

# Compliance guidelines for marking and labeling systems



Most electrical products and equipment must be marked with specific safety-related information and comply with the permanence of marking requirements. These markings can include electrical ratings, use instructions, warnings regarding potential safety hazards and cautionary markings. Compliance with the permanence of marking requirements helps ensure that the labels will both adhere to the application surface and that the text will remain legible for the product’s intended use.

This UL Solutions white paper discusses the specifics of marking and labeling requirements and how to identify compliant marking and labeling systems for use by product and equipment manufacturers. After providing an initial review of the various definitions of marking and labeling systems, the paper will then briefly examine the testing and evaluation protocol required under current marking and labeling standards. The white paper then discusses the process for sourcing compliant marking and labeling systems before concluding with recommendations for both end-product manufacturers and label converters and printers.

## What are marking and labeling systems?

Labels (also referred to as nameplates or markers) convey a wide range of information regarding necessary installation safety measures and the use of any given product. For example, information about a product’s electrical rating can help confirm compatibility with an electrical system or another product, thereby preventing circuit overloads or product failures. Other information can warn users about the risk of electric shock under certain operating conditions, such as proximity to water or sources of moisture. In other cases, labels can provide the user with information about appropriate use environments, e.g., “for indoor use only,” or how to properly use the product.

Government regulations and codes, such as the National Electric Code® or product safety standards, often stipulate products must meet applicable safety requirements. Many distributors and retailers may set additional requirements. These obligations usually include requirements for the permanence of markings when a label is used to convey safety-related information, cautioning against hazards, warnings, installation instructions and electrical ratings. Even in cases where safety standards don’t apply, original equipment manufacturers (OEMs) often specify marking performance requirements to their label suppliers. At UL Solutions, these types of labels are referred to as “marking and labeling systems.”

## Standards that address the permanence of marking

Whether mandated by regulations, codes, retailers or manufacturers themselves, specific permanence of marking performance requirements are often required for products such as appliances, consumer electronics, motors, lighting, medical equipment and more. There are several permanence of marking standards for labels, but three of the most widely referenced are ANSI/UL 969, The Standard for Marking and Labeling Systems, ANSI/CAN/UL 969A, The Standard for Marking and Labeling Systems Flag Labels, Flag Tags, Wrap-Around Labels and Related Products, and CSA C22.2 No. 0.15, Adhesive Labels.



### **ANSI/UL 969, Marking and labeling systems**

UL 969 was first published in 1978. It is the primary UL Standard used to determine permanence of marking requirements. UL 969 is referenced in over 450 UL and over 30 ULC end-product Standards, and it is mentioned in ASTM, NFPA, ANSI and manufacturer specifications, making UL 969 a widely referenced label Standard in the supply chain.

UL 969 covers pressure-sensitive labels and related products for use as permanent nameplates or markers that provide information, instructions or identification in the form of text or pictographs.

The Standard outlines specific criteria regarding the permanence and legibility of the labels as well as the test procedures required to determine compliance. Under UL 969, labels are evaluated on application surfaces (typically flat and smooth) for use in indoor or outdoor locations, temperature ranges and additional conditions, such as occasional exposure to oils, detergents or gasoline splashing. Because most U.S.-based safety standards and manufacturers reference UL 969 requirements, labels found to meet the requirements of this Standard are considered suitable for use with a wide range of products.

### **ANSI/CAN/UL 969A, Flag labels, flag tags, wrap-around labels and related products**

UL 969A was published in 2020. It has since been adopted by both the United States (through ANSI) and Canada (through SCC).

It covers flag labels, flag tags, wrap-around labels and related products affixed to electrical power supply cords and hoses. As with UL 969, which is primarily used for flat surfaces only, the above products are evaluated for indoor or outdoor suitability, temperature ranges and other environmental conditions. In addition, flag labels and flag tags can be evaluated for a limited slippage rating.



