

Electric components - Reliability - Reference conditions
for failure rates and stress models for conversion

EESTI STANDARDI EESSÕNA

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English Version

**Electric components - Reliability - Reference conditions for
failure rates and stress models for conversion
(IEC 61709:2017)**

Composants électriques - Fiabilité - Conditions de référence
pour les taux de défaillance et modèles de contraintes pour
la conversion
(IEC 61709:2017)

Bauelemente der Elektronik - Zuverlässigkeit -
Referenzbedingungen für Ausfallraten und
Beanspruchungsmodelle zur Umrechnung
(IEC 61709:2017)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

The text of document 56/1714/FDIS, future edition 3 of IEC 61709, prepared by IEC/TC 56 "Dependability" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61709:2017.

The following dates are fixed:

- latest date by which the document has to be (dop) 2017-12-24
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standard or by endorsement
- latest date by which the national (dow) 2020-03-24
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document have to be withdrawn

This document supersedes EN 61709:2011.

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Endorsement notice

The text of the International Standard IEC 61709:2017 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 60300-3-2:2004	NOTE	Harmonized as EN 60300-3-2:2005.
IEC 60300-3-3	NOTE	Harmonized as EN 60300-3-3.
IEC 60721 (series)	NOTE	Harmonized as EN 60721 (series).
IEC 60721-3-3	NOTE	Harmonized as EN 60721-3-3.
IEC 60721-3-4	NOTE	Harmonized as EN 60721-3-4.
IEC 60721-3-5	NOTE	Harmonized as EN 60721-3-5.
IEC 60721-3-7	NOTE	Harmonized as EN 60721-3-7.
IEC 61014:2003	NOTE	Harmonized as EN 61014:2003.
IEC 61360 (series)	NOTE	Harmonized as EN 61360 (series).
IEC 61360-1:2009	NOTE	Harmonized as EN 61360-1:2010.
IEC 61360-4:2005	NOTE	Harmonized as EN 61360-4:2005.
IEC 61508 (series)	NOTE	Harmonized as EN 61508 (series).
IEC 61649:2008	NOTE	Harmonized as EN 61649:2008.
IEC 61703:2002	NOTE	Harmonized as EN 61703:2002.
IEC 61710	NOTE	Harmonized as EN 61710.

IEC 61810-2:2011	NOTE	Harmonized as EN 61810-2:2011.
IEC 61810-2-1:2011	NOTE	Harmonized as EN 61810-2-1:2011.
IEC 62007 (series)	NOTE	Harmonized as EN 62007 (series).
IEC 62741	NOTE	Harmonized as EN 62741.
IEC 62308:2006	NOTE	Harmonized as EN 62308:2006.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-192	2015	International electrotechnical vocabulary - Part 192: Dependability	-	-

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INTRODUCTION

This document is intended for the reliability prediction of electric components as used in equipment and is aimed at organizations that have their own data and describes how to state and use that data in order to perform reliability predictions.

It can also be used to allow an organization to set up a failure rate database and describes the reference conditions for which field failure rates should be stated. The reference conditions adopted in this document are typical of the majority of applications of components in equipment however when components operate under other conditions the users may consider stating these conditions as their reference conditions.

Using the presented stress models allows extrapolation of failure rates from reference conditions to other operating conditions which in turn permits the prediction of failure rates at assembly level. This allows estimation of the effect of design changes or changes in the environmental conditions on component reliability. Reliability prediction is most useful in the early design phase of equipment. It can be used, for example, to identify potential reliability problems, the planning of logistic support strategies and the evaluation of designs.

The stress models contained herein are generic and are as simple as possible while still being comparable with more complex equations contained in other models. The predictions generated using this document have a wide range of prediction accuracy.

This document does not contain failure rates, but it describes how they can be stated and used. This approach allows a user to select the most relevant and up to date failure rates for the prediction from a source that they select. This document also contains information on how to select the data that can be used in the presented models.

The failure rates considered in this document are assumed to be constant, either for an unlimited period of operation (general case) or for limited periods. The limitation of life is called useful life and applies only for some few component families, reaching the wear-out failure period (during which the failure rate is increasing) within the normal period of use. It is hence assumed that during useful life, the failure rate can be considered constant for any practical use.

For the purposes of this document the term electric component includes the commonly used terms “electronic component”, “electrical component” and “electro-mechanical component”.