TECHNICAL REPORT

IEC TR 61592

Second edition
2003-05

Household electrical appliances – Guidelines for consumer panel testing

Appareils électrodomestiques –
Guide pour les essais avec utilisateurs

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD ELECTRICAL APPLIANCES – GUIDELINES FOR CONSUMER PANEL TESTING

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example “state of the art”.

IEC 61592, which is a technical report, has been prepared by IEC technical committee 59: Performance of household electrical appliances.

This second edition cancels and replaces the first edition published in 1996. It constitutes a revision mainly concerning ease of handling and needs of older persons and people with disabilities (ISO/IEC Guide 71).

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
59/294/DTR	59/321/RVC

Full information on the voting for the approval of this technical report 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 2006. At this date, the publication will be

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

INTRODUCTION

Panel testing can be an important tool both for overall as well as partial evaluation of products, since the results directly reflect practical aspects which are of interest to the user. Panel testing should be used to complement technical tests and physical measurements, if any, which are often more abstract for the consumer.

In general, panel testing can be used when

– technical tests are not considered sufficiently;

– an assessment of overall performance is needed;

– characteristics requiring a degree of human involvement have to be evaluated (e.g. handling, cleaning, ergonomic, instructions for use).

These guidelines are to be used as a checklist in determining when and how to apply panel testing and how to avoid the most obvious pitfalls.

Panel testing generally gives information at the time of the test. Comparison is possible with previous or parallel tests only when at least a reference sample and a particular methodology are used.

HOUSEHOLD ELECTRICAL APPLIANCES – GUIDELINES FOR CONSUMER PANEL TESTING

1 Scope

This Technical Report applies to panel testing of household electrical appliances within the scope of IEC technical committee 59: Performance of household electrical appliances.

NOTE The provisions in this Standard can also be used to evaluate other kind of products.

2 Normative references

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.

ISO/IEC Guide 14, *Product information for consumers*

ISO/IEC Guide 37, *Instructions for use of products of consumer interest*

ISO/IEC Guide 46, *Comparative testing of consumer products and related services – General principles*

ISO/IEC Guide 71, *Guidelines for standards developers to address the needs of older persons and persons with disabilities*

ISO 8317, *Child-resistant packaging – Requirements and testing procedures for reclosable packages*

3 Definitions

For the purposes of this document, the following definition applies:

3.1
panel testing
method of assessing aspects of a product, by means of a selected group of people who are asked to evaluate selected or overall aspects of the product

NOTE 1 Examples of such aspects are: function(s), handling, noise, cleaning and instructions for use.

NOTE 2 A list of aspects that can be evaluated by panel testing is given for information in Annex A.

4 Criteria

4.1 Purpose of panel testing

Panel testing is easier when the panel can compare products. In any case, the purpose of the type of panel test to be performed (comparative testing, evaluation of only one product type, evaluation of experimental designs, etc.) and the statistical method to be used have to be stated before starting any panel testing.

For reasons of continuity, to allow a better evaluation of the evolution of products, it may be useful to include as reference for the actual panel testing products tested by a previous panel.

Since panel testing can be used for overall as well as for partial evaluation, data analysis of the results is possible with significant results only when the statistical method has been chosen before the panel testing is performed. This allows for optimisation of panel size and costs.

Statistical methods require a predetermination of the hypothesis and then checking it by panel testing.

4.2 Panel testing leadership

The carrying out of panel testing and the reliability of the test results largely depend on the panel test leadership.

The panel test leader shall set up the panel test. Specifically he shall take care of the composition and characteristics of the panel, training of panel members (when necessary) and the test results evaluation system.

Panel testing should be directed by (a) qualified person(s) who should be competent in the fields listed below, either by direct experience or by consulting outside experts if needed:

– knowledge of all the relevant panel testing and statistical methods and how to combine them according to circumstances;
– knowledge of how to conduct interviews and how to guide the panel members without influencing them in any way;
– at least basic knowledge of the physiology of the senses, perception and psychology.

The design of the test should consider all the age ranges and the ergonomic features of these ages and consult the assistance of an ergonomist or other experts in preparing the tests.

The panel testing leader should not be personally involved in the design, production or marketing of the products under evaluation.

