

INTERNATIONAL STANDARD



**Process management for avionics – Counterfeit prevention –
Part 1: Avoiding the use of counterfeit, fraudulent and recycled electronic
components**



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2024 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.



IEC 62668-1

Edition 1.1 2024-09
CONSOLIDATED VERSION

INTERNATIONAL STANDARD



**Process management for avionics – Counterfeit prevention –
Part 1: Avoiding the use of counterfeit, fraudulent and recycled electronic
components**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 03.100.50, 31.020, 49.060

ISBN 978-2-8322-9708-7

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	6
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and abbreviated terms	8
3.1 Terms and definitions.....	8
3.2 Abbreviated terms.....	13
4 Technical requirements	15
4.1 General.....	15
4.2 Minimum avionics OEM requirements	15
4.3 Intellectual property	19
4.3.1 General	19
4.3.2 Definition of intellectual property.....	20
4.4 Counterfeit consideration	20
4.4.1 General	20
4.4.2 Legal definition of counterfeit.....	21
4.4.3 Fraudulent components	21
4.4.4 How to establish traceability	21
4.4.5 Reasons for the loss of component traceability	22
4.5 The counterfeit problem	23
4.5.1 General	23
4.5.2 General worldwide activities combating counterfeit issues	23
4.5.3 Cultural differences	24
4.5.4 Counterfeiting activities and avionics equipment.....	24
4.5.5 Electronic components direct action groups	27
4.6 Recycled components	27
4.6.1 General	27
4.6.2 Why the avionics industry does not use recycled components	27
4.6.3 How recycled components become suspect and potentially fraudulent.....	28
4.7 Original component manufacturer (OCM) anti-counterfeit guidelines	28
4.7.1 General	28
4.7.2 Chinese Reliable Electronic Component Supplier (RECS) audit scheme	28
4.7.3 Original component manufacturer (OCM) ISO 9001 and AS/EN/JISQ 9100 Third Party Certification	28
4.7.4 Original component manufacturer's (OCM) trademarks	28
4.7.5 Original component manufacturer's (OCM) IP control.....	29
4.7.6 Original component manufacturer's (OCM) physical part marking and packaging marking.....	29
4.7.7 The Semiconductor Industries Association Anti Counterfeit Task Force (ACTF)	29
4.7.8 USA Trusted Foundry Program	30
4.7.9 USA Trusted IC Supplier Accreditation Program	30
4.7.10 Physical unclonable function (PUF)	30
4.7.11 Original component manufacturer (OCM) best practice	31
4.8 Distributor minimum accreditations	31
4.9 Distributor AS/EN/JISQ 9120 Third Party Certification.....	31
4.10 Franchised distributor network	31
4.10.1 General	31

© IEC 2024

4.10.2	SAE AS6496.....	33
4.10.3	Control stock through tracking schemes	33
4.10.4	Control of scrap	33
4.10.5	RECS	33
4.11	Non-franchised distributor anti-counterfeit guidelines	33
4.11.1	General	33
4.11.2	CCAP-101 certified program for independent distributor	34
4.11.3	SAE AS6081.....	34
4.11.4	OEM managed non-franchised distributors	34
4.11.5	Brokers.....	34
4.12	Avionics OEM anti-counterfeit guidelines when procuring components.....	35
4.12.1	Anti-counterfeiting general approach	35
4.12.2	Buy from approved sources	35
4.12.3	Traceable components	35
4.12.4	Certificate of conformance and packing slip.....	36
4.12.5	Plan and buy sufficient quantities	36
4.12.6	Use of non- franchised distributors	37
4.12.7	Brokers.....	37
4.12.8	Contact the original manufacturer	37
4.12.9	Obsolete components and franchised aftermarket sources	37
4.12.10	IEC 62239-1 approved alternatives.....	38
4.12.11	Product redesign	38
4.12.12	Non traceable components	38
4.12.13	OEM anti-counterfeit plans including SAE AS5553 and SAE AS6174.....	38
4.13	OEM anti-counterfeit guidelines for their products.....	45
4.13.1	IP control.....	45
4.13.2	Tamper-proofing the OEM design.....	46
4.13.3	Tamper-proof labels.....	46
4.13.4	Use of ASICs and FPGAs with IP protection features.....	46
4.13.5	Control the final OEM product marking	46
4.13.6	Control OEM scrap.....	47
4.13.7	OEM trademarks and logos.....	47
4.13.8	Control delivery of OEM products and spares and their useful life.....	47
4.13.9	MRC activities	47
4.14	Counterfeit, fraud and component recycling reporting	48
4.14.1	General	48
4.14.2	USA FAA suspected unapproved parts (SUP) program	48
4.14.3	EASA.....	49
4.14.4	UK counterfeit reporting.....	49
4.14.5	EU counterfeit reporting.....	49
4.14.6	UKEA anti-counterfeiting forum.....	49
4.15	Anti-counterfeit awareness training	49
4.16	Information to support the management of the supply chain.....	49
Annex A (informative) Useful contacts		50
A.1	World Intellectual Property Organization (WIPO).....	50
A.1.1	General	50
A.1.2	What is WIPO?	50
A.1.3	WIPO Intellectual Property Services	51
A.1.4	WIPO global network on Intellectual Property (IP) Academies.....	52

