

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Portable Electric Luminaires, UL 153, are being proposed:

- 1. Excluding Work Lights and Hand Lights with Batteries from UL 153***
- 2. Portable Luminaires with Separately Packaged Power Supply***
- 3. Damage to Internal Wiring***
- 4. Braided Power Supply Cords***
- 5. Attachment Plug Configurations***
- 6. Portable Luminaires with Integral Plant Platform ("Plant Lamp")***
- 7. Remove 50 Foot Cord Length Restriction***
- 8. Switches for Tungsten-Halogen Portable Luminaires with Double-Ended Lamps***
- 9. Instructions for Interconnected Units***
- 10. Minimum Letter Height for Form B and C Markings***
- 11. Mounting Requirements***
- 12. Grounding and Polarization of Interconnected Unit Load Connectors***
- 13. Receptacle Covers for Wet Location Portable Luminaires***
- 14. Additional Exception to the Stability Test***
- 15. Editorial Revisions***
- 16. Exposed Class 2 Conductor Abnormal Operation Test***

STP BALLOTS AND ALL COMMENTS DUE: JULY 16th, 2018

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If you are interested in applying for STP 153 membership or are aware of potential candidates for this STP, please contact the STP Project Manager, Julio.Morales@UL.com.

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~.

1. Excluding Work Lights and Hand Lights with Batteries from UL 153

RATIONALE

Proposal submitted by: Michael Shulman, UL

UL 153 currently allows batteries to be included in all product types, through application of the requirements of Section 47 which were added to UL 153 in 2012. Section 47 in turn refers to UL 2054 for the rechargeable battery packs themselves, with an additional reference to UL 1642 where lithium cells are involved.

A new standard, UL 1576, Standard for Flashlights and Lanterns, has just been published. These requirements provide for a more comprehensive safety evaluation of battery-operated appliances that are subject to rough handling. Rather than reference UL 2054, UL 1576 refers to UL 2595, General Requirements for Battery-Operated Appliances. The evaluation program within UL 2595 is more demanding than that of UL 2054.

Most portable luminaires within the scope of UL 153 are reasonable stationary and not subject to much mechanical disturbance in use. UL 2054 remains an appropriate evaluation standard for battery packs used within the products. But work lights and hand lights are frequently transported (often rather roughly) and used where subject to frequent and potentially significant mechanical forces. The track record of these cord-connected products, when evaluated to UL 153 requirements, has been very good. However, the introduction of high energy capacity battery packs does create a new level of concern. Rather than introduce a new set of requirements for these two product lines into UL 153 (which is already a large and complex standard), it seems more practical to shift these products, when they include batteries, over to a standard that already incorporates an appropriate test program.

PROPOSAL

1.5 Work lights and portable hand lights that include primary or secondary battery packs are within the scope of UL 1576 , Standard for Flashlights and Lanterns.

125.9 A work light with an integral or separable battery pack is not within the scope of this Standard. See 1.5.

136.5 A portable hand light with an integral or separable battery pack is not within the scope of this Standard. See 1.5.

2. Portable Luminaires with Separately Packaged Power Supply

RATIONALE

Proposal submitted by: Michael Shulman, UL

As the portable luminaire industry continues to evolve and embrace the low voltage, low power-consuming attributes of LED technology, an increasing number of luminaires are being designed for use isolated in some manner from the branch circuit (120 V, 15A) supply source. These portable luminaires

are intended for use with a separate power unit, and many contain integral rechargeable batteries for operation completely separate (and mobile) from utility-supplied power. These portable luminaires still warrant evaluation for safety, primarily for fire hazards associated with heat generation and the concentrated energy storage of lithium battery cells.

Through clause 8.2 and the markings of clause 199.1, UL 153 allows these portable luminaires to be packaged separate from their intended power supply. This proposal moves a step further towards distinguishing the luminaire from the power supply, by allowing the luminaire to identify a suitable power supply by its output ratings alone. This essentially eliminates the need for the luminaire manufacturer to provide the power supply. It acknowledges, without directly stating, that detachable mating class 2 power connectors are sufficiently (mechanically) standardized that compatible power supplies can be found as a separate, post-purchase activity based on electrical ratings alone.

These separate power supplies, when provided, are required to comply with their own standards, such as UL 1310 (Standard for Class 2 Power Units) or UL 8750 (Standard for LED Equipment), per the Components clause (4.1) and the list of standards in Appendix A. The power supply standards already require output ratings to be marked. The additional markings currently required for these power supplies by UL 153 subclauses 199.1(a) and (c) do not add any safety-related value. The safe operation of the portable luminaire warrants identifying the appropriate upstream power source, but the safe operation of a power supply that complies with its own safety standard is not dependent on that power supply identifying a specific (product type, manufacturer and model number) connected load.