## History of UL 969A:

It's important to note that in 2017, nearly 50 UL Solutions end-product Standards were identified as having permanence of marking requirements for flag labels, flag tags or wrap-around labels, often simply referred to as "cord tags." Most requirements across these Standards were similar, but there were a few critical differences, such as the types of environments these marking systems are anticipated to be used in (e.g., indoor vs. outdoor), elevated aging temperatures and if the "cord tag" is allowed to slip during evaluation.

With the publication of UL 969A, manufacturers and label suppliers are able to test to a single document covering the performance requirements in virtually all the end-product Standards with cord tag requirements.

### CSA C22.2 No. 0.15, Adhesive labels

The Canadian Standards Association's (operating as "CSA Group") standard C22.2 No. 0.15 was first published in 1990 and covers the performance requirements of labels used for products evaluated to CSA standards. Its scope is similar to UL 969 and includes testing procedures and performance requirements of labels. However, the CSA and UL Standards are not identical as the test methods, exposure conditions and performance requirements presented in each standard differ.

### Label requirements of other standards

Some safety standards have chosen to utilize their own label performance requirements instead of a Standard like UL 969. Examples of these standards include UL 299, the Standard for Dry Chemical Fire Extinguishers, or UL 50E, the Standard for Enclosures for Electrical Equipment, Environmental Considerations. In such instances, the safety standard for these types of products have special requirements that differ from typical products. As a result, the labels must be evaluated against the specialized performance requirements of those products as stated in the standard guidelines.



## Testing and evaluation

The evaluation for marking and labeling systems includes both a construction examination and testing for permanence. The test program involves the performance evaluation of each system on an actual or representative end-product surface after being subjected to environmental conditions that simulate the conditions that would be encountered in the label's intended use, e.g., indoor, outdoor, etc.



### Construction examination

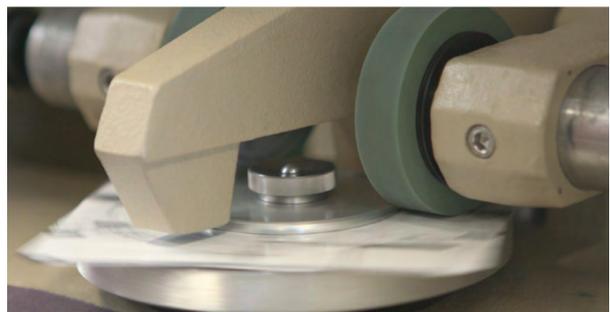
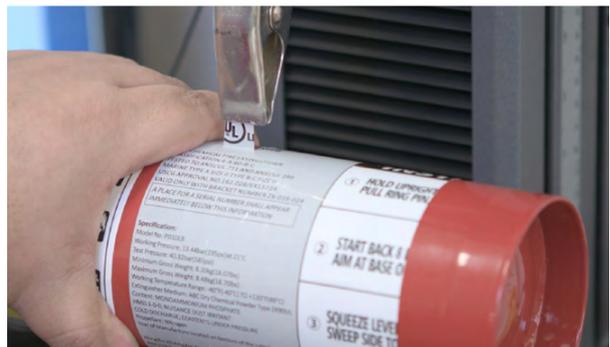
The construction examination is used to verify and document its construction. It involves the review of the label's layers, including their individual thickness, and whether the label incorporates an overlamination, varnish or support stock. The construction examination also identifies the layer (or layers) to which the ink was applied, e.g., top-surface vs sub-surface, and confirms the generic type of label stock employed, e.g., paper- or polymer-based. UL 969 and other marking and labeling Standards typically specify only performance requirements and do not mandate the use of specific label materials.

### Testing for permanence

UL 969, UL 969A, CSA C22.2 No. 0.15 and most other marking and labeling standards utilize environmental conditioning of labels prior to their evaluation for label permanence. After applying label samples to the actual or representative test surfaces, the labels are conditioned in such exposures as water immersion, elevated and lowered temperatures, chemical immersions and ultraviolet (UV) weathering. After the environmental conditioning has been completed, label compliance is determined by a visual examination of the samples for evidence of curling, wrinkling, shrinkage or loss of adhesion around the perimeter. Compliance typically

includes the evaluation of the label's legibility, resistance to defacement and rubbing, and minimum adhesion performance. If the label samples are deemed compliant, the suitable test surface and environmental conditions will be limited only to those that have been evaluated.

