IEC 62309

Edition 2.0 2024-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Dependability of new products containing reused parts and life-extended products

Sûreté de fonctionnement des produits neufs contenant des composants réutilisés et des produits à durée de vie prolongée

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DEPENDABILITY OF NEW PRODUCTS CONTAINING REUSED PARTS AND LIFE-EXTENDED PRODUCTS

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 62309 has been prepared by IEC technical committee 56: Dependability. It is an International Standard.

This second edition cancels and replaces the first edition published in 2004. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) the previous Annex A has been separated into Annex B (Dependability aspects) and Annex C (Example with QAGAN parts);
b) a new normative Annex A has been written with expansion of lifecycle activities, to describe extending the useful life by refurbishment, life extension, updating, upgrading and second-hand use;
c) revision of Figure 1 accordingly;

d) minor editorial alignments throughout the document;

e) the abbreviation "quagan" has been changed "QAGAN" to reflect more contemporary use.

The text of this International Standard is based on the following documents:

Draft	Report on voting
56/2057/FDIS	56/2073/RVD

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 International Standard is English.

This document was drafted in accordance with 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/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

The marketplace for products in the 21st century is a rapidly changing one, with increased speed of technological growth, and new pressures on environmental sustainability as humanity's demand for ecological resources currently far exceeds what the Earth can regenerate in the same timeframe.

Owing to the improving quality of manufacturing, most parts have been manufactured with a life expectancy far longer than the user needs.

Technological changes are also making products more reliable. However, commercial pressures and legislation changes are leading to an increased rate of technological change, resulting in a difficulty in obtaining supplies, spares and or support for the superseded parts [a discipline known as obsolescence management (see IEC 62402 [1][1])], and the need to upgrade systems before all their parts have reached their life expectancy.

The disposal of products and their component parts, which can be potentially useful, is fuelling the cycle of waste and the overuse of finite materials.

It is unlikely that the speed of technological growth can be slowed, or significant changes can be made to user needs. However, what can be done is to increase the reuse of parts that have not reached their life expectancy. This document addresses this goal to reduce waste by reusing parts, and the additional benefits that come with reusing parts.

This document provides customers with dependability assurance when manufacturers are producing new products containing previously used parts. The main concept is to qualify the reused parts to ensure that the product under consideration will fulfil the requirements for a product containing only new parts. The reused parts can then be declared QAGAN (qualified-as-good-as-new) and used interchangeably with new parts in the product.

This document firstly describes, in Clauses 4 to 7, requirements for qualification of reuse of parts in new products. A QAGAN part is qualified only for a specific application, often the same or similar to that for which it was previously used. This means that QAGAN parts are not declared as qualified for general use.

QAGAN parts are already type approved for their original application. The declaration QAGAN certifies that a reused part that has previously been qualified for use in a specific product has been checked that it has not deteriorated to a degree that it cannot be used in new products. A new product containing QAGAN parts is tested only to the same extent as if it contained only new parts.

Secondly, in Clauses A.3 to A.7, this document describes the life extension of products already in use. In most cases, life extension can be made using new components, new parts, or QAGAN parts that have been qualified for the specific application.

[1] Numbers in square brackets refer to the Bibliography.

Reuse of parts and materials is one way to save resources. Another way is to extend the useful life of products as described in Annex A, extending the useful life by refurbishment, life extension, updating, upgrading or second-hand use. These concepts are defined and the requirements for using the term QAGAN with reference to this document are stated. This document expresses guidance to support the circular economy and anticipates application by organisations to enable, permit and encourage reuse of functional parts. This document envisages that the item, the subject under consideration, which attracts the declaration or designation "QAGAN" may be an individual part, component, device, or functional unit. This document does not cover reused materials or large structures and large systems, nor does it cover software products, concepts, and ideas.

DEPENDABILITY OF NEW PRODUCTS CONTAINING REUSED PARTS AND LIFE-EXTENDED PRODUCTS

1 Scope

This International Standard introduces the concept to check the reliability and functionality of reused parts and their usage within new products. It also provides information and criteria about the assurance [for example, testing and analysis, required for products containing reused parts, which are declared "qualified-as-good-as-new" (QAGAN)] relative to the designed life of the product.

This document specifies requirements to be satisfied before making a declaration or applying a designation of QAGAN. This document also gives guidance to support any organisation that makes declarations about dependability of products containing reused parts.

In this document, the term "product" covers electrical, electro-mechanical, mechanical parts or hardware that can contain software.

"Qualified-as-good-as-new" (QAGAN) does not apply to reused materials or large structures and large systems, nor does it cover software products, concepts, and ideas.

The purpose of this document is to ensure by tests and analysis that the reliability and functionality of a new product containing reused parts is comparable to a product that contains only new parts. This would justify the manufacturer granting the next customer the full warranty of the product with "qualified-as-good-as-new" (QAGAN) parts.

NOTE This document can also be applied in producing product-specific standards by technical committees responsible for an application sector.

Annex A describes extending useful life by refurbishment, updating, upgrading, maintenance and used as second-hand. These concepts are defined and the requirements for using the term with reference to this document are stated.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at https://www.electropedia.org/
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