



## TECHNICAL REPORT

**No. : 42231**

Client Electrical Safety Council  
1.10, Canterbury Court  
1-3 Brixton Road  
London SW9 6DE

Client contact Stephen Curtler

Scope of report Safety Screening of Health and Beauty Products  
-Hair Dryers

Sample/s tested / Condition 4 samples / new, boxed

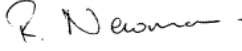
Reference Standards **EN 60335-2-23:2003 + A1:08** used with  
**EN 60335-1:2002 +A11:04 +A1:04 +A12:06 +A2:06 +A13:08 +A14:10**


Date sample received 11 January 2011

Test period 11 January 2011 to 14 January 2011

Date of issue 14 February 2011

Tests carried out at 20 ± 5°C

Testing Officer  Richard Newman

Verified by  Peter Cross

Form No: QF102-2  
Issue No: 1  
Issue Date: 03.08.07



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THIS REPORT APPLIES ONLY TO THE PARTICULAR SAMPLE UNIT(S) TESTED AND TO THE SPECIFIC TESTS CARRIED OUT AS DETAILED IN THIS REPORT.

## Introduction

The Electrical Safety Council established a safety screening testing project for household electrical health and beauty products, (see appendix A), and commissioned Nemko Ltd to carry out electrical safety screening tests on four hairdryers, purchased by the Council, under the general safety provisions of the following safety standards:-

### **EN 60335-1:2002 +A11:04 +A1:04 +A12:06 +A2:06 +A13:08 +A14:10**

Household and similar electrical appliances – Safety  
Part 1: General requirements

### **EN 60335-2-23:2003 +A1:08**

Household and similar electrical appliances – Safety –  
Part 2-23: Particular requirements for appliances for skin or hair care

The hair dryers tested are listed below and illustrated on page 3.

The electrical safety screening tests have been carried out under various headings taken from EN 60335-1 with some additions and consist of inspections and measurement with limited testing. Nemko engineers applied their professional judgement in deciding upon the limited tests carried out and it must be stressed that full testing to the above safety standards is outside the scope of this project.

## Summary

One of the instruction leaflets did not include all the text contained in Clause 7.12 EN60335-1. The product also had mechanical failures. One of the products is decorated like a toy. Two of the products were deemed to pass but with observations detailed in the report

The table below contains the sample details and the assessment results.

<u>Sample Code</u>	<u>Description</u>		<u>Assessment result</u>
03	Hairdryer 1200W	Basic model	Fail
04	Hairdryer 2000W	High performance	Pass*
05	Hairdryer 1400W	Basic model	Pass*
06	Hairdryer 1800W	Ionic.	Fail

\* denotes generally "PASS" but with observations in report details section

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## Project Samples

The following four samples were selected for testing under this project:

**Sample code 03**



**Sample code 04**



**Sample code 05**



**Sample code 06**



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## Electrical Safety Screening Tests – Report Details

Hairdryer 1200W – Basic Model (Sample code 03)



### Test summary

Safety Criteria	Results
Plug and fuse	Fail
Classification	Pass
Initial operation	Pass
Marking and instructions	Pass*
Protection against access to live parts	Pass
Power input and current	Pass
Heating	Pass
Leakage current and electric strength	Pass
Abnormal operation	Pass
Mechanical strength	Pass
Construction	Fail
Internal wiring	Pass
Supply connection and external flexible cords	Pass
Provision for earthing	Pass
Clearance, creepage distances and solid insulation	Pass

### **Additional Heading**

Components	Pass
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### Details of non-compliance

- Plug and Fuse. The live pin was noticeably loose and was tested on a test jig (N544) according to BS1363-1 clause 12.12. The movement was excessive at 3.5°. Maximum allowed is 3°.

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### Construction

- The hairdryer is bright purple and decorated with cartoon characters. The box is also brightly coloured with cartoon characters. There is a note on the box saying 'This is not a toy' but in very small letters only 1.5mm high. There are ample warnings in the instructions for adult supervision and 'Children should not play with the appliance'. However it is considered that the basic design of the product would make it an attractive plaything for young children. Enclosures that are 'shaped or decorated like a toy' are not permitted by EN60335-1 clause 22.44

**Observation.** (denoted by \* in above table) The substance of 'If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard' is missing from the instruction leaflet.

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**Hairdryer 2000W. High performance** (Sample code 04)



**Test summary**

Safety Criteria	Results
Plug and fuse	Pass
Classification	Pass
Initial operation	Pass
Marking and instructions	Pass*
Protection against access to live parts	Pass
Power input and current	Pass
Heating	Pass
Leakage current and electric strength	Pass
Abnormal operation	Pass
Mechanical strength	Pass
Construction	Pass
Internal wiring	Pass
Supply connection and external flexible cords	Pass
Provision for earthing	Pass
Clearance, creepage distances and solid insulation	Pass

**Additional Heading**

Components	Pass
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**Observation** (denoted by \* in above table)

- The markings on the handle are correct but they are moulded into the handle and are the same colour as the appliance making them difficult to read.

