UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

DATE: January 21, 2015

BALLOT VOTE SHEET

This document has been electronically approved and signed.

TO: The Commission
Albert E. Mills, Acting Secretary

THROUGH: Stephanie Tsacoumis, General Counsel
Patricia H. Adkins, Executive Director

FROM: Patricia M. Pollitzer, Assistant General Counsel
Mary A. House, Attorney, OGC

SUBJECT: Proposed Rule to Amend Substantial Product Hazard List to Include Extension Cords

Ballot Vote Due - January 27, 2015

The Office of the General Counsel is providing for Commission consideration the attached draft proposed rule for publication in the *Federal Register*. The proposed rule would amend the Commission's rule at 16 C.F.R. part 1120, Substantial Product Hazard List, to state that applicable extension cords that do not contain one or more of five characteristics (minimum wire size, sufficient strain relief, proper polarization, proper continuity, outlet covers (for certain 2-wire indoor cords), or flexible jacketed insulation (for outdoor cords)) constitute a substantial product hazard under the Consumer Product Safety Act (CPSA). By voting to publish the draft proposed rule, the Commission is determining preliminarily that:

- the five characteristics in the extension cords being addressed are readily observable and have been addressed by voluntary standards;
- such voluntary standards have been effective in reducing the risk of injury from the extension cords and are being substantially complied with; and
- that as a result, extension cords that do not contain one or more of the identified safety characteristics should be deemed a substantial product hazard.

BALLOT VOTE DUE January 27, 2015

Please indicate your vote on the following options:

I. Approve publication of the attached document in the *Federal Register*, as drafted.

_____ _____
(Signature) (Date)

II. Approve publication of the attached document in the *Federal Register*, with changes. (Please specify.)

_____

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_____ _____

(Signature) (Date)

III. Do not approve publication of the attached document in the *Federal Register*.

_____ _____

(Signature) (Date)

IV. Take other action. (Please specify.)

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_____ _____

(Signature) (Date)

Attachment: Draft *Federal Register* Notice: Proposed Rule Regarding Substantial Product Hazard List: Extension Cords

Billing Code 6355-01-P

CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Part 1120

[CPSC Docket No. CPSC-2015-00XX]

Substantial Product Hazard List: Extension Cords

AGENCY: Consumer Product Safety Commission

ACTION: Notice of proposed rulemaking

SUMMARY: The Consumer Product Safety Commission (CPSC or Commission) is proposing a rule to specify that extension cords (both indoor and outdoor use extension cords) that do not contain one or more readily observable characteristics set forth in the proposed rule constitute a substantial product hazard under the Consumer Product Safety Act (CPSA). The rule would amend 16 CFR part 1120, which lists products that the Commission has determined present a substantial product hazard if the products have or lack specified characteristics that are readily observable, have been addressed by a voluntary standard, such standard has been effective in reducing the risk of injury associated with the product, and there is substantial compliance with the standard.

DATES: Written comments must be received by [INSERT DATE THAT IS 75 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may submit comments, identified by Docket No. CPSC-2015-00XX, by any of the following methods:

Electronic Submissions: Submit electronic comments to the Federal eRulemaking Portal at: http://www.regulations.gov. Follow the instructions for submitting comments. The Commission does not accept comments submitted by electronic mail (e-mail), except through

www.regulations.gov. The Commission encourages you to submit electronic comments by using the Federal eRulemaking Portal, as described above.

Written Submissions: Submit written submissions by mail/hand delivery/courier to: Office of the Secretary, Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814; telephone (301) 504-7923.

Instructions: All submissions received must include the agency name and docket number for this notice. All comments received may be posted without change, including any personal identifiers, contact information, or other personal information provided, to: http://www.regulations.gov. Do not submit confidential business information, trade secret information, or other sensitive or protected information that you do not want to be available to the public. If furnished at all, such information should be submitted in writing.

Docket: For access to the docket to read background documents or comments received, go to: http://www.regulations.gov, and insert the docket number CPSC-2015-00XX, into the "Search" box, and follow the prompts.

FOR FURTHER INFORMATION CONTACT: Arthur Lee, Office of Hazard Identification and Reduction, Consumer Product Safety Commission, National Product Testing and Evaluation Center, 5 Research Place, Rockville, MD 20850; telephone: 301-987-2008; alee@cpsc.gov.

SUPPLEMENTARY INFORMATION:

I. Introduction

The Commission proposes to issue a rule under section 15(j) of the CPSA, 15 U.S.C. 2064(j), which would amend the substantial product hazard list in 16 CFR part 1120 (part 1120). The substantial product hazard list in part 1120 would be amended to add extension cords that

lack certain readily observable characteristics. Four characteristics apply to all general-use extension cords (indoor and outdoor extension cords including indoor seasonal extension cords):

(1) minimum wire size;

(2) sufficient strain relief;

(3) proper polarity; and

(4) proper continuity.

In addition, one characteristic (outlet covers) applies to certain 2-wire indoor extension covers and one characteristic (jacketed insulated cord) applies to outdoor extension cords. Under the proposed amendment to part 1120, extension cords that do not contain one or more of the specified readily observable characteristics would be deemed to create a substantial product hazard under section 15(a)(2) of the CPSA because such products pose a risk of electrical shock or fire. These identified, readily observable characteristics for extension cords have been addressed in a voluntary standard, Underwriters Laboratories (UL), *Standard for Cord Sets and Power-Supply Cords*, UL 817, 11th Edition, dated March 16, 2001, revised February 3, 2014 (UL 817).[1]

As detailed in this notice, the Commission determines preliminarily that:

- minimum wire size; sufficient strain relief; polarization; continuity; outlet covers (for indoor cords); and flexible jacketed insulation (for outdoor cords) are all readily observable characteristics of extension cords;
- the identified readily observable characteristics are addressed by a voluntary standard, UL 817;

[1] The UL mark and logo are trademarks of UL, LLC (formerly known as Underwriters Laboratories, Inc.).

- conformance to UL 817 has been effective in reducing the risk of injury from shock and fire associated with indoor and outdoor extension cords; and
- extension cords sold in the United States substantially comply with UL 817.

A. Background and Statutory Authority

Section 223 of the Consumer Product Safety Improvement Act of 2008 (CPSIA), amended section 15 of the CPSA, 15 U.S.C. 2064, to add a new subsection (j). Section 15(j) of the CPSA provides the Commission with the authority to specify, by rule, for any consumer product or class of consumer products, characteristics whose existence or absence are deemed a substantial product hazard under section 15(a)(2) of the CPSA. 15 U.S.C. 2064(j). Section 15(a)(2) of the CPSA defines a "substantial product hazard," in relevant part, as a product defect which (because of the pattern of defect, the number of defective products distributed in commerce, the severity of the risk, or otherwise) creates a substantial risk of injury to the public. For the Commission to issue a rule under section 15(j) of the CPSA, the characteristics involved must be "readily observable" and have been addressed by a voluntary standard. Moreover, the voluntary standard must be effective in reducing the risk of injury associated with the consumer products; and there must be substantial compliance with the voluntary standard. *Id*.

The Commission has issued two previous final rules under section 15(j) of the CPSA, codified in 16 CFR part 1120, involving drawstrings on children's upper outerwear (76 FR 42502, July 19, 2011) (drawstring rule) and integral immersion protection on handheld hair dryers (76 FR 37636, June 28, 2011) (hair dryer rule). Additionally, on October 16, 2014, the Commission issued a notice of proposed rulemaking to include seasonal and decorative lighting products in part 1120. 79 FR 62081. The Commission has not defined a "readily observable" characteristic in any rule. In the proposed drawstring rule (75 FR 27497, 27499, May 17, 2010),

the Commission found that the requirements detailed in the relevant voluntary standard could be evaluated with "simple manipulations of the garment, simple measurements of portions of the garments, and unimpeded visual observation." The Commission stated: "more complicated or difficult actions to determine the presence or absence of defined product characteristics also may be consistent with 'readily observable.'" The Commission stated its intent to evaluate "readily observable" characteristics on a case-by-case basis. 75 FR at 27499. Finally, in the proposed rule on seasonal and decorative lighting, the Commission determined preliminarily that minimum wire size, sufficient strain relief, and overcurrent protection were "readily observable" characteristics of lighting products through visual observation, or visual observation of a simple measurement. 79 FR at 62082 & 62084-06.

B. Extension Cords

1. Product Description

The proposed rule uses the phrase "extension cord" to identify the products that are within the scope of the rule. The Commission proposes to define an "extension cord" (also known as a cord set) as a length of factory-assembled flexible cord with an attachment plug or current tap as a line fitting and with a cord connector as a load fitting. Extension cords are used for extending a branch circuit supply of an electrical outlet to the power-supply cord of a portable appliance, in accordance with the National Electrical Code.® For purposes of the proposed rule, the term applies to extension cords that are equipped with National Electrical Manufacturer Association (NEMA) 1-15, 5-15 and 5-20 fittings, and that are intended for indoor use only or for both indoor and outdoor use. We refer to cords intended for indoor use only as "indoor cords" and to cords intended for both indoor and outdoor use as "outdoor cords." The term extension cord does not include detachable power supply cords, appliance cords, power

strips and taps, and adaptor cords supplied with outdoor tools and yard equipment. The proposed definition is consistent with the description of products subject to the applicable voluntary standard, as set forth in section 1 of UL 817.

Indoor Cord

Outdoor Cord

Seasonal Indoor Cord

Picture 1. Extension Cords

Picture 1 depicts products that come under the definition of "extension cord" in the proposed rule. All in-scope products are covered by UL 817. Table 1 provides a non-exhaustive list of examples of extension cords that fall within and out of scope of the proposed rule. Not included in this rule are detachable power supply and appliance cords with non-NEMA fittings and adaptor cords supplied with outdoor tools and yard equipment because these are specific-purpose, rather than general-use, cords. The products that are out of scope for the proposed rule, are not subject to UL 817, or do not present the same risks of injury.

Table 1: Extension Cords:
Products Within and Outside the Scope of the Proposed Rule

In Scope: Household extension cords, factory-assembled, 120 volts AC, including: • Indoor or general-use cord sets, including seasonal indoor cord sets • Outdoor cord sets
Out of Scope: • Detachable power cords, either with appliance or other nonstandard plugs (*e.g.*, accompanying electronic or other electrically powered items), or with fittings of different configurations (*e.g.*, a clothes washer replacement cord with a plug at one end and individual wire terminals at the other end) • Unassembled components, such as flexible cord or fittings, which may be assembled into extension cords or installed in permanent branch circuit wiring systems • Cord sets intended for use with non-branch-circuit household current, *i.e.*, greater or less than nominal 120 volts AC (*e.g.*, for use with 220 volt appliances, or for 15-50 ampere/125-–250-volt recreational vehicles) • Power strips, power taps, and surge protectors

2. Applicable Voluntary Standard

The current voluntary standard applicable to extension cords is UL 817-2014. UL has updated UL 817 over the years to address various safety issues to make extension cords safer, *see* Staff's Draft Proposed Rule to Add Extension Cords to the Substantial Product Hazard List in 16 CFR Part 1120, January 21, 2015 (Staff Briefing Package) Tab B, Extension Cords: Abbreviated History and the Associated UL Standards. The staff's briefing package is available on the CPSC's website at: [INSERT LINK]. Since 1987, the standard has addressed most of the identified, readily observable characteristics (minimum wire size, sufficient strain relief, proper polarization, proper continuity, outlet covers for indoor cords, and jacketed insulated cords for outdoor extension cords) that are included in this proposed rule.

