Amphenol Air LB

Management Guide

Counterfeits parts

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The intent of this guide is to define best practice to prevent proliferation of counterfeit goods in the supply chain. What will be discussed is applicable to manufacturers, MRO's and distribution organizations.

1 Risk Management

Counterfeit goods pose a significant risk to the supply chain, potentially resulting in loss of material, mission, or life.
Your risk of receiving counterfeit parts or assemblies with counterfeit parts will vary. The more supply chain intermediaries incorporating parts the greater your risk.

Risk: An undesirable situation or circumstance that has both a likelihood of occurring and a potentially negative consequence.

Risk is dependent on both the sources of supply and the product application.
There is risk associated with the procurement source. Buying directly from the original manufacturer poses less risk than buying from non-authorized sources, where traceability to the original manufacturer may have been lost or ignored.
Then there is risk the parts themselves represent in the product. For example, an electronic part used in a personal computer may represent less risk than a similar part used on an aircraft. The more risk the part represents, the higher level of controls required to ensure the part will function in its intended use and environment.

Risk management weighs the likelihood that an event will occur against the consequence of the occurrence.
Risk assessment and mitigation are collaborative efforts between sub-assembly manufacturer, design authority, and the manufacturer of the end product.

Contract Review is an important part of the risk assessment and mitigation processes. The customer requirements often indicate the level of risk by the counterfeit part requirements flowed down. It is important that the correct functions within your organization review the contract language to confirm your organization's ability to comply with the customer's requirements.

2 Customer and/or Regulatory Requirements/Flow Down

Customers frequently specify design and production process requirements that they want to see applied to the product. These requirements can include counterfeit avoidance measures and regulatory requirements that the customer wants to see in place at its sub-tiers to lower its own risk of getting counterfeit material. It is important that your organization have a flow down process that receives the latest requirements from the customer and distributes them to the internal functions where compliance is to be demonstrated. When the customer is flowing down counterfeit avoidance requirements, it is important to:

- Ensure common understanding of customer counterfeit requirements. A protocol has to be established for reviewing the requirements with customer and where customer specialists and in-house specialists can discuss and agree on the interpretations of the flowed down requirements.
- Understand the customer's strategy on obsolescence management.
- Ensure all customer requirements are flowed down internally
- Ensure lifecycle (obsolescence management) planning and counterfeit avoidance planning are compliant with the customer requirements. The customer may want to review and approve these plans. During the design cycle the customer may also want to understand how product design tools are used to facilitate the planning effort.
- Ensure requirements are flowed down to all levels of the supply chain.
- Ensure sub-tiers understand and comply with the requirements.

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3 Training

A key strategic element of mitigating the risks posed by counterfeit parts and materials is through on-going training for all relevant personnel. This training will increase awareness of the potential of counterfeit parts helping prevent their introduction into the supply chain.
Relevant personnel are any persons involved in any way with parts/material. This includes personnel with responsibility for management, design, contracts, procurement, inspection and testing, and any person who deals with the parts/materials.
General awareness training is appropriate for all relevant employees. In addition, detailed training for specific functional roles and responsibilities is appropriate and may be required by your customer.

Elements of training should include:

- General awareness training
  - Background information:
    - Definition of counterfeit materials and parts
    - The origins of counterfeit materials and parts and how they enter the supply chain
    - Vulnerabilities to counterfeit parts (e.g. obsolete and hard-to-find parts)
    - New laws and regulations
    - Examples of counterfeit parts or materiel
  - Strategies to Eliminate Counterfeit
    - Avoidance
      - Procuring from Authorized Sources
  - Detection
    - Making Sure Counterfeits are Stopped prior to integration in higher level assembly
  - Mitigation
    - Minimizing Risk and Damage to the project or customer use
- Disposition
  - Decide on Proper Action & Resolution through Disposition

Additional Training should be considered for the following personnel:

- Receiving/Incoming Inspection
- Purchasing
- Engineering
- Program/Project Management
- Stock management
- Assembly/MRO personnel
- Operators
- In-process Inspection
- Quality Assurance Inspection
- Internal Auditors

4 Obsolescence

Due to diminishing manufacturing source issues, many industries may have difficulty in continuing to obtain manufactured products designed years ago to support fielded and new systems. The challenge of avoiding counterfeit parts and materials occurs when customers are obliged to purchase out of production parts to support existing products. Choosing materials that are likely to become obsolete in the lifetime of the product's production can cause procurement departments to seek out sources of supply that have higher inherent risks of providing counterfeit material.
To lower these risks you are encouraged to:

4.1 Develop Parts/Material Plan

Avoid single sources when possible – Single sources can expose the supply chain to many risks. Fire or natural disasters, war and civil uprisings can interrupt supply. In addition, the source can go out of business or change ownership or move the production location to an unauthorized/illegal location. Any of these events can force procurement to look at inventories of material that may not be traceable back to the Original Component Manufacturer (OCM)/Original Equipment Manufacturer (OEM), elevating the risk of obtaining counterfeit material.

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4.2 Determine product/component availability

Even multi sourced components embodied in the end-product can quickly go out of production at all sources as new technology replaces them or other market factors force them out of the market. Some analysis of the likelihood of losing the supply of components needs to be conducted before committing the design to that component.

4.3 Drive common part usage

Using common parts with broad industry demand provides a higher level of assurance that the parts will not become obsolete. In addition, if demand is broad it is likely that multiple sources will exist.

