

# **SAE AS5553 - A New Standard in the Fight against Counterfeit Electronic Parts**

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# Agenda

- “Overall Supply Chain Best Practices”, Defense Industrial Base Assessment: Counterfeit Electronics, Department of Commerce - Bureau of Industry & Security Office of Technology Evaluation (DOC BIS OTE)
- Overview of AS5553
- NASA Efforts in addressing Counterfeit Electronic Parts



# Overall Supply Chain Best Practices

## DOC BIS OTE

### INSTITUTIONALIZED POLICIES AND PROCEDURES

- Respondents ... stressed the importance for organizations to have institutionalized policies and procedures in place on how to avoid and handle counterfeit components
  - Employees need clear direction from management on combating counterfeits as well as written guidance on how to: avoid purchasing counterfeit parts; test, handle, and track incoming and outgoing parts; and manage and dispose of suspected counterfeit components



# Overall Supply Chain Best Practices

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### INTERNAL AND EXTERNAL COMMUNICATION

- Suppliers need to discuss the risks associated with procuring obsolete and hard-to-find parts, parts that require long lead times, and parts from unauthorized (suppliers)
  - Survey respondents said OCMs in particular need to alert customers and industry in a timely manner when parts will no longer be manufactured



# Overall Supply Chain Best Practices

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### PROCUREMENT OF PARTS

- ...procurement process has become a main entry point for counterfeits due to the use of unapproved suppliers, lack of part authentication procedures, lack of communication and cooperation between suppliers and customers, insufficient inventory control procedures, and limited counterfeit avoidance procurement policies and practices. To this end, respondents recommended steps that organizations can take to reduce the vulnerabilities in procurement processes



# Overall Supply Chain Best Practices

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### PROCUREMENT OF PARTS

- The most widely suggested best practice to avoid purchasing counterfeits is to buy parts directly from OCMs and authorized distributors, rather than from parts brokers, independent distributors, or the gray market
- Traceability is a key means for verifying legitimate parts in any supply channel
  - Organizations should require their suppliers to trace parts back to OCMs in order to prove part authenticity



# Overall Supply Chain Best Practices

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### SUPPLY CHAIN REQUIREMENTS

- Organizations should confirm suppliers use desired counterfeit avoidance policies and practices. This can be done through contract requirements and language in purchase orders
  - Organizations can legally require certificates of conformance, testing certification, and procedures for handling any counterfeit parts that slip through
  - All requirements must be communicated to an organization's suppliers instead of assuming that suppliers take unilateral actions to prevent counterfeits



# Overall Supply Chain Best Practices

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### COUNTERFEIT PART TRAINING PROGRAMS

- A majority of survey participants identified a need for training on how to inspect parts and identify possible counterfeits (e.g., non-conforming part markings)
  - This training – preferably hands-on – should be given to all employees that handle electronic parts, including purchasing, quality assurance, and receiving personnel



# Overall Supply Chain Best Practices

## RECEIVING AND STORING PARTS

DOC BIS OTE

- Organizations should implement procedures to mitigate the risk posed by counterfeits when they take possession of purchased parts...

## MANAGING COUNTERFEITS

- Organizations should remove suspected and confirmed counterfeit parts from regular inventory and quarantine them
- ...organizations should report all information on suspected and confirmed counterfeit parts to industry associations and databases. One of the more prominent information-sharing mechanisms for organizations conducting business with the U.S. Government is GIDEP
- Suspected and confirmed counterfeit parts need to be reported to law enforcement agencies in order for them to investigate incidents and stop counterfeiters

# AS5553 Rationale

**“... created in response to a significant and increasing volume of counterfeit electronic parts entering the aerospace supply chain, posing significant performance, reliability, and safety risks.”**

Counterfeit Electronic Parts Avoidance, Detection, Mitigation, and Disposition

Issued 2009-04

## RATIONALE

*This standard was created in response to a significant and increasing volume of counterfeit electronic parts entering the aerospace supply chain, posing significant performance, reliability, and safety risks.*

*This standard was created to provide uniform requirements, practices and methods to mitigate the risks of receiving and installing counterfeit electronic parts.*

## FOREWORD

*To assure customer satisfaction, aerospace industry organizations must produce, and continually improve, safe, reliable products that meet or exceed customer and regulatory authority requirements. The globalization of the aerospace industry and the resulting diversity of regional/national requirements and expectations has complicated this objective. End-product organizations face the challenge of assuring the quality and integration of product purchased from suppliers throughout the world and at all levels within the supply chain. Aerospace suppliers and processors face the challenge of delivering product to multiple customers having varying quality expectations and requirements.*

