SAE INTERNATIONAL STANDARDS- COUNTERFEIT AVOIDANCE, DETECTION, MITIGATION AND DISPOSITION

July 2014

Bruce Mahone
Director, Washington Operations
SAE International
www.sae.org
SAE's main purpose is to collect, develop, and disseminate technical information related to mobility technology.
About SAE: Purpose

- Materials
- Environmental Standards
- Standard Parts
- Human Factors
- Integrated Vehicle Health Management (IVHM) & Reliability

- Counterfeit Parts Avoidance
- Deicing
- Military Avionics
G-19 & G-21 Counterfeit Prevention & Detection Standards

1. OEMS/Users of Electronics: AS5553
2. OEMS/Users of Materiel (other than electronics): AS6174
3. Independent Distributors/Brokers of Electronics: AS6496
4. Authorized Distributors of Electronics: AS6081
5. Test Laboratories of Electronics: AS6171
# SAE G-19 & G-21 Document Proposed Roadmap, 2014

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<td>Test Provider</td>
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<td>Operator(s) Certified to PT Scheme for Identified AS6171 Test Methods</td>
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<table>
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<td>Authorized/ Franchised</td>
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**AS6171**, Test Methods Standard; Counterfeit Electronic Parts, SAE G-19A

**Asxxxx**, Compliance Standard or Guide (Includes Audit Checklist) SAE G-19C

**ASxxxx**, OCM Counterfeit Mitigation Subcommittee. SAE G-19O

**AS6469**, Authorized Distributor Counterfeit Parts Mitigation Sub-com. SAE G-19AD

**AS6496**, Authorized Distributor Counterfeit Parts Mitigation Sub-com. SAE G-19AD

**AS6081**, Counterfeit Electronic Parts Avoidance, ID’s. SAE G-19D

**Asxxxx**, Compliance Standard or Guide (Includes Audit Checklist) SAE G-19C

**AS6553A**, Fraudulent/Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition. SAE G-19C

**AS6301**, Compliance Standard or Guide (Includes Audit Checklist) SAE G-19C

**AS6602**, Compliance Standard or Guide (Includes Audit Checklist) SAE G-19C

**Asxxxx**, Compliance Standard or Guide (Includes Audit Checklist) SAE G-19C

**AS6631**, Compliance Standard or Guide (Includes Audit Checklist) SAE G-19C

**AS6462**, Compliance Standard or Guide (Includes Audit Checklist) SAE G-19C

**AR6174**, Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel SAE G-21

**AS6463**, Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel

**Commodity Slash Sheets in Rev. A document. SAE G-21**

**AS6464**, Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel

**Commodity Slash Sheets in Rev. A document. SAE G-21**

**AS6465**, Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel

**Commodity Slash Sheets in Rev. A document. SAE G-21**

**AS6466**, Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel

**Commodity Slash Sheets in Rev. A document. SAE G-21**

**AR6174**, Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel

**Commodity Slash Sheets in Rev. A document. SAE G-21**

**Asxxxx**, Compliance Standard or Guide (Includes Audit Checklist) SAE G-21C

**AIR6273**, Terms and Definitions – Fraudulent/Counterfeit Electronic Parts SAE G-19T

**ASxxxx**, Anti-Tamper and Transportation Security G-19AT

Published | In Development | Gap
SAE Aerospace G-19
Counterfeit Electronic Parts Committee

• Chartered in 2007 to address aspects of preventing, detecting, responding to and counteracting the threat of counterfeit electronic components. Participants included:
  – Government
  – Defense/Aerospace Manufacturers
  – Industry Groups
  – Testing Laboratories

• April 2009 - SAE International released aerospace standard AS5553, Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition

• August 2009 – United States Department of Defense adopted AS5553
SAE G-19 Members