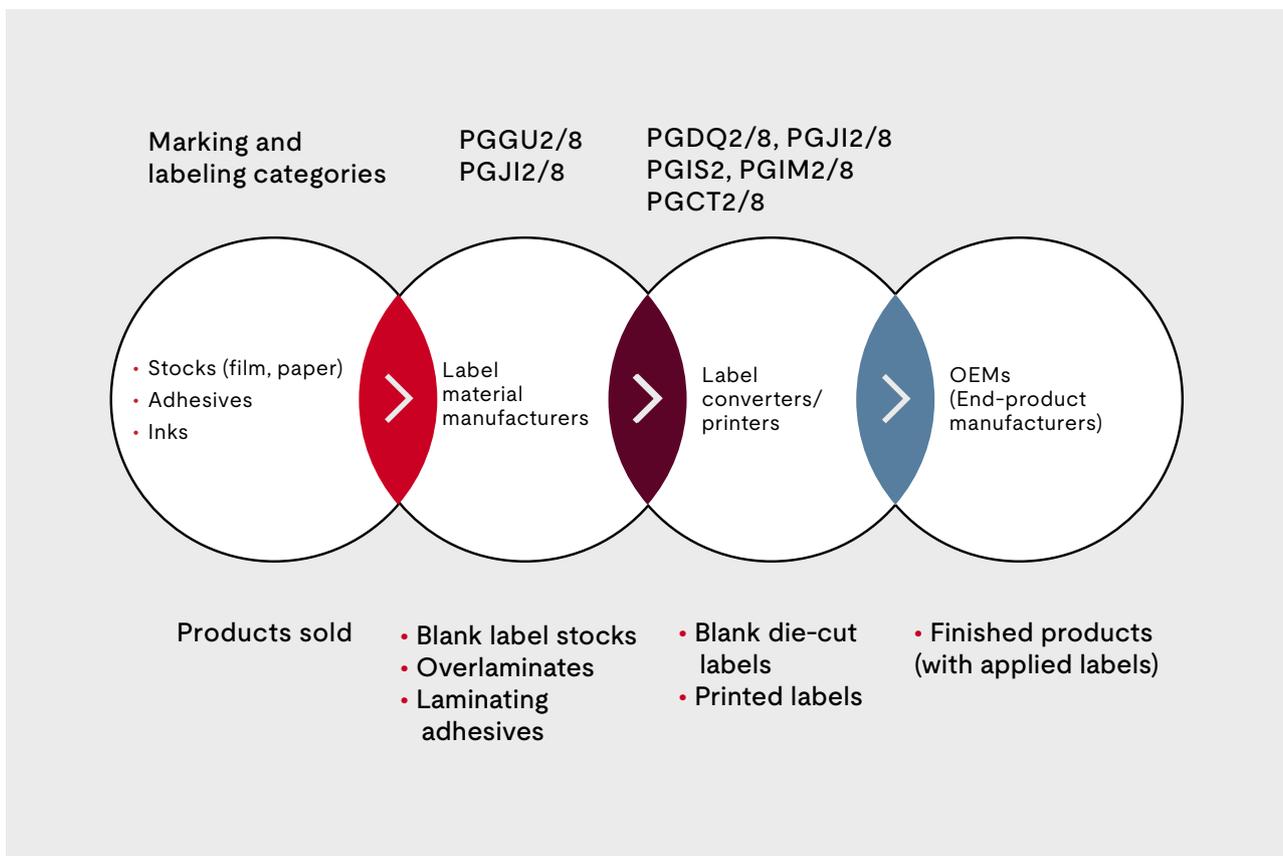
IEC-based standards typically require compliance with a marking durability rub test. In general, the marking durability rub test involves rubbing label samples with a cloth soaked with such liquids as water, petroleum spirit (hexane), methylated spirit (ethyl alcohol denatured with methanol) or isopropyl alcohol solution, followed by a visual examination of the label samples for legibility and adhesion. The choice and sequence of the liquids used and the duration of rubbing vary among IEC standards that include "Durability of Marking Requirements." Compliance is determined by visually examining the label samples to confirm print legibility and no excessive curling/uplifting of the label edge.