Many of the safety requirements for extension cords predate the existence of the CPSC. CPSC staff believes that UL incorporated requirements for polarized (and grounded) plugs and receptacles on cord sets around 1962. A CPSC staff search found that grounded plugs were developed as early as 1911, and polarized plugs became available in 1914. The National Electrical Code (NEC) adopted requirements for polarized electrical outlets in 1948 and for grounded 120-volt receptacles in 1962.

Table 2 summarizes the required characteristics in UL 817 associated with all extension cords, as well as specific requirements for indoor and outdoor use extension cords.

Table 2. Readily Observable Characteristics for Extension Cords

General Extension Cord Usage	Readily Observable Characteristics				
	Minimum Wire Size (AWG)	**Sufficient Strain Relief**	**Proper Polarization**	**Proper Continuity**	**Protective Feature**
Indoor ***UL 817 Section 20***	16AWG, or 17/18AWG with integral overcurrent protection *UL 817 Sections 2.10, 21*	18AWG or larger must withstand 30 pound force *UL 817 Section 84*	Cord fittings must be polarized (NEMA1-15) or have a grounding pin (NEMA5-15) *UL 817 Sections 9, 19*	Plug and outlet terminals must be connected in identical configuration (*i.e.*, Hot-to-Hot, likewise for Neutral and Ground) *UL 817 Sections 16, 105*	Outlet covers must be provided on unused outlets on 2-wire parallel *UL 817 Section 26.7*
Outdoor ***UL 817 Section 30***	SAME *UL 817 Section 2.13, 30*	SAME	SAME *UL 817 Sections 31, 32*	SAME	Jacketed flexible cord *UL 817 Section 30*

3. Electrocution and Fire Hazards

Consumers can be seriously injured or killed by electrical shocks or fires if extension cord products are not constructed properly. All extension cords covered by UL 817 must comply with requirements for minimum wire size, sufficient strain relief, proper polarization, and proper continuity. Meeting these requirements reduces the risk of injury caused by fires or electrical shocks.

- *Wire size*. Conforming to the minimum wire size requirement in UL 817 supports a product's electrical load to avoid the hazard of fire and electrical shock. When an extension cord does not contain the correct wire size for the load, the cord becomes hot and the insulation is degraded. Damaged insulation can fail by sagging, melting, or hardening and breaking apart, which can expose the energized wire inside the extension cord. Exposed energized wires present a risk of fire and electrical shock. Additionally, conforming to the minimum wire size requirement contributes to the necessary mechanical strength to endure handling and other forces imposed on an extension cord during expected use of the product.

- *Strain relief.* Conforming to the strain relief requirement in UL 817 helps to ensure that use of extension cords, including pulling and twisting the cords, does not cause mechanical damage to the connections and prevents separation of wires from their terminal connections during handling (pulled, twisted, etc.). Damaged connections, such as broken strands of copper wiring inside the insulated wiring, could cause overheating (leading to a fire) or separation of wires from their terminal connections, which could expose bare energized conductors, leading to electrical shock and fire.

- *Proper polarity*. An extension cord that conforms to the proper polarity requirements in UL 817 minimizes the risk of accidental contact with an energized conductor. Polarization clearly identifies the energized wire in the cord set and ensures, in conjunction with other construction requirements, that products, such as lighting, appliances, and other equipment plugged into the extension cord provide power in the same orientation as the receptacle of the branch circuit. For example, a product that employs a power switch that must be located in the energized side of the power supply circuit will be supplied in the proper orientation, thus reducing the risk of electrical shock.

- *Proper Continuity*. An extension cord that conforms to continuity requirements in UL 817 provides a continuous conductive path from line to load fitting so that the cord can serve the function for which it is intended. For each terminal in the plug fitting, a corresponding conductor must be attached to the corresponding terminal in the load fitting. For example, a cord attached to a plug with a grounding pin must have a grounding conductor. Each wire in the cord also must be connected properly on each end so that, for example, the grounding pin of the plug on a three-wire cord is connected to the grounding socket on the outlet, and the energized blade

on the plug is not wired to the non-energized receptacle on the outlet. Proper continuity from end to end reduces the risk of both fire and electrical shock.

Indoor and outdoor extension cords each have one additional safety requirement that is also readily observable and reduces the risk of injury.

- *Outlet covers*. Indoor 2-wire parallel extension cords with polarized parallel-blade and -slot fittings must contain outlet covers. Outlet covers reduce the risk of injury to children, in particular, by minimizing the opportunity for a child to probe plugs with small objects or chew on the exposed receptacle surfaces, which can lead to hand or mouth burns and electrical shock.

- *Jacketed cords.* Outdoor extension cords must have jacketed cords. A jacketed cord protects the individual insulated wires from damage when exposed to weather and other conditions associated with outdoor use. An unjacketed extension cord used outdoors is susceptible to damage that can lead to exposed conductors, thus presenting a risk of shock and fire.

4. Risk of Injury

CPSC has been concerned with the number of fires and injuries resulting from extension cords for many years. CPSC staff searched extension cord incident data from CPSC's Injury or Potential Injury Database (IPII) for both fatal and nonfatal incidents, and staff searched the Death Certificate Database (DTHS) for fatal incidents. Staff limited the scope of the incidents considered to incidents involving fire, burn, and shock hazards. Separate product codes do not exist in CPSC's databases for indoor and outdoor extension cords. Moreover, incident narratives often do not make clear which type of cord was involved. Accordingly, staff's analysis considers indoor and outdoor extension cords together.

Staff's search of IPII data found 716 in-scope fatal extension cord incidents between 1980 and 2013. These incidents caused 1,078 deaths. The search of DTHS found 47 unique (not duplicates of incidents found in IPII) fatal, in-scope incidents that occurred between 1980 and 2013. These 47 incidents led to 47 deaths. In total, the two databases have 763 fatal in-scope extension cord incidents that caused 1,125 deaths between 1980 and 2013.

Table 3 shows the annual average number of incidents for five different periods for fatal incidents, deaths, and nonfatal incidents. The table breaks the 34-year period into four 7-year periods and a 6-year period. Reporting may not be complete for the most recent period because sometimes CPSC receives reports of incidents years after the incidents have occurred. Table 3 shows a decline in the number of reported extension cord fire, burn, and shock fatal incidents, deaths, and nonfatal incidents in CPSC databases from the 1980s.

Table 3. Extension Cord Annual Average[2] of Reported Fatal Incidents, Deaths, and Nonfatal Incidents from 1980–2013[3]

Years	Fatal Incidents	Deaths	Nonfatal Incidents
1980–1986	32.7	47.7	201.0
1987–1993	27.7	46.6	178.7
1994–2000	23.6	31.1	131.6
2001–2007	15.9	21.7	112.3
2008−2013[3]	10.7	15.8	51.0

5. Office of Compliance Efforts to Address Extension Cord Hazards

In numerous instances, CPSC staff has considered the absence of one or more of the identified readily observable characteristics (minimum wire size, sufficient strain relief, proper polarization, proper continuity, outlet covers for indoor cords, and jacketed insulated cords for outdoor extension cords) to present a substantial product hazard and has sought appropriate

[2] The numbers are given as annual averages instead of totals because the periods are not divided equally.
[3] A lag exists between when an incident occurs and when it appears in the data. The most recent years may be incomplete. For the IPII extension cord data, 99 percent of the nonfatal incidents have a lag time of less than 1 year. For the fatal IPII incidents, 96 percent of the data have a lag time of less than 1 year. For DTHS, as of December 31, 2014, the database is 76 percent complete for 2013, 97 percent complete for 2012, 98 percent complete for 2011, and 99 percent complete for 2009 and 2010.

corrective action to prevent injury to the public. From 1994 to August 2014, as shown in the Staff Briefing Package, Tab D, Extension Cords: Product Recalls and Import Stoppages, Table 1, CPSC staff obtained 29 voluntary recalls of extension cords involving a total of 3.2 million units. In addition to recalls, CPSC staff identified 54 shipments of extension cords at import involving a total of 160,000 units, in which extension cords may not have complied with UL 817. *See* Staff Briefing Package, Tab D, Table 2. Tables 1 and 2 of Tab D list enforcement actions based on a staff preliminary determination of a substantial product hazard. Most of the hazards listed in Tables 1 and 2 correspond to the readily observable characteristics in the proposed rule. Accordingly, if the proposed rule is finalized, such nonconformance would constitute a Commission-determined substantial product hazard under 16 CFR part 1120.

Additionally, the Office of Compliance sent a letter dated January 9, 2015 to manufacturers, importers, and retailers of extension cords, informing them that the Office of Compliance considers products that do not conform to the UL 817 requirements for the identified readily observable characteristics to be defective and to present a substantial product hazard. *See* Staff Briefing Package, Tab A, Office of Compliance January 9, 2015 Letter to Manufacturers, Importers, and Retailers of Extension Cords. Accordingly, relevant stakeholders are on notice of the requirements of UL 817 and reporting requirements under section 15 of the CPSA.

II. Preliminary Determination of Substantial Product Hazard

A. Defined Characteristics Are Readily Observable

Sections 2, 9, 16, 19, 20, 21, 26, 30, 31, 32, 84, and 105 of UL 817 set forth the requirements for the identified readily observable characteristics specified in the proposed rule: minimum wire size, sufficient strain relief, proper polarization, proper continuity, outlet covers for certain 2-wire indoor cords, and jacketed insulated cords for outdoor extension cords. Table

2 in section I.B.2 of this preamble summarizes the technical requirements for the identified readily observable characteristics in UL 817. Additionally, Tab C of the Staff's Briefing Package, Extension Cords: Readily Observable Safety Characteristics, provides more detail on the information presented in Table 2. If finalized, the rule would deem the absence of any one or more of these specified characteristics to be a substantial product hazard under section 15(a)(2) of the CPSA.

1. Minimum Wire Size

Section 2 of UL 817 specifies a "general-use cord set" using flexible cord as described in Table 20.1 of UL 817 with conductors sized 18, 17, 16, 14, 12, or 10 AWG terminated in a plug and outlet. Extension cords using flexible cord with conductors sized 18 or 17 AWG also require overcurrent protection.