*This document standardizes requirements, practices, and methods related to: parts management, supplier management, procurement, inspection, test/evaluation, and response strategies when suspect or confirmed counterfeit parts are discovered.*

# G-19 Members & Liaisons

Note: Technical experts participate on SAE Committees as individuals and not as official representatives of their companies or organizations

## U.S. Government ...

- DCIS HQs, Economic Crimes
- DOE, Office of Inspector General
- DSCC
- GIDEP
- MDA
- NASA
- Office of Management & Budget, Office of Federal Procurement Policy
- U.S. Air Force/NRO (Aerospace Corp.)
- U.S. Army - AMRDEC
- U.S. Customs and Border Protection
- U.S. DOT, Office of Inspector General/Office of Investigations
- U.S. Navy - NAVAIR
- U.S. Navy - NSWC
- U.S. Navy - NCIS
- U.S. Nuclear Regulatory Commission

## Industry Associations ...

- Aerospace Industries Association (AIA)
- Best Manufacturing Practices Center of Excellence (BMPCOE)
- ERAI, Inc.
- Government Electronics & Information Technology Association (GEIA)
- Independent Distributors of Electronics Association (IDEA)

## Industry ...

- American Electronic Resources
- Analytical Solutions
- Arcadia Components
- Arrow Zeus Electronics
- BAE Systems
- Boeing
- General Dynamics
- Jabil Circuits
- Lockheed Martin
- Maxim Integrated Products
- N.F. Smith & Associates
- Northrop Grumman
- Orbital Sciences
- QP Semiconductor
- Raytheon

# Counterfeit Part Definition

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## 3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions stated in ISO 9000 and the following shall apply:

### 3.1 Suspect Part

A part in which there is an indication by visual inspection, testing, or other information that it may have been misrepresented by the supplier or manufacturer and may meet the definition of counterfeit part provided below.

### 3.2 Counterfeit Part

A suspect part that is a copy or substitute without legal right or authority to do so or one whose material, performance, or characteristics are knowingly misrepresented by a supplier in the supply chain. Examples of counterfeit parts include, but are not limited to:

- Parts which do not contain the proper internal markings (die, manufacturer, wire bonding, etc.) consistent with the ordered part.
- Parts which have been used, refurbished, or otherwise misrepresented as new product.
- Parts which have different material, performance, or finish than the ordered parts.
- Parts which have not been produced by the Original Component Manufacturer's (OCM)'s full production and test flow, but are otherwise indistinguishable from the OCM's parts.

## Suspect Part

A part in which there is an indication by visual inspection, testing, or other information that it may have been misrepresented by the supplier or manufacturer and may meet the definition of counterfeit part provided below.

## Counterfeit Part

A suspect part that is a copy or substitute without legal right or authority to do so or one whose material, performance, or characteristics are knowingly misrepresented by a supplier in the supply chain...

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- Terms and Definitions**
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  - Purchasing Process
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  - In Process Investigation
  - Material Control
  - Reporting
- Appendices with Detailed Guidance**

# Risk Mitigation starts with a Control Plan

## 4. REQUIREMENTS

### 4.1 Counterfeit Electronic Parts Control Plan

The organization shall develop and implement a counterfeit electronic parts control plan that documents its processes used for risk mitigation, disposition, and reporting of counterfeit parts. The control plan shall include the processes described in paragraphs 4.1.1 through 4.1.7 below.

#### 4.1.1 Parts Availability

The processes shall maximize the availability of authentic, originally designed and/or qualified parts throughout the product's life cycle, including management of parts obsolescence. Information and guidance for ensuring parts availability is provided in Appendix A, Parts Availability.

#### 4.1.2 Purchasing

The processes shall:

- a. Assess potential sources of counterfeit parts (e.g., equipment suppliers) to determine the risk of receiving counterfeit parts. This assessment shall include audits, review of product alerts (e.g., GIDEP, ERAI), and review of supplier quality data to determine past performance.
- b. Maintain a register of counterfeit parts to track the risk of counterfeit parts. The register shall include the name and location of all of the supply chain intermediaries from the part manufacturer to the direct source of the product for the seller. If this traceability is unavailable or the documentation is suspected of being falsified, a documented risk assessment is required. Guidance and information regarding supply chain traceability are provided in Appendix C, Supply Chain Traceability.
- c. Specify a preference to procure counterfeit parts from OCMs or authorized suppliers. This shall be accomplished and documented for every application when it is necessary to procure from other than the OCM or an authorized supplier.
- d. Assure that approved/qualified suppliers are maintaining effective processes for mitigating the risks of supplying counterfeit electronic parts. Assurance actions may include surveys, audits, review of product alerts, and review of supplier quality data to determine past performance.
- e. Assess and mitigate risks of procuring counterfeit parts from sources other than OCMs or authorized suppliers. This shall be accomplished and documented for every application when it is necessary to procure from other than the OCM or an authorized supplier.
- f. Specify supply chain traceability to the OCM or aftermarket manufacturer that identifies the name and location of all of the supply chain intermediaries from the part manufacturer to the direct source of the product for the seller. If this traceability is unavailable or the documentation is suspected of being falsified, a documented risk assessment is required. Guidance and information regarding supply chain traceability are provided in Appendix C, Supply Chain Traceability.

## Requirement

“The organization shall develop and implement a counterfeit electronic parts control plan...”

AS5553 4.1 Counterfeit Electronic Parts Control Plan



# Enhance Purchasing Processes with Counterfeit Focus

Assess potential sources of supply

Maintain a register of approved suppliers

Assure sources maintain effective processes for mitigating the risks of supplying counterfeit electronic parts

Specify supply chain traceability to the OCM or aftermarket manufacturer

## Requirement

“The processes shall...”

Specify flow down of applicable requirements

Specify a preference to procure directly from OCMs or authorized suppliers

Assess and mitigate risks of procuring counterfeit parts from sources other than OCMs or authorized suppliers

AS5553 4.1.2 Purchasing

# Reduce Risk with Strong Contract Clauses

## **Requirement Purchasing Information**

“The documented process shall specify contract/purchase order quality requirements to minimize the risk of being provided counterfeit parts.”

### **Sample Contract Clause:**

#### **Product Impoundment and Financial Responsibility**

“If counterfeit parts are furnished under this purchase agreement, such items shall be impounded. The seller shall promptly replace such items with items acceptable to the <BUYER> and the seller may be liable for all costs relating to impoundment, removal, and replacement. <BUYER> may turn such items over to US Governmental authorities (Office of Inspector General, Defense Criminal Investigative Service, Federal Bureau of investigation, etc.) for investigation and reserves the right to withhold payment for the items pending the results of the investigation.”

AS5553 4.1.3 Purchasing Information

# Compliance Verification is a Multi-Stepped Process

## Requirement

Verification of Purchased Product  
“The documented processes shall assure detection of counterfeit parts prior to formal product acceptance...”

