

INTERNATIONAL STANDARD

IEC 61855

First edition
2003-01

Household electrical hair care appliances – Methods of measuring the performance

*Appareils électrodomestiques destinés aux soins
des cheveux –
Méthodes de mesure de l'aptitude à la fonction*
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD ELECTRICAL HAIR CARE APPLIANCES –
METHODS FOR MEASURING THE PERFORMANCE**

FOREWORD

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International Standard IEC 61855 has been prepared by IEC technical committee 59: Performance of household electrical appliances.

The text of this standard is based on the following documents:

FDIS	Report on voting
59/307/FDIS	59/318/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2005-04. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This standard does not deal with hair care appliances with radiant heating or with helmet dryers (see Scope) for the following reasons:

- the test methods are likely to be complicated and expensive and they might not be sufficiently repeatable;
- suitable and or proven test methods are not known at present;
- developing of test methods for these appliances will incur considerable costs;
- the market shares of these appliances are rather small.

National Committees who consider that hair care appliances with radiant heating and helmet dryers should be included into maintenance activities are requested to submit proposals suitable for the corresponding test method.

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HOUSEHOLD ELECTRICAL HAIR CARE APPLIANCES – METHODS FOR MEASURING THE PERFORMANCE

1 Scope

This International Standard applies to electrical appliances for household and similar use for drying and styling hair (including their accessories).

This standard defines the main performance characteristics that are of interest to the user and specifies methods of measuring these characteristics.

The measuring procedures are developed for comparable tests.

This standard does not specify requirements for performance.

This standard does not cover hair care appliances with radiant heating, helmet-type dryers or cutting devices.

NOTE 1 This standard does not deal with safety requirements (IEC 60335-2-23).

NOTE 2 Due to the influence of environmental conditions, variations in time, origin of test materials and proficiency of the operator, most of the described test methods will give more reliable results when applied for comparative testing of a number of appliances at the same time, in the same laboratory and by the same operator.

2 Normative references (standards.iteh.ai)

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

IEC 60584-2, *Thermocouples – Part 2: Tolerances*

IEC 60704-2-9, *Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 2-9: Particular requirements for electrical hair care appliances*¹

IEC 61254, *Electric shavers for household use – Methods for measuring the performance*

IEC/TR 61592, *Household electrical appliances – Guidelines for consumer panel testing*

ISO 2267:1986, *Surface active agents – Evaluation of certain effects of laundering- Methods of preparation and use of unsoiled cotton control cloth*

3 Definitions

For the purpose of this document, the following definitions apply.

3.1

hairstyling appliance

appliance for styling or curling hairs

NOTE Hairstyling appliances may comprise brushes and combs.

¹ To be published.

**3.2
hairstyling appliance with warm air**

hairstyling appliance in which a stream of warm air is produced for drying and styling the hair

**3.3
curling appliance**

appliance in which heat is produced for styling dry hair.

NOTE The hair may contain a small quantity of residual moisture.

**3.4
curling set**

set of rollers that can be heated for styling hair.

**3.5
concentrator**

accessory for directing the air flow.

**3.6
diffuser**

accessory providing a wide distribution of the airflow.

NOTE For the purposes of this standard, a volumiser is considered to be a diffuser.

**3.7
rated voltage**

voltage assigned to the appliance by the manufacturer.

**3.8
rated frequency**

frequency assigned to the appliance by the manufacturer.

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4 List of measurements and tests

Depending on the appliance, the following measurements or tests shall be carried out, as appropriate:

- mass, according to 6.1;
- length of the flexible cord, according to 6.2;
- power input, according to 6.3;
- heating-up time, according to 6.4;
- temperatures, according to 6.5;
- air flow of hand-held hairdryers and hairstyling appliances with warm air, according to 6.6;
- drying rate, according to 6.7;
- attachment of accessories, according to 6.8;
- ease of handling, according to 6.8.2;
- features, according to clause 8;
- instructions for use, according to clause 9;
- airborne acoustical noise, according to clause 7;
- drop test according to 6.9.

5 General conditions for measurements

Unless otherwise specified, the tests are carried out under the conditions of 5.1 to 5.5.

5.1 General

The measurements are made with controls adjusted to their highest setting and when steady conditions according to 5.4 are established.

5.2 Test room

The tests are carried out in a substantially draught-free room. The ambient temperature is maintained at (23 ± 2) °C.

5.3 Power supply

The tests are carried out at the rated voltage ± 1 % and the rated frequency ± 1 %.

If a voltage or a frequency range is specified by the manufacturer the appliance is to be supplied at the nominal voltage and at the nominal frequency of the country in which the appliance is intended to be used. In this case the test voltage and frequency shall be stated in the report.