Government and Defense Members

- Defense Logistics Agency (DLA)
- Defense Contract Management Agency (DCMA)
- DOE - National Nuclear Security Administration (NNSA)
- DHS – Department of Homeland Security, Customs and Border Protection (CBP)
- Federal Aviation Administration (FAA)
- Intelligence Advanced Research Projects Activity (IARPA)
- Ministry of Defence (MoD), UK
- National Aeronautics and Space Administration (NASA)
- US Department of Defense (DOD)
- USAF/NRO (National Reconnaissance Office)
- USAF Wright Patterson Air Force Base (AFB)
- US Army - AMCCC Business Operations HQAMC
- US Army Aviation & Missile Command
- US Army Redstone Arsenal
- US Missile Defense Agency (MDA)
- US Navy - Naval Air Warfare Center
- US Navy - Naval Surface Warfare Center (NSWC )Crane
- US Navy - NAVSEA Crane
- US Navy, Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity
- US Department of Transportation

Note: Members function as individuals intending to represent the best interests of the industry, and not as agents or representatives of any organization with which they may be associated
Participating Industry Associations ...

- ACLASS Accreditation Services
- Aerospace Industries Association (AIA)
- ANSI-ASQ Accreditation Board (ANAB)
- Component Obsolescence Group (COG)
- The Electronic Components Supply Network
- EIA Standards and Technology Electronic Components
- ERAI, Inc.
- Independent Distributors of Electronics Association (IDEA)
- Performance Review Institute (PRI)
- UK Electronics Alliance (UKEA)
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Subsidiary/Associated Company</th>
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</thead>
<tbody>
<tr>
<td>Adaptive Management Solutions</td>
<td>General Dynamics UK</td>
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<tr>
<td>Aero Engine Controls</td>
<td>GE Aviation</td>
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<tr>
<td>American Electronic Resource</td>
<td>Goodrich Control Systems</td>
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<tr>
<td>Analytical Alternatives</td>
<td>Greenberg &amp; Bass</td>
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<td>Analytical Solutions</td>
<td>Harris</td>
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<tr>
<td>Applied DNA Sciences</td>
<td>Hi-Relability Microelectronics</td>
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<td>Arcadia Components</td>
<td>Hi-Rel Laboratories</td>
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<tr>
<td>Ares Corp</td>
<td>Honeywell Aerospace Electronic Systems</td>
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<td>Arrow Electronics</td>
<td>Honeywell Int'l</td>
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<td>Astute Electronics</td>
<td>Honeywell Technology Solutions</td>
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<tr>
<td>BAE Systems (Operations)</td>
<td>Infineon Technologies AG</td>
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<td>BAE Systems</td>
<td>Integra Technologies</td>
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<td>Ball Aerospace &amp; Technologies</td>
<td>Jabil Circuits</td>
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<td>Boeing</td>
<td>Jacobs Engineereing</td>
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<td>Boeing Advanced Systems</td>
<td>Jet Propulsion Laboratory</td>
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<td>Business Quality Process Management</td>
<td>L-3 Communications - CSW</td>
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<td>Bechtel Plant Machinery</td>
<td>Left Coast Technical Solutions</td>
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<tr>
<td>CALCE University Of Maryland</td>
<td>Lockheed Martin Aeronautics</td>
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<td>Celestica Corp. Technology &amp; Engineering</td>
<td>Lockheed Martin Missiles &amp; Fire Control</td>
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<td>China Aero-Polytechnology Establishment</td>
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<td>3M</td>
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<td>Crestwood Technology Group</td>
<td>Microram Electronics</td>
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<td>DA-Tech</td>
<td>Motronics Circuits International</td>
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<td>Derf Electronics</td>
<td>Mouser Electronics</td>
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<tr>
<td>Det NordskeVeritas (DNV)</td>
<td>Nisene Technology Group</td>
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<tr>
<td>DPA Components International</td>
<td>Northrop Grumman Electronic Systems</td>
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<td>Electronic Supply Chain Solutions</td>
<td>N.F.Smith &amp; Associates</td>
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<td>Eltek Semiconductors</td>
<td>NQA</td>
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<td>General Dynamics</td>
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<td>Orbital Sciences</td>
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<td>Plexus</td>
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<td>Premier Semiconductor Services</td>
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<td>Process Sciences</td>
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<td>Schlumberger HPS</td>
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<td>Selex Galileo</td>
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<td>Silicon Cert Laboratories</td>
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<td>Sonoscan</td>
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<td>Trace Laboratories</td>
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<td>TTI</td>
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<td>Underwriters Laboratories, UL DQS</td>
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<td>Westland Helicopters</td>
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<td>White Horse Laboratories</td>
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<td>World Data Products</td>
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<td>World Micro</td>
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<td>Wyle Laboratories</td>
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G-19 Subcommittees Formed Since 2009

