SAE International...

- Global Offices:
  - World Headquarters – Warrendale PA, USA
  - Automotive Headquarters – Troy MI, USA
  - Aerospace Standards Office – Washington DC
  - SAE International China Office – Shanghai
  - **Aerospace Standards Europe Office – London**

  - Established in 2007
  - Focus on European operations for SAE Aerospace Standards program
  - Liaison with European industry and government
  - New Standards Development

**UK Staff**
- Senior Coordinator
- Standards Engineer
- Aerospace Standards Specialist
Key SAE Standards Activities

- Materials
- Environmental Standards
- Standard Parts
- Human Factors
- Integrated Vehicle Health Management (IVHM) & Reliability
- Counterfeit Parts Avoidance
- Deicing
- Military Avionics
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
from Government, Defense and Industry Sectors

Government and Defence Members …
• Defense Logistics Agency (DLA)
• Defense Contract Management Agency (DCMA)
• DOE - National Nuclear Security Administration (NNSA)
• Federal Aviation Administration (FAA)
• Intelligence Advanced Research Projects Activity (IARPA)
• Ministry of Defence (MoD), UK
• National Aeronautics and Space Administration (NASA)
• 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.
SAE G-19 Members From Industry Sectors

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)
SAE G-19 Industry Members

Adaptive Management Solutions
Aero Engine Controls
American Electronic Resource
Analytical Alternatives
Analytical Solutions
Applied DNA Sciences
Arcadia Components
Ares Corp
Arrow Electronics
Astute Electronics
BAE Systems (Operations)
BAE Systems
Ball Aerospace & Technologies
Boeing
Boeing Advanced Systems
Business Quality Process Management
Bechtel Plant Machinery
CALCE University Of Maryland
Celestica Corp. Technology & Engineering
China Aero-Polytechnology Establishment
Crestwood Technology Group
DA-Tech
Derf Electronics
Det NortskeVeritas (DNV)
DPA Components International
Electronic Supply Chain Solutions
Eltek Semiconductors
General Dynamics
General Dynamics UK
GE Aviation
Goodrich Control Systems
Greenberg & Bass
Harris
Hi-Reliability Microelectronics
Hi-Rel Laboratories
Honeywell Aerospace Electronic Systems
Honeywell Int'l
Honeywell Technology Solutions
Infineon Technologies AG
Integra Technologies
Jabil Circuits
Jacobs Engineering
Jet Propulsion Laboratory
L-3 Communications - CSW
Left Coast Technical Solutions
Lockheed Martin Aeronautics
Lockheed Martin Missiles & Fire Control
3M
Micronor Electronics
Motronics Circuits International
Mouser Electronics
Nisene Technology Group
Northrop Grumman Electronic Systems
N.F.Smith & Associates
NQA
Northrop Grumman
Orbital Sciences
Plexus
Premier Semiconductor Services
Process Sciences
Raytheon
Rochester Electronics
Sandia National Laboratories
Schlumberger HPS
Selex Galileo
Silicon Cert Laboratories
SMT Corp
SoITEc Electronics
Sonix
Sonoscan
Star Associates International
Trace Laboratories
TTI
Underwriters Laboratories, UL DQS
Westland Helicopters
White Horse Laboratories
World Data Products
World Micro
Wyle Laboratories
G-19 Subcommittees Formed Since 2009

G-19 Committee
AS5553

G-19 CI
Continuous Improvement Subcommittee
(ASTM553A: Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition)

G-19 D
Distributor Subcommittee
(ASTM6081: Counterfeit Electronic Parts; Avoidance Protocol, Distributors)

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
(ASTM6171: Test Methods Standard; Counterfeit Electronic Parts)

G-19 C
Standards Compliance Verification Subcommittee
AS6462 Verification Criteria

G-19 T
Terms and Definitions
AIR6273 Terms and Definitions - Fraudulent/Counterfeit Electronic Parts
### DISTRIBUTOR

- **ARP6178**, Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors
  - (Worksheet and User Guide in progress)

### AS5553A

AS5553A, Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition

### USER

- **AS6462** Compliance Standard or Guide
  - (includes Audit Checklist)

### TEST METHODS

- **AS6171**, Test Methods Standard; Counterfeit Electronic Parts
  - ASXXXX Compliance Standard or Guide for AS6171 (includes Audit Checklist)

### Certification Bodies

- **AS6081**, Counterfeit Electronic Parts; Avoidance Protocol, Distributors

- **AS6301** Compliance Standard or Guide for AS6081 (includes Audit Checklist)

**G-19 Committee Oversight**

**Accreditation Body (ASxxxx Based in ISO 17021)**

**Auditor Competency (ASxxxx)**

**Certification Bodies**
“... 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>
</thead>
<tbody>
<tr>
<td>Target Audience</td>
<td>Organization 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 |
| 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 AS 6081 (for distributors) |
SAE AS5553A – Aerospace Standard

Main Subjects Covered:

– Fraudulent/Counterfeit EEE Parts Control Plan inc:
  • 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
SAE AS5553A – Aerospace Standard

Subjects covered continued

- In-process Investigation
- Failure Analysis
- Material Control - Appendix F
- Reporting – Appendix G
- Post Delivery Support
- Acronyms and Abbreviations-Appendix H
# Document Roadmap since AS5553

<table>
<thead>
<tr>
<th>DISTRIBUTOR</th>
<th>USER</th>
<th>TEST METHODS</th>
</tr>
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<tr>
<td>ARP6178, Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors (Worksheet and User Guide in progress)</td>
<td>AS5553A, Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition</td>
<td>AS6171, Test Methods Standard; Counterfeit Electronic Parts</td>
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<tr>
<td>AS6081, Counterfeit Electronic Parts; Avoidance Protocol, Distributors</td>
<td>AS6462 Compliance Standard or Guide (includes Audit Checklist)</td>
<td>ASXXXX Compliance Standard or Guide for AS6171 (includes Audit Checklist)</td>
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<tr>
<td>AS6301 Compliance Standard or Guide for AS6081 (includes Audit Checklist)</td>
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</table>

## G-19 Committee Oversight

### Accreditation Body (ASxxxx Based in ISO 17021)

### Accreditation Body (ASxxxx Based in ISO 17025)

### Auditor Competency (ASxxxx)

### Certification Bodies

- ARP6178, Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors
- AS5553A, Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition
- AS6081, Counterfeit Electronic Parts; Avoidance Protocol, Distributors
- AS6301 Compliance Standard or Guide for AS6081 (includes Audit Checklist)
- AS6462 Compliance Standard or Guide (includes Audit Checklist)
- AS6171, Test Methods Standard; Counterfeit Electronic Parts
- ASXXXX Compliance Standard or Guide for AS6171 (includes Audit Checklist)
<table>
<thead>
<tr>
<th>Table: SAE AS6081 – Aerospace Standard</th>
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<tbody>
<tr>
<td><strong>Counterfeit Electronic Parts Avoidance – Distributors</strong></td>
</tr>
<tr>
<td><strong>Purpose</strong></td>
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<td><strong>Target Audience</strong></td>
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<td><strong>Uses</strong></td>
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<td><strong>Status</strong></td>
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</table>
SAE AS6081 – Aerospace Standard
Counterfeit Electronic Parts; Avoidance Protocol, Distributors

– 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
OEMs can specify their suppliers comply with AS6081 to meet selected flow-down requirements of AS5553

AS6081 requirements are intended to be applied/flowed down to distributor’s 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
### DISTRIBUTOR

- ARP6178, Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors
  (Worksheet and User Guide in progress)

### USER

- AS5553A, Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition

- AS6081, Counterfeit Electronic Parts; Avoidance Protocol, Distributors

- AS6462 Compliance Standard or Guide
  (includes Audit Checklist)

### TEST METHODS

- AS6171, Test Methods Standard; Counterfeit Electronic Parts

- ASXXXX Compliance Standard or Guide for AS6171
  (includes Audit Checklist)
# ARP6178 – Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors

(Aerospace Recommended Practice)

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Tool for the evaluation of a distributor’s processes for the prevention, detection, containment, and reporting of counterfeit electronic components</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 | • In Draft; balloting expected in late 2011 |
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
SAE ARP6178

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)
ARP6178 – 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
DISTRIBUTOR USER TEST METHODS

AS5553A, Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition

AS6462 Compliance Standard or Guide (includes Audit Checklist)

AS6171, Test Methods Standard; Counterfeit Electronic Parts

ASXXXX Compliance Standard or Guide for AS6171 (includes Audit Checklist)

ARP6178, Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors
(Worksheet and User Guide in progress)

AS6081, Counterfeit Electronic Parts; Avoidance Protocol, Distributors

AS6081 Compliance Standard or Guide for AS6081 (includes Audit Checklist)
### Test Methods Standard; Counterfeit Electronic Parts

<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>
<tbody>
<tr>
<td>Target Audience</td>
<td>Independent Testing Facilities Distributors (in-house testing capability)</td>
</tr>
</tbody>
</table>
| Uses | Definition of Test Methods for counterfeit detection  
Accreditation  
Intended to be used for accreditation of Independent Test Laboratories or Distributors (ILAC, through ACLASS, A2LA, etc.) |
| Status | In Draft |
AS 6171-
Test Methods Standard; Counterfeit Electronic Parts

• Test Methods
  – External visual inspection
  – Radiological inspection,
  – X-ray fluorescence,
  – Remarking and resurfacing,
  – De-lid/ De-capsulation or destructive physical analysis,
  – Electrical tests,
  – Acoustic microscopy,
  – Optical/SEM (Scanning Electron Microscope) inspection,
  – FTIR/DSC/TMA testing and miscellaneous testing

• Risk Criteria and sampling plans

• Personnel Certification requirements
AS6171 –
Test Methods Standard; Counterfeit Electronic Parts

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
AS6171 –
Test Methods Standard; Counterfeit Electronic Parts

• 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
AS6171 - Test Methods Standard; Counterfeit Electronic Parts

- 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 for the tests based on tier level of accepted risk, level of confidence required, and acceptable reject criteria.
# AS 6174 – Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel

## Counterfeit Materiel Other than Electronic Parts

### 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,
  - 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
Committee G-21
Counterfeit Materiel

• April 20, 2010 – DoD PSMC (Part Standardization and Management Committee) requested SAE to address counterfeit NON-electronic parts

• May 14, 2010 – First telecon of new group

• 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 WH Intellectual Property Enforcement Coordinator (IPEC) PEC input

• Published May 2012
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.
## Summary of SAE G-19 Aerospace Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Title</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE AS5553A (G19-CI)</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>SAE AS6171 (G19-A)</td>
<td>Test Methods Standard; Counterfeit Electronic Parts</td>
<td>In draft; balloting expected in 3Q-2012</td>
</tr>
<tr>
<td>SAE AS6462 (G19-C)</td>
<td>Verification Criteria for Certification against AS5553</td>
<td>Ballot 4Q-2011; publication likely 4Q-2012. Negotiations underway with ANAB for certification programs</td>
</tr>
<tr>
<td>AIR6273 (G19-T)</td>
<td>Terms and Definitions:</td>
<td>In draft expected late 2012</td>
</tr>
</tbody>
</table>
Summary of SAE G-19/G-21 Aerospace Standards continued

<table>
<thead>
<tr>
<th>Standard</th>
<th>Title</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE AS6301 (G19D)</td>
<td>Fraudulent/Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition – Distributors Verification Criteria</td>
<td>In draft</td>
</tr>
<tr>
<td>SAE ARP6178 (G19-DR)</td>
<td>Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors</td>
<td>Ballots complete; released for publication in Dec 2011</td>
</tr>
<tr>
<td>SAE AS6174 (G-21)</td>
<td>Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel</td>
<td>Published May 2012</td>
</tr>
</tbody>
</table>
Thank you for your time and attention!
Are there any questions?

SAE Aerospace Standards Europe
SAE International