## Sourcing compliant marking and labeling systems

UL Solutions maintains a comprehensive online database, UL iQ for Labels (<https://iq.ul.com/labels/>), helping manufacturers search for UL Certified component marking and labeling systems (often referred to as UL Recognized Components) that have been tested and evaluated by UL Solutions. The UL iQ for Labels database lists over 1,400 companies offering more than 30,000 UL Recognized Components. The database provides an easy and convenient way for OEMs to identify and acquire labels that meet the permanence of marking requirements applicable to their products and helps reduce the need for duplicate testing and surveillance of commercially available labels. In addition, recognized marking and labeling systems fall under UL Follow-Up Services program and are regularly evaluated for continued compliance with UL Solutions requirements through factory inspections at the label manufacturer’s facility and sample testing.

UL Solutions certifies marking and labeling systems under six category code numbers (CCN) – PGDQ2/8, PGJ12/8, PGGU2/8, PGIS2, PGIM2/8 and PGCT2/8 – based on the type of label product and end-use application (see Table 1 for additional details on each category). Individual component listings in UL Solutions maintained directories (such as [UL Product iQ®](#)) provide detailed use ratings. In the case of marking and labeling systems, the use ratings include application surfaces and the associated minimum and maximum exposure temperatures, use conditions (indoor or outdoor) and any additional chemical exposures. Other relevant information may also be available, such as suitability for end-user printing at OEMs and the specific inks that may be used to produce such printing.



In addition to the UL Solutions database, UL Solutions also provides additional guidance on the proper use of marking and labeling systems. The guide information page describes each certification category’s intended use, applicable standards, conditions of acceptability and the appropriate certification mark to be used by the label supplier. As such, the individual component listings and guide information provide data vital to determining suitability of any given marking and labeling system for its application in a specific end product.

PRODUCT TYPE	PRODUCT DESCRIPTION	FABRICATED AS	REQUIREMENTS	CERTIFICATION CATEGORY	ADDITIONAL GUIDELINES AND RELATED WEBLINKS
Marking and Labeling Systems	Covers <b>printed labels</b> that are manufactured by a label printer/converter. They are not intended to receive additional printing by end-use product manufacturers.	These products are sold as die-cut, finished printed labels.	UL 969	PGDQ2	<a href="#">Guide Information</a>
			CSA C22.2 No. 0.15	PGDQ8	<a href="#">Guide Information</a>
Marking and Labeling Systems — Printing Materials	Covers <b>printed labels and unprinted stocks that have been evaluated to receive additional printing by end-use product manufacturers</b> using simple printing equipment, including thermal transfer. Additional printing inks for which the labels have been found compatible are specified in the Recognition. Additional printing is considered an optional process for printed labels.	These products are sold by label material suppliers in bulk roll form or by label printer/converters as die-cut labels that are blank or preprinted with blank areas in which information is to be added.	UL 969	PGJ12	<a href="#">Guide Information</a>
			CSA C22.2 No. 0.15	PGJ18	<a href="#">Guide Information</a>
Marking and Labeling Systems — In-Mold	Covers <b>printed in-mold labels</b> that are manufactured by a label printer/converter and are intended to embed into a molded plastic part during the molding process.	These products are sold as die-cut, finished printed in-mold labels.	UL 969	PGIM2	<a href="#">Guide Information</a>
			CSA C22.2 No. 0.15	PGJIM8	<a href="#">Guide Information</a>
Marking and Labeling Systems — Materials	Covers materials that are used to make labels. Products in this category include <b>blank label stocks, laminating adhesives and overlaminations</b> . This category is intended for use by label printers/converters, not OEMs.	These products are typically produced in bulk sizes and sold to label printers/converters for the production of labels.	UL 969	PGGU2	<a href="#">Guide Information</a>
			CSA C22.2 No. 0.15	PGGU8	<a href="#">Guide Information</a>
Marking and labeling systems — flag labels, flag tags and wrap-around labels	Covers <b>flag labels, flag tags, wrap-around labels</b> and related products that are typically affixed to a flexible electrical cord or fluid carrying hose either as a label that is adhered to itself like a flag, as a tag that is attached with a securement strap through a hole or as a label that is wrapped around the circumference.	These products may be sold by material suppliers in bulk roll form or by label printer/converters as die-cut labels/tags that are blank or preprinted with blank areas in which information is to be added.	UL 969A	PGCT2	<a href="#">Guide Information</a>
			CAN/UL 969A	PGCT8	<a href="#">Guide Information</a>
Marking and Labeling Systems — Limited Use	Covers <b>limited-use labels, cord tags (securement-strap attached, flag type, wrap-around) and placards</b> that have been evaluated for compliance with requirements in specific end-product standards where performance requirements are either less stringent or different than those in UL 969. Label use is limited to the types of products covered by those end-product standards only.	These products are sold as die-cut, finished printed labels, cord tags, and placards.	Various UL end-product Standards	PGIS2	<a href="#">Guide Information</a>