G-19 CI - Continuous Improvement Subcommittee
(AS5553A: Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition)

G-19 D - Independent Distributor Subcommittee
(AS6081: Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition; Independent Distribution)

G-19 AD - Authorized Distributor Counterfeit Mitigation Subcommittee
(AS6496: Counterfeit Electronic Parts Counterfeit Mitigation AD’s)

G-19 DR - Distributor Risk Characterization Subcommittee
(ARP6178: Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors)

G-19 A - Test Laboratory Standards Development Subcommittee
(AS6171: Test Methods Standard; Counterfeit Electronic Parts)

G-19 C - Standards Compliance Verification Subcommittee
(AS6462: AS5553, Verification Criteria
AS6301: AS6081 Verification Criteria)

G-19 T - Definitions Task Group
(AIR6273: Terms and Definitions - Counterfeit Parts)
“... 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.”
## SAE AS5553 and AS5553A Aerospace Standards

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

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Provide uniform requirements, practices and methods to mitigate the risks of purchasing and supplying counterfeit electronic parts</th>
</tr>
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<tbody>
<tr>
<td>Target Audience</td>
<td>Original Equipment Manufacturers and Users/Integrators that purchase and/or manufacture products with electrical components</td>
</tr>
</tbody>
</table>
| Uses | • Requirements for developing a Counterfeit Parts Control Plan  
• Guidelines in the appendices for Counterfeit Mitigation industry best-practices  
• Compliance standard under development for the Rev. A |
| Status | • AS5553 - Issued - April 2009 through G-19  
• AS5553A – Issued – January 2013 through G-19CI  
• Adopted by NASA in November, 2009  
• Adopted by DoD in August, 2009  
• Under revision by G-19CI Committee to AS5553B  
  ➢ To be aligned with other G-19 Standards |
### (AS5553A) Fraudulent/Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition

<table>
<thead>
<tr>
<th>Scope</th>
<th>• Standardizes requirements, practices, and methods related to: parts management, supplier management, procurement, inspection, test/evaluation, and response strategies when suspect or confirmed fraudulent/counterfeit Electrical, Electronic, and Electromechanical (EEE) parts are discovered.</th>
</tr>
</thead>
</table>
| Applicability | • All organizations that procure and/or integrate electronic parts and/or assemblies containing such items.  
• Not for use by organizations that distribute parts, |
| Commodity(s) Covered | • EEE parts |
| Overview | • Created in response to counterfeit electronic parts entering the supply chain, posing significant performance, reliability and safety risks.  
• The mitigation of counterfeit EEE parts in this standard is risk-based and will vary depending on the desired performance or reliability of the equipment/hardware. |
Main Subjects Covered:

• Fraudulent/Counterfeit EEE Parts Control Plan:
  - Personnel Training
  - Parts Availability - Covered in Annex A
  - Purchasing Process - Appendix B
    - Assessment of Suppliers
    - Supply Chain Traceability - Appendix C
  - Verification of Purchased/Returned Part(s)
  - In-Process Investigation
Subjects covered continued

• Fraudulent/Counterfeit EEE Parts Control Plan:
  ➢ Failure Analysis
  ➢ Material Control - Appendix F
  ➢ Reporting – Appendix G
  ➢ Post Delivery Support
  ➢ Acronyms and Abbreviations-Appendix H
### Purpose

Standardizes practices to:

- a. procure parts from reliable sources,
- b. assess and mitigate risk of distributing counterfeit parts,
- c. control suspect or confirmed counterfeit parts,
- d. report suspect and confirmed counterfeit parts to other potential users and Authority Having Jurisdiction,
- e. and assess, mitigate, control, and report parts which have been used, refurbished, or reclaimed, but represented as new product.

