Counterfeit Electronic Parts

Leadership ViTS Meeting
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nsc.nasa.gov/articles/SFCS
Definitions

- **Electronics Manufacturing Industry**
  - Substitutes or unauthorized copies
  - A part in which the materials used or its performance has changed without notice
  - A substandard component misrepresented by the supplier

- **Electronics Distributor Industry**
  - Items that are produced or distributed in violation of intellectual property rights, copyrights, or trademark laws
  - Items that are deliberately altered in such a way as to misrepresent the actual quality of the item with intent to defraud or deceive the purchaser.
    - Any information omitted or means taken to mislead the purchaser to believe that such items are authentic or lawful

- **US Department of Energy**
  - A copy or substitute without legal right or authority to do so, or one whose material, performance, or characteristics are knowingly misrepresented

- **EIA/G-12 Committee**
  - An item whose identity or pedigree has been deliberately altered or misrepresented by its supplier
Where They Come From

- Parts may be re-topped and/or re-marked to disguise parts differing from those offered by the original part manufacturer.
- Defective parts scrapped by the original manufacture may be salvaged and sold as compliant parts.
- Previously used parts may be salvaged from scrapped assemblies and resold as new.
- Refurbished devices represented as new product.

Silicon bilateral switches used in ejection seat hardware.

op amp for Shuttle/Station notebook computers.

Space Shuttle pyrotechnic actuator voltage reference.

Space Shuttle Pulse-Width-Modulation motor driver.
How They’re Produced

A landfill of discarded circuit boards

A child salvaging components from a circuit board
Counterfeiting Industry

Components on river bank drying

0402 Case Size Capacitors ($0.005 ea from Fran. Disty)
Quantity of alerts will increase throughout 2012
The Magnitude

Total Counterfeit Incidents

U.S. Department of Commerce – Preliminary Data (as of March 4, 2009)

Special Study – Counterfeit Electronic Parts
Trend and Magnitude

United States Customs Notifications

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>1</td>
</tr>
<tr>
<td>2006</td>
<td>29</td>
</tr>
<tr>
<td>2007</td>
<td>169</td>
</tr>
<tr>
<td>2008</td>
<td>604</td>
</tr>
</tbody>
</table>
## GIDEP Counterfeit Case Summaries

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE-A-06-01</td>
<td>Test failures at a defense contractor were found to be microcircuits containing many different chips</td>
</tr>
<tr>
<td>EE-A-06-03</td>
<td>Supplier of military hardware found suspect counterfeit microcircuits having dual part number markings</td>
</tr>
<tr>
<td>EE-A-06-04</td>
<td>Microcircuits that failed product testing were found to have chips from another source</td>
</tr>
<tr>
<td>M9-A-07-01</td>
<td>During manufacturing of a military product, suspect counterfeit transistors were functional failures</td>
</tr>
<tr>
<td>6E-P-07-01</td>
<td>Memory device supplier confirmed parts marked with their name did not contain their chips</td>
</tr>
<tr>
<td>UY7-P-07-01</td>
<td>Microcircuits, that failed electrical testing, were found to contain chips from another manufacturer</td>
</tr>
<tr>
<td>NB4-P-07-01</td>
<td>Suspect counterfeit microcircuits, from an unauthorized distributor, found during testing at an aerospace supplier</td>
</tr>
<tr>
<td>J5-A-07-01</td>
<td>Independent distributor supplied suspect counterfeit parts (not available from original supplier) to defense plant</td>
</tr>
<tr>
<td>J5-A-07-02</td>
<td>Microcircuits, supplied by an independent distributor, were suspect counterfeit (device markings not authentic)</td>
</tr>
<tr>
<td>A2W-A-07-01</td>
<td>Suspect counterfeit transistors failed electrical tests; found to have many different chips</td>
</tr>
<tr>
<td>J5-A-07-06</td>
<td>Programmable logic devices found to be suspect counterfeit (lot code was after manufacturer discontinued parts)</td>
</tr>
<tr>
<td>J5-A-07-09</td>
<td>Microcircuits found to be suspect counterfeit as the lot date code was after the manufacturer stopped production</td>
</tr>
<tr>
<td>UE-A-07-01</td>
<td>Suspect counterfeit microcircuits failed electrical tests; contained chips from another manufacturer</td>
</tr>
<tr>
<td>AAN-U-08-052</td>
<td>A government entity reported counterfeit circuit breakers in nuclear power plants</td>
</tr>
<tr>
<td>CE9-P-08-02</td>
<td>Military parts manufacturer reported U. S. authorities have recently intercepted many counterfeit parts shipments</td>
</tr>
<tr>
<td>UL-P-08-01</td>
<td>Distributor unable to provide test reports on suspect counterfeit microcircuits that failed during factory testing</td>
</tr>
<tr>
<td>D4-A-09-01</td>
<td>Military hardware manufacturer found suspect counterfeit programmable devices showed part remarking</td>
</tr>
</tbody>
</table>
How Companies are Uncovering Counterfeits