**NOTES:**  
 Guidelines addressing the suitability of the label when used with an end product are included online and generally cover application surfaces, temperature ratings, and additional exposure conditions for which the label was found acceptable. Labels evaluated to UL 969 under PGDQ2, PGJ12, PGIM2 and PGGU2 may have additionally been evaluated for specific end-use applications — including IEC marking of durability requirements and fire extinguishers.

**Table 1:** Marking and labeling systems summary table

## Guidelines for reading the component listing card

Published certifications for marking and labeling systems follow a similar format across all product categories starting with basic information about the supplier, product designation and label type (e.g., pressure-sensitive printed labels) at the top, followed by detailed use ratings below. It is important to note that published certifications for marking and labeling systems indicate suitability for use on generic application surface types (e.g., aluminum, polypropylene, etc.) as opposed to specific grades or suppliers of these surface types. This approach affords OEMs great flexibility in selecting labels suitable for use on their product.

Figure 1 illustrates a typical format for published certification of a printed label under category PGDQ2, which covers finished printed labels evaluated to UL 969. In this example, the label was evaluated and found acceptable for use with five different generic application surfaces. Each application surface is smooth and flat, and labels can be used within the temperature ranges and conditions indicated for that surface.

**Marking and Labeling Systems** (guide info) MH012345

**Label Supplier**  
333 Pfingsten Rd, Northbrook, IL 60062

**LS101**  
Pressure-sensitive printed labels

Application Surface	Max Temp (°C)	Min Temp (°C)	Indoor Use	Outdoor Use	Additional Conditions
Aluminum	150	-40	Yes	Yes	O
Alkyd paint	100	-40	Yes	No	RT(1)
Galvanized steel	100	-40	Yes	Yes	-
Stainless steel	100	-40	Yes	No	O, C
Acrylonitrile butadiene styrene	80	-40	Yes	No	RT(3)

**C** - Occasional exposure to Cooking Oil (room temp).  
**O** - Occasional exposure to Gasoline splashing.  
**RT(1)** - Complies with UL 514A, UL 60950-1, UL 60335-1, UL 60745-1, UL 60974-1, UL 61058-1 and IEC 60950-1 marking durability rub test requirements.  
**RT(3)** - Complies with UL 60601-1 and IEC 60601-1 marking durability rub test requirements.

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**Figure 1:** A sample published Certification of a printed label under PGDQ2

Figure 2 illustrates a typical format for published certification of a printed label under categories PGJ12 and PGJ18. These categories cover finished printed and unprinted stocks evaluated to UL 969 and CSA C22.2 No. 0.15 that have been found suitable for additional end-user printing. This example follows the format illustrated in Figure 1 but also includes information on the printing process and ink type permitted for use with this label. The Canadian certification is published in a separate section because CSA C22.2 No. 0.15 and UL 969 are different and the application surfaces and use conditions may not be the same.

