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GUIDE

colour inside

Application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD 3
INTRODUCTION 5
1 Scope 7
2 Normative references 7
3 Terms and definitions 7
4 Application of uncertainty of measurement principles 8
4.1 General 8
4.2 Uncertainty of measurement principles 10
4.3 Background 10
4.4 Uncertainty of measurement principles – Application of procedures 11
4.5 Conclusion 13
5 Guidance on making uncertainty of measurement calculations including examples of how to perform the calculations 13
5.1 General principles 13
5.2 Summary of steps when estimating uncertainty 14
5.3 Simple example – Estimation of measurement uncertainty for a temperature-rise test with thermocouples 17
Annex A (informative) Uncertainty of measurement calculations for product conformity assessment testing – Examples 1 to 6 19
Bibliography 30

Figure 1 – Procedure 1: uncertainty of measurement calculated 11
Figure 2 – Procedure 2: accuracy method 12

Table 1 12
Table 2 13
Table 3 14
Table 4 17
Table 5 18
Table 6 18
Table A.1 – Input test 20
Table A.2 – Input power test 22
Table A.3 – Leakage current measurement test 23
Table A.4 – Distance measurement using calliper gauge 25
Table A.5 – Torque measurement 27
Table A.6 – Pre-conditioning for ball pressure test 28

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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APPLICATION OF UNCERTAINTY OF MEASUREMENT TO CONFORMITY ASSESSMENT ACTIVITIES IN THE ELECTROTECHNICAL SECTOR

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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This second edition of IEC Guide 115 has been prepared, in accordance with ISO/IEC Directives, Part 1, Annex A, by IECEE/CTL. This is a non-mandatory guide in accordance with SMB Decision 136/8.

This second edition cancels and replaces the first edition published in 2007.

The main changes with respect to the previous edition are as follows:

a) editorial alignment to ISO/IEC 17025:2017 without adapting the technical content;
b) references to ISO/IEC 17025:2005 and ISO/IEC 17025:2017 in order to help for the transition to the new edition of ISO/IEC 17025.

The text of this IEC Guide is based on the following documents:

Four months' vote	Report on voting
SMBNC/8/DV	SMBNC/14/RV

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

The language used for the development of this Guide is English.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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INTRODUCTION

This document has been prepared by the IECEE Committee of Testing Laboratories (CTL) to provide guidance on the practical application of the measurement uncertainty requirements of ISO/IEC 17025 to the electrical safety testing conducted within the IECEE CB Scheme.

The IECEE CB Scheme is a multilateral, international agreement, among over 40 countries and some 60 national certification bodies, for the acceptance of test reports on electrical products tested to IEC standards.

The aim of the CTL is, among other tasks, to define a common understanding of the test methodology with regard to the IEC standards as well as to ensure and continually improve the repeatability and reproducibility of test results among the member laboratories.

The practical approach to measurement uncertainty outlined in this document has been adopted for use in the IECEE Schemes, and is also extensively used around the world by testing laboratories engaged in testing electrical products to national safety standards.

This document is of particular interest to the following IEC technical committees, which ~~may~~ can decide to make use of it if necessary:

TECHNICAL COMMITTEE 13: ~~EQUIPMENT FOR ELECTRICAL ENERGY MEASUREMENT, TARIFF AND LOAD CONTROL~~ ELECTRICAL ENERGY MEASUREMENT AND CONTROL

TECHNICAL COMMITTEE 17: HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR

TECHNICAL COMMITTEE 18: ELECTRICAL INSTALLATIONS OF SHIPS AND OF MOBILE AND FIXED OFFSHORE UNITS

TECHNICAL COMMITTEE 20: ELECTRIC CABLES

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TECHNICAL COMMITTEE 82: SOLAR PHOTOVOLTAIC ENERGY SYSTEMS

TECHNICAL COMMITTEE 110: ELECTRONIC DISPLAYS

APPLICATION OF UNCERTAINTY OF MEASUREMENT TO CONFORMITY ASSESSMENT ACTIVITIES IN THE ELECTROTECHNICAL SECTOR

1 Scope

This Guide presents a practical approach to the application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector. It is specifically conceived for use in IECEE Schemes as well as by testing laboratories engaged in testing electrical products to national safety standards. It describes the application of uncertainty of measurement principles and provides guidance on making uncertainty of measurement calculations. It also gives some examples relating to uncertainty of measurement calculations for product conformity assessment testing.