Minimum wire size is readily observable by measuring the bare conductors. Before measuring the wire size, staff must expose the conductors within the wire. Exposing the wire is done quickly and easily by using a small, handheld tool to strip the electrical insulation from the wiring. One method of measurement uses a circular wire gauge, which can determine if the wire size meets the minimum, as specified in UL 817. Picture 2 demonstrates use of a wire gauge to measure wire size. In Picture 2, the 16 AWG wire passes through the 16 AWG slot but not through any of the thinner (numerically larger) AWG slots.

Picture 2: Measuring Wire Size

In CPSC staff's experience, extension cords that do not meet the minimum wire size requirement typically fail by using wiring that is substantially undersized for the product; staff has observed products that use wiring that is more than six wire sizes smaller than the minimum required.

The Commission determines preliminarily that minimum wire size, as required in section 2 of UL 817, is a readily observable characteristic of extension cords that can be observed visually by taking a simple measurement of the product's bare wires.

2. Sufficient Strain Relief

Section 84 of UL817 describes the strain relief test required for all extension cords. Section 84.2.1 specifies that cords with 18AWG or larger conductors must withstand a 30-pound pull force on the connection between the fitting and the cord. Section 84.2.2 of UL 817 specifies that a weight must be steadily suspended from the cord for 1 minute so that the cord is pulled directly from the fitting without the cord pulling loose or stretching from the plug/load fitting. In CPSC staff's experience, a lighting product with insufficient strain relief will typically fail this test within a few seconds of suspending the applicable weight. CPSC engineering staff has

found that equivalent results are accomplished by suspending a weight from the body of the fitting, as illustrated in Picture 3.

Picture 3: Strain Relief

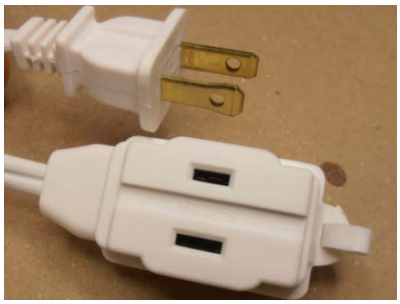
The Commission determines preliminarily that sufficient strain relief, as required in section 84 of UL 817, is a readily observable characteristic of extension cords that can be observed based on whether an extension cords stretches or breaks when suspending a 30-lb. weight from the plug and load fittings.

3. Proper Polarization

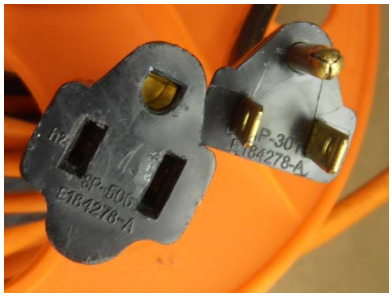
Section 19 of UL 817 requires that all two-wire extension cords must have polarized fittings. Sections 31 and 32 of UL 817 require that all two-conductor outdoor extension cords must have polarized fittings and that grounding fittings must be used on three-conductor cords. General UL construction specifications on fittings (Section 9.3 of UL 817) require that polarized outlets must reject improper or reversed insertion of polarized plugs to reduce the risk of shock.

Proper polarization is readily observable by visually inspecting the plug for a difference in the slot and blade widths or for the presence of a grounding pin and a matching outlet opening. Another visually observable method to determine compliance to UL 817 is to insert the plug of the extension cord (or any polarized two-blade plug) into the outlet on the opposite end of the cord using every possible orientation. The plug must fit into the outlet in only one orientation.

Pictures 4a and 4b demonstrate two types of polarized plugs. The extension cord shown in picture 4a meets the polarization requirement by using the slot and blade width method, and the extension cord shown in picture 4b meets the requirement using slot and blade width, and a grounding pin.



Picture 4a. Indoor fittings—plug & outlet in a NEMA 1-15 configuration



Picture 4b. Outdoor fittings–plug & outlet in a NEMA 5-15 configuration

The Commission determines preliminarily that proper polarization, as required in sections 9, 19, 31, and 32 of UL 817, is a readily observable characteristic of extension cords that can be observed based on a visual inspection of the plug.

4. Proper Continuity

Section 16 of UL 817 requires that corresponding terminals of line (plug) and load (outlet) fittings must be connected to the same conductor of the cord. Section 105 of UL 817 prescribes testing requirements for all manufactured extension cords so that the conductors are connected to the intended terminals of the fittings, and that electrical continuity exists throughout the entire length of the conductor/contact assembly. The wires of an extension cord must form continuous paths from one end to the other so the cord can serve the function for which it is intended. Each wire in the cord also must be properly connected on each end so that, for example, the grounding pin of the plug on a three-wire cord is connected to the grounding socket on the outlet, and the energized blade on the plug is not wired to the non-energized receptacle on the outlet.

Continuity is readily observable by checking the plug and outlet connections using a simple battery-light continuity tester. A simple continuity tester can be purchased at hardware stores or from online retailers for $5 to $7. For this procedure, insert one probe of the tester into a receptacle contact (slot or hole) of the extension cord and touch the other probe against each prong (blade or pin) of the extension cord plug. The tester light illuminates when the probes simultaneously touch the correct corresponding conductor terminals. An inexpensive portable ohmmeter or multimeter may also be used in a similar manner. The observation takes less than 1 minute. Picture 5 shows a battery light continuity tester with an extension cord.

Picture 5. Observation of Proper Continuity

The Commission determines preliminarily that proper continuity, as required in sections16 and 105 of UL 817, is a readily observable characteristic of extension cords that can be visually observed using a battery-light continuity tester.

5. Outlet Covers (Certain 2-Wire Indoor Extension Cords)

Section 26.7 of UL 817 requires that an indoor 2-wire parallel extension cord with polarized parallel-blade and -slot fittings that has more than one outlet must have covers for all the additional outlets, as illustrated in Picture 6. Outlet covers are readily observable by visually verifying that all but one outlet has an outlet cover.

Picture 6. Outlet cover on unused outlets

The Commission determines preliminarily that outlet covers on indoor 2-wire parallel extension cords with polarized parallel-blade and -slot fittings, as required in section 26 of UL 817, are a readily observable characteristic of indoor extension cords by visual inspection for the presence of the covers.

6. Jacketed Insulated Cords (Outdoor Extension Cords)

Section 30 of UL 817 requires that extension cords for outdoor use be manufactured using jacketed insulated flexible cord, that is, a cord consisting of two or three insulated wires covered by an additional jacket of insulation.

The required jacket is readily observable through visual observation of the thicker insulation on the cord. The jacket also is observable after cutting the cord. An outer insulator around the individual conductors is easily observed. Picture 7 depicts an example of a jacketed outdoor extension cord.

Picture 7. Jacketed outdoor extension cord

The Commission determines preliminarily that jacketed insulated cords on outdoor extension cords, as required in section 30 of UL 817, are a readily observable characteristic of outdoor extension cords by visual inspection.

B. Conformance to UL 817 Has Been Effective in Reducing the Risk of Injury

The Commission determines preliminarily that conformance to sections 2, 9, 16, 19, 20, 21, 26, 30, 31, 32, 84, and 105 of UL 817, as summarized in Table 2 in section I.B.2 of this preamble, has been effective in reducing the risk of injury from shock and fire associated with extension cords. Additionally, the CPSC's incident data suggest that conformance to UL 817 has contributed to a decline in the risk of injury associated with extension cords. *See* Tab E of Staff's Briefing Package, Extension Cords: Fire or Shock Incidents from 1980 to 2013.

Table 3 in section I.B.4 of this preamble lists the reported deaths associated with extension cords from 1980 to 2013.[4] The 34-year period is broken up into four 7-year periods and a 6-year period. Although reporting may not be complete for the most recent period because sometimes CPSC receives reports of incidents years after the incidents have occurred, Table 3 demonstrates that the average numbers of fatal incidents, deaths, and nonfatal incidents have declined since 1980.

Figure 1 presents a 3-year moving average for reported deaths due to extension cords, by year, for the period 1980−2013,[5] for data from the Potential Injury Database (IPII), and the Death Certificate Database (DTHS). Figure 1 shows that the reported number of deaths has declined since as early as 1993, and continued on a downward trend to 2013. This decrease may be due to

[4] The numbers are given as annual averages instead of totals because the periods are not divided equally.

[5] A lag exists between when an incident occurs and when it appears in the data. The most recent years may be incomplete. For the IPII extension cord data, 99 percent of the nonfatal incidents have a lag time of less than 1 year. For the fatal IPII incidents, 96 percent of the data have a lag time of less than 1 year. For DTHS, as of December 31, 2014, the database is 76 percent complete for 2013, 97 percent complete for 2012, 98 percent complete for 2011, and 99 percent complete for 2009 and 2010.

various factors, such as changes to UL 817, home building codes, and fire-prevention strategies. The reduced number of reported deaths may be partially attributed to the construction and performance requirements in the current UL 817 standard.

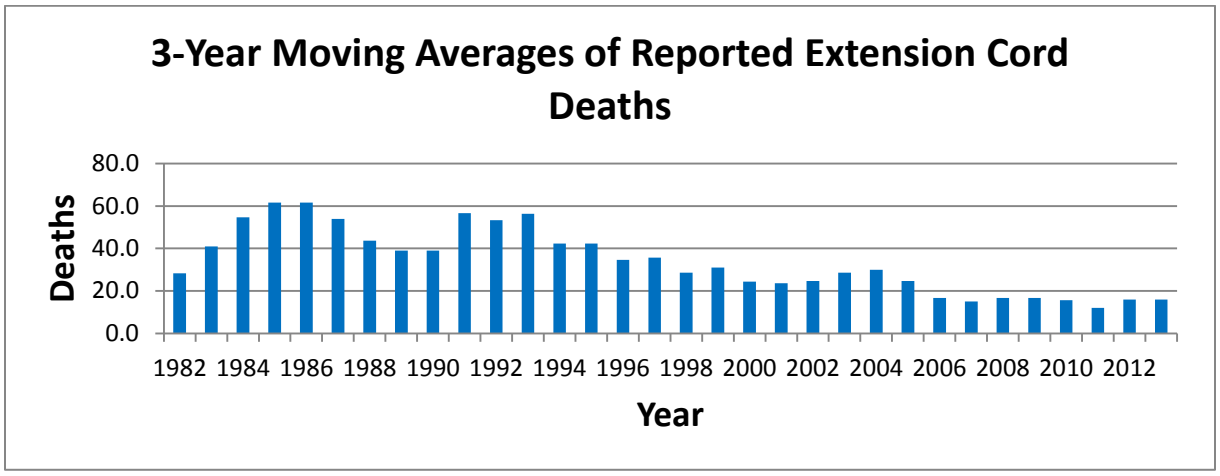


Figure 1. Three-Year Moving Averages of Reported Extension Cord Product Deaths from 1980 to 2013

Figure 2 presents a 3-year moving average for nonfatal incidents due to extension cord products, by year, for the period 1980−2013, for data from IPII. Figure 2 also demonstrates an overall downward trend during this period, with the exceptions of yearly fluctuations. The decrease can be attributed to several factors, including: changes to UL 817, enhanced home building code requirements, and fire prevention strategies. The construction and performance requirements in the current UL 817 standard for extension cord products have made the products safer than products manufactured without these construction and performance requirements. As discussed above, the identified characteristics increase the safety of extension cords.