4.3 Characteristics of the panel

The composition of the panel and the number of panel members should correspond to the purpose and required significance of the results.

In the selection of the panel membership, the following aspects are to be considered.

a) The composition of the panel should cover the intended and probable users of the product, taking into account
   – age;
   – sex;
   – physical ability;
   – presence and type of disabilities/handicaps;
   – age impairment (e.g. poor memory, arthritis, etc.);
   – left or right handedness;
   – knowledge, experience and competence;
   – previous acquaintance with, or lack of knowledge about similar products;
   – social/economic categories;
   – level of education and language ability, including intellectual impairments.
b) In principle panel members should be potential users and their knowledge should not be superior to that of an experienced user.

c) If sensory evaluation is involved (e.g. for food or food preparation machines or espresso coffee makers) it may be necessary to have a panel of trained persons.

d) Panels composed of experts in (a) special function(s)/characteristic(s) may be used in some cases to evaluate specific characteristics/products.

e) Panel members should have a positive attitude vis-à-vis the characteristic(s)/function(s) to be tested.

f) Prior acquaintance with the product or its function(s) can be necessary.

g) In principle, the panel should not be selected from the staff of a company that is involved with the products under testing or a similar specific group of people. If this is nevertheless the case, a wide representation of users has to be ensured and care has to be taken to avoid biasing effects

5 Testing principles

Relevant testing conditions (such as environment, input, loading and setting of accessories) as well as whether the test was carried out in a laboratory or in a household environment, has to be previously decided upon by the panel leader. These conditions should be recorded in detail and be presented with the results.

The number of samples per panel member shall be limited in order to prevent fatigue and transfer of skills.

If necessary, the panel members shall have the possibility of becoming acquainted with the products and relevant instruction material, before the actual test. Care has to be taken that all panel members get equal opportunity to become familiar with each product. Each panel member has to have direct access to the products and relevant instructions for use.

Depending on the objectives of the assessment, and in case of products normally supplied with an instruction booklet, the panel-testing leader has to decide if the panel members is to rely only on the instructions for use, or whether further guidance for using the products is necessary.

The conditions under which products are tested should correspond to day-to-day or typical operation, in order to avoid artificial situations.

6 Questionnaire and scoring system

The results can be collected by observation, by interview, by questionnaire or by other suitable means. Questionnaires shall be worded very carefully to ensure their neutrality and allow the checking of reliability, etc.

In establishing a questionnaire, it is recommended

– to adapt the questions to the wording and language that people use spontaneously;

– to verify that the number of questions is not too high and that questions are understood;

– to verify that the answers correspond to real use (what people say is not always what they do);

– to verify that the criteria are relevant;

– to combine characteristics, if possible.

It is recommended that the panel-testing leader carry out a pre-test to check the suitability of the questionnaire.

As for the scoring system, a scale with an adequate number of classes (normally between 5 and 10) is recommended. The scoring system should be odd-numbered to provide a mid-point. The classes can be replaced by an appreciation in words.

A global evaluation given by each of the panel members and concerning all the items of the questionnaire can be useful.

7 Evaluation and presentation of the test results

It is recommended to evaluate the performance of products by independent parameters, or with parameters with known interdependence.

Differences between the products can only be presented if they are statistically significant. If not, products shall be evaluated as belonging to the same statistical class.

If results are such that statistical analysis is not feasible, deviating results can only be selected if particular reasons are given.

When summarized, the results have to give a representative evaluation of the test, they have to be unbiased and they shall not be truncated or skewed.

The following should be included in the presentation of the test results:

– aim of the test;
– size and characteristics of the panel;
– statistical approach, testing criteria and evaluation procedure;
– laboratory or actual household use;
– what written and/or oral instructions were given to the panel;
– duration of the test for each product and for each person;
– means of collecting the results;
– any other relevant information on the test.

8 Connection with existing related guidelines or SMMP (Standard Methods of Measuring Performance*)*

These guidelines are to be used taking into consideration ISO/IEC Guides 14, 37, 46 and 71:

In case of electric household appliances these guides can be applied either

– when an existing SMMP makes reference to, or requires panel testing,
– when panel testing is considered as an appropriate system for the evaluation of a product or a category of products, or
– if panel testing is not indicated by an existing SMMP or for a product for which no SMMP exists.