### Target Audience

Independent Distributors/Brokers of Electronic Components

### Uses

- Requirements for a Counterfeit Mitigation program
- Intended to be used for certification of Distributors (ANAB)

### Status

### Scope
- Sets forth practices and requirements for use by distributors of (EEE) parts purchased and sold from the Open Market, including purchased excess and purchased returns.

### Applicability
- Distributors of EEE parts purchased and sold from the Open Market, including purchased excess and purchased returns.
- Does not apply to system integrators, their OEMs nor to Authorized (Franchised) Distributors and Aftermarket Manufacturers when supplying parts obtained directly from the OCM or the OCM Authorized (Franchised) Distributor for whom they are authorized.
- Can be used by internal and external parties, including Certification Bodies accredited by an International Accreditation Forum (IAF) Multilateral Recognition Arrangements (MLA) Signatory Accreditation Body (http://www.iaf.nu), to meet customer, regulatory or the Distributor’s requirements to mitigate the risk of conducting commerce in suspect, fraudulent or counterfeit parts.

### Supply Chain Sector

### Commodity(s) Covered
- EEE parts

### Overview
- Invoked in accordance with contractual language established between the Customer and the Organization.
- Does not “qualify” or “certify” the parts.
Fraudulent/Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition – Independent Distribution

- Quality Management System
  - Counterfeit Mitigation Policy
- Counterfeit Electronics Parts Control Plan
  - Customer Related Contract Review, Agreement, & Execution
  - Purchasing
  - Purchase Order Requirements
  - Supply Chain Traceability
  - Verification of Purchased Product
  - Material Control
  - Reporting
  - Personnel Training and Certification
SAE AS6081 – Aerospace Standard

Fraudulent/Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition – Independent Distribution

- OEMs may specify their independent distributor suppliers comply with AS6081 to support flow-down requirements of AS5553
- AS6081 requirements are intended to be applied/flowed down to Independent Distributor/Broker suppliers
- Independent, third-party certification bodies (CBs) verify of compliance to AS6081
- Accreditation of Certification Bodies (CB) will be through a recognized and respected accreditation body (AB) to ensure the impartiality and competence of each Certification Body
(AS6462) – AS5553: counterfeit Parts; Avoidance, Detection, Mitigation, and Disposition Verification Criteria

| Scope | • Defines the verification criteria used to assess AS 5553 compliant counterfeit EEE parts plans |
| Purpose | • This criteria will be used to establish compliance to AS 5553 |
| Applicability | • Applicable to all Aerospace, Defense, high performance electronic equipment and systems |
| Supply Chain Sector | • All contractors operating to an SAE AS 5553 compliant counterfeit parts plan |
| Commodity(s) Covered | • Electronic Hardware and Systems containing EEE components |
| Overview | • Does not define the infrastructure or scheme in which the criteria is applied.  
• Documents the record of compliance and supporting documents / processes  
• Future revisions should be incorporated into AS 5553 |
(AS6462) – counterfeit Parts; Avoidance, Detection, Mitigation, and Disposition Verification Criteria

