

TECHNICAL SPECIFICATION



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

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 03.100.50; 31.020; 49.060

ISBN 978-2-8322-3573-7

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PROCESS MANAGEMENT FOR AVIONICS –
COUNTERFEIT PREVENTION –****Part 2: Managing electronic components
from non-franchised sources**

FOREWORD

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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62668-2, which is a technical specification, has been prepared by IEC technical committee 107: Process management for avionics.

This second edition cancels and replaces the first edition, published in 2014. This edition constitutes a technical revision.

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

- a) Updates to the risk assessment process.
- b) Updates to the test methods including reference to the SAE AS6171 test methods in development.
- c) Updates in line with IEC TS 62668-1 for definitions and references to DFARS and removal of reference to RECS.

This technical specification is to be used in conjunction with IEC TS 62239-1 and IEC TS 62668-1.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
107/280/DTS	107/286/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

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

A list of all the 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 will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

The avionics industry has a responsibility to ensure that all flight equipment produced has a predicted product life which correlates to the predicted repair and service life to ensure the public is not endangered. Typically an original equipment manufacturer (OEM) calculates a mean time between failure (MTBF) and possibly a mean time to failure (MTTF) prediction. These calculations assume all components are new, or considered as “unused”, at the point of introduction into flight use and that no useful component life and/or any “unsafe” component conditions have been used. For example it is therefore essential that counterfeit, recycled and fraudulent components which have had potentially some of their “useful life” consumed and which may also be malfunctioning are not purchased for use in aerospace, defence and high performance (ADHP) industries.

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PROCESS MANAGEMENT FOR AVIONICS – COUNTERFEIT PREVENTION –

Part 2: Managing electronic components from non-franchised sources

1 Scope

This part of IEC 62668, which is a technical specification, defines requirements for avoiding the use of counterfeit, recycled and fraudulent components when these components are not purchased from the original component manufacturer (OCM) or are purchased from outside of franchised distributor networks for use in the aerospace, defence and high performance (ADHP) industries. This practice is used, as derogation, only when there are no reasonable or practical alternatives.

NOTE Typically this technical specification is used in conjunction with IEC TS 62239-1 and IEC TS 62668-1, enabling ADHP industries to manage and avoid the use of counterfeit, recycled and fraudulent components in their supply chains.

Although developed for the ADHP industry, this document may be used by other high-performance and high-reliability industries, at their discretion.

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

IEC TS 62668-1:2016, *Process management for avionics – Counterfeit prevention – Part 1: Avoiding the use of counterfeit, fraudulent and recycled electronic components*

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>

3.1.1

aftermarket source

reseller which may or may not be under contract with the original component manufacturer (OCM) or is sometimes a component “re-manufacturer”, under contract with the OCM

Note 1 to entry: The reseller accumulates inventories of encapsulated or non-encapsulated components (wafer and/or die) whose end of life date has been published by the OCM. These components are then resold at a profit to fill a need within the market for components that have become obsolete.

[SOURCE: IEC TS 62668-1:2016, 3.1.1]

3.1.2 broker

individual or corporate organization that serves as an intermediary between buyer and seller

Note 1 to entry: In the electronic component sector a broker specifically seeks to supply obsolete or hard to find components in order to turn a profit. To do so it may accumulate an inventory of components considered to be of strategic value or may rely on inventories accumulated by another. The broker operates within a worldwide component exchange network.

[SOURCE: IEC TS 62668-1:2016, 3.1.2]

3.1.3 COTS product commercial off-the-shelf product

one or more components, assembled and developed for multiple commercial consumers, whose design and/or configuration is controlled by the manufacturer's specification or industry standard

Note 1 to entry: COTS products can include electronic components, subassemblies or assemblies, or top level assemblies. Electronic COTS subassemblies or assemblies include circuit card assemblies, power supplies, hard drives, and memory modules. Top-level COTS assemblies include a fully integrated rack of equipment such as raid arrays, file servers to individual switches, routers, personal computers, or similar equipment.

[SOURCE: IEC TS 62668-1:2016, 3.1.3]

3.1.4 counterfeit, verb

action of simulating, reproducing or modifying a material, good or its packaging without authorization

Note 1 to entry: It is the practice of producing products which are imitations or are fake goods or services. This activity infringes the intellectual property rights of the original manufacturer and is an illegal act. Counterfeiting generally relates to willful trademark infringement.

[SOURCE: IEC TS 62668-1:2016, 3.1.4]

3.1.5 counterfeited component

material good imitating or copying an authentic material, good which may be covered by the protection of one or more registered or confidential intellectual property rights

Note 1 to entry: A counterfeited component is one whose identity or pedigree has been altered or misrepresented by its supplier.