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 17025, *General requirements for the competence of testing and calibration laboratories*

~~*Guide to the expression of uncertainty in measurement* (GUM) (1995)~~
~~[BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML]~~

~~*International vocabulary of basic and general terms in metrology* (VIM) (1996)~~
~~[BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML]~~

IEC GUIDE 115

Edition 2.0 2021-03

GUIDE

GUIDE

Application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector

Application de l'incertitude de mesure aux activités d'évaluation de la conformité dans le secteur électrotechnique



IEC GUIDE 115:2021-03(en-fr)

CONTENTS

FOREWORD 3
INTRODUCTION 5
1 Scope 7
2 Normative references 7
3 Terms and definitions 7
4 Application of uncertainty of measurement principles 8
4.1 General 8
4.2 Uncertainty of measurement principles 10
4.3 Background 10
4.4 Uncertainty of measurement principles – Application of procedures 11
4.5 Conclusion 13
5 Guidance on making uncertainty of measurement calculations including examples of how to perform the calculations 13
5.1 General principles 13
5.2 Summary of steps when estimating uncertainty 14
5.3 Simple example – Estimation of measurement uncertainty for a temperature-rise test with thermocouples 17
Annex A (informative) Uncertainty of measurement calculations for product conformity assessment testing – Examples 1 to 6 19
Bibliography 30

Figure 1 – Procedure 1: uncertainty of measurement calculated 11
Figure 2 – Procedure 2: accuracy method 12

Table 1 12
Table 2 13
Table 3 14
Table 4 17
Table 5 18
Table 6 18
Table A.1 – Input test 20
Table A.2 – Input power test 22
Table A.3 – Leakage current measurement test 23
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Table A.5 – Torque measurement 27
Table A.6 – Pre-conditioning for ball pressure test 28

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SOMMAIRE

AVANT-PROPOS 33
INTRODUCTION 35
1 Domaine d'application 37
2 Références normatives 37
3 Termes et définitions 37
4 Application des principes de l'incertitude de mesure 38
4.1 Généralités 38
4.2 Principes de l'incertitude de mesure 40
4.3 Contexte 40
4.4 Principes de l'incertitude de mesure – Application des procédures 41
4.5 Conclusion 43
5 Recommandations pour la réalisation des calculs de l'incertitude de mesure avec des exemples de calculs 43
5.1 Principes généraux 43
5.2 Résumé des étapes pour l'estimation d'une incertitude 44
5.3 Exemple simple – Estimation de l'incertitude de mesure pour un essai d'échauffement avec des thermocouples 47
Annex A (informative) Calculs de l'incertitude de mesure pour les essais d'évaluation de la conformité des produits – Exemples 1 à 6 49
Bibliographie 62

Figure 1 – Procédure 1: Incertitude de mesure calculée 41
Figure 2 – Procédure 2: Méthode d'exactitude 42

Tableau 1 42
Tableau 2 43
Tableau 3 44
Tableau 4 47
Tableau 5 48
Tableau 6 48
Tableau A.1 – Essai en entrée 50
Tableau A.2 – Essai de la puissance d'entrée 52
Tableau A.3 – Essai de mesure du courant de fuite 53
Tableau A.4 – Mesure de distance avec un pied à coulisse 56
Tableau A.5 – Mesure du couple 58
Tableau A.6 – Préconditionnement pour essai à la bille 60

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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APPLICATION DE L'INCERTITUDE DE MESURE AUX ACTIVITÉS D'ÉVALUATION DE LA CONFORMITÉ DANS LE SECTEUR ÉLECTROTECHNIQUE

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Cette deuxième édition du Guide IEC 115 a été préparée par le CTL de l'IECEE selon les Directives ISO/IEC, Partie 1, Annexe A. Ceci est un guide non obligatoire selon la Décision 136/8 du SMB.

Cette deuxième édition annule et remplace la première édition publiée en 2007.