MH012345

**Printing Materials** (guide info)

**Label Supplier**  
333 Pfungsten Rd, Northbrook, IL 60062

**unprinted stock dsq: 102B**  
**printed stock dsq: 102**  
PRESSURE-SENSITIVE SYSTEMS  
Suitable for additional printing with one or more of the following inks (in the black color unless otherwise indicated):

**Thermal transfer ribbon**  
Company 1: Type A, Type B  
Company 2: Type C

Application Surface	Max Temp (°C)	Min Temp (°C)	Indoor Use	Outdoor Use	Additional Conditions
Acrylonitrile butadiene styrene	80	-40	Yes	Yes	-
Nylon - Polyamide	80	-40	Yes	Yes	-
Phenolic - Phenol Formaldehyde	80	-40	Yes	Yes	-
Polybutylene terephthalate	80	-40	Yes	Yes	-
Polycarbonate	80	-40	Yes	Yes	-

CANADIAN USES –  
Suitable for additional printing with one or more of the following inks (in the black color unless otherwise indicated):

**Thermal transfer ribbon**  
Company 2: Type C

Canadian Application Surface	Max Temp (°C)	Indoor Use	Outdoor Use	Additional Conditions
Metals - bare, plated, painted or enameled steel or aluminum	80	Yes	Yes	-
Plastic Group III - polycarbonate, acetate, acrylic	80	Yes	Yes	-
Plastic Group IV - polyethylene, polypropylene, polybutylene	80	Yes	Yes	-
Plastic Group V - polyamide, polyimide	80	Yes	Yes	-

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Figure 2: A sample published Certification of an unprinted stock and printed label under PGJ12 and PGJ18

Figure 3 illustrates a typical format for published Certification of a printed flag label under category PGCT2, which covers finished labels or tags evaluated to UL 969A. In this example, the flag label was evaluated and found acceptable for use on a SJTW flexible cord at the minimum size specified and can be used within the temperature ranges and conditions indicated for that cord.

MH012345

Flag labels, flag tags, wrap-around labels and related products

**Label Supplier**  
333 Pfungsten Rd, Northbrook, IL 60062

**Pressure-sensitive printed flag label: FLAG01**

Type	Min size	Max temp (°C)	Min temp (°C)	Indoor use	Outdoor use	Additional Conditions	Limited Slippage Rating
SJTW	18 AWG / 2 C	150	-40	Yes	Yes	O	Yes

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Figure 3: A sample published certification of a printed flag label under PGCT2.

## Recommendations for OEM compliance

The diversity of global safety requirements for end products and the varying needs of OEMs can introduce many challenges in the effort to ensure the use of compliant marking and labeling systems. The following steps can help OEMs meet the challenge.

### 1. Identify requirement and use

The marking and labeling requirements and uses are governed by end-product standards. OEMs should reference the marking and labeling requirements specified in the applicable safety standard or seek guidance from a qualified source, such as the UL Solutions engineer handling the end product investigation. In instances where more than one safety standard is used, such as UL, CSA and/or IEC standards, the label must meet the requirements of all standards. This process should result in identifying the proper marking and labeling requirements that apply to a given product based on its intended use.

### 2. Identify surface

Review the product design and the materials to which the label will be applied (typically, the product enclosure). In some cases, the bill of materials may make specific mention of a particular supplier and grade; therefore, research may be required to identify the generic equivalent (for example, LEXAN™ is a term often used for generic polycarbonate). In addition, special attention should be given to verify whether the surface to which a label will be applied is smooth or textured, and flat or curved. Completing this step will result in a full understanding of the generic application surface and its surface characteristics.

### 3. Identify additional printing

Review the manufacturing process to identify whether end-user printing is necessary to add information to the label, such as model and serial numbers, date codes, plant codes or voltage/ amperage and other rating information.