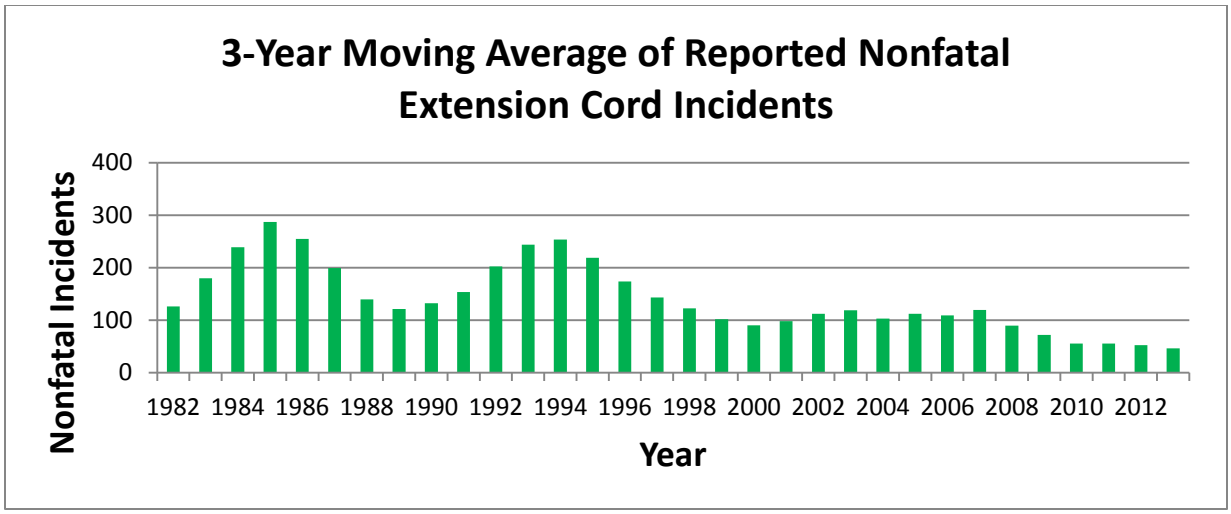


Figure 2. Three-Year Moving Averages of Reported Extension Cord Product Nonfatal Incidents from 1980 to 2013

C. Extension Cords Substantially Comply with UL 817

The CPSA does not define "substantial compliance" with a voluntary standard. Legislative history of the CPSA regarding a finding of "substantial compliance" in the context of issuing a consumer product safety standard indicates that substantial compliance should be measured by considering the number of complying products rather than the number of manufacturers of products that comply with a standard. H.R. Rep. No. 208, 97th Cong., 1st Sess. 871 (1981). This same legislative history indicates further that substantial compliance may be found when an unreasonable risk of injury associated with a product will be eliminated or adequately reduced "in a timely fashion." *Id*. The Commission has not articulated a bright line rule for substantial compliance. Rather, in the rulemaking context, the Commission has stated that the determination of substantial compliance should be made on a case-by-case basis.

The Commission determines preliminarily that compliance with UL 817 is "substantial" as that term is used in section 15(j) of the CPSA. This determination is based on CPSC staff's review of market information and compliance activity. Staff estimates that the current level of voluntary conformance to UL's standard for extension cords, UL 817, is very high among units

sold to consumers in the United States, likely in excess of 90 percent. S*ee* Tab F of Staff's Briefing Package, Extension Cords: Information about the Product and Level of Conformance to UL Voluntary Standard.

1. Market Data

Limited information is available about the market for extension cords and about producers and sellers. A substantial majority of products that would be subject to the proposed rule appear to be imported, primarily from the People's Republic of China. Other exporting nations named in International Trade Commission (ITC) reports include Mexico, Germany, the Republic of China (Taiwan), and Canada. Some cord sets are produced domestically, and some of these are household products subject to UL 817; however, most domestically produced items appear to be intended for industrial or other commercial use. Based on contacts with industry representatives and a review of online listings, CPSC staff has identified only four domestic producers of extension cords that would be subject to the proposed rule.

Imports of extension cords are enumerated under the ITC's Harmonized Tariff System of the United States (HTS) code 8544.42.9000, "insulated electric conductors, for a voltage not exceeding 1,000 volts, fitted with connectors, not elsewhere specified or included." This category includes a wide variety of communication and energy transmission cables, components, and related products; data for extension cords are not reported separately. The HTS grouping is analogous to the North American Industry Classification System (NAICS) code 335999 for domestically produced miscellaneous electrical equipment and components; this NAICS code includes 40 distinct product subcategories, including many that are industrial or commercial products. The ITC reported that in 2013 the declared value of imports under this HTS code was about $2.8 billion, comprising about 775,000 entry lines (*i.e.*, individual shipments) by nearly

11,000 importers (including brokers and shipping companies that file bills of lading). Monthly ITC reports indicate that the category will increase by about 6 percent in 2014, to approximately $3.0 billion in import value. Although no breakdowns of these published aggregate statistics are available, the large number of products involved suggests that only a small proportion of the volume and value of shipments under this HTS code likely are comprised of products that would be subject to the proposed rule.

The ITC tariff database shows that the largest number of import shipments in 2013 originated from China. An online wholesale directory, GlobalSources.com, identified 77 suppliers (including trading companies) in China, Hong Kong, or Taiwan that export extension cords to the United States. Another product directory, Made-in-China.com, identified 798 Chinese suppliers of extension cords and other flexible cords. About 10 to 15 members of the National Electrical Manufacturers Association (NEMA) produce or import extension cords, almost all from China. NEMA reports that all of its members market only UL-conforming products.

Given the large number of firms involved in trade for the wide variety of products in the category, a small minority of such firms likely imports extension cords subject to UL 817; however, even if only 10 percent were subject to the proposed rule, the number of firms would still be substantial at more than 1,000. Some importers market products only to wholesalers and retailers; other importers are also retailers that market directly to consumers, either online or through physical stores. CPSC staff has identified about 20 leading importers, most of which appear to be large, multinational firms; however, a great majority of the importers of extension cords likely are small businesses.

Some of the leading importers market multiple brands of extension cords that would be covered by the proposed rule. Roughly 20 to 25 national brands (including those of several major retailers) are dominant in the consumer market. Some of the lowest-priced products are unbranded.

2. Usage and Pricing

According to the U.S. Census Bureau, from 2009 to 2013, there was an average of roughly 115 million U.S. households. Extension cords are ubiquitous; a substantial majority of households likely owns at least one cord set. Although no published estimates of usage are available, the number of extension cord-owning households may exceed 100 million. Furthermore, in view of the large number of electrical items found in homes, many households likely have multiple cord sets for indoor and outdoor use.

Extension cords are generally low import value items. Based on the range of observed retail prices, most items probably have an import value (before distribution chain mark-ups) in the range of $1.00 to $10.00 per unit. Observed retail prices of extension cords range from a few dollars (for the least expensive indoor cord sets) to more than $100 (for the largest outdoor cord sets). CPSC staff observed that typical per-unit retail pricing is roughly $5.00 to $10.00 for indoor cord sets, and $15 to $30 for outdoor cord sets. Extension cords represent a minor expenditure for most households.

Information on the numbers of indoor versus outdoor extension cords in use, and on the relative market share of each type, is not available. The indoor cord set dollar value market share is undoubtedly much smaller than the unit share because indoor cord sets, on average, are much lower in price than outdoor cord models.

3. Estimated Voluntary Conformance

Recent data on extension cord recalls and import stoppages[6] over the past decade show that relatively few of these products have been affected by enforcement actions. Fewer recalls occurred since 2004 (6 recalls involving 6 importers and 775,000 units) compared to the previous decade (23 recalls involving 22 importers and 2.5 million units); this is generally consistent with the observed decline in reported fire and shock incidents since the late 1980s. The 54 reported import shipment stoppages since 2004 involved 23 importers but only about 160,000 units. Assuming that the Compliance data present a reasonably accurate view of nonconformance, the 29 importers and roughly 1 million products that were either involved in recalls or otherwise identified as potentially violative over the entire last decade represent less than 3 percent of the possible 1,000 importers and an unknown but small percentage of all units sold.

Three testing organizations certify U.S. market extension cords as conforming to UL 817: UL; Intertek Co. (ETL); and CSA Group (CSA, formerly known as the Canadian Standards Association). All three companies perform tests in accordance with the UL standard and sell listing mark rights to manufacturers, importers, or private labelers. Although some products may be defective and fail to conform even though the products carry a listing or certification mark, such incidents appear to be rare. Of the enforcement actions over the past decade described above, only one of the recalls and two of the import stoppages involved extension cords from importers who claim to offer only UL-conforming goods. For purposes of CPSC staff's analysis, all products carrying the UL, ETL, or CSA mark are presumed to be in conformance with UL 817. Leading major retailers appear to offer only UL-listed or similarly certified electrical products. Retailers' specifications may encourage many suppliers to offer only UL-conforming

[6] Staff Briefing Package, Tab D, Extension Cords: Product Recalls and Import Stoppages.

cord sets. Staff's review of retail store offerings and online catalogs and directories revealed only one seller of unlisted extension cords.

Direct data on shipments of conforming versus nonconforming extension cords are not available; however, an approximation of likely UL 817 conformance can be made based on the following points:

- Staff's review of online catalogs and directories revealed 20 to 25 major national brands of extension cords; such products are likely to represent a majority of all units sold for household use. All of these major brands are advertised to be UL-, ETL-, or CSA-listed. CPSC staff has identified only two domestic producers of cord sets that may not conform to UL 817 and has not identified any importers or other domestic manufacturers of unlisted cord sets.
- Major retailers appear to offer only products that conform to the UL standard; these retailers and their online affiliates account for an unknown but large proportion of extension cord sales.
- Available CPSC data on recalls and import violations suggest a very low incidence of defects and nonconformance, in the range of a few percent. A low number of violations is an indicator that conformance to the UL standard is likely very high. CPSC staff estimates that more than 90 percent of extension cords sold to consumers conform.

