SLOVENSKI STANDARD
SIST EN 62429:2008

01-junij-2008

Rast zanesljivosti - Obremenjevalno preskušanje za odkrivanje zgodnjih odpovedi v edinstvenih kompleksnih sistemih (IEC 62429:2007)

Reliability growth - Stress testing for early failures in unique complex systems

Zuverlässigkeitswachstum - Beanspruchungsprüfung auf Frühausfälle in einzelnen komplexen Systemen

Croissance de fiabilité - Essais de contraintes pour révéler les défaillances précoces d'un système complexe et unique

Ta slovenski standard je istoveten z: **EN 62429:2008**

ICS:

03.120.01	Kakovost na splošno	Quality in general
21.020	Značilnosti in načrtovanje strojev, aparatov, opreme	Characteristics and design of machines, apparatus, equipment

SIST EN 62429:2008 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62429

April 2008

ICS 03.120.01; 03.120.99

English version

Reliability growth - Stress testing for early failures in unique complex systems

(IEC 62429:2007)

Croissance de fiabilité - Essais de contraintes pour révéler les défaillances précoces d'un système complexe et unique (CEI 62429:2007)

Zuverlässigkeitswachstum - Beanspruchungsprüfung auf Frühausfälle in einzelnen komplexen Systemen (IEC 62429:2007)

This European Standard was approved by CENELEC on 2008-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 62429:2008 E

Foreword

The text of document 56/1232/FDIS, future edition 1 of IEC 62429, prepared by IEC TC 56, Dependability, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62429 on 2008-03-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2008-12-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2011-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62429:2007 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60300-1	NOTE Harmonized as EN 60300-1:2003 (not modified).
IEC 60300-2	NOTE Harmonized as EN 60300-2:2004 (not modified).
IEC 60300-3-1	NOTE Harmonized as EN 60300-3-1:2004 (not modified).
IEC 60706-5	NOTE Harmonized as EN 60706-5:2007 (not modified).
IEC 60812	NOTE Harmonized as EN 60812:2006 (not modified).
IEC 61014	NOTE Harmonized as EN 61014:2003 (not modified).
IEC 61025	NOTE Harmonized as EN 61025:2007 (not modified).
IEC 61078	NOTE Harmonized as EN 61078:2006 (not modified).
IEC 61160	NOTE Harmonized as EN 61160:2005 (not modified).
ISO 9000	NOTE Harmonized as EN ISO 9000:2005 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60050-191	1990	International Electrotechnical Vocabulary (IEV) - Chapter 191: Dependability and quality of service	-	-
IEC 60300-3-5	-[1]	Dependability management - Part 3-5: Application guide - Reliability test conditions and statistical test principles	-	-
IEC 60605-2	-[1]	Equipment reliability testing - Part 2: Design of test cycles	-	-
IEC 61163-1	2006	Reliability stress screening - Part 1: Repairable assemblies manufactured in lots	EN 61163-1	2006
IEC 61163-2	-[1]	Reliability stress screening - Part 2: Electronic components	-	-
IEC 61164	-[1]	Reliability growth - Statistical test and estimation methods	EN 61164	2004[2]
IEC 61710	-[1]	Power law model - Goodness-of-fit tests and estimation methods	-	-

[1] Undated reference.

[2] Valid edition at date of issue.

IEC 62429

Edition 1.0 2007-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Reliability growth – Stress testing for early failures in unique complex systems

Croissance de fiabilité – Essais de contraintes pour révéler les défaillances précoces d'un système complexe et unique

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

RELIABILITY GROWTH – STRESS TESTING FOR EARLY FAILURES IN UNIQUE COMPLEX SYSTEMS

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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International Standard IEC 62429 has been prepared by IEC technical committee 56: Dependability.

The text of this standard is based on the following documents:

FDIS	Report on voting
56/1232/FDIS	56/1249/RVD

Full information on the voting for the approval of this standard 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 maintenance result date indicated on the IEC web site 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.

RELIABILITY GROWTH – STRESS TESTING FOR EARLY FAILURES IN UNIQUE COMPLEX SYSTEMS

1 Scope

This International Standard gives guidance for reliability growth during final testing or acceptance testing of unique complex systems. It gives guidance on accelerated test conditions and criteria for stopping these tests. “Unique” means that no information exists on similar systems, and the small number of produced systems means that information deducted from the test has limited use for future production.

This standard concerns reliability growth of repairable complex systems consisting of hardware with embedded software. It can be used for describing the procedure for acceptance testing, "running-in", and to ensure that reliability of a delivered system is not compromised by coding errors, workmanship errors or manufacturing errors. It only covers the early failure period of the system life cycle and neither the constant failure period, nor the wear out failure period. It can also be used when a company wants to optimize the duration of internal production testing during manufacturing of prototypes, single systems or small series.

It is applicable mainly to large hardware/software systems, but does not cover large networks, for example telecommunications and power networks, since new parts of such systems cannot usually be isolated during the testing.

It does not cover software tested alone, but the methods can be used during testing of large embedded software programs in operational hardware, when simulated operating loads are used.

It addresses growth testing before or at delivery of a finished system. The testing can therefore take place at the manufacturer's or at the end user's premises.

If the user of a system performs reliability growth by a policy of updating hardware and software with improved versions, this standard can be used to guide the growth process.

This standard covers a wide field of applications, but is not applicable to health or safety aspects of systems.

This standard does not apply to systems that are covered by IEC 62279[39].

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.

IEC 60050-191:1990, *International Electrotechnical Vocabulary – Chapter 191: Dependability and quality of service*

IEC 60300-3-5, *Dependability management – Part 3-5: Application guide – Reliability test conditions and statistical test principles*

IEC 60605-2, *Equipment reliability testing – Part 2 Design of test cycles*

IEC 61163-1:2006, *Reliability stress screening – Part 1: Repairable assemblies manufactured in lots*

IEC 61163-2, *Reliability stress screening – Part 2: Electronic components*

IEC 61164, *Reliability growth – Statistical test and estimation methods*

IEC 61710, *Power law model – Goodness-of-fit and estimation methods*

3 Terms, definitions, abbreviations and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-191, as well as the following, apply.

3.1.1
time compression
reducing test time by testing with higher use time than in the field

NOTE An example is testing a system that is used 8 h a day for 24 h a day.

3.1.2
accelerated test
test in which the applied stress level is chosen to exceed that stated in the reference conditions in order to shorten the time duration required to observe the stress response of the item, or to magnify the response in a given time duration

NOTE To be valid, an accelerated test should not alter the basic fault modes and failure mechanisms, or their relative prevalence.

[IEV 191-14-07]

3.1.3
(time) acceleration factor
ratio between the time durations necessary to obtain the same stated number of failures or degradations in two equal size samples, under two different sets of stress conditions involving the same failure mechanisms and fault modes and their relative prevalence.

NOTE One of the two sets of stress conditions should be a reference set.

[IEV 191-14-10]

3.1.4
execution time
time to perform a stated number of transactions

3.1.5
fault
state of an item characterized by inability to perform a required function, excluding the inability during preventive maintenance or other planned actions, or due to lack of external resources.

NOTE 1 A fault is often the result of a failure of the item itself, but may exist without prior failure.

[IEV 191-05-01]