



MARK INTEGRITY PROGRAM

UL Traceability Requirements

Material and Components Used for UL/C-UL/ULC Mark Follow-Up Services

UL defines minimum requirements for material and components used in UL certified end products as part of its Follow-Up Services procedures. This document applies to all customers of UL's product certification services for the U.S. and Canadian markets, i.e., UL/C-UL/ULC Mark certifications.

UL Works to Support You Through:

Why This Requirement is Important A key element in verifying compliance with UL requirements is determining that materials and components used in UL certified products are consistent with their descriptions in UL Follow-Up Services procedures. Determining compliance of materials and components used in UL certified products is an important step in getting safer products to market. Additionally, maintaining the traceability of these materials and components helps support the ongoing integrity of the supply chain resulting in higher levels of confidence that materials being received meet sourcing requirements.

Requirements

Responsibility It is a manufacturer's responsibility to assure that all components and materials are as described in the UL Follow-Up Services procedure and to maintain all required records so they are readily available for review by a UL field representative. UL Field representatives will verify compliance to the applicable traceability programs and requirements specified in this document.

UL Recognized Components

Overview This program provides traceability for a large and diversified group of components. Although they may be vastly different in form and function, components covered by this program meet all of the following criteria:

- Subject to a third-party factory follow-up program
- Incomplete in certain construction features or restricted in performance capabilities
- Intended only for factory installation in end-products or equipment where the limitations of use are known to an end-product manufacturer
- Not authorized to bear the UL Listing Mark or UL Classification Marking

Method of Traceability Components covered under UL's Component Recognition and Follow-Up Services programs are identified by a Recognized Component marking. Unless otherwise specified in a component's published information, a Recognized Component marking consists of the following:

- Recognized company identification/name
- Recognized company catalog or model number

Information about UL Recognized Components is published in the UL Recognized Component Directory available at www.ul.com/database. In addition to the Recognized company name and model number, components covered under this program may also bear the Recognized Component Mark for the United States, Canada or the combination Mark for the United States and Canada.



For more information, please contact your local UL field representative.

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Fabricated Parts (Category QMMY2)

Overview UL's fabricated parts traceability program covers material traceability for molded, encapsulated, potted and other fabricated plastic parts. This program is intended to provide quick verification of material identity through markings on a fabricated part.

Component specifications are noted in individual end-product UL Follow-Up Services procedures. An end-product manufacturer must pay particular attention to the UL Follow-Up Services procedure to be sure that the component specifications are not compromised and continue to meet UL requirements, especially when molders or fabricators use additives, regrinds and recycled plastics.

Method of Traceability Traceability is provided by means of identification markings on a part, shipping carton or accompanying specification sheet that includes the following information:

- UL-assigned designation
- Name of molder/fabricator
- Factory location, when more than one factory location is used
- Part identification
- Date of molding or fabrication
- Material manufacturer's name and grade designations. This may be a code mutually agreed upon between an end-product/designated-party manufacturer and a molder/fabricator

Spoiled Wire and Cable

Overview Wire and cable used in the production of UL certified products must be traceable to the original UL Mark (label) (typically affixed to the spool by adhesive or tag). Surface printing on the wire alone is not sufficient verification of UL wire certification. Traceability is often lost when the UL Mark (label) is separated from the spool and discarded. In order to avoid loss of traceability, the UL Mark (label) should always be kept with the spool/packaging.

Method of Traceability To maintain traceability of wire and cable, verification from the wire back to the original UL spool label must be readily available. Manufacturers are encouraged to adopt the following practices to ensure traceability:

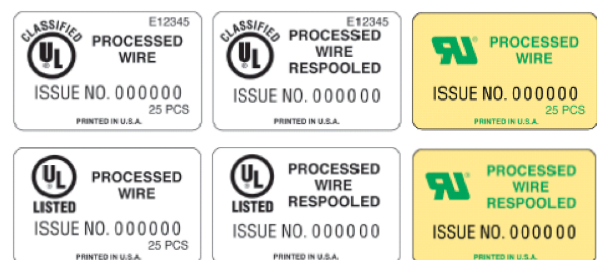
- If the UL Mark (label) is affixed to outer wrapping, immediately staple or otherwise affix the tag with the UL Mark (label) to the wire reel upon removal of the wrapping
- Request that the wire supplier affix the UL Mark (label) directly to the spool, rather than the outer wrap
- Reject spools of wire that do not have UL Marks (labels) attached during incoming inspection
- Communicate wire traceability requirements to personnel handling wire in production

Processed Wire (Categories ZKLU, ZKLU2, ZKLU7 and ZKLU8)

Overview This program provides traceability for various types of wire/cable that have been subjected to processing subsequent to original manufacturing and labeling. Wire in these categories originates as insulated wire that is then cut into specified lengths with insulation stripped from one or both ends and packaged for further processing. The stripped ends may be soldered or tinned and may have eyelet, ring, open spade or quick-connect terminals attached by crimping, soldering or welding. This program can also cover wire that has been respooled into smaller quantities.