### 4. Verify marking and labeling system compliance

Working with a label supplier and reviewing the information on UL iQ for Labels database, it is important to verify that the label selected addresses all the requirements identified above, including application surfaces, uses and additional printing inks if they are used. Table 1, on page 7, provides guidance on the appropriate UL certification category as well as a link to the additional guide information that should be reviewed. If a suitable

label is not available, or if a certified label does not meet all the identified requirements, UL Solutions can evaluate the label during the end-product evaluation to confirm full compliance with the identified requirements.

### Authorized label suppliers

Many product manufacturers have the option to source UL certification Marks from third-party label printers. If OEMs choose to have label printers supply the UL certification Marks for use on their products, the label printer must be part of UL's Authorized Label Suppliers Program. UL's Authorized Label Suppliers Program specifically addresses the printing format and distribution of the UL Solutions certification markings provided by label printers.

Go to [UL.com/labels](https://www.ul.com/labels) to find authorized label suppliers and to learn more.



### 5. Maintain appropriate traceability

OEMs are encouraged to maintain traceability records on certified marking and labeling systems and additional printing inks (if applicable) to support the ongoing integrity of the manufacturing process. Traceability records must be readily available for review by UL Solutions field engineers when inspecting and verifying that a marking and labeling system meets all applicable requirements that may be necessary during the end-product evaluation.

## Recommendations for label converters and printers

Label converters and printers are often called upon to assist OEMs in sourcing compliant labels but may have limited information on specific end-product requirements. The following steps provide a roadmap that can help label converters and printers provide customers with compliant labels.

### 1. Confirm requirement and application surface of end product

It is the responsibility of the OEM to provide information regarding the label application surfaces and the intended exposure environment of the end product. Specifically, this includes information on the generic surface type to which the label will be applied, the surface characteristics (smooth, flat, curved, textured, etc.), applicable standards, intended environmental exposure and temperature ratings.

### 2. Verify additional printing needs

Some OEMs prefer to add information to a label using thermal transfer ribbons, laser toners or similar means. If the OEM is adding information, the label supplier needs information regarding the printing ink and process to be used.

### 3. Find a suitable marking and labeling system

Label converters/printers can review existing UL Certified labels under their UL Solutions file to determine if they meet the requirements of a given end-use application. Alternatively, a label converter or printer can submit a new label construction or request a revision to existing UL Solutions label construction for evaluation. If an OEM's label design bears a UL certification Mark, the label supplier must also participate in UL's Authorized Label Supplier Program.