- Returned as Defective: 1261
- Discovered Defective Parts/Poor Performance: 1116
- Markings, Appearance, Condition of Parts: 929
- Notification by OCM: 835
- Testing: 776
- Customer Suspected Part Was Counterfeit: 693
- Notification by US Customs: 604
- Self-Initiated Investigations: 341
- Notification by OEM: 180
- Returned as Wrong Merchandise: 50
- Absence of Original Documentation: 15
- Returned as Excess Inventory: 18
- Notification by GIDEP: 16
- Notification by DLA: 16
- Notification by Other US Government Agencies: 3
- Notification by Non-US Government Agency: 3
- Unauthorized Overrun by Contract Manufacturers: 2

U.S. Department of Commerce – Preliminary Data (as of March 4, 2009)
IEEE Spectrum Tech Alert: Did Bad Memory Chips Down Russia’s Mars Probe?

IEEE report blames the loss of Russia’s ambitious Phobos-Grunt space mission on faulty memory chips. The report suggests that the chips were counterfeits that had been intentionally misrepresented as offering higher performance than they were actually capable of.

Report cites malfunctioning WS512K32 chip (a single-package assembly of static random access memory (SRAM) chips) suspected to be counterfeit.

Mockup of Phobus-Grunt main propulsion unit
“Most broker organizations are very small and do not have established quality control procedures in place. We have more than 10,000 brokers in our database. Of those only 200 have more than 10 employees and quality control procedures for their staff. That leaves us 9,800 to fall victim to. Many brokers are working out of their home. All someone needs is a phone, fax and e-mail address and they are in business.”

American Electronic Resource, Inc.
The Gray Market

Broker with Cage Code in California

Address is a private home

Is this Broker selling genuine product?
Is he maintaining the product under proper conditions?
Do you Really Know this Supplier???
Innovative and Hi-Tech Re-Marking

Exemplar Top Surface

Suspect Top Surface

Pure Acetone / 7 Day Soak—No Affect

New blacktop material can only be removed with an X-ACTO blade
What We’re Up Against

Bogus Test Reports

• 19% of companies employing testing contractors had problems with faulty or forged testing.
• The parts were cleared by the test house, but were later found to be counterfeit.

U.S. Department of Commerce
Recent Convictions

October 25, 2011

Administrator of Vision Tech Components, LLC sentenced to 38 months in prison for role in sales of counterfeit integrated circuits destined to U.S. military.
February 22, 2012

Operations Manager for MVP Micro sentenced to 20 months in prison for conspiring to sell counterfeit electronics to the U.S. military
Congress

Report Regarding
NASA’s Efforts to Prevent Counterfeit Electronic Parts from Entering the Supply Chain
Pursuant to
Section 1205(d) of the NASA Authorization Act of 2010 (P.L. 111-307)

October 2011

White House

U.S. Government Procurement Anti-Counterfeiting Inter-Agency Working Group

Report to the President of the United States
SEC. 848. DETECTION AND AVOIDANCE OF COUNTERFEIT ELECTRONIC PARTS.

(a) Revised Regulations Required.—

(1) In general.—Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall revise the Department of Defense Supplement to the Federal Acquisition Regulation to address the detection and avoidance of counterfeit electronic parts.

(2) Contractor responsibilities.—The revised regulations issued pursuant to paragraph (1)
Data Reporting

**Complaint Type:** Counterfeit Parts

**Company:** For Lik Shun Electronics Technology Limited
- **Phone:** 86-755-8393-8937
- **Fax:** 86-755-8395-8627
- **Email:** forlks_shun@hotmail.com
- **Address:** R2008 North #2 Unit Jing Geng Ming Yuan, Shenzhen, China

**Status:** UNRESOLVED
- **Last Updated:** 08/22/2012
- **Date Modified:** 08/28/2007
- **Scheduled Release:** 08/22/2012

Details:

In June 2007, a member placed an order with For Lik Shun Electronics for 1,100 pieces of part number PEF2053410V2 totalizing $18,508.00. The invoice is dated June 26, 2007 and the order was facilitated through an escrow service with a 5-day inspection period.

