IEC TR 62970

Edition 1.0 2016-06

TECHNICAL REPORT

Guidance on how to conduct round robin tests for household and similar electrical appliances

IEC TR 62970:2016-06(en)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 97.030

ISBN 978-2-8322-3488-4

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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GUIDANCE ON HOW TO CONDUCT ROUND ROBIN TESTS FOR HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). 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. 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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IEC TR 62970, which is a Technical Report, has been prepared by IEC technical committee 59: Performance of household and similar electrical appliances.

This Technical Report is based on EN TR 50619:2014.

The text of this Technical Report is based on the following documents:

Enquiry draft	Report on voting
59/627/DTR	59/652/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 the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. 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- withdrawn,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

It is the responsibility of each standardization committee testing household and similar electrical appliances to establish the repeatability and reproducibility of the measurement standards developed.

Results from inter-laboratory comparisons are important for

a) identification of interlaboratory differences;

b) establishment of the effectiveness and comparability of test or measurement methods;

c) validation of uncertainties;

d) evaluation of the performance of laboratories for specific tests or measurements and monitoring laboratories' continuing performance;

e) identification of problems in laboratories and initiation of actions for improvement which, for example, may be related to inadequate test or measurement procedures, effectiveness of staff training and supervision, or calibration of equipment; and

f) education of participating laboratories based on the outcomes of such comparisons.

The need for ongoing confidence in laboratory performance is not only essential for laboratories and their contractors but also for other interested parties, such as regulators, laboratory accreditation bodies and other organizations that specify requirements for laboratories. ISO/IEC 17011 requires accreditation bodies to take account of laboratories' participation and performance in proficiency testing.

In this respect, round robin testing was widely made in the past by IEC TC 59 for the development of measurement procedures for the purpose of EU regulatory measures on Labelling and Ecodesign. Round robin test results have been widely taken into account in the establishment of regulations, in defining tolerance levels for verification of declared values and/or limits.

This document is intended to provide a consistent basis for performing round robin testing. It gives guidance to all interested parties to determine the competence among each other. It provides common ground for reliable statistical data (repeatability and reproducibility levels, etc.) as needed for regulation purposes (like for Labelling and Ecodesign).

GUIDANCE ON HOW TO CONDUCT ROUND ROBIN TESTS FOR HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES

1 Scope

This document provides guidance for carrying out round robin tests (RRT) and hence for the determination of levels of repeatability (intra-laboratory variability) and reproducibility (inter-laboratory variability) for household and similar electrical appliances.

This document can also be used to verify the measurement methods, to improve the measurement method, and to qualify laboratories.

It is not applicable for the determination of production variation for a particular product.

General advice on proficiency testing of laboratories is given in ISO/IEC 17043. This document can be used in addition to ISO/IEC 17043.

NOTE The repeatability and reproducibility levels are important factors for the establishment of uncertainty margins of the measurement methods and for the definition of tolerance levels in verification schemes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 17043:2010, *Conformity assessment – General requirements for proficiency testing*

IEC TR 61923, *Household electrical appliances – Method of measuring performance – Assessment of repeatability and reproducibility*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 17043:2010 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
contracting body
organization or individual for which a round robin testing is provided through a contractual arrangement

[SOURCE: ISO/IEC 17043:2010, 3.3, modified – The term "customer" has been replaced by "contracting body". In the definition, "proficiency testing scheme" has been replaced by "round robin testing".]

3.2
repeatability
precision under repeatability conditions

Note 1 to entry: Repeatability can be expressed quantitatively in terms of the dispersion characteristics of the results.

[SOURCE: ISO 3534-2:2006, 3.3.5, modified – Cross-references have been deleted.]

3.3
reproducibility
precision under reproducibility conditions

Note 1 to entry: Reproducibility can be expressed quantitatively in terms of the dispersion characteristics of the results.

Note 2 to entry: Results are usually understood to be corrected results.

[SOURCE: ISO 3534-2:2006, 3.3.10, modified – Cross-references have been deleted.]

3.4
round robin testing
RRT
ring testing
process in which one or more items is tested according to a specific protocol by a number of different laboratories

Note 1 to entry: It is the intention to derive levels of repeatability and reproducibility and hence to make classifications of laboratories.

Note 2 to entry: The term “proficiency testing”, defined in ISO/IEC 17043:2010, 3.7, is more general, as it covers aspects other than derivation of repeatability and reproducibility.

Note 3 to entry: Round robin testing may be used for the evaluation of laboratory performance against pre-established criteria.

4 Process and responsibilities

4.1 Process

4.1.1 Product to be tested

The product category to be tested should be clearly specified and one or more representative products should be selected. If only one product is selected, it should be representative in the sense that it reflects the typical behaviour and performance of the defined product category. It is recommended that two or more products be tested in order to get an indication of the measurement uncertainty across the range of performance that is likely to be encountered in the market (for example, one product with high and one with low energy/water consumption or performance).

The products to be used for the RRT can be selected either by pre-testing, pre-selection or special production.

Additional sample(s) should be put aside as replacements in case any RRT samples are damaged.

NOTE It may be appropriate to circulate key items of test equipment or other test objects together with the RRT samples.

4.1.2 Parameters to be tested

The parameters to be tested should be clearly defined.