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Hairdryer 1400W. Basic model (Sample code 05)



## Test summary

Safety Criteria	Results
Plug and fuse	Pass
Classification	Pass
Initial operation	Pass
Marking and instructions	Pass
Protection against access to live parts	Pass
Power input and current	Pass
Heating	Pass
Leakage current and electric strength	Pass
Abnormal operation	Pass
Mechanical strength	Pass
Construction	Pass
Internal wiring	Pass
Supply connection and external flexible cords	Pass
Provision for earthing	Pass
Clearance, creepage distances and solid insulation	Pass

## **Additional Heading**

Components	Pass*
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## Observations (denoted by \* in above table)

- The mains switch appears fit for purpose but does not have any third party approval markings.

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**Hairdryer 1800W. Ionic** (Sample code 06)



**Test summary**

Safety Criteria	Results
Plug and fuse	Pass
Classification	Pass
Initial operation	Pass
Marking and instructions	Pass*
Protection against access to live parts	Pass
Power input and current	Fail
Heating	Pass
Leakage current and electric strength	Pass
Abnormal operation	Pass
Mechanical strength	Fail
Construction	Pass
Internal wiring	Pass
Supply connection and external flexible cords	Pass
Provision for earthing	Pass
Clearance, creepage distances and solid insulation	Pass

**Additional Heading**

Components	Pass
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**Details of non-compliances**

Marking and instructions. Only part of the requirement for clause 7.12 is included. ‘*This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.*

- The substance of ‘*If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard*’ is missing from the instruction leaflet.



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Power input and Current The product is rated at 1800W at 230V and the measured power is only 1523W at 230V which is a -15.3% difference. The standard only allows a -10% difference.

- Mechanical strength The product failed the drop test as per clause 21.101 (EN60335-2-23). On the third drop, the cover over the ionic outlets was dislodged exposing the ionic electrodes. This is not a consumer removable part. The ionic module generates  $2.5\text{kV} \pm 0.5\text{kV}$  which could be a hazard. Internal circuitry (ELV) is also exposed. The cover is glued in place and the glue bond was broken.

----- End of Report -----

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## Appendix A

### Electrical Safety Council Screening Test for Household Health and Beauty Products

#### **Plug and fuse**

Check for fitting of approved plug and fuse link including counterfeit indications. Visual inspection and measurement of essential plug pin and fuse link dimensions.

#### **Classification**

Confirm the classification, as defined in the standard.

#### **Initial operation**

A functional test is required to establish whether the product operates, as intended by the manufacturer and as described in the user instructions.

#### **Marking and instructions**

Confirm the presence of standard markings either on the product or the rating label, or both. User instructions must also be checked for the presence of standard warnings, in particular EN 60335-1, clause 7.12, referring to the use of products by persons (including children) with reduced physical, sensory or mental capabilities etc.

#### **Protection against access to live parts**

Inspection for access to live parts particularly after removal of detachable parts.

#### **Power input and current**

Measurement required confirming that product is within standard permissible power input and current deviations.

#### **Heating**

Limited to the measurement, under steady state conditions, for hotplates of hair straightening irons and curling tongs only.

#### **Leakage current and electric strength**

Testing required determining adequate electrical insulation properties.

#### **Abnormal operation**

This may consist of very limited testing perhaps ensuring only that the thermal cut-out operates in a hairdryer as an example.

#### **Mechanical strength**

Carry out impact testing on parts liable to be weak with emphasis on mould lines. The drop test of EN 60335-2-23, clause 21.101 may also be required.

#### **Construction**

Inspection is required confirming the product can be properly assembled and connected with particular comments required in the following areas:

Construction of swivel connections with consideration to the environment in which they may be used.

Amendment A2 modifies EN 60335-1, clause 22.32 and states that *“insulating material in which heating conductors are embedded is considered to be basic insulation and not reinforced insulation”*. Hair straightening irons are to be examined and tested for evidence of adequate supplementary insulation.

Clause 22.44 states that *“appliances shall not have an enclosure that is shaped or decorated like a toy”*. A decision is required against this clause.

#### **Internal wiring**

Basic inspection only.

#### **Supply connection and external flexible cords**

Inspect for marking of cross sectional area and measure conductors in cases of doubt. For products having a swivel connection, the additional requirements in EN 60335-2-23, clause 25.14 and 25.15 may be required.

#### **Provision for earthing**

Check essential earthing requirements, although it is expected that the products will be class II in construction.

#### **Clearance, creepage distances and solid insulation**

Inspection with measurement only in cases of doubt.

Particular emphasis is required under EN 60335-1, clause 29.3, which states that *“supplementary insulation and reinforced insulation shall have adequate thickness, or have a sufficient number of layers, to withstand the electrical stresses that can be expected during the use of the appliance”*.