### 4. UL markings

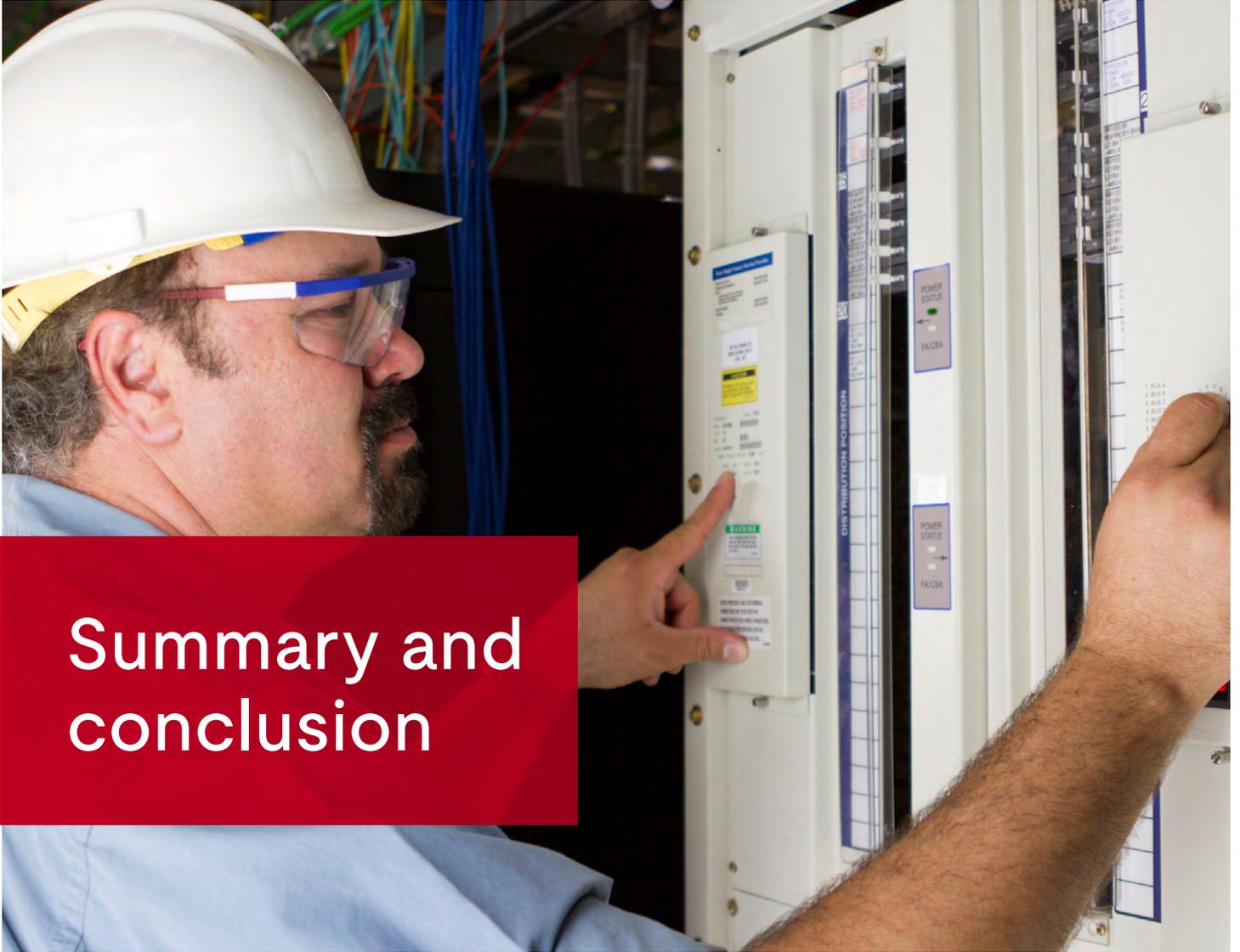
It is the responsibility of the label converter or printer to manufacture labels in accordance with UL's procedures and to mark the product packaging or roll core with the appropriate UL Marks when the labels are shipped to customers. Such markings are the only means of identifying their label products as certified by UL. These markings play a critical role for OEMs, as it provides a clear method of traceability to identify evaluated marking and labeling systems at the product manufacturing facilities.



### Label adoption process

It is common for label converters and printers who are submitting new label constructions to UL Solutions to use Recognized label materials, such as label stocks, laminating adhesives and overlaminations. Label converters who use these Recognized label materials can receive the benefit of that Recognition when establishing Recognition for printed labels made from those materials. This process is known as "label adoption."

However, printed labels made from Recognized label materials are not automatically considered Recognized printed labels. To establish recognition for a printed label, the label converter or printer must submit the complete printed label system to UL Solutions for evaluation. Testing of representative samples is typically necessary and depends on several factors, including the required conditions of acceptability for label use and the label materials used. You can learn more about the Label Adoption Process at [UL.com/labeladoption](https://www.ul.com/labeladoption)



## Summary and conclusion

Labels are critical components that provide users with safety-related information on a wide variety of products. UL 969 is globally recognized as an established label performance Standard, but other Standards, such as UL 969A, CSA C22.2 No. 0.15 or IEC durability of marking requirements, are used either instead of or in addition to UL 969. OEMs need to be aware of the permanence of marking requirements for their products and should incorporate best practices in their company to ensure that compliant labels are sourced. The easiest way to accomplish this is to source Certified labels on UL iQ for Labels that are appropriate for the intended end-use application.

**For further information and details on marking and labeling systems, please visit [UL.com/mls](https://www.ul.com/mls)**





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