This proposal will permit certification of class 2 portable luminaires without the need to specify, or separately provide, a specific power supply.

PROPOSAL

8.2 A portable luminaire shall be shipped from the factory in a carton or as an unpackaged complete assembly. Unassembled parts, such as glassware, chains, and similar components, when required elsewhere in the standard to accompany the product, shall be included. Decorative glassware is not required to be mounted in a frame or holder and is able to be separately wrapped to protect it from breakage during shipment.

Exception: A non-integral power supply is permitted to be shipped separately when the portable luminaire and power supply are is marked in accordance with Non-Integral Power Supply, Section 199.

199.1 ~~Per the exception to 8.2, A~~ portable luminaire intended for connection to a separately packaged non-integral power supply shall be marked in Form B-5, "For use with _____ power supply." The blank is filled with ~~either the manufacturer and model number~~. The separately packaged power supply shall be marked in Form A-1 with:

- a) ~~Portable Luminaire Power Supply;~~ the power supply manufacturer and model number, or
- b) ~~Electrical rating of secondary circuit in volts and amperes; and~~ "Class 2, _____ V, max _____ W". Amps (A or mA) may be marked instead of Watts (W).
- c) For use with _____ portable luminaire. The blank is filled with the manufacturer and model number. If the power supply is intended to supply more than one portable luminaire, the blank shall also indicate the maximum number and wattage of each portable luminaire.

3. Damage to Internal Wiring

RATIONALE

Proposal submitted by: Michael Shulman, UL

UL periodically receives reports of damage to supply cords and internal wiring where it passes through hinged joints. This damage can also occur during user assembly of some portable luminaires that are shipped unassembled. UL 153 has requirements specifically targeting such occurrences. This proposal seeks to simplify and clarify these requirements so they can be applied more effectively.

Clause 8.4 addresses portable luminaires that are shipped unassembled. The multi-paragraph exception to clause 8.4 is especially complex, with several overlapping “and” and “or” phrases that are difficult to follow. One of the paragraphs within the exception, subclause (c), limits accessibility to splices and makes a vague reference to strain relief. These safeguards are applicable to all portable luminaires that require user assembly and not just those, per the base requirement of 8.4, whose mating joint is subject to more than 360 degrees of rotation during assembly. The proposed restructuring of 8.4 eliminates the exception by creating two simple compliance paths, one based on limited rotation designs and one based on the Power Supply Cord Twist Test. The Power Supply Cord Twist Test method also needs clarification and adjustment for this slightly broader scope of application.

Clause 29.1 addresses the potential for wire damage when the user manipulates the mechanical structure of the portable luminaire. The requirement for stranded wiring and no strain at connections should apply to all portable luminaires where conductors are subject to movement, and not be limited to only those where it is somehow known that damage could occur.

PROPOSAL

8.4 When wires pass through a joint between sections of a portable luminaire that are separable for packing purposes, the wires exposed at the joint prior to assembly shall contain no splices. During assembly, the joint shall either: ~~be such that rotation of one section with respect to the other during the assembly of the sections is limited to not more than 360 degrees. Friction alone does not meet the intent of the requirement to prevent rotation.~~

a) Be limited, by threads or mechanical interference or similar, to no more than 360 degrees of rotation; or

b) Comply with the Power Supply Cord Twist Test, Section 157.

~~Exception: When all of the following conditions exist, rotation between sections of a portable luminaire is not limited to 360 degrees:~~

~~a) The internal diameter of the tubing through which the wires pass is 1/2 inch (12.7 mm) or more or the Power Supply Cord Twist Test, Section 157 is conducted with acceptable results; and~~

~~b) The rotation during assembly is limited to not more than one revolution for each 3 inches (76 mm) of unobstructed tubing length through which the wires pass, when such rotation does not place any stress on the conductors; and~~

~~c) The conductors do not involve splices unless the splices are:~~

~~1) Inaccessible during assembly in accordance with Accessibility of Live Parts, Section 23; and~~

~~2) Secured and provided with strain relief that has been shown to be reliable and not easily defeated by the user.~~

29.1 Internal wiring within or attached to a movable or a flexible part that is capable of being bent in a manner that could damage the insulation or break internal strands shall be stranded, and shall be secured so movement does not cause insulation damage or strain at connections or splices.