NOTE IEC 61254 describes an extensive method of panel testing for the evaluation of the performance of electric shavers. In many cases such an extensive method of panel testing will not be necessary, but IEC 61254 may serve as a useful example.

9 Panel testing ethics

The following ethical aspects should be considered:

– products should be assembled and controlled for an adequate level of safety;

– workmanship of prototypes or experimental set-ups should correspond to good engineering practice of safety;

– ownership rights to the questionnaire and to the results of panel testing belong to the principal of the research;

– duty of confidentiality exists on collected data and people according to the ESOMAR code of conduct.

NOTE ESOMAR: European Society of Opinion and Market Research.

10 Panel testing limitations

In order to obtain a statistical result from a panel testing, certain requirements for ensuring that the panel is representative shall be met (i.e. representative samples and number of participants).

A given surrounding (i.e. laboratory) can (negatively) influence the way panel members behave.

Changes of characteristics of elements can influence the outcome of tests (changes in characteristics can be related to country, season, etc.).

Attention is drawn to the fact that it is difficult for panel tests, due to their inherent nature, to give the level of tolerance which may be required for certification/verification purposes.

Annex A
(informative)

Example of aspects that can be evaluated by panel testing

– Packaging and unpacking (taking into account the disposal of the packaging for the environmental impact).
– Assembling and installation of the product and its accessories.
– Storage of the product and its accessories.
– Instructions for use.
– Handling (transportation, setting up, operation, use of accessories, etc).
– Legibility, visibility and comprehensibility of indications/instructions of the product.
– Simplicity of use of control panel and programming (if any).
– Loading/unloading of the product.
– Stability of the product during use.
– Sound/noise of the product during use.
– Performance of its intended primary function(s).
– Inside visibility (visual clarity) in operation.
– Cleaning.
– User maintenance.
– Servicing.
– Disposal of the product at the end of its life (taking into account also the environmental impact).
– Overall judgement of the product.

This list is given as a reference that can help the panel leader and standardisation committees when deciding the characteristics of the products that may be evaluated by the panel. It lists the general items. The panel leader should take care to specify for each item what indications to give to panel members and what questions to ask, and to detail for each item all the characteristics that have to be evaluated, taking into account the purpose of the panel testing.

Bibliography

IEC 61254:1993, *Electric shavers for household use – Methods for measuring the performance*

IEC Guide 109, *Environmental aspects – Inclusion in electrotechnical product standards*

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.....

Q2 Please tell us in what capacity(ies) you bought the standard *(tick all that apply).* I am the/a:

purchasing agent ❑
librarian ❑
researcher ❑
design engineer ❑
safety engineer ❑
testing engineer ❑
marketing specialist ❑
other.....

Q3 I work for/in/as a: *(tick all that apply)*

manufacturing ❑
consultant ❑
government ❑
test/certification facility ❑
public utility ❑
education ❑
military ❑
other.....

Q4 This standard will be used for: *(tick all that apply)*

general reference ❑
product research ❑
product design/development ❑
specifications ❑
tenders ❑
quality assessment ❑
certification ❑
technical documentation ❑
thesis ❑
manufacturing ❑
other.....

Q5 This standard meets my needs: *(tick one)*

not at all ❑
nearly ❑
fairly well ❑
exactly ❑

Q6 If you ticked NOT AT ALL in Question 5 the reason is: *(tick all that apply)*

standard is out of date ❑
standard is incomplete ❑
standard is too academic ❑
standard is too superficial ❑
title is misleading ❑
I made the wrong choice ❑
other .....

Q7 Please assess the standard in the following categories, using the numbers:
(1) unacceptable,
(2) below average,
(3) average,
(4) above average,
(5) exceptional,
(6) not applicable

timeliness.....
quality of writing.....
technical contents.....
logic of arrangement of contents .....
tables, charts, graphs, figures.....
other .....

Q8 I read/use the: *(tick one)*

French text only ❑
English text only ❑
both English and French texts ❑

Q9 Please share any comment on any aspect of the IEC that you would like us to know:

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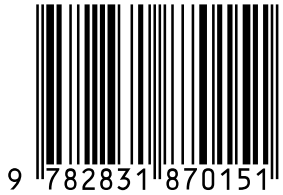

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