III. Description of the Proposed Rule

The proposed rule would add two new paragraphs in part 1120. Proposed § 1120.2(e) would define an "extension cord," also known as a "cord set," as a length of factory-assembled flexible cord with an attachment plug or current tap as a line fitting and with a cord connector as a load fitting. Extension cords are used for extending a branch circuit supply of an electrical

outlet to the power-supply cord of a portable appliance, in accordance with the National Electrical Code.® As defined in the proposed rule, the term applies to extension cords that are equipped with National Electrical Manufacturer Association (NEMA) 1-15, 5-15 and 5-20 fittings, and that are intended for indoor use only, or for both indoor and outdoor use. The term "extension cord" does not include detachable power supply cords, appliance cords, power strips and taps, and adaptor cords supplied with outdoor tools and yard equipment.

This definition is adapted from descriptions of extension cords defined in section 1 of UL 817. We intend to include within the scope of the proposed rule, indoor and outdoor general-use extension cords that can be used with many different types of electrical appliances. All in-scope products are covered by UL 817. Excluded from the definition are detachable power supply and appliance cords with non-NEMA fittings and adaptor cords supplied with outdoor tools and yard equipment because these are specific-purpose cords, rather than general-use cords. The products that would not be covered by proposed rule are not subject to UL 817, or they do not present the same risks of injury.

Proposed § 1120.3(d)(1) states that extension cords that lack the identified characteristics in accordance with the requirements specified in the relevant sections of UL 817 (sections 2, 9, 16, 19, 20, 21, 26, 30, 31, 32, 84, and 105) of UL 817 are deemed substantial product hazards under section 15(a)(2) of the CPSA:

(i) Minimum wire size requirements in sections 2, 20, 21, 30, and 31 of UL 817;

(ii) Sufficient strain relief requirements in sections 20, 30, and 84 of UL 817;

(iii) Proper polarization requirements in sections 9, 19, 20, 30, 31, and 32 of UL 817;

(iv) Proper continuity requirements in sections 16, 20, 30, and 105 of UL 817;

(v) Outlet cover requirement (for indoor 2-wire parallel extension cords with polarized parallel-blade and -slot fittings) in sections 20 and 26 of UL 817; or

(vi) Jacketed insulated cord requirement (for outdoor use extension cords) in section 30 of UL 817.

These characteristics and the UL 817 requirements are explained in more detail in sections I.B.2 (Table 2) and II.A of this preamble.

IV. Effect of the Proposed 15(j) Rule

Section 15(j) of the CPSA allows the Commission to issue a rule specifying that a consumer product or class of consumer products has characteristics whose presence or absence creates a substantial product hazard. Such a rule would not be a consumer product safety rule, and thus, would not trigger the statutory requirements of a consumer product safety rule. For example, a rule under section 15(j) of the CPSA does not trigger the testing or certification requirements under section 14(a) of the CPSA.

Although a rule issued under section 15(j) of the CPSA is not a consumer product safety rule, placing a consumer product on the substantial product hazard list in 16 CFR part 1120 would have certain ramifications. A product that is or has a substantial product hazard is subject to the reporting requirements of section 15(b) of the CPSA, 15 U.S.C. 2064(b). A manufacturer, importer, distributor, or retailer that fails to report a substantial product hazard to the Commission is subject to civil penalties under section 20 of the CPSA, 15 U.S.C. 2069, and is possibly subject to criminal penalties under section 21 of the CPSA, 15 U.S.C. 2070.

A product that is or contains a substantial product hazard also is subject to corrective action under sections 15(c) and (d) of the CPSA, 15 U.S.C. 2064(c) and (d). Thus, if the Commission issues a final rule under section 15(j) for extension cords, the Commission could

order the manufacturer, importer, distributor, or retailer of extension cords that do not contain one or more of the identified readily observable characteristics to offer to repair or replace the product or to refund the purchase price to the consumer.

A product that is offered for import into the United States and is or contains a substantial product hazard shall be refused admission into the United States under section 17(a) of the CPSA, 15 U.S.C. 2066(a). Additionally, CBP has the authority to seize certain products offered for import under the Tariff Act of 1930 (19 U.S.C. 1595a) (Tariff Act), and to assess civil penalties that CBP, by law, is authorized to impose. Section 1595a(c)(2)(A) of the Tariff Act states that CBP may seize merchandise, and such merchandise may be forfeited if: "its importation or entry is subject to any restriction or prohibition which is imposed by law relating to health, safety, or conservation and the merchandise is not in compliance with the applicable rule, regulation, or statute." Thus, if the proposed rule is finalized, extension cords that violate the rule are subject to CBP seizure and forfeiture.

V. Regulatory Flexibility Act Analysis

The Regulatory Flexibility Act (RFA) requires that proposed rules be reviewed for the potential economic impact on small entities, including small businesses. 5 U.S.C. 601-612. Section 603 of the RFA requires agencies to prepare and make available for public comment an Initial Regulatory Flexibility Analysis (IRFA), describing the impact of the proposed rule on small entities and identifying impact-reducing alternatives. The requirement to prepare an IRFA does not apply if the agency certifies that the rulemaking will not have a significant economic impact on a substantial number of small entities. *Id.* 605. Because the Commission expects that the economic effect on all entities will be minimal, the Commission certifies that the proposed rule will not have a significant economic impact on a substantial number of small entities.

Small Entities to Which the Proposed Rule Would Apply

ITC statistics indicate that about 11,000 companies are involved in import trade of products covered under an aggregate HTS code 8544.42.9000 that includes extension cords. The category includes imports of communications cables and many other electrical products and components and counts shipping companies, as well as product sellers. An unknown percentage of these 11,000 firms import items that would be within the scope of the proposed rule on extension cords. The proportion may be small; however, even if only 10 percent were subject to the proposed rule, the number of firms would still be substantial at more than 1,000. The latest available (2011) Census of Manufacturers data from the U.S. Department of Commerce indicate that there are about 400 domestic producers of miscellaneous electrical equipment, including flexible cord and cord sets (North American Industry Classification System (NAICS) code 335999). Based on contacts with industry representatives and a review of online listings, CPSC staff has identified only four firms that manufacture consumer-market extension cords in the United States. Three of these four companies appear to be small businesses.

CPSC staff has identified about 20 to 25 leading importers and one large U.S. manufacturer of extension cords. Some of the leading importers are large general merchandise or building material retailers with their own branded cord sets. Other firms among the top 20 to 25 importers are national brand owners who specialize in wire/cable and related electrical products; these firms are not as large as the major retailers, but would not be considered small under U.S. Small Business Administration (SBA) size standards. Most of the remaining firms are likely small businesses. The total number of small firms is unknown, but may be in the hundreds or even a thousand.

Manufacturers and importers of extension cords typically also market various kinds of electrical or other household products. CPSC staff has identified no companies that market only extension cords. Some smaller importers may not consistently market the same brands of cord sets or import from the same supply sources from year to year.

Potential Impact of the Proposed Rule

A proposed rule designating extension cords that do not conform to any one of the five specified provisions of UL 817 as a substantial product hazard will not likely have a significant impact on a substantial number of small businesses or other small entities. This conclusion is based on the following evidence:

- CPSC staff estimates that a very high percentage, probably in excess of 90 percent, of extension cords already conform to UL 817. CPSC staff's examination of products sold by physical and online retailers identified only two sellers of products that did not carry a certification mark or label from one of the three certifying organizations. Manufacturers, importers, distributors, and retailers that market only conforming products would not experience any impacts under the proposed rule. Thus, a substantial majority of firms, including small firms, would be unaffected by the proposed rule and would probably experience zero economic impact.
- To the extent that small importers may market nonconforming cord sets, such firms may market other flexible cord or related products as well. CPSC staff is aware of no firms whose revenues are dependent solely on extension cords. Small importers could either discontinue marketing nonconforming extension cords, or these importers could acquire conforming products. Conforming cord sets are readily available at similar prices, so small importers' incomes would not be significantly

affected by the proposed rule, if the firms chose to acquire conforming products. Moreover, product lines should not be significantly curtailed if the firms ceased marketing extension cords altogether. It is unknown whether or how the two small, domestic manufacturers of cord sets that may not conform would be impacted by the proposed rule.

- The proposed rule reflects the existing practice of the CPSC's Office of Compliance and Field Operations to designate extension cords that use undersized wiring, have insufficient strain relief, or lack polarized plugs, electrical continuity, outlet covers, or cord jackets, as substantial product hazards. CPSC staff would continue to seek recalls or other enforcement actions for such products, regardless of the rule's existence.

VI. Environmental Considerations

Generally, the Commission's regulations are considered to have little or no potential for affecting the human environment, and environmental assessments and impact statements are not usually required. *See* 16 CFR 1021.5(a). The proposed rule to deem extension cords that do not contain one or more of the identified readily observable characteristics to be a substantial product hazard is not expected to have an adverse impact on the environment and is considered to fall within the "categorical exclusion" for the purposes of the National Environmental Policy Act. 16 CFR 1021.5(c).

VII. Paperwork Reduction Act

The proposed rule does not require anyone to create, maintain, or disclose information. Thus, no paperwork burden is associated with the proposed rule, and the Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3520) does not apply.

VIII. Preemption

The proposed rule under section 15(j) of the CPSA would not establish a consumer product safety rule. Accordingly, the preemption provisions in section 26(a) of the CPSA, 15 U.S.C. 2075(a), would not apply to this rule.

IX. Effective Date

The Administrative Procedure Act (APA) generally requires that the effective date of a rule be at least 30 days after publication of a final rule. 5 U.S.C. 553(d). The Commission proposes that any extension cord that does not conform to the specified sections of UL 817 regarding minimum wire size, sufficient strain relief, proper polarization, proper continuity, outlet covers (indoor extension cords), and jacketed insulated cord (outdoor extension cords), be deemed a substantial product hazard effective 30 days after publication of a final rule in the *Federal Register*. After that date, all extension cords that are subject to, but do not comply with, UL 817 regarding the identified readily observable characteristics, will be deemed to be a substantial product hazard.

The Commission believes that a 30-day effective date is appropriate because substantial conformance exists and because there is longstanding knowledge among importers and manufacturers about the requirements in UL 817. The Office of Compliance sent a letter dated January 9, 2015, to manufacturers, importers, distributors, and retailers of extension cords, informing them that the Office of Compliance considers products that do not conform to UL 817, regarding minimum wire size, sufficient strain relief, proper polarization, proper continuity, covers for outlets (indoor use), and jacketed cords (outdoor), to be defective and present a substantial product hazard. Accordingly, relevant stakeholders are on notice of the requirements of UL 817. Moreover, importers likely will have ample time and opportunity to acquire

conforming products, if necessary, from suppliers within normal business cycles before a final rule is promulgated. Based on the available information, the Commission concludes that a 30-day effective date would not likely result in significant impacts on industry or disrupt the supply of conforming products.