a) ~~Stranded; and~~

b) ~~Secured so that:~~

~~1) The wiring is not cut or abraded; and~~

~~2) There is no strain or motion at the connections.~~

~~Examples of constructions where this requirement applies are enclosed swivel joints or where a sharp bend occurs in a wire or cord between two points of restraint less than 6 inches (152 mm) apart.~~

~~157.1.1 TheA portable luminaire with a joint capable of more than 360 degrees of rotation during assembly, per 8.4(b), power supply cord passing through a section of tubing or an interconnecting fitting with a diameter less than 1/2 inch (12.7 mm) in accordance with the Exception to 8.4 shall be tested by assembling the unit as intended and rotating the cord as described in 157.2. Where multiple separable joints are involved, each shall be individually tested. Compliance criteria is described in 157.3.~~

~~157.2.1 The maximum amount of rotation permitted is to be determined by assembling the portable luminaire per the instructions. The power supply cord external to the tubing is to be secured 1 inch (25 mm) from the point where the cord emerges from the tubing or interconnecting fitting. The tubing or fitting is then to be twisted at least two full rotations (720 degrees), or to the maximum number of rotations permitted by the assembly, which ever is greater.~~

~~157.2.2 With the joint unassembled, the power supply cord is to be firmly grasped 1 inch (25 mm) from where it emerges from the separated joint. The tubing through which the cord passes is then to be rotated in one direction the maximum amount permitted by the assembly, and held there for 10 seconds, while the emerged supply cord is held in a fixed position. After releasing, the test is then to be repeated by rotating the other half of the joint the maximum amount permitted by the assembly, again while firmly holding the emerged supply cord 1 inch (25 mm) from where it emerges.~~

~~157.3.1 Twisting of the cord The rotation(s) shall not place any stress on the internal connections or splices.~~

4. Braided Power Supply Cords

RATIONALE

Proposal submitted by: Michael Shulman, UL

Suffix "B" is being added to UL 62, Standard for Flexible Cords, with the 20th edition. The rationale statement in the proposal bulletin (8-4-2017) says:

“Overall, fabric braids are desired on flexible cords. These braids are for decorative purposes. The presence of these braids may increase the flammability of the cord. In addition, if the braid is present, it should not fray or break when subjected to a flexibility tests. Cords incorporating the overall braid shall be marked to indicate that the cord/braid combination has been evaluated. The tests to evaluate the braid have been identified. . Cords with a decorative braid are identified with a “-B” suffix.”

Balloting of the proposal closed in October, and consensus was obtained. There were comments related to a revision to the cold impact test (which has no bearing on the fabric braid issue), and resolving those comments has caused some delay in publishing the new edition. Cords with a “B” suffix are now available, so it is appropriate for UL 153 to address them.

PROPOSAL

Table 31.1
Flexible cord types^b

Extra hard usage	Hard usage	Not hard usage	
S	SJ	SP-2	SV ^a
SE	SJE	SPE-2	SVE ^a
SEO	SJEO	SPT-2	SVEO
SO	SJO	NISP-2	SVO ^a
SOO	SJOO	NISPE-2	SVOO ^a
ST	SJT	NISPT-2	SVT ^a
STO	SJTO		SVTO ^a
STOO	SJTOO		SVTOO ^a

^a Individual conductors shall be provided with supplementary insulation or spaced away from metal.
^b Flexible cords with a “W” or “B” suffix are permitted.

5. Attachment Plug Configurations

RATIONALE

Proposal submitted by: Michael Shulman, UL

This proposal seeks to resolve some conflicts between UL 153 clauses covering the configuration of attachment plugs.

Clause 26.2 explicitly allows portable luminaires to be rated up to 16 Amps when provided with a 20 amp plug configuration. And Table 26.1 permits 14 AWG supply cords to carry up to 18 amps. But clause 32.1 limits all plugs to a maximum 15 amp rating, and clause 33.3 (addressing interconnected units) provides no guidance relative to overcurrent protection needs when a 20 amp plug configuration is provided. There is no reason to limit these 125 volt NEMA plug configurations to 15 amps; a 20 amp plug configuration is actually required for portable luminaires rated more than 12 A (and up to 16 A).

Clause 1.1 declares the scope of UL 153 as portable luminaires intended for use in accordance with the NEC. Clause 34.1, and its referenced instruction set (clause 218.8.1), refer to portable luminaires intended for use in other countries where different plug configurations may be required. These alternative configurations should be permissible provided that a U.S.-compliant configuration is also available; this can be accomplished by allowing the alternative plug configurations only where a