<table>
<thead>
<tr>
<th>SAE AS5553 Clause</th>
<th>Requirement</th>
<th>Comply? Yes Or No</th>
<th>Criteria For Compliance</th>
<th>Record of Compliance</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>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 4.1.1 through 4.1.7.</td>
<td>Yes</td>
<td>1. The plan is a Released Document with configuration control. This plan can be a standalone plan or a plan that points to existing released documents/processes. 2. Sections within document for Parts Availability, Purchasing, Purchasing Information, Verification of purchased product, In Process Investigation, Material Control, and Reporting</td>
<td>Record document title, number(s), release date, and revision. Record SME rationale for acceptability and comments. Record other documented evidence / artifact.</td>
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<td>4.1.1</td>
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<tr>
<td><strong>Scope</strong></td>
<td>Defines the verification criteria used to assess AS6081 compliant counterfeit EEE parts plans</td>
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<tr>
<td><strong>Purpose</strong></td>
<td>Identify reliable sources, assess / mitigate distribution risks, and reporting to users and Authorities</td>
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</tr>
<tr>
<td><strong>Applicability</strong></td>
<td>Distributors of EEE parts purchased and sold from the Open Market</td>
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<tr>
<td><strong>Supply Chain Sector</strong></td>
<td>“Non franchised” EEE component distributors</td>
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<tr>
<td><strong>Commodity(s) Covered</strong></td>
<td>Electronic Hardware and Systems containing EEE components</td>
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<tr>
<td><strong>Overview</strong></td>
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<td></td>
<td>Documents the record of compliance and supporting documents / processes</td>
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<td></td>
<td>Future revisions should be incorporated into AS6081</td>
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</table>
### (AS 6301) – counterfeit Parts; Avoidance, Detection, Mitigation, and Disposition Verification Criteria

<table>
<thead>
<tr>
<th>SAE AS5553 Clause</th>
<th>Requirement</th>
<th>Comply? Yes Or No</th>
<th>Criteria For Compliance</th>
<th>Method of Evaluation (MOE)</th>
<th>Record of Compliance</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Requirements - All requirements of “Section 4. REQUIREMENTS” shall (1) apply when this standard is invoked in contractual language between the Customer and Organization. For the purposes of this document, the handling of both fraudulent and counterfeit electronic parts shall (2) be identical.</td>
<td></td>
<td>(1) Meets all mandatory requirements of AS6081 if the standard was invoked as a contract requirement for individual procurements. (2) Fraudulent and counterfeit parts are processed in the same manner.</td>
<td>MOE - Review documented process procedures to verify AS6081 section 4 is being complied with and that fraudulent and counterfeit parts are being handled via the same processes.</td>
<td></td>
<td>Record an overall assessment of the extent of compliance to AS6081</td>
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<tr>
<td>4.1.1</td>
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</table>
## Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Tool for assessing distributors that sell electronic components without contractual authorization from the OCM.</th>
</tr>
</thead>
</table>
| Target Audience | • Distributors of Electronic Components (self assessment)  
• Customers of Distributors (for assessment and the calculation of a risk score) |
| Uses | • Develop Risk Assessment score for the Counterfeit Mitigation program  
• NOT intended to be used for certification of Distributors |
| Status | • User Guide and Worksheet Published 2011-12-19. |
(ARP6178) – Aerospace Recommended Practice Tool for Risk Assessment of Distributors

**Scope**
- Tool for assessing distributors that sell electronic components without contractual authorization from the OCM.

**Purpose**
- Evaluate distributor processes for the prevention, detection, containment, and reporting of fraudulent/counterfeit electronic components.

**Applicability**
- Applicable to all organizations that procure electronic components from sources other than the OCM.

**Supply Chain Sector**
- Aviation, space, defense, and other high performance/reliability electronic equipment applications.

**Commodity(s) Covered**
- Electronic Components

**Overview**
- This tool, in the form of a survey, generates a score which provides a consistent indication of the distributor’s capability and effectiveness in the prevention, detection, containment, and reporting of fraudulent, suspect counterfeit and counterfeit parts.
**Benefits**

- Easily supports requirements called out in AS5553-A & AS6081
- The tool takes the form of a survey
  - Breaks supplier evaluation into Pre-Visit and On-Site Assessments
    - Pre-Visit Assessment
      - Provides insight relative to the supplier’s awareness of fraudulent/counterfeit electronic parts risk and its avoidance and detection capability. This ensures time and money is not lost visiting suppliers not yet equipped to meet your organization’s needs/expectations.
      - Assessor’s time and attention can be focused during site visit.
    - On-Site Assessment checklist ensures visit is mapped out, focused and productive.
- Customizable Excel file format
- Contains 143 revealing questions ensuring an accurate supplier analysis
- Scoring methodology ensures consistency between assessors
  - Scores range from 0-3
    0 – No compliance or not addressed.
    1 – Partial compliance or partially addressed; short of optimal response.
    2 – Mostly compliant or addressed. Minor discrepancies separate reply from optimal response.
    3 – Fully compliant to the expectations of the question.

*This survey WILL help both assessors & suppliers improve processes*
Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors

– Justification for Assessment
– Pre-visit Assessment Survey
– Site Assessment Survey
– Supplier Selection
– Assessment Spreadsheet
  • Survey
  • Tabulates score
Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors

– Survey

• General Company Information
• Pre-Assessment Information
• Industry Membership and Reporting
• Quality System and Processes
• Warranty and Insurance
• Supplier Qualification and Purchasing Process
• Handling and Facilities
• Training and Certification
• Inspection and Test
• Non-Conforming Material Control
• Additional Test and Inspection (In-house or Third-Party)
Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors

• Intended for use by organizations that procure electronic components from suppliers other than the original component manufacturer (OCM)

• Provides organizations with a tool to assess a supplier’s capability to prevent, detect, contain and report suspect or confirmed counterfeit electronic components

• Not intended to replace certification compliance criteria
AS6171 – Test Methods Standard

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Standardize practices to detect suspect counterfeit electronic parts and to ensure consistency of test techniques and requirements across the supply chain</th>
</tr>
</thead>
</table>
| Target Audience | • Independent Testing Facilities  
• Distributors & OEMs (in-house testing capability) |
| Uses | • Test Methods for counterfeit detection  
• Proficiency for counterfeit test & evaluation  
• Intended to be used for accreditation of Independent Test Laboratories or Distributors (ILAC, through ACLASS, A2LA, etc.) |
| Status | In Development. Resolving ballot comments. Expected publication Q4-2014. |
# AS6171 draft Test Methods Standard; General Requirements, Suspect/Counterfeit Electrical, Electronic, and Electromechanical Parts

<table>
<thead>
<tr>
<th><strong>Scope</strong></th>
<th>• Provide uniform requirements, practices and methods to mitigate the risks of receiving and installing SC EEE parts.</th>
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<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>• Standardize practices to detect suspect counterfeit electronic parts and to ensure consistency of test techniques and requirements across the supply chain</td>
</tr>
<tr>
<td><strong>Applicability</strong></td>
<td>• All laboratories testing EEE parts and devices, whether such parts and devices are procured directly or integrated into electronic assemblies or equipment.</td>
</tr>
<tr>
<td><strong>Supply Chain Sector</strong></td>
<td>• Aviation, Space, Defense, Industrial, Medical, Automotive and Commercial</td>
</tr>
<tr>
<td><strong>Commodity(s) Covered</strong></td>
<td>• EEE parts</td>
</tr>
</tbody>
</table>
| **Overview** | • This standard is being created in response to a significant and increasing volume of Suspect/Counterfeit (SC) Electrical, Electronic, and Electromechanical (EEE) parts entering the aerospace supply chain, posing significant performance, reliability, and safety risks.  
• This standard is intended to provide uniform requirements, practices and methods to mitigate the risks of receiving and installing SC EEE parts |
AS6171 - Each Test Method section will include:

• Processes and a description of procedures
• Apparatus needed for the test technique
• Required qualification and certification of processes and personnel
• Guidelines and requirements for reporting
Current Test Methods Covered Under the First Release

• External Visual Inspection (including SEM)
• Radiography
• XRF
• Delid physical analysis
• Electrical Test
• Acoustic Microscopy
• FTIR
• RAMAN Spectroscopy
• Thermogravimetric Analysis (TGA)
• Design Recovery
• Selected Environmental
  – Seal
  – Temp Cycling
  – Thermal Shock
  – Latency Mitigation / Burn-in
• Risk Criteria and sampling plans
• Personnel Certification requirements
Proposed Tests to Be Covered in a Future Rev.

- Secondary Ion Mass Spectroscopy (SIMS)
- X-Ray Photoelectron Spectroscopy (XPS)
- Auger Electron Spectroscopy (AES)
- Ion Exchange Chromatography (IEC)
- Inductively Coupled Plasma/Optical Emission Spectroscopy (ICP/OES)
- Differential Scanning Calorimetry (DSC)
- Thermomechanical Analysis (TMA)
- Surface Profilometry
- Packaging
- Tampered Parts
<table>
<thead>
<tr>
<th><strong>Scope</strong></th>
<th>Defines requirements for mitigating counterfeit products in the authorized supply chain by the authorized distributor.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
<td>Delineates practices to procure, authenticate, trace and minimize risk of counterfeit parts in authorized supply chain</td>
</tr>
<tr>
<td><strong>Applicability</strong></td>
<td>Applicable to authorized distributors acquiring parts directly from manufacturers for which they are authorized</td>
</tr>
<tr>
<td><strong>Supply Chain Sector</strong></td>
<td>Customers procuring electronic parts from authorized distributors</td>
</tr>
<tr>
<td><strong>Commodity(s) Covered</strong></td>
<td>Electronic parts—electronic components, assemblies, supplies and equipment</td>
</tr>
<tr>
<td><strong>Overview</strong></td>
<td>Covers mitigation policy, control plan, customer processes, purchasing, traceability, returns, training, scrap control, inventory control and reporting.</td>
</tr>
</tbody>
</table>
Requires development of control plan for:
- Risk mitigation
- Disposition
- Reporting

Requires disclosure of non-authorization
- Traceability--military parts accompanied by manufacturer’s certification and C of C on packing slip

New terms

Verification of authorization—manufacturer’s website or directly from manufacturer
AS6171 – Test Methods Standard

AS6171 will include guidance for:

• Evaluating risk and recommended tier level of testing based on:
  – Risk of the supplier,
  – Risk of the part,
  – Risk of application, and
  – Other risk factors.

• Recommended sampling plans
AS6171 – Test Methods Standard

• Standardize practices to detect suspect counterfeit electronic parts and to ensure consistency of test techniques and requirements across the supply-chain

• Level of testing is risk-based and includes sampling plans

• Accreditation of the Test Laboratory will be through International Laboratory Accreditation Cooperation (ILAC) (AClass, A2LA or other laboratory accreditation bodies) to ensure the impartiality and competence of the Test Laboratory

• A third party proficiency scheme is recommended to reduce variability among operators
# AS6174 – Counterfeit Materiel

## Counterfeit Materiel Other than Electronic Parts; Assuring Acquisition of Authentic and Conforming Materiel

| Purpose and Uses | This SAE Standard standardizes practices to:  
|---|---|
| | a. maximize availability of authentic materiel (made from the proper materials using the proper processes with required testing,)  
| | b. procure materiel from reliable sources  
| | c. assure authenticity and conformance of procured materiel  
| | d. control materiel identified as counterfeit, and  
| | e. report counterfeit materiel to other potential users and government investigative authorities |

| Target Audience | • Organization that purchase and/or manufacture products other than electrical components |

| Rationale | • Created in response to a significant and increasing volume of counterfeit material entering the supply chain |

| Status | • Published May 2012. Rev. A in development. |
## (AS 6174) - Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel

| **Scope** | • This document standardizes requirements, practices, and methods related to: (a) materiel management, parts management, supply chain management, procurement, inspection, test/evaluation to assure the authenticity and conformance of materiel being acquired, and (b) response strategies when suspect or confirmed counterfeit materiel is discovered. |
| **Purpose** | • This standard was created to provide uniform requirements, practices and methods to improve the likelihood of only acquiring authentic and conforming materiel of any type in any industry sector. |
| **Applicability** | • Suppliers, processors, and end product organizations. |
| **Supply Chain Sector** | • Any industry sector for non-electronics material and parts. |
| **Commodity(s) Covered** | • All materials and parts except electronics. Currently working specifics on refrigerants, packaging, and raw materials (metals, including castings and forgings) and components made from such materials (valves, fasteners, etc.). |
| **Overview** | • This standard was created in response to a significant and increasing volume of counterfeit materiel (in violation of intellectual property laws) entering the supply chain, posing significant performance, reliability, and safety risks.  
• This standard is a capstone standard. AS5553 pertains directly to electronic parts, and supplements the guidance of this standard. |
April 20, 2010 – DoD PSMC (Part Standardization and Management Committee) requested SAE to address counterfeit NON-electronic parts

October 4, 2010 – AS6174 based on major rewrite of AS5553 to address all materiel, nearly complete

Jan-May 2011 – revised to consider Office of the Secretary of Defense (OSD) and White House Intellectual Property Enforcement Coordinator(IPEC) input

Published May 2012 - Tracks closely with draft Office of the Secretary of Defense (OSD) and White House policy for avoiding counterfeits with all materiel, including medicine, tourniquets, etc. – Adopted by DoD on 17 June 2013

Working minor revisions to basic standard and commodity specific “slash sheets” (appendices).
AS6174 - Counterfeit Materiel

• For all applications
  – Preference for purchase from original manufacturer or licensed/franchised dist.
  – Extra documentation/testing for other distributors/brokers

• Tracks closely with draft Office of the Secretary of Defense (OSD) and White House (WH) policy for avoiding counterfeits with all materiel, including medicine, tourniquets, etc.
AS6174 - Counterfeit Materiel

• **New Areas of Work:**
  
  – Source Requirements – need revision
  
  – Refrigerants (TACOM, TARDEC, DuPont)
  
  – Packaging
  
  – Raw Materials
  
  – Bearings
  
  – Fasteners
  
  – Others?
## Summary of SAE G-19/G-21 Aerospace Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Title</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE AS5553A</td>
<td>Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition</td>
<td>Issued January 2013 and available at <a href="http://www.sae.org">www.sae.org</a></td>
</tr>
<tr>
<td>(G19-CI)</td>
<td></td>
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<tr>
<td>(G19-C)</td>
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<tr>
<td>SAE AS6171</td>
<td>Test Methods Standard; Counterfeit Electronic Parts</td>
<td>In draft; Individual test methods balloted. Main document balloting expected in 4Q-2013</td>
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<tr>
<td>(G19-A)</td>
<td></td>
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<tr>
<td>SAE AIR6273</td>
<td>Terms and Definitions:</td>
<td>In draft. Expected balloting in Q4-2014.</td>
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<td>(G19-T)</td>
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<tr>
<td>(G19-D)</td>
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<tr>
<td>SAE AS6301</td>
<td>Fraudulent/Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition – Independent Distributors Verification Criteria</td>
<td>In draft.</td>
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<td>(G19-C)</td>
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<tr>
<td>SAE ARP6178</td>
<td>Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors</td>
<td>Published 2011-12.</td>
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<tr>
<td>SAE AS6496</td>
<td>Authorized Distributor Counterfeit Mitigation</td>
<td>In draft. Expected publication Q3-2014.</td>
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<td>(G19-AD)</td>
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<tr>
<td>SAE AS6174</td>
<td>Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel</td>
<td>Published May 2012. Rev. A in development.</td>
</tr>
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<td>(G-21)</td>
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</tbody>
</table>
QUESTIONS?

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Director, Washington Operations
SAE International
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bmahone@sae.org