Les modifications majeures par rapport à l'édition précédente sont les suivantes:

a) alignement rédactionnel sur l'ISO/IEC 17025:2017 sans adaptation du contenu technique;
b) références à l'ISO/IEC 17025:2005 et à l'ISO/IEC 17025:2017 afin de faciliter la transition vers la nouvelle édition de l'ISO/IEC 17025.

Le texte du présent Guide IEC est issu des documents suivants:

Vote des quatre mois	Rapport de vote
SMBNC/8/DV	SMBNC/14/RV

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de ce Guide.

La langue employée pour l'élaboration de ce Guide est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

INTRODUCTION

Le présent document a été établi par le Comité des laboratoires d'essai (CTL, *Committee of Testing Laboratories*) du système IEC d'essais de conformité et de certification des équipements électriques (IECEE, I*EC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components*) afin de donner des recommandations pour l'application pratique des exigences concernant l'incertitude de mesure de l'ISO/IEC 17025 aux essais de sécurité électrique réalisés dans le cadre de la méthode des organismes de certification (OC) du système IECEE.

La méthode OC du système IECEE est un accord international multilatéral conclu entre plus de 40 pays et quelque 60 organismes nationaux de certification pour l'acceptation des rapports d'essai sur les produits électriques soumis à essai selon les normes IEC.

Le but du CTL est, entre autres tâches, de définir une analyse commune de la méthodologie d'essai selon les normes IEC ainsi que d'assurer et d'améliorer de manière continue la répétabilité et la reproductibilité des résultats d'essai entre les laboratoires membres.

L'approche pratique de l'incertitude de mesure décrite dans le présent document a été adoptée pour être utilisée dans les méthodes du système IECEE et elle est également largement utilisée dans le monde par les laboratoires d'essai pour les essais des produits électriques selon les normes nationales de sécurité.

Le présent document présente un intérêt particulier pour les Comités d'études suivants de l'IEC, qui peuvent, si nécessaire, décider de l'utiliser.

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COMITE D'ETUDES 61: SÉCURITÉ DES APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES

COMITE D'ETUDES 62: ÉQUIPEMENTS ÉLECTRIQUES DANS LA PRATIQUE MEDICALE

COMITE D'ETUDES 64: INSTALLATIONS ÉLECTRIQUES ET PROTECTION CONTRE LES CHOCS ÉLECTRIQUES

COMITE D'ETUDES 65: MESURE, COMMANDE ET AUTOMATION DANS LES PROCESSUS INDUSTRIELS

COMITE D'ETUDES 66: SÉCURITÉ DES APPAREILS DE MESURE, DE COMMANDE ET DE LABORATOIRE

COMITE D'ETUDES 76: SÉCURITÉ DES RAYONNEMENTS OPTIQUES ET MATÉRIELS LASER

COMITE D'ETUDES 77: COMPATIBILITÉ ÉLECTROMAGNÉTIQUE

COMITE D'ETUDES 78: TRAVAUX SOUS TENSION

COMITE D'ETUDES 80: MATÉRIELS ET SYSTÈMES DE NAVIGATION ET DE RADIOCOMMUNICATION MARITIMES

COMITE D'ETUDES 82: SYSTÈMES DE CONVERSION PHOTOVOLTAÏQUES DE L'ÉNERGIE SOLAIRE

COMITE D'ETUDES 110: AFFICHAGES ÉLECTRONIQUES

APPLICATION DE L'INCERTITUDE DE MESURE AUX ACTIVITÉS D'ÉVALUATION DE LA CONFORMITÉ DANS LE SECTEUR ÉLECTROTECHNIQUE

1 Domaine d'application

Le présent Guide présente une approche pratique de l'application de l'incertitude de mesure aux activités d'évaluation de la conformité dans le secteur électrotechnique. Il est spécifiquement conçu pour être utilisé dans les méthodes du système IECEE ainsi que par les laboratoires qui réalisent les essais des produits électriques selon les normes nationales de sécurité. Il décrit l'application des principes de l'incertitude de mesure et donne des recommandations pour la réalisation des calculs de l'incertitude de mesure. Le présent Guide donne également quelques exemples de calculs de l'incertitude de mesure pour des essais d'évaluation de la conformité de certains produits.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

ISO/IEC 17025, *Exigences générales concernant la compétence des laboratoires d'étalonnages et d'essais*