5.4 Steady conditions

For hand-held hairdryers and hairstyling appliances with warm air, steady conditions are considered to be established 10 min after switching on the appliance.

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For other appliances steady conditions are considered to be established 20 min after switching on the appliance or when the thermostat has operated four times, if this occurs first.

5.5 Thermocouples

The thermocouples shall:

- be of class 1 according to IEC 60584-2;
- be accurate to $\pm 1,5$ K;
- have a nominal diameter of 0,25 mm.

6 Measurements

6.1 Mass of the appliance

The mass of the appliance is determined including the flexible cord but excluding any accessory.

The mass of each accessory is measured separately.

The results are expressed in kg to the nearest 0,01 kg.

6.2 Length of the flexible cord

The length of the flexible cord is measured between the point where the cord or cord guard enters the appliance and the cord entry point of the plug. Coiled cords are stretched with a pull of 10 N before measurement. The length is expressed in metres rounded down to the nearest 0,05 m.

[IEC 61254, 5.3, modified]

6.3 Power input

The power input of the appliance is measured at rated voltage without any accessory, in accordance with 5.3. The accuracy of power-measurement is to be within ± 1 %.

The power input is expressed in watts, rounded off to the nearest integer.

6.4 Heating-up times

6.4.1 Hand-held hairdryers

Not applicable.

6.4.2 Curling appliances

The heating up time of curling appliances is the time taken for the temperature rise of the barrel to reach 100 K, measured in accordance with 6.5.3.1. The time is expressed in minutes and seconds.

NOTE This temperature rise implies a temperature of approximately 120 °C which is considered to be the minimum temperature necessary for styling of dry hair.

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6.4.3 Curling set

Under consideration.

6.4.4 Other hair styling appliances

Under consideration.

6.5 Temperatures

6.5.1 General

The test methods are only applicable for comparative testing, except for the tests according to 6.5.2 and 6.5.3.1, which are considered to be reproducible.

6.5.2 Outlet air temperature of hand-held hairdryers

Controls are adjusted to obtain the highest outlet air temperature measured using the device as described in Figures 2 and 3. The temperature is measured within 30 s after steady conditions have been reached, in accordance with 5.4.

The measured outlet air temperature T_i of each measurement is the mean value of the five measuring points with the highest values and is expressed in °C, rounded off to one decimal place. The accuracy of measurement is to be within ± 3 K.

In order to compensate the variation of the ambient temperature the measured outlet air temperature T_i has to be corrected according to formula (1):

$$T_{i,\text{comp}} = T_i - T_{\text{act amb}} + 23 \quad [^{\circ}\text{C}] \quad (1)$$

where

$T_{i,\text{comp}}$ is the compensated outlet air temperature;

$T_{\text{act amb}}$ is the actual ambient temperature measured 100 mm from the air inlet side of the appliance immediately before switching it on;

23 is the nominal ambient temperature in $^{\circ}\text{C}$.

The distance between the device and the the air outlet is:

- without attachments: 25 and 100 mm, as shown in Figure 4a;
- with a concentrator: 100 mm, as shown in Figure 4b;
- with a diffuser: 50 mm, as shown in Figure 4c.

The measurement without attachments has to be carried out three times. The mean value out of these three measurements is the final outlet temperature and is calculated from formula (2):

$$T_{\text{fin}} = \frac{T_{1,\text{comp}} + T_{2,\text{comp}} + T_{3,\text{comp}}}{3} \quad [^{\circ}\text{C}] \quad (2)$$

NOTE Three measurements are needed to achieve a sufficient reproducibility of the drying rate.

The test can be repeated with the control adjusted to lower settings, if any, except for supplying cold air.

6.5.3 Hair styling appliances

6.5.3.1 Temperature of the barrel of curling appliances

The appliance is positioned horizontally and at a distance of at least 100 mm from the test floor.

Five thermocouples are evenly distributed along the longitudinal edge at the top of the curling barrel (see Figure 5) on the side away from the test floor. The thermocouples are not placed under the curling tongue.

The temperature is the mean value of the three measuring points with the highest values and is expressed in $^{\circ}\text{C}$. This temperature shall be corrected according to formula (1) in 6.5.2. The ambient temperature is to be measured in a distance of 100 mm behind the handle immediately before switching on the appliance.

6.5.3.2 Outlet air temperature of hairstyling appliances with warm air

The appliance is placed in a horizontal position over the thermocouple grid, specified in Figures 2 and 3. The appliance is centred with its axis parallel to the line of measuring points 2 and 52, the distance between the grid and the surface of the barrel holding the brush being 15 mm. The appliance is rotated about its horizontal axis to find out the position giving rise to the highest temperatures.

NOTE A brush is used for disentangling and/or shaping the hair.

The controls are adjusted to give the highest outlet air temperature, which is measured when steady conditions are established.