



**US Army Corps
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ENGINEERING AND CONSTRUCTION BULLETIN

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Subject: Prevention of Counterfeit Electrical Components incorporated into Construction Projects

Applicability: Guidance

1. This ECB provides guidance to reduce use of counterfeit electrical components in USACE construction projects. This guidance is focused on USACE work for contingency operations; however, it may also be applicable to USACE non-contingency projects as well.
2. In the past few years, counterfeit electrical parts have increasingly become more prevalent in construction projects and pose a significant potential to result in serious physical harm, as well as fire and property damage. The use of counterfeit electrical components is highest in contingency operations locations.
3. Although most of the counterfeit electrical components originate from China, it is not the sole source. It is important to realize that many electrical products manufactured in China are certified by safety testing laboratories, such as Underwriters Laboratories (UL) and are therefore compliant electrical products.
4. Counterfeit components are manufactured with the focus on mass production at a low cost. In many cases, they include well known names and certification marks from recognized testing laboratories. Most recent reports indicates that electrical products that are most commonly counterfeited include power cords, surge suppressors, smoke detectors, circuit breakers, fuses, control relays, electronic lighting, timers, switches, sockets, lamp ballasts, and conduit fittings.
5. Examples of counterfeit electrical components found by Industry and by U.S. Customs that could have created significant safety conditions and property damage includes the following:
 - a. Counterfeit power strips marked for 12 gauge wire actually contained 24 gauge wire
 - b. Counterfeit circuit breakers contained only a switch inside
 - c. Breaker labeled as 200A, but actually was a 70Amp breaker
 - d. Ground rod with 2 to 3 mil copper rather than the minimum 10 mils of copper
 - e. Counterfeit breakers did not trip as designed, with some breakers not tripping or tripping late when subjected to 135% and 200% rated current
 - f. Extension cords bearing UL marks and manufactured with undersized conductor (and melted within a few minutes of testing)

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- g. Outlet strips with plastic casing that ignited immediately in testing and was constructed with reverse-polarity wiring which is a shock hazard

6. Active engagement of the Quality Control and Quality Assurance Representatives is key in reducing or eliminating counterfeit electrical components. Visual inspection can provide an early and easy detection of counterfeit electrical products. However, even if a product passes a visual inspection, it still could be a counterfeit. As electrical components arrive on site, and prior to payment for the material, a review of the invoice and inspection of material should be conducted. The following are visual indicators of potential counterfeit electrical products:

- a. Check invoices to determine if material shipped from unknown supplier or distributor
- b. Price is well below normal cost
- c. Name and address of manufacturer is not on the box
- d. Poor quality packaging
- e. Labels or packaging with incorrect colors
- f. Missing or misplaced certification marks on product
- g. Missing components or features of product
- h. Letters uneven or words misspelled on product
- i. Country of origin different from a known genuine part
- j. Incorrect shape or design of the product
- k. Electrical conductors specific visual inspection:
 - 1) Verify wire insulation is firm and has uniform pattern and color
 - 2) Check insulation to verify that it does not have a new coat/surface with relabeling as another product. Apply rubbing alcohol to test permanency of the markings.
 - 3) Cut sample of wire to verify insulation is uniform around conductors
- l. Circuit breaker specific visual inspection:
 - 1) Verify uniform color (A counterfeit circuit breaker will often have scratches or marks on the housing or breaker itself.)
 - 2) Check if the breaker is loose or if it snaps when triggered (If the breaker does not resist movement it is most likely counterfeit.)
 - 3) Verify UL label, or other standard testing organization label, is on straight with no errors on it
 - 4) If the UL, or other standard testing organization, paper label appears oily, rub a small amount of rubbing alcohol on the sticker to see if the text can be removed.
- m. Verify product information through safety testing laboratory directory or product information on-line, including Underwriters Laboratories (UL) and Canadian Standards Association (CSA), as to whether the product's certification is current

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7. Additional quality control/quality assurance field verification testing measures that can be taken with personnel trained in the equipment operation and applicable safety measures include:

- a. Multi-meter
 - 1) Used to determine the conductor size based on its resistance
 - 2) Used to detect “shorts” between copper conductors, which is normally a result of defective insulation
 - 3) Used to find “open” or fault locations for conductors and circuit breakers
- b. Use a voltage tester on circuit breakers to verify operations

8. The following electrical material testing can identify counterfeit products and should be accomplished only through highly trained in-house resources, through separate contracted services, or included in the contract technical provisions.

- a. A Megger Insulation Tester is a portable electrical tester that carries a range of operating volts, such as 300V, 750V, and 1000 volts.
 - 1) Can be used to evaluate the integrity of the insulation
 - 2) Lower ohms reading suggest cable problems
- b. Overload testing on circuit breakers will verify trip design.

9. When reasonable doubt exists, after a visual inspection and QA/QC testing, further laboratory testing may be warranted to verify the quality of the electrical product.

10. Most well known, reputable manufacturers and distributors are making every effort to curb counterfeit products through constant monitoring and inspection. Check with the manufacturer, supplier, and/or safety laboratory certification any electrical components that do not appear to be genuine.

11. The Anti-Counterfeit Products Initiative, at www.counterfeitscankill.com, provides current information as to efforts to curb these products. Several of the safety testing laboratories and electrical component manufacturers include updates on their efforts against counterfeiting.

12. HQ USACE has set up a link on the Technical Excellence Network (TEN) relating to counterfeit electrical products. This site will also have a subdirectory that all TEN users to be able to post *.pdf files of photos with brief text to explain counterfeit electrical products found in the field. Explanations should include information that may help others in detecting and eliminating counterfeit electrical products on the job site, including point of contact for the file, how the counterfeit was detected, and name of distributor/ supplier. This link is:

<https://ten.usace.army.mil/TechExNet.aspx?p=s&a=AREASOFEXPERTISE;1208>

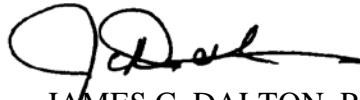
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13. To effectively combat the increasing use of counterfeit electrical products in contingency operations areas, the following actions should be initiated through the Districts and included in quality management plans:

- a. Training is essential in contingency operations areas to insure effective quality assurance. District Office and Area Office should utilize expertise both within their area of responsibility and with reach back capabilities to develop applicable electrical quality assurance training.
- b. Districts should increased emphasis relating to quality control and quality assurance of electrical products. Enforcement of quality control system, combined with improved quality assurance methods, using in-country technical experts and reach back capabilities, will reduce potential for counterfeit products.
- c. Conduct laboratory testing. A testing laboratory or professional services may need to be acquired through separate contract means.
- d. Consider including contract technical provisions requiring additional quality control inspection, testing, and reporting.
- e. Districts should develop procedures for reporting suspected counterfeit electrical products to testing laboratory, manufacturer, and distributor.
- f. Districts should develop procedure for insuring documentation on the above stated TEN site for sharing information with others. Each Area Office may experience different types of counterfeit products from different sources. Sharing of this information through the TEN site will assist others in improving quality assurance and will be included in the Area Office University training course.

14. HQUSACE point of contact for this ECB is Paul Dicker, CECW-CE, 202-761-0995.



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