X. Incorporation by Reference

The Commission proposes to incorporate by reference certain provisions of UL 817. The Office of the Federal Register (OFR) has regulations concerning incorporation by reference. 1 CFR part 51. The OFR recently revised these regulations to require that, for a proposed rule, agencies must discuss in the preamble of the NPR ways that the materials the agency proposes to incorporate by reference are reasonably available to interested persons or how the agency worked to make the materials reasonably available. In addition, the preamble of the proposed rule must summarize the material. 1 CFR 51.5(a).

In accordance with the OFR's requirements, section I.B.2. of this preamble summarizes the provisions of UL 817 that the Commission proposes to incorporate by reference. Interested persons may purchase a copy of UL 817 from UL, Inc. at 333 Pfingsten Road, Northbrook, IL 60062. The standard is also available for purchase from UL's website at http://ulstandards.ul.com/access-standards/. One may also inspect a copy at CPSC's Office of the Secretary, U.S. Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814, telephone 301-504-7923.

XI. Request for Comments

The Commission invites interested persons to submit their comments to the Commission on any aspect of the proposed rule. Comments should be submitted as provided in the instructions in the ADDRESSES section at the beginning of this notice.

List of Subjects in 16 CFR Part 1120

Administrative practice and procedure, Clothing, Consumer protection, Cord sets, Extension cords, Household appliances, Lighting, Infants and children, Imports, Incorporation by reference.

For the reasons stated above, and under the authority of 15 U.S.C. 2064(j), 5 U.S.C. 553, and section 3 of Public Law No. 110-314, 122 Stat. 3016 (August 14, 2008), the Consumer Product Safety Commission proposes to amend 16 CFR part 1120 as follows:

PART 1120 – SUBSTANTIAL PRODUCT HAZARD LIST

1. The authority citation for part 1120 continues to read as follows:

Authority: 15 U.S.C. 2064(j).

2. In § 1120.2, add paragraph (e) to read as follows:

§ 1120.2 Definitions.

* * * * *

(e) *Extension cord (also known as a cord set)* means a length of factory-assembled flexible cord with an attachment plug or current tap as a line fitting and with a cord connector as a load fitting. Extension cords are used for extending a branch circuit supply of an electrical outlet to the power-supply cord of a portable appliance, in accordance with the National Electrical Code.® For purposes of this rule, the term applies to extension cords that are equipped

with National Electrical Manufacturer Association (NEMA) 1-15, 5-15 and 5-20 fittings, and that are intended for indoor use only, or for both indoor and outdoor use. The term "extension cord" does not include detachable power supply cords, appliance cords, power strips and taps, and adaptor cords supplied with outdoor tools and yard equipment.

3. In § 1120.3, add paragraph (d) to read as follows:

§ 1120.3 Products deemed to be substantial product hazards.

* * * * *

(d)(1) Extension cords that lack one or more of the following specified characteristics in conformance with requirements in sections 2, 9, 16, 19, 20, 21, 26, 30, 31, 32, 84, and 105 of Underwriters Laboratories (UL) *Standard for Cord Sets and Power-Supply Cords,* UL 817, 11th Edition, dated March 16, 2001, revised February 3, 2014 (UL 817):

(i) Minimum wire size requirement in sections 2, 20, 21, 30, and 31 of UL 817;

(ii) Sufficient strain relief requirement in sections 20, 30, and 84 of UL 817;

(iii) Proper polarization requirement in sections 9, 19, 20, 30, 31, and 32 of UL 817;

(iv) Proper continuity requirement in sections 16, 20, 30, and 105 of UL 817;

(v) Outlet cover requirement (for indoor 2-wire parallel extension cords with polarized parallel-blade and -slot fittings) in sections 20 and 26 of UL 817; or

(vi) Jacketed insulated cord requirement (for outdoor use extension cords) in section 30 of UL 817.

(2) The Director of the Federal Register approves the incorporations by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy from UL, Inc., 333 Pfingsten Road, Northbrook, IL 60062. You may inspect a copy at the Office of the Secretary, U.S. Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda,

MD 20814, telephone 301-504-7923, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal-register/cfr/ibr-locations.html.

Dated: _____

_____
Alberta E. Mills, Acting Secretary
Consumer Product Safety Commission.

Staff Briefing Package

Staff's Proposed Draft Rule to Add Extension Cords to the Substantial Product Hazard List in 16 CFR Part 1120

January 21, 2015

Table of Contents

Briefing Memorandum: Substantial Product Hazards Posed by Extension Cords: Draft Proposed Rule under Section 15(j) of the Consumer Product Safety Act

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

This document has been electronically approved and signed.

MEMORANDUM

Date: January 21, 2015

TO : The Commission
Alberta E. Mills, Acting Secretary

THROUGH: Stephanie Tsacoumis, General Counsel
Patricia H. Adkins, Executive Director
Robert J. Howell, Deputy Executive Director for Safety Operations

FROM : George A. Borlase, Ph.D., P.E.
Assistant Executive Director
Office of Hazard Identification and Reduction

Arthur S. Lee
Office of Hazard Identification and Reduction

SUBJECT : Substantial Product Hazards Posed by Extension Cords: Draft Proposed Rule under Section 15(j) of the Consumer Product Safety Act

The U.S. Consumer Product Safety Commission (CPSC, Commission) is considering a rule that would deem extension cords that lack certain safety characteristics set forth in an existing voluntary standard for extension cords a "substantial product hazard" (SPH). CPSC staff recommends that the Commission publish staff's draft proposed rule to deem extension cords that lack one or more of five readily observable safety characteristics identified by staff in the existing voluntary standard associated with extension cords an SPH, as authorized under section 15(j) of the Consumer Product Safety Act (CPSA). The five readily observable safety characteristics are specified in an existing voluntary standard, Underwriters Laboratories (UL) *Standard for Cord Sets and Power-Supply Cords,* UL 817, 11th Edition, dated March 16, 2001, revised on February 3, 2014 (UL 817).[1] The draft proposed rule would amend 16 C.F.R. part 1120, which lists Commission-determined SPHs, to incorporate by referencethe sections of UL 817 that contain the readily observable safety characteristics. This briefing package presents the basis for staff's recommendation.

I. Introduction

A. Section 15(j) of the CPSA

The Consumer Product Safety Improvement Act of 2008 (CPSIA)[2] expanded section 15 of the CPSA by creating a new subsection (j) that allows the Commission to specify, by rule, for a consumer product, or class of consumer products, characteristics whose existence or absence the

[1] The UL mark and logo are trademarks of UL, LLC (formerly known as Underwriters Laboratories, Inc.).
[2] Pub. L. No. 110-314.

Commission deems present a substantial product hazard, as defined in section 15(a)(2) of the CPSA. To deem the presence or absence of characteristics an SPH:

- the characteristics must be "readily observable";
- the characteristics must be addressed by a voluntary standard;
- the voluntary standard must be effective at reducing the risk of injury; and
- there must be substantial compliance with the voluntary standard.

A rule issued under section 15(j) of the CPSA (15(j) rule) is not a "consumer product safety rule," as defined in section 3(a)(6) of the CPSA. Rather, section 15(j) allows the Commission to determine through the rulemaking process that products that do not comply with certain aspects of a voluntary standard present an SPH. As explained in this briefing package, CPSC staff currently evaluates extension cords for safety characteristics. Staff has stopped numerous noncompliant products at the ports or has negotiated voluntary recalls when safety characteristics in extension cords are lacking. Staff's enforcement of extension cord safety under section 15 will continue, regardless of whether the Commission issues the recommended rule. However, a 15(j) rule on extension cords would create a Commission determination that extension cords that lack the identified characteristics present an SPH, eliminating the need to rely on a staff preliminary determination that extension cords that do not comply with the voluntary standard present an SPH. A Commission determination of an SPH amends 16 C.F.R. part 1120, incorporating by reference applicable sections of a voluntary standard to add the readily observable safety characteristics.

A Commission determination that extension cords that lack the identified readily observable safety characteristics constitute an SPH would clarify for consumers and for industry the hazards associated with extension cords. A product that contains a defect that presents an SPH is subject to the reporting requirements of section 15(b) of the CPSA, 15 U.S.C. § 2064(b). A manufacturer, importer, distributor, or retailer who fails to report a substantial product hazard to the Commission in accordance with section 15(b) requirements is subject to civil penalties, and possibly, criminal penalties.

In addition to creating clarity for stakeholders, a Commission specification by rule of an SPH creates enforcement efficiencies for the CPSC. For example, a product that is or contains an SPH is subject to corrective action. The Commission could order the manufacturer, importer, distributor, or retailer of extension cords that violate the 15(j) rule to offer to repair or replace the product or to refund the purchase price to the consumer. Additionally, CPSC can refuse admission of violative products offered for import, or CPSC can request U.S. Customs and Border Protection (CBP) to seize extension cords that violate the 15j rule under CBP's authority under the Tariff Act of 1930 (19 U.S.C. § 1595a).

B. Extension Cord Hazards

If not constructed properly, extension cords can pose a risk of burns, electrical shock, electrocution, or fire. Throughout the agency's history, CPSC staff has been active in addressing fire and electrocution risks associated with extension cords. In preliminary hazard determinations, CPSC staff, on a number of occasions, has identified extension cords that did not contain the following characteristics required in UL 817 to present an SPH:

All Extension Cords
(1) minimum wire size,
(2) sufficient strain relief,
(3) proper polarity,
(4) proper continuity

Indoor 2-Wire Parallel Extension Cords with polarized parallel-blade and -slot fittings
(5a) covers for outlets

Outdoor Extension Cords
(5b) jacketed cords

Staff believes that all the safety characteristics for extension cords identified above can be readily observed by CPSC staff.

The applicable voluntary safety standard, UL 817, requires a minimum wire size, sufficient strain relief, proper polarization, and proper continuity for all extension cords. In addition, certain 2-wire indoor extension cords require outlet covers, and outdoor cords require jacketed cords. CPSC's incident data suggest that UL 817 has contributed to a decline in the risk of injury associated with extension cords.

Moreover, the CPSC's Directorate for Economic Analysis estimates that at least 90 percent of the extension cords sold in the United States already comply with UL 817. Accordingly, CPSC staff concludes that all of the criteria required by section 15(j) of the CPSA for inclusion of extension cords on the SPH list in 16 C.F.R. part 1120 have been met.

II. Proposed Definition of Extension Cords

Staff's draft proposed rule uses the phrase "extension cords" to identify products that are within the proposed rule. Staff recommends that the definition of "extension cords," for purposes of the draft proposed rule, be consistent with the description of products defined in section 1.2 of UL 817, but exclude a subset of products that poses less risk of fire or electrocution. Accordingly, an "extension cord" is defined in the draft proposed rule as:

> *Extension cord (also known as a cord set)* means a length of factory-assembled flexible cord with an attachment plug or current tap as a line fitting and with a cord connector as a load fitting. Extension cords are used for extending a branch circuit supply of an electrical outlet to the power-supply cord of a portable appliance, in accordance with the National Electrical Code.® For purposes of this rule, the term applies to extension cords that are equipped with National Electrical Manufacturer Association (NEMA) 1-15, 5-15 and 5-20 fittings, and that are intended for indoor use, only or for both indoor and outdoor use. The term "extension cord" does not include detachable power supply cords, appliance cords, power strips and taps, and adaptor cords supplied with outdoor tools and yard equipment.

Under this definition, the draft proposed rule would cover extension cords for indoor use and for both indoor and outdoor use if the cords are equipped with National Electrical Manufacturer Association (NEMA) 1-15, 5-15 and 5-20 fittings. The category of indoor extension cords includes seasonal indoor extension cords, *i.e.*, cords that are intended only for use with seasonal decorative lighting. Figure 1 demonstrates cord set fittings to which the draft proposed rule would apply. Figure 2 depicts samples of extension cords within the scope of the draft proposed rule.

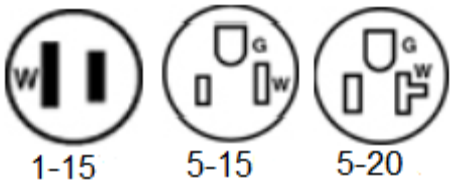


Figure 1. In-scope NEMA Configurations for extension cord fittings

Indoor Cord

Outdoor Cord

Seasonal Indoor Cord

Figure 2. Extension Cords

We intend to include within the scope of the proposed rule, indoor and outdoor general-use extension cords that can be used with many different types of electrical appliances. All extension cords defined within the rule are covered by UL 817. Other products covered by UL 817 or other UL voluntary standards are excluded from the scope of the draft proposed rule. Not included in this rule are detachable power supply and appliance cords with non-NEMA fittings and adaptor cords supplied with outdoor tools and yard equipment, because these are specific-purpose, rather than general- use, cords. Table 1 provides a non-exhaustive list of examples of products that fall within and outside the scope of the draft proposed rule. The products that are out of scope for the draft proposed rule are not subject to UL 817 or do not present the same risks of injury.

Table 1: Extension Cords:
Products Within and Outside the Scope of the Proposed Rule

In Scope: Household extension cords, factory-assembled, 120 volts AC, including: • Indoor or general use cord sets, including seasonal indoor cord sets • Outdoor cord sets
Out of Scope: • Detachable power cords, either with appliance or other nonstandard plugs (*e.g.*, accompanying electronic or other electrically powered items), or with fittings of different configurations (*e.g.*, a clothes washer replacement cord with a plug at one end and individual wire terminals at the other end) • Unassembled components, such as flexible cord or fittings, which may be assembled into extension cords or installed in permanent branch circuit wiring systems • Cord sets intended for use with non-branch-circuit household current, *i.e.*, greater or less than nominal 120 volts AC (*e.g.*, for use with 220 volt appliances, or for 15−50 ampere/125–250 volt recreational vehicles) • Power strips, power taps, and surge protectors

III. Substantial Product Hazards Associated with Extension Cords

Section 15(a)(2) of the CPSA defines an SPH, in relevant part, as a product defect, which (because of the pattern of defect, the number of defective products distributed in commerce, the severity of

the risk, or otherwise) creates a substantial risk of injury to the public. To address effectively the risk of injury from burns, shock, electrocution, and fire posed by extension cords, CPSC staff has identified four readily observable safety characteristics shared by all types of extension cords and one additional characteristic each for: (a) indoor 2-wire parallel extension cords with polarized parallel-blade and -slot fittings, and (b) outdoor use extension cords. The absence of any one or more of these characteristics to the applicable extension cord presents an SPH, including electrical shock and fire hazards:

<u>All Extension Cords</u>
(1) minimum wire size
(2) sufficient strain relief,
(3) proper polarity,
(4) proper continuity

<u>Indoor 2-Wire Parallel Extension Cords with polarized parallel-blade and -slot fittings</u>
(5a) covers for outlets

<u>Outdoor Extension Cords</u>
(5b) jacketed cords

Each of these characteristics is described in more detail below.

Consumers can be seriously injured or killed by electrical shocks or fires if extension cord products are not constructed properly. All extension cords covered by UL 817 must comply with requirements for minimum wire size, sufficient strain relief, proper polarization, and proper continuity. Meeting these requirements reduces the risk of injury caused by burns, fires or electrical shocks.

- *Wire size*. Conforming to the minimum wire size requirement in UL 817 supports a product's electrical load to avoid the hazard of fire and electrical shock. When an extension cord does not contain the correct wire size for the load, it becomes hot and the insulation is degraded. Damaged insulation can fail by sagging, melting, or hardening and breaking apart, which can expose the energized wire inside the extension cord. Exposed energized wires present a risk of fire and electrical shock. Additionally, conforming to the minimum wire size requirement contributes to the necessary mechanical strength to endure handling and other forces imposed on an extension cord during expected use of the product.

- *Strain relief.* Conforming to the strain relief requirement in UL 817 helps to ensure that use of extension cords, including pulling and twisting the cords, does not cause mechanical damage to the connections and prevents against separation of wires from their terminal connections during handling (pulled, twisted, etc.). Damaged connections, such as broken strands of copper wiring inside the insulated wiring, could cause overheating (leading to a fire) or separation of wires from their terminal connections, which could expose bare energized conductors leading to electrical shock and fire.

- *Proper polarity.* Conforming to the proper polarity in UL 817 minimizes the risk of accidental contact with an energized conductor. Polarization clearly identifies the energized wire in the cord set and assures, in conjunction with other construction requirements, that products, such as lighting, appliances, and other equipment, plugged into the extension cord provides power in the same orientation as the receptacle of the branch circuit. For example, a product that employs a power switch that must be located in the energized side of the

power supply circuit will be supplied in the proper orientation, thus reducing the risk of electrical shock.

- *Proper Continuity*. Conforming to continuity in UL 817 provides a continuous conductive path from line to load fitting so the cord can serve the function for which it is intended. For each terminal in the plug fitting, there must be a corresponding conductor that is attached to the corresponding terminal in the load fitting. For example, a cord attached to a plug with a grounding pin must have a grounding conductor. Each wire in the cord must also be properly connected on each end so that, for example, the grounding pin of the plug on a three-wire cord is connected to the grounding socket on the outlet, and the energized blade on the plug is not wired to the non-energized receptacle on the outlet. Assuring the proper continuity from end to end reduces the risk of both fire and electrical shock.

Indoor and outdoor extension cords each have one additional safety requirement that is also readily observable and reduces the risk of injury.

- *Covers for Outlets*. Conforming to covers for outlets in UL 817 reduces the risk of injury to children, in particular, by minimizing the opportunity for probing plugs with small objects or for chewing on the exposed receptacle surfaces. Indoor 2-wire parallel extension cords with more than one outlet must have covers for all the additional outlets. Outlet covers used on the unused outlets minimize hand or mouth burns and electrical shock.

- *Jacketed cords.* Conforming to jacketed cords in UL 817 protects the individual insulated wires from damage when exposed to weather and other conditions associated with outdoor use. Outdoor-use extension cords must have jacketed cords. An unjacketed extension cord used outdoors is susceptible to damage that can lead to exposed conductors, thus presenting a risk of shock and fire.

In numerous instances, CPSC staff has considered the absence of one or more of the readily observable characteristics described above to present an SPH and has sought appropriate corrective action to prevent injury to the public. From 1994 to August 2014, as shown in Table 1 of Tab D, Extension Cords: Product Recalls and Import Stoppages, CPSC staff obtained 29 voluntary recalls of indoor and outdoor extension cords involving a total of 3.2 million units. In addition to product recalls, CPSC staff identified 54 shipments at import involving a total of 160,000 units of extension cords that may not have complied with UL 817. *See* Tab D, Table 2. Tables 1 and 2 of Tab D list enforcement actions based on a staff preliminary determination of a substantial product hazard. Most of the hazards listed in Tables 1 and 2 would be considered readily observable characteristics in the proposed rule. Accordingly, if the proposed rule is finalized, such nonconformances will constitute a Commission-determined substantial product hazard under 16 CFR part 1120.

Additionally, the Office of Compliance sent a letter dated January 9, 2015, to manufacturers, importers, distributors and retailers of extension cords, informing them that the CPSC considers products that do not conform to the five identified readily observable safety characteristics, as required in UL 817, to be defective and present an SPH. *See* Tab A, Office of Compliance January 9, 2015 Letter to Manufacturers, Importers, Distributors and Retailers of Extension Cords.

IV. Readily Observable Safety Characteristics

UL 817 requires that all extension cords contain a minimum wire size, sufficient strain relief, proper polarization, and proper continuity. Additionally, UL 817 requires that indoor extension cords must contain outlet covers and that outdoor extension cords must have jacketed cords. CPSC staff believes that each characteristic is readily observable by making a simple measurement or by observing the product for the presence or absence of a feature. Table 2 summarizes the required characteristics in UL 817 associated with all extension cords, as well as specific requirements for indoor and outdoor use extension cords. *See* also Tab C, Extension Cords: Readily Observable Safety Characteristics.

Table 2. Readily Observable Characteristics for Extension Cords

General Extension Cord Usage	Readily Observable Characteristics				
	Minimum Wire Size (AWG)	**Sufficient Strain Relief**	**Proper Polarization**	**Proper Continuity**	**Protective Feature**
Indoor ***UL 817 Section 20***	16AWG, or 17/18AWG with integral overcurrent protection *UL 817 Sections 2.10, 21*	18AWG or larger must withstand 30 pound force *UL 817 Section 84*	Cord fittings must be polarized (NEMA1-15) or have a grounding pin (NEMA5-15) *UL 817 Sections 9, 19*	Plug and outlet terminals must be connected in identical configuration (*i.e.,* Hot-to-Hot, likewise for Neutral and Ground) *UL 817 Sections 16, 105*	Outlet covers must be provided on unused outlets on 2-wire parallel cord *UL 817 Section 26.7*
Outdoor ***UL 817 Section 30***	SAME *UL 817 Section 2.13, 30*	SAME	SAME *UL 817 Sections 31, 32*	SAME	Jacketed flexible cord *UL 817 Section 30*

A. Minimum Wire Size Is Readily Observable

Minimum wire size is readily observable by means of a simple measurement. Section 2 of UL 817 specifies a "general-use cord set" using flexible cord, as described in Table 20.1 of UL 817 with conductors sized 18, 17, 16, 14, 12, or 10 American Wire Gauge (AWG) terminated in a plug and outlet. Cord sets using flexible cord with conductors sized 18 or 17 AWG also require overcurrent protection. Minimum wire size is readily observable by measuring the bare conductors. Before measuring the wire size, staff must expose the conductors within the wire. The wire is exposed quickly and easily by using a small, handheld tool to strip the electrical insulation from the wiring. A circular wire gauge can be used to determine if the wire size meets the minimum, as specified in UL 817.

In CPSC staff's experience, extension cords that do not meet the minimum wire size requirement typically fail by using wiring that is substantially undersized for the product (for example, wiring that is more than six wire sizes smaller than the minimum required). Minimum wire size can be readily observed using a wire gauge, as shown in Figure 3. In this example, the 16 AWG wire passes through the 16 AWG slot but not through any of the thinner (numerically larger) AWG slots.

Figure 3: Measuring Wire Size

B. Sufficient Strain Relief Is Readily Observable

Sufficient strain relief is readily observable by observing the extension cord with suspended weights. Section 84 of UL817 describes the strain relief test required for all extension cords. Section 84.2.1 specifies that cords with 18AWG or larger conductors must withstand a 30 pound pull force on the connection between the fitting and the cord. Section 84.2.2 of UL 817 specifies that a weight must be steadily suspended from the cord for 60 seconds so that the cord is pulled directly from the fitting without the cord pulling loose or stretching from the plug/load fitting.

In CPSC staff's experience, an extension cord with insufficient strain relief will typically fail this test immediately, or within a few seconds of suspending the applicable weight. CPSC engineering staff has found that equivalent results are achieved by suspending a weight from the body of the fitting, as illustrated in Figure 4 below.

Figure 4: Strain Relief

C. Proper Polarization Is Readily Observable

Polarized receptacles and plugs are readily observable through visual inspection. Section 19 of UL 817 requires that all two-wire extension cords must have polarized fittings. Sections 31 and 32 of UL 817 require that all two-wire outdoor extension cords must have polarized fittings and that grounding fittings must be used on three-wire cords. General UL construction specifications on fittings (Section 9.3 of UL 817) require that polarized outlets must reject improper or reversed

insertion of polarized plugs, which reduces the risk of shock. Proper polarization is easily observable by looking at the difference in slot and blade widths or presence of a grounding pin and matching outlet opening. Another observable method is to insert the plug of the extension cord (or any polarized two-blade plug) into the outlet on the opposite end of the cord using every possible orientation. The plug must fit into the outlet in only one orientation. Figures 5a and 5b represents two types of polarized plugs. The extension cord shown in Figure 5a meets the polarization requirement by using the slot and blade width method, and the extension cord shown in Figure 5b meets the requirement using slot width and a grounding pin.

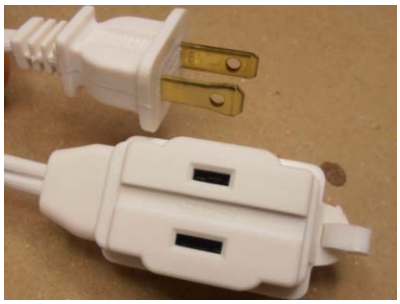


Figure 5a. Indoor fittings—plug & outlet in a NEMA 1-15 configuration

Figure 5b. Outdoor fittings–plug & outlet in a NEMA 5-15 configuration

D. Proper Continuity Is Readily Observable

Extension cord continuity is readily observable using a simple test. Section 16 of UL 817 requires that corresponding terminals of line (plug) and load (outlet) fittings must be connected to the same conductor of the cord. Section 105 of UL 817 imposes testing requirements on all manufactured extension cords to ensure that the conductors are connected to the intended terminals of the fittings and that electrical continuity exists throughout the entire length of the conductor/contact assembly. Continuity is readily observable by checking the plug and outlet connections using a simple battery-light continuity tester. One probe of the tester is inserted into a receptacle contact (slot or hole) of the extension cord and the other probe is touched against each prong (blade or pin) of the extension cord plug. The tester light illuminates when the probes simultaneously touch the correct corresponding conductor terminals. An inexpensive portable ohmmeter or multimeter may also be used in a similar manner. Figure 6 demonstrates observation of continuity on an extension cord. The observation takes less than a minute. Moreover, expensive equipment is unnecessary to test for proper continuity. A simple continuity tester can be purchased at most hardware stores or from popular online retailers for less than $10.

Figure 6. Continuity Testing

E. Covers for Outlets on Indoor Extension Cords Are Readily Observable

Outlet covers are readily observable. Section 26.7 of UL 817 requires that an indoor 2-wire parallel extension cord with more than one outlet must have covers for all the additional outlets, as illustrated in Figure 7. Outlet covers are readily observable by visually verifying that all but one outlet contains an outlet cover.

Figure 7. Outlet cover on unused outlets

F. Jacketed Cords on Outdoor Extension Cords Are Readily Observable

A jacketed cord on an outdoor extension cord is readily observable by visual inspection. Section 30 of UL 817 requires that extension cords for outdoor use be manufactured using a jacketed flexible cord, which is a cord consisting of two or three insulated wires covered by an additional jacket of insulation. The jacket is visually observable by the thicker insulation on the cord. The jacket is also observable after the cord is cut. An insulator around the individual wires is easily observed. Figure 8 depicts an example of the components in a jacketed outdoor extension cord.

Figure 8. Jacketed outdoor extension cord components

V. Identified Readily Observable Characteristics Are Addressed by UL 817

UL 817 has been updated over the years to address various safety issues to make extension cords safer; *see* Tab B, Extension Cords: Abbreviated History and the Associated UL Standards. These safety requirements (minimum wire size, sufficient strain relief, proper polarization, proper continuity, jacketed cord, and plug covers) have been addressed in the standard.

Many of the safety requirements for extension cords predate the existence of CPSC. The requirements for polarized (and grounded) plugs and receptacles on cord sets appear to have been incorporated into the standard around 1962. A CPSC staff search found that grounded plugs were developed as early as 1911, and polarized plugs became available in 1914. The National Electrical Code (NEC) adopted requirements for polarized electrical outlets in 1948 and for grounded 120 Volt receptacles in 1962.

The requirement in UL 817 for 16AWG flexible cord (or 17-18AWG with overcurrent protection) on general use cords, including extension cords, became effective in the late 1980s.

VI. UL 817 Has Been Effective in Reducing the Number of Reported Injuries Associated with Extension Cords

The incident data suggest that UL 817 has contributed to a decline in the number of reported injuries and deaths associated with extension cords; *see* Tab E, Extension Cords: Fire or Shock Incidents from 1980 to 2013.

Table 3 lists the reported deaths associated with extension cord products from 1980 to 2013. The 34-year period is broken up into four 7-year periods and a 6-year period. Reporting may not be complete for the most recent period because sometimes, CPSC receives reports of incidents years after they have occurred. The average numbers of fatal incidents, deaths, and nonfatal incidents have declined since 1980.

Table 3. Extension Cord Annual Average[3] of Reported Fatal Incidents, Deaths, and Nonfatal Incidents from 1980 – 2013[4]

Years	Fatal Incidents	Deaths	Non-fatal Incidents
1980–1986	32.7	47.7	201.0
1987–1993	27.7	46.6	178.7
1994–2000	23.6	31.1	131.6
2001–2007	15.9	21.7	112.3
2008−2013[4]	10.7	15.8	51.0

Figure 9 presents a 3-year moving average for reported deaths due to extension cords, by year, for the period 1980−2013[3] for data from the Potential Injury Database (IPII), and the Death Certificate Database (DTHS). Figure 9 shows that the reported number of deaths has declined since

[3] The numbers are given as annual averages instead of totals because the periods are not divided equally.
[4] There is a lag between when an incident occurs and when it appears in the data. The most recent years may be incomplete. For the IPII extension cord data, 99 percent of the nonfatal incidents have a lag time of less than 1 year. For the fatal IPII incidents, 96 percent of the data have a lag time of less than 1 year. For DTHS, as of December 31, 2014, the database is 76 percent complete for 2013, 97 percent complete for 2012, 98 percent complete for 2011, and 99 percent complete for 2009 and 2010.

as early as 1993, and continued on a downward trend to 2013. This decrease may be due to various factors, such as changes to UL 817, home building codes, and fire-prevention strategies. The reduced number of reported deaths may be partially attributed to the construction and performance requirements in the current UL 817 standard.

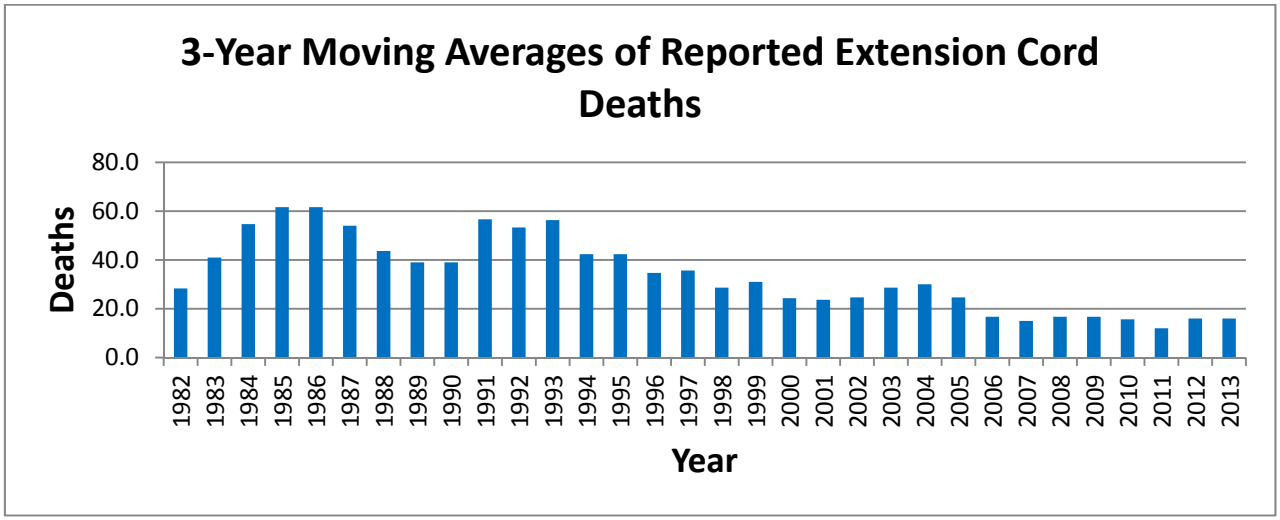


Figure 9. Three-Year Moving Averages of Reported Extension Cord Product Deaths from 1980 to 2013[4]

Figure 10 presents a 3-year moving average for reported, nonfatal incidents due to extension cord products, by year, for the period 1980−2013, using data from IPII. Figure 10 also demonstrates an overall downward trend to 2013. The decrease may be attributed to several factors, including: changes to UL 817, home building code, and fire prevention strategies. The construction and performance requirements in the current UL 817 standard for extension cord products have made the products safer than products manufactured without these construction and performance requirements. As discussed above, the identified characteristics increase the safety of extension cords.