Determine aftermarket supply – The aftermarket tends to have higher counterfeit risks because of the 'Grey Market' shops that offer parts with unapproved repairs or 'new' parts of suspect origin. Ideally the supply of new parts to the aftermarket should be through the same source as the authorized production source. Lifetime buys for sustainment should also be considered while parts are still available from authorized sources,
If parts are coming from repair sources, they should be working to approved repair schemes and have the proper documentation to show the part is airworthy. If parts are coming from repair sources within an OCM/OEM, they should be working to Engineering approved repair schemes and Engineering should be involved in the approval of these repair shops.
If part obsolescence increases the counterfeit risk, it is important to coordinate with your customer to ensure the needs over the product lifecycle are met.

5 Procurement

Procurement can be divided into three components:

- Component One - Supplier Approval,
- Component Two - Source Selection, and
- Component Three - Purchase Order Placement.

Supplier Approval is the process of selecting suppliers to be on the approved supplier list. Source Selection is the process of selecting a supplier for specific order from the approved supplier list. Purchase Order Placement is the process for preparing and issuing the purchase order.

Supplier risk mitigation is accomplished via the supplier approval process
and is the first line of defense against purchasing counterfeit parts.

Historical data has shown that there is a higher risk of counterfeit parts when parts are procured from unauthorized or independent distributors. Procuring parts from original manufacturers and their authorized distributors provides a much higher likelihood of ensuring genuine products.

6 Traceability

Traceability serves several functions in counterfeit part mitigation. The first function is to track a part from the manufacturer through intermediaries to minimize the opportunity of procuring or introducing a counterfeit part into the supply chain.
The next function traceability serves is to be able to track and identify any suspect or confirmed counterfeit parts that are in-process or in service so that the parts can be recalled and replaced as necessary. It allows the organization to quickly quarantine parts in service, replace the affected parts, and return the products to service. This minimizes both field impact and production impact.

There are trade-offs between the cost of providing the traceability and the cost avoidance if production or in-service product is affected. Hence the level of traceability needed may vary depending on application, supply chain environment, and the risk to the end user. Examples include very detailed part traceability (e.g. serial number), lot traceability where the part usage can be identified and limited to a particular production lot or batch of deliverable hardware, or some other method.

Purchase Order should define the traceability requirements as applicable. Aerospace fasteners, for example, require date and lot code because they can be traced back to the manufacturer. When purchasing parts from a distributor, knowledge of the required documentation is essential. A CofC (Certificate of Conformance) may include traceability information but can be easily counterfeited so reliance on this document alone is not foolproof.
Unless full product traceability to the OCM/OEM is provided with the part, extra visual inspection as well as testing will provide an increased level of confidence that the parts will function as required. This will require a level of communication between the procurement and engineering organizations to assess the level of risk and develop an inspection and testing plan appropriate to the level of risk the part poses in the product.

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Upon receipt, traceability documentation should be evaluated in an effort to identify suspect material. The verification activities shall be appropriate to the product risk.

- Identity: Original manufacturer, part number, date code, lot number, serial number, batch number, etc.
- Pedigree: Origin, ownership history, storage, handling, physical condition, previous use, etc.
- Inspection and test results

Customer contract or legislation may require that traceability records be maintained. This can be a short period (a few years) but could be as long as the life of the product, which could be many decades.

7 Part Authentication

As stated earlier in the Risk Management section, the best method to avoid counterfeit parts is to purchase the parts directly from the original manufacturer. This is not always possible or practical. It is not just the parts that can be counterfeited. Counterfeiting can also occur in the documentation attesting to the authenticity of a part. Therefore, your organization should establish inspection and test criteria as applicable to detect possible counterfeits.
Your organization's quality manual will already address product verification activities to assure an externally provided product conforms to its specified requirements. The applicable quality requirement flow down and the level of purchased product controls, are determined in accordance with the effect the purchased product has on subsequent product realization and the end product. In other words, verification activities are performed based on customer requirements, source selection risk, component risk, and application criticality. Likewise, risk determines the most appropriate methods of inspection and test.

Some examples of inspection activities are: review of data deliverables (certificates of conformity, test results, process control documentation, first article reports, etc.), independent laboratory tests, product and/or process audits/assessments, product inspection at a supplier's facility, inspection/verification of the product and accompanying documentation upon receipt, and formal delegation of product acceptance to the supplier.

8 Determination of Suspect Counterfeit

The interpretation of inspection results should be documented in accordance with the specific test/inspection method(s) used. Analysis may require a forensics approach. There could be distinct and subtle indications that suggest that an item is suspect counterfeit. Indications for counterfeiting and quality defects from the authentic manufacturer and other quality related issues (e.g., poor storage and handling) can often be confused, leading to false positive or false negative results. Care should be taken to resolve inconclusive findings and to distinguish between counterfeit indications and quality indications. The sum-total of the observations from the complete test/inspection sequence is what establishes the overall conclusion.

One indicator from the parts or packaging may be sufficient if it is conclusive enough. If there are enough indicators that lead to a conclusion with a reasonable level of confidence that the parts are more likely suspect counterfeit, you may want to consult with the authentic manufacturers. There are times when they are willing to provide pertinent information to the decision making. If the indicator(s) lead to a conclusion that the parts contain quality issues, then document the quality issues in the final review and relevant information that led you to believe the final determination is quality related rather than counterfeit related.

If parts do not exhibit indicators that lead to a conclusion with a reasonable level of confidence that the parts are suspect/counterfeit, then the final determination that the parts passed required testing and that there was no evidence of counterfeiting based on the testing/inspection performed.

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