Identity = original manufacturer, part number, date code, lot number, testing, inspection, documentation or warranty etc.

Pedigree = origin, ownership history, storage, handling, physical condition, previous use, etc.

[SOURCE: IEC TS 62668-1:2016, 3.1.5]

3.1.6 customer device specification

device specification written by a user and agreed by the supplier

[SOURCE: IEC TS 62668-1:2016, 3.1.6]

3.1.7 customer user

original equipment manufacturer (OEM) which purchases electronic components, including integrated circuits and/or semiconductor devices compliant with this technical specification, and uses them to design, produce, and maintain systems

[SOURCE: IEC TS 62668-1:2016, 3.1.7]

3.1.8 data sheet

document prepared by the manufacturer that describes the electrical, mechanical, and environmental characteristics of the component

[SOURCE: IEC TS 62668-1:2016, 3.1.8]

3.1.9 franchised distributor or agent

individual or corporate organisation that is legally independent from the franchiser (in this case the electronic component manufacturer or OCM) and agrees under contract to distribute products using the franchiser's name and sales network

Note 1 to entry: Distribution activities are carried out in accordance with standards set and controlled by the franchiser. Shipments against orders placed can be dispatched either direct from the OCM or the franchised distributor or agent. In other words, the franchised distributor enters into contractual agreements with one or more electronic component manufacturers to distribute and sell the said components. Distribution agreements may be stipulated according to the following criteria: geographical area, type of clientele (avionics for example), maximum manufacturing lot size. Components sourced through this route are protected by the OCM's warranty and supplied with full traceability.

[SOURCE: IEC TS 62668-1:2016, 3.1.9]

3.1.10 fraudulent component

electronic component produced or distributed either in violation of regional or local law or regulation, or with the intent to deceive the customer

Note 1 to entry: This includes but is not limited to the following which are examples of components which are fraudulently sold as new ones to a customer:

- 1) a stolen component;
- 2) a component scrapped by the original component manufacturer (OCM) or by any user;
- 3) a recycled component, that becomes a fraudulent recycled component when it is a disassembled component resold as a new component (see Figure 1), where typically there is evidence of prior use and rework (for example solder, re-plating or lead re-attachment activity) on the component package terminations;
- 4) a counterfeit component, a copy, an imitation, a full or partial substitute of brands;
- 5) fraudulent designs, models, patents, software or copyright sold as being new and authentic. For example: a component whose production and distribution are not controlled by the original manufacturer;
- 6) unlicensed copies of a design;
- 7) a disguised component (re-marking of the original manufacturer's name, reference date/code or other identifiers etc.), which may be a counterfeit component (see Figure 1);
- 8) a component without an internal silicon die or with a substituted silicon die which is not the original manufacturer's silicon die.

[SOURCE: IEC TS 62668-1:2016, 3.1.10]

**3.1.11
microcircuit
component
device**

electrical or electronic device that is not subject to disassembly without destruction or impairment of design use and is a small circuit having a high equivalent circuit element density which is considered as a single part composed of interconnected elements on or within a single substrate to perform an electronic circuit function

Note 1 to entry: This excludes printed wiring boards / printed circuit boards, circuit card assemblies and modules composed exclusively of discrete electronic components).

[SOURCE: IEC TS 62668-1:2016, 3.1.11]

**3.1.12
non-franchised distributor**

companies which do not fall under a franchised distributor or OCM

Note 1 to entry: These distributors may purchase components from component manufacturers, franchised distributors, or through other supply channels (open markets). These distributors cannot always provide the guarantees and support provided by the franchised distributor network; components sourced through this source are usually protected by the source's warranty only. However, some of them are able to purchase traceable components and/or to provide traceability paperwork and/or are able to return stock for investigation to the OCM.

[SOURCE: IEC TS 62668-1:2016, 3.1.12]

**3.1.13
OCM
original component manufacturer**

company specifying and manufacturing the electronic component

[SOURCE: IEC TS 62668-1:2016, 3.1.13]

**3.1.14
OEM
original equipment manufacturer**

manufacturer which defines the electronic subassembly that includes the electronic components or defines the components used in an assembly and/or test specification

[SOURCE: IEC TS 62668-1:2016, 3.1.14]

**3.1.15
piracy**

willful copyright infringement

[SOURCE: IEC TS 62668-1:2016, 3.1.15]

**3.1.16
purchasing agency**

organization which groups the quantities of electronic components required by a series of companies in order to constitute significant buying power and thereby obtain the best possible supplier conditions for purchasing (especially as regards pricing and purchasing conditions) as well as for assistance with management, documentation, financing, etc.