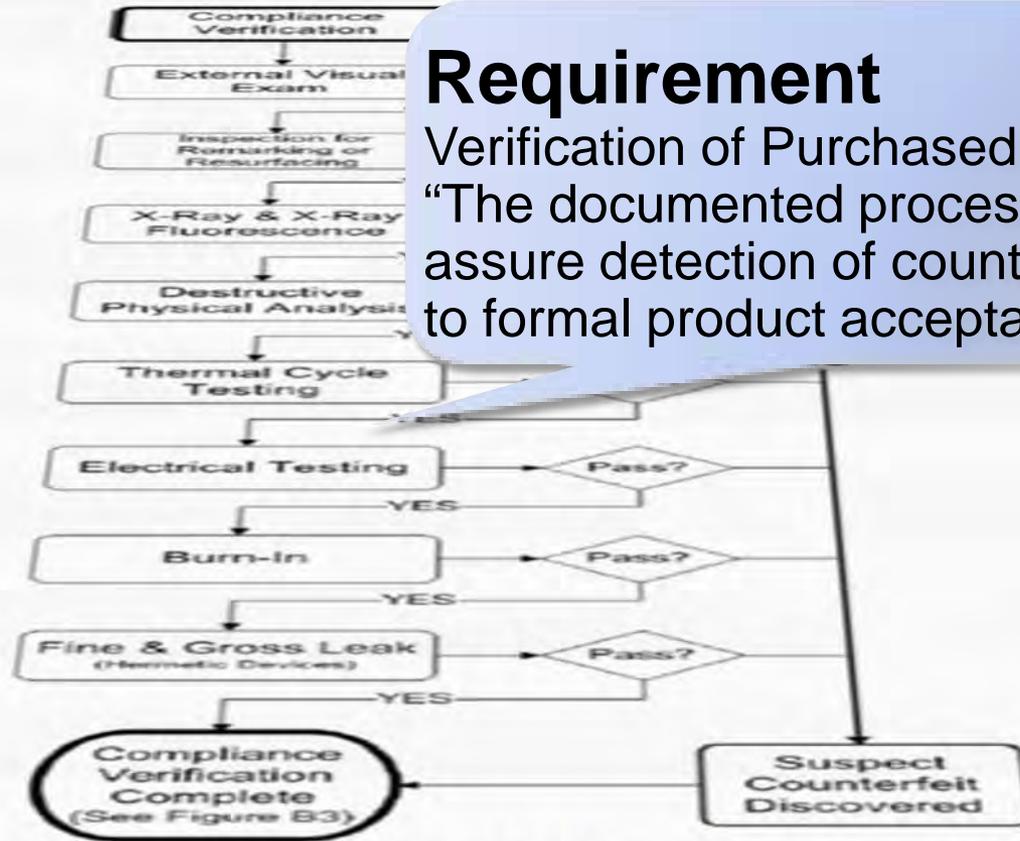


FIGURE E1 - SAMPLE AUTHENTICITY VERIFICATION PROCESS FLOW

AS5553 4.1.4 Verification of Purchased Product

# Post-Acceptance Processes

## Requirement

### In Process Investigation

... processes shall address the detection, verification and control of in-process and in-service suspect counterfeit parts

### Material Control

... processes shall specify methods for physical identification, segregation/quarantine, and control of suspect or confirmed counterfeit parts to preclude their use or installation... processes shall ensure that counterfeit parts do not re-enter the supply chain

### Reporting

... processes shall assure that all occurrences of counterfeit parts are reported ...to internal organizations, customers, government reporting organizations (e.g., GIDEP), industry supported reporting programs (e.g., ERAI), and criminal investigative authorities

AS5553 4.1.5, 4.1.6, 4.1.7

A vertical American flag is positioned on the left side of the slide, showing the stars and stripes.

# SAE G-19 Committee Initiatives

- Develop distributor risk characterization methodology
- Develop and Release new aerospace industry standard for certification of Component Distributors
  - Secure 3<sup>rd</sup> party Certification Body

A vertical strip of the American flag is visible on the left side of the slide, showing the stars and stripes.

# NASA Efforts

# Awareness

- Awareness Briefings at HQs, Center Director Levels and within Centers
- Awareness briefings at Aerospace Quality Group gatherings (IAQG and AAQG) and NASA/ESA/JAXA Trilateral meetings
- Report ERAI counterfeit parts alerts to all NASA organizations
- Host NASA Quality Leadership Forum (QLF) every 6 months and annual Supplier conferences
  - Numerous topical presentations on Counterfeit Parts issues and solutions available via QLF web site

# Training

- Provide IDEA Inspection Standard 1010A to all NASA Centers and prime contractors
- Conduct course in Counterfeit Parts Avoidance for Inspectors, Operators, Auditors and Suppliers
- Conduct AS5553 training course for SAE International



# Industry Involvement

- Participate in Aerospace Industries Association (AIA) Counterfeit Parts Integrated Project Team (IPT)
- Lead development of industry anti-counterfeiting standards
- Co-hosted 1-day Counterfeit Electronics Parts Workshop
- Sponsor and support planning of various anti-counterfeiting meetings and events



# NASA Policy Directive

November 2008 – Released NASA Policy Directive, NPD-8730.2C “NASA Parts Policy”

Develop, document, and implement a counterfeit EEE parts control plan for the avoidance, detection, mitigation, disposition, control, and reporting of counterfeit EEE parts (Requirement). Control plans may be project unique or apply to multiple Center projects... Detailed guidance and definitions are provided in AS5553

# NASA Outlook

- Provide FAR Council recommendation for new FAR clause specifying procurement of parts from reliable sources
- Develop NASA FAR Supplement (NFS) clause mandating GIDEP reporting
- Support SMTA/CALCE Counterfeit Symposium, December 2-3, 2009
- Provide NASA Center counterfeit parts avoidance training and assistance in developing counterfeit parts control plans

# Thank you!

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## Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition

Document Number: AS5553  
Date Published: April 2009

Issuing Committee:  
G-19 Counterfeit Electronic Parts Committee

**Scope:**  
This document is intended for use in aviation, space, defense, and other high performance electronic equipment applications. This standard is recommended for use by all contracting organizations that procure electronic parts, whether such parts are procured directly or integrated into electronic equipment. The requirements of this standard are intended to be applied/flowed down to all products that procure electronic parts, regardless of type, product provided.

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