Method of Traceability Traceability for wire that is covered under this program is through an appropriate UL certification mark on an attached tag, reel or smallest unit container in which product is packaged. In addition, tagmarking information provided by an original wire manufacturer is transferred onto tags provided by a wire processor. The certification marks applicable to this program include:

- UL Listed processed wire
- Respoiled UL Listed processed wire
- UL Classified processed wire
- Respoiled UL Classified processed wire
- UL Recognized processed wire
- Respoiled UL Recognized processed wire



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Wiring Harnesses (category ZPFW2)

Overview This program provides traceability for wiring harnesses that are assembled at off-site locations and intended for use as factory installed components at an end-product manufacturing facility. They are defined as components consisting of two or more wires joined electrically and/or mechanically, and may include connectors, plugs, strain reliefs, splices, etc. When assembled at an off-site location, traceability for components used to construct a wiring harness is not possible at an end-product factory location. This program can be used to provide this traceability. Each wiring harness is normally constructed in accordance with a harness diagram and is generally designed for a specific application that is indicated on a diagram or carton marking. These wiring harnesses are not intended for field installation. An assembly consisting solely of a cord set, power supply cord or power supply cord attached to an appliance, such as a motor, is not eligible for coverage under this program.

Method of Traceability An off-site fabricator assembles a wiring harness in accordance with a harness diagram, print or other specification from an end-product manufacturer that details construction elements and components to be used in assembling a harness. A harness manufacturer will assemble a harness in accordance with these specifications and, provided that a wiring harness is in compliance with these specifications, it may be shipped with the UL Mark. Traceability for these construction elements is further determined at an end-product manufacturing location and involves verifying that these features comply with an end-product Follow-Up Services procedure.

The UL Recognized Component Mark on the smallest bundle or unit container in which a product is packaged is the only method used to identify wiring harnesses manufactured under the UL Recognition and Follow-Up Service programs.



Printed Wiring Board Assemblies (category ZPVI2)

Overview This program provides traceability for printed wiring board assemblies. It covers materials and components of assembled printed wiring boards, including a board itself, when these can only be identified at a board assembly location. This program is used when printed wiring boards are assembled remotely from an end-product manufacturing location and traceability of a board or its components is a concern. It is intended to address traceability of a UL Recognized board and/or components only. All other aspects of design, spacings, etc., are evaluated as part of the UL investigation of end-use products.

Method of Traceability An assembler is required to keep records to trace the identity of all materials and components from receipt through storage, inventory, withdrawal, assembly, packaging and shipping. Printed wiring assemblies covered under the category ZPVI2 are identified by an assembler's name and UL code designation on a part, shipping container or included specification sheet. Relevant material and component manufacturer name and type designations are marked on a part, shipping container or accompanying documentation. In addition, assemblies covered under this program will also bear the UL Recognized Component Mark.



High Technology Equipment Subassemblies (Category VZQC2)

Overview This program provides traceability for high technology subassemblies, which are a group of components that constitute a portion of a complete component or product. They are limited to use in a specific group of high tech equipment including audio/visual equipment, information technology equipment and telephone equipment. This program is not intended to address subassemblies ordinarily covered under a separate UL certification program. These subassemblies are covered under their respective product categories.

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Method of Traceability Each subassembly is constructed and/or tested in accordance with a drawing or specification provided by an end-product manufacturer. In addition, a sub-assembler is required to keep records that will trace the identity of all components and materials identified on a drawing or specification from receipt through storage, assembly, packaging and shipping. Subassemblies covered under this program are identified by a UL-assigned code designation and a sub-assembler's name and part identification. In addition, these subassemblies will also bear the UL Recognized Component Mark.



Repackaged Product Program (Categories TEOW, TEOY, TEOZ, TEPC and TEOU2)

Overview This program is intended to accommodate redistribution of bulk shipments of UL certified products. Through this program, the appropriate UL markings can be applied to new packaging for individual items or sub-lot quantities. It provides a solution for distributors, retailers, importers and manufacturers who redistribute bulk shipments to accommodate different customer needs and manage inventories. For further information on this program, please visit www.ul.com/repackaged/index.html.

Split Inspection Program

Overview The split inspection program provides a means of traceability for components, materials and subassemblies that are manufactured or assembled at an off-site or contract manufacturing facility. This program is usually implemented when other UL programs do not resolve a specific traceability issue. Follow-Up Service inspections are conducted at these off-site factory locations to establish traceability for specific components, materials or assemblies.

Method of Traceability These special components will be described in a UL Follow-Up Services procedure that contains specific instructions for inspections/verifications for each component. Upon verification of compliance with the inspection instructions, special components will be permitted to bear an agreed-upon special marking. This identification

permits a UL field representative at an end-product manufacturing facility to accept these components as having been previously counterchecked, therefore avoiding any re-inspection.