A.2	Anti-Counterfeiting Trade Agreement (ACTA).....	52
A.2.1	ACTA.....	52
A.2.2	Global Anti-Counterfeiting Network (GACG).....	53
A.3	World Semiconductor Council (WSC) and GAMS	53
A.4	SEMI.....	54
A.5	Electronics Authorized Directory	55
A.6	UK	55
A.6.1	The UK intellectual property office	55
A.6.2	Alliance for IP	56
A.6.3	UK Chartered Trading Standards Institute.....	56
A.6.4	UK HM Revenue and Customs.....	56
A.6.5	Anti-Counterfeiting Forum.....	56
A.6.6	Electronic Component Supplier Network (ESCN)	57
A.6.7	UK Ministry of Defence	57
A.7	Europe.....	57
A.7.1	Europa Summaries of EU Legislation.....	57
A.7.2	Europol, the European Law Enforcement Agency.....	57
A.7.3	European Patent Office	57
A.7.4	EUIPO	57
A.7.5	European Aviation Safety Agency (EASA)	58
A.7.6	IECQ audit schemes	59
A.7.7	BEAMA.....	59
A.8	USA.....	59
A.8.1	United States Patent and Trademark Office	59
A.8.2	The International Trade Administration, US Department of Commerce.....	60
A.8.3	International Intellectual Property Alliance	60
A.8.4	The Federal Aviation Administration (FAA)	60
A.8.5	Trusted Access Program Office (TAPO).....	61
A.8.6	Independent Distributors of Electronics Association (IDEA)	61
A.8.7	ECIA formerly National Electronic Distributors Association (NEDA)	62
A.8.8	Components Technology Institute Inc. (CTI)	63
A.8.9	Defense Logistics Agency (DLA).....	63
A.8.10	DFARS	63
A.8.11	IAQC.....	64
A.8.12	USA Homeland Security	64
A.9	China.....	64
A.9.1	SNIPA	64
A.9.2	Chinese Patent and Trademark Office	64
A.9.3	China Electronics Associations:	64
A.9.4	China Quality Certification Centre (CQC).....	64
A.9.5	Civil Aviation Administration of China (CAAC).....	64
A.9.6	China lawinfo.Co Ltd., for Law info China	64
A.10	Japan – Japanese Patent Office (JPO)	65
A.11	Physical unclonable function	65
A.12	PUF and tags initiative and solutions	66
A.12.1	The Hardware Intrinsic Security (HIS) initiative	66
A.12.2	Examples of tag providers	66
A.13	Examples of tamper-proof design companies	67
A.14	Examples of FPGA die serialization	67

A.15	Examples of NVRAM manufacturers	67
A.16	SAE G-19	67
A.17	iNEMI.....	72
A.18	OECD	72
A.19	ICC	72
A.20	Applied DNA Sciences	72
A.21	"Safety Directors" Forum.....	72
A.22	"Stop fake bearings" video	72
A.23	Industrial company's online anti-counterfeit awareness training	73
A.24	Subscription based anti-counterfeit awareness training.....	73
A.25	USA Government anti-counterfeit publications and awareness training	73
A.26	IECQ WG6.....	73
A.27	Anti-counterfeiting videos.....	73
Annex B	(informative) Examples of aftermarket sources	74
B.1	Examples of franchised aftermarket sources	74
B.2	Examples of sources of franchised die which can be packaged.....	74
B.3	Examples of third party custom packaging houses which provide aftermarket solutions	74
B.4	Examples of emulated aftermarket providers.....	74
Annex C	(informative) Typical example of a RECS certificate	76
Annex D	(informative) Flowchart of IEC 62668-1 requirements	77
Annex E	(Informative) Typical use of anti-counterfeit standards in supply chains	80
Bibliography	88
Figure 1	– Suspect components perimeter	21
Figure 2	– Typical IEC 62668-1 and SAE AS5553 traceability requirements approach	22
Figure D.1	– Flowchart of IEC 62668-1 requirements and their relationship to external standards.....	79
Figure E.1	– Available anti-counterfeit standards for supply chains.....	80
Figure E.2	– Overview of typical relationships for anti-counterfeit standards in an avionics supply chain.....	84
Figure E.3	– Overview of typical anti-counterfeit standards in an avionics OEM supply chain.....	85
Figure E.4	– IECQ OD 3702 traceability audit	86
Figure E.5	– Typical IECQ OD 3702 coverage in any supply chain.....	87
Table 1	– Anti-counterfeit awareness training guidelines.....	18
Table 2	– IEC 62668-1 requirements satisfied or not if OEM has an approved	
Table 3	– IEC 62668-1 requirements satisfied or not if OEM has an approved SAE AS553B AS5553D plan	42

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PROCESS MANAGEMENT FOR AVIONICS –
COUNTERFEIT PREVENTION –****Part 1: Avoiding the use of counterfeit, fraudulent and
recycled electronic components**

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC [draws/draws] attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62668-1 edition 1.1 contains the first edition (2019-09) [documents 107/335/CDV and 107/346A/RVC] and its amendment 1 (2024-09) [documents 107/416/FDIS and 107/421/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 62668-1 has been prepared by IEC technical committee 107: Process management for avionics.

This first edition cancels and replaces the third edition of IEC TS 62668-1 published in 2016. This edition constitutes a technical revision.

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

- a) added a reference to AS/EN/JISQ 9100 and AS/EN/JISQ 9110 which contain anti-counterfeit requirements which may be used to satisfy the requirements of 4.2;
- b) added reference to USA DFAR rule 252.246.7008 and to UK Defence Standard 05-135;
- c) added reference to more GAO, OECD and ICC reports in 4.5.1;
- d) updated weblinks and other references;
- e) added new Annex E with figures describing how anti-counterfeit documents can be used in supply chains;
- f) added a reference to the new IECQ OD 3702 traceability audit;
- g) added new definition for re-manufactured components with a warning that these are not recommended.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62668 series, published under the general title *Process management for avionics – Counterfeit prevention*, can be found on the IEC website.

The committee has decided that the contents of this document and its amendment 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

PROCESS MANAGEMENT FOR AVIONICS – COUNTERFEIT PREVENTION –

Part 1: Avoiding the use of counterfeit, fraudulent and recycled electronic components

1 Scope

This part of IEC 62668 defines requirements for avoiding the use of counterfeit, recycled and fraudulent components used in the aerospace, defence and high performance (ADHP) industries. It also defines requirements for ADHP industries to maintain their intellectual property (IP) for all of their products and services. The risks associated with purchasing components outside of franchised distributor networks are considered in IEC 62668-2. Although developed for the avionics industry, this document can be applied by other high performance and high reliability industries at their discretion.

NOTE IEC 62668 (all parts) does not address the restriction on the re-use of a component in maintenance, repair and overhaul (MRO) operations and only addresses MRO activities when they are under the OEM's responsibility.

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.

IEC 62239-1, *Process management for avionics – Management plan – Part 1: Preparation and maintenance of an electronic components management plan*

IEC 62668-2, *Process management for avionics – Counterfeit prevention – Part 2: Managing electronic components from non-franchised sources*

ISO 9001, *Quality management systems – Requirements*

AS/EN/JISQ 9100, *Quality Management Systems – Requirements for Aviation, Space and Defense Organizations*

AS/EN/JISQ 9100, *Quality Maintenance Systems – Aerospace – Requirements for Maintenance Organizations*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions 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>