.

### 1.2 Object

*Addition:*

Requirements for the declaration of noise emission values are not within the scope of this standard.

NOTE 101 For determining and verifying noise emission values declared in product specifications, see IEC 60704-3.

### 1.3 Measurement uncertainty

*Replacement:*

For washing machines the estimated values of standard deviations of sound power levels, determined according to this standard, are as indicated in Table 101:

**Table 101 – Standard deviations of sound power levels for washing machines**

Standard deviation (dB)	
$\sigma_r$ (repeatability)	$\sigma_R$ (reproducibility)
0,6	1,0

For spin extractors the estimated values of standard deviations of sound power levels, determined according to this standard, are as indicated in Table 102:

**Table 102 – Standard deviations of sound power levels for spin extractors**

Standard deviation (dB)	
$\sigma_r$ (repeatability)	$\sigma_R$ (reproducibility)
0,5	1,0

### 1.101 Standard deviation for declaration and verification

For the purpose of determining and verifying declared noise emission values for washing machines according to IEC 60704-3, the values indicated in Table 103 apply:

**Table 103 – Standard deviations for declaration and verification for washing machines**

Standard deviation (dB)		
$\sigma_P$ (production)	$\sigma_t$ (total)	$\sigma_M$ (reference)
1,0 to 2,2	1,4 to 2,4	2,5

For the purpose of determining and verifying declared noise emission values for spin extractors according to IEC 60704-3, the values indicated in Table 104 apply:

**Table 104 – Standard deviations for declaration and verification for spin extractors**

Standard deviation (dB)		
$\sigma_P$ (production)	$\sigma_t$ (total)	$\sigma_M$ (reference)
1,0 to 1,2	1,4 to 1,6	2,0

## 2 Normative references

This clause of Part 1 is applicable except as follows:

*Addition:*

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

## 3 Terms and definitions

This clause of Part 1 is applicable except as follows:

### 3.101

#### washing machine

appliance for cleaning and rinsing of textiles using water which may also have a means of extracting excess water from the textiles