Document Audit

Overview Other programs described in this document are the preferred methods for establishing traceability. However, UL recognizes that there may be isolated circumstances when document audits may be necessary. With a few exceptions, the document audit can be used only for a short period of time while a manufacturer implements another of UL's traceability programs. For example, the document audit is not an acceptable long-term traceability method for verifying wire, cable, connectors, etc., when these products are assembled off-site. Another of the UL traceability programs described in this document, e.g., wiring harnesses, processed wire or split inspection, must be established to address these traceability issues.

The document audit program involves examining documentation and specifications to determine that components and materials comply with specified requirements. To be successful, a manufacturer's procurement system must address the following:

- When sourcing, an end-product manufacturer must provide a vendor or supplier with appropriate component and material requirements
- An end-product manufacturer must require that a vendor/supplier provide confirmation with each product shipment that the components in the shipment meet the stated requirements
- An end-product manufacturer must implement a method to address on-going verification – either through supplier audits, incoming inspection, etc. – that all received components and materials meet requirements

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Following are some examples when document audit may be used on a continual basis:

When a UL Certification Mark is on the Product, but it is Incomplete

- Components with only the “UL in a circle” or the UL Recognized Component Mark on a product may use a vendor-supplied document to provide additional information from the packaging for the UL certification marking along with all conditions or instructions provided on or within the original packaging. Examples include:
 - A fusible link has only the “UL in a circle” stamped in it: a supplier document can provide product category and control number from the required four-element UL Listing Mark on the package along with the temperature rating stamped on the box
 - A fluorescent lamp holder has only the “UL in a circle” molded into it: a supplier document can provide product category and control number from the required four-element UL Listing Mark on the package along with “Suitable for Outdoor Use” as stamped on the package
 - A crimp terminal has only the “UL in a circle” stamped in it: a supplier document can provide the product category and control number from the required four-element UL Listing Mark on the package along with all installation instructions, wire combination, required crimp tool and other restrictions noted on the packaging
 - Gasket material is cut in such a way that only the UL Component Recognition Mark can be identified: a supplier document can provide manufacturer’s name and model number to verify compliance



The document audit may be an acceptable method for validating traceability requirements on an on-going basis for UL certified components when the UL Mark is required and a part is marked with an indication of coverage by UL.

Attribute Traceability When no Formal Program Exists

- A document audit may be an acceptable means of determining traceability for specific attributes such as chemical formulations, metallurgical content, steel coating thickness, etc. A document audit is also acceptable for verifying elements described in the UL Follow-Up Services procedure used in the construction of non-UL certified motors or transformers, including wire integral to the construction of such a device.

However, a document audit is not acceptable for UL certified components requiring a certification mark on the product or packaging. In addition, this approach is not an acceptable method for verifying dimensions. UL expects that manufacturers maintain the capability to verify dimensions identified in Follow-Up Service procedures. While statements of compliance provided by suppliers can help satisfy a manufacturer’s requirements for subcontractor control, these statements may not be the sole means of verification or used as a rationale for a manufacturer to opt out of possessing the inspection, measuring and test equipment required to validate dimensions described in a Follow-Up Services procedure.

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Verification of Molded Plastic Parts

Unless the use of a Recognized Component fabricated part (category QMMY2) is a required construction feature specified in an end-product Follow-Up Services procedure, a document audit can be used to verify plastic materials (raw material manufacturer's name and grade designations) for plastic parts molded off-site. At a minimum, any documentation must provide sufficient information to determine that requirements defined in an end-product procedure are met. As a best practice, certificates of compliance or other documentation for plastic parts molded off-site should include the following:

- Name of molder
- Molding date
- Shipment quantity
- Material manufacturer's name or trade name and material designation
- Percent of thermoplastic regrind used (1)
- Color concentrates or other additives (2)
- Name of company buying the product, i.e., end-product manufacturer
- Part name or number
- Specification number
- Purchase order number or other means to properly link a component to documentation
- Shipment date
- Manufacturer representative's name, signature or function to authorize and attest to information accuracy

Notes

- 1. Regrind is non-contaminated product or scrap such as sprues and runners that have been reclaimed by shredding and granulating for use in-house. Thermoplastic regrind is limited to 25% by weight unless the specific material used is authorized for greater than 25% as specified in the UL Recognized Component Directory. Thermoset regrind is not acceptable at any level unless any content used is evaluated and authorized**
 - I. Examples of common thermoplastics: Polyethylene, polycarbonate, polystyrene, polyamide, etc.
 - II. Examples of common thermosets: Phenolic, epoxy, melamine resins, polyester fiberglass, vulcanized rubber, etc.
- 2. Color concentrate use: A UL Recognized Base Resin Material may be pigmented by dry-blending with Recognized Color Concentrate or dyestuff providing that the let-down ratio is not exceeded and that the color concentrate has been investigated for use with the appropriate base resin material**

Finally, if there are any additional construction elements specified in the description in the UL Follow-Up Service procedure, any certificate or documentation should also address these features.

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