**3.1.17
reseller**

general supplier which offers a selection of electronic components to order from a catalogue

[SOURCE: IEC TS 62668-1:2016, 3.1.16]

3.1.18**recycled component**

electrical component removed from its original product or assembly and available for reuse

Note 1 to entry: The component has authentic logos, trademarks and markings. However, it typically has no output to measure the useful life remaining for its reuse. A recycled component can fail earlier than a new one when re-assembled into another product or assembly. A recycled component may also be physically or ESD damaged during the removal process.

[SOURCE: IEC TS 62668-1:2016, 3.1.17]

3.1.19**semiconductor**

electronic component in which the characteristic distinguishing electronic conduction takes place within a semiconductor

Note 1 to entry: This includes semiconductor diodes which are semiconductor devices having two terminals and exhibiting a nonlinear voltage-current characteristic and transistors which are active semiconductor devices capable of providing power amplification and having three or more terminals.

[SOURCE: IEC TS 62668-1:2016, 3.1.18]

3.1.20**subcontractor**

manufacturer of electronic subassemblies or supplier manufacturing items in compliance with customer design data pack and drawings, and under the authority of the OEM

Note 1 to entry: This supplier may potentially procure all or part of the electronic components required to produce a subassembly and is often referred to as the contract electronic manufacturer (CEM) or electronics manufacturing services (EMS).

[SOURCE: IEC TS 62668-1:2016, 3.1.19]

3.1.21**supplier**

company which provides to another an electronic component which is identified by the logo or name marked on the device

Note 1 to entry: A supplier can be an OCM, a franchised distributor or agent, a non-franchised distributor, broker, reseller, OEM, CEM, and EMS etc.

[SOURCE: IEC TS 62668-1:2016, 3.1.20]

3.1.22**suspect component**

electronic component which has lost supply chain traceability back to the original manufacturer and which may have been misrepresented by the supplier or manufacturer and may meet the definition of fraudulent or counterfeit component

Note 1 to entry: Suspect components may include but are not limited to:

- (1) counterfeit components;
- (2) recycled components coming from uncontrolled recycling operations carried outside of the OEM, franchised network and OEM business where typically it has been fraudulently sold to the OEM as being in a new unused condition.

[SOURCE: IEC TS 62668-1:2016, 3.1.21]

3.1.23**traceability**

ability to have for an electronic component its full trace back to the original component manufacturer

Note 1 to entry: This traceability means that every supplier in the supply chain is prepared to legally declare in writing that they know and can identify their source of supply, which goes back to the original manufacturer and can confirm that the electronic components are brand new and were handled with appropriate handling precautions including ESD and MSL. This authenticates the electronic components being supplied are unused, brand new components with no ESD, MSL or other damage. This ensures that the electronic components are protected by any manufacturer's warranties, have all of their useful life remaining and function according to the manufacturer's published data sheet, exhibiting the expected component life in the application for the OEM's reliability predictions and product warranty.

[SOURCE: IEC TS 62668-1:2016, 3.1.22]

3.1.24 untraceable

property of electronic components which have lost their traceability (see 3.1.23)

[SOURCE: IEC TS 62668-1:2016, 3.1.23]

3.2 Abbreviated terms

ACTF	Semiconductor Industries Association Anti Counterfeit Task Force
ADHP	aerospace, defence and high performance
COTS	commercial off-the-shelf
CEM	contract electronic manufacturer
CSAM	C-mode scanning acoustic microscopy
DSCC	Defence Supply Centre Columbus (see http://www.dscc.dla.mil/), now known as DLA
DLA	Defense Logistics Agency
EMS	electronics manufacturing services
ERAI	Electronic Reseller Association International (see http://www.era.com)
ESCO	Electronic Systems Challenges and Opportunities (see http://www.esco.org.uk/about-v2/)
ESD	electrostatic discharges
G-19	SAE Counterfeit Electronic Parts Committee
GIDEP	Government-Industry Data Exchange Program
GIFAS	Groupement des Industries Françaises Aéronautiques et Spatiales (French Aerospace Association)
HTRB	high temperature reverse bias
IDEA	Independent Distributors of Electronics Association
LTB	last time buy
LDC	lot date code
MSL	moisture sensitivity level
MTBF	mean time between failure
MTTF	mean time to failure
OCM	original component manufacturer
OEM	original equipment manufacturer
SEM	scanning electron microscopy