The parts were sent to an independent test facility for testing prior to being sent to the Customer. The test results dated July 10, 2007 state:

"...showed evidence of marking and resurfacing. The die shows LSI Logic as the manufacturer with H5083F as a mask code in an Infineon marked part. The product is removed and therefore counterfeit."

According to the Reporting Member, they contacted For Lik Shun the same day the test results were received, July 10th, for an RMA and refund and this and all other subsequent attempts to contact For Lik Shun Electronics have been ignored. ERAI has not received a response from For Lik Shun Electronics regarding this matter, leaving it unresolved as of this date.
Authorized Suppliers List

Qualified Suppliers List

Welcome to the world's premier AUTHORIZED source directory. Our authorized distributors provide guaranteed assurance that products are fully traceable and certified by the manufacturer. In today's electronics marketplace, selecting an authorized distributor is more important than ever before. With accelerating inventories of questionable quality, including counterfeit and sub-standard product sold through surplus dealers, customers need a directory of reputable and authorized distributors.

This directory has been created through the endorsement and efforts of the SIA Anti-Counterfeit Task Force. Through a network of corporate CEOs and working committees, SIA shapes public policy on issues critical to the industry and provides a spectrum of services to aid members in growing their businesses.

For your printed copy of the EHSO click here!
Training

Counterfeit Parts Avoidance Training

Counterfeit Parts in the News
- In 2009, Acting Administrator Christopher Scoles disclosed to Congress that counterfeit parts are a significant cause of budget over-runs for NASA.
- Estimated cost to NASA - unknown
- In late 2007, the US Patent and Trademark Office estimated that counterfeiting and piracy drain about $250 billion out of the US economy each year along with 750,000 jobs.
- Counterfeit EEE parts comprise about 10% of the parts in the supply chain.
- In December 2008, four executives at Western Titanium Inc were indicted for fraud.

Class Details
Class Objectives
- To learn about counterfeit parts and why they are a significant risk.
- To learn inspection methods to be used for the detection and avoidance of counterfeit parts.
- To mitigate the risks of acquiring counterfeit parts and to eliminate the risk of introducing counterfeit parts into flight hardware.
- To apply inspection techniques during an individual hands-on examination of counterfeit EEE parts, with microscopes.

4-hour class is for anyone who works with EEE parts and includes the following:
- Terms and Definitions Overview
- Counterfeit Parts in the Industry
- JPL Counterfeit Parts Mitigation Strategy
- Best Industry Practices
- Case Studies of Counterfeit Investigations
- Hands-On Training and Written Exam

Please contact Katherine Whittington, S02-1060, at 818-354-6749 for information about the class content or related questions.

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Available to Employees of:
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- OEMs
- CMs/EMS

The IDEA Professional Inspector’s Certification Exam is designed to demonstrate inspection competency for the benefit of all stakeholders. Successful examination provides the employee and the employer with a heightened degree of confidence in the basic working knowledge and responsibilities of the Inspector.

When personnel conduct visual inspection of product from the excess market have been certified, the company’s stakeholders are provided objective evidence of inspection competency and the reason for increased confidence that customer satisfaction will be achieved and further offer increased marketability of products and services.

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IDEA Member Exam Renew
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Click “View Cart” to checkout

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Standards

**Aerospace Standard**

Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition

**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 ensuring the quality and integration of products purchased from suppliers throughout the world and at all levels within the supply chain. Aerospace suppliers and purchasers 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.

**SAE Standards**

1. Buyers
2. Distributors
3. Test Laboratories

Supplier Certification

The Independent Distributors of Electronics Association’s

IDEA-STD-1019-A
Acceptability of Electronic Components Distributed in the Open Market

**IDEA**

Quality
Qualität Calidad
品質 Qualité
Authentication Services

1. Manufacturer asks for encrypted number

2. Secure server provides number

3. Product ships to places unknown

4. Buyer validates number before using it
NASA Satellites Get 'Counterfeit' Parts; Taxpayers Pay
Agency Chief Says Suppliers Sometimes Skip Safety Tests

By NED POTTER
March 7, 2009

Maybe it was something he didn't mean to say. Or maybe NASA has a problem.

At a House subcommittee hearing on NASA's cost overruns, the agency's acting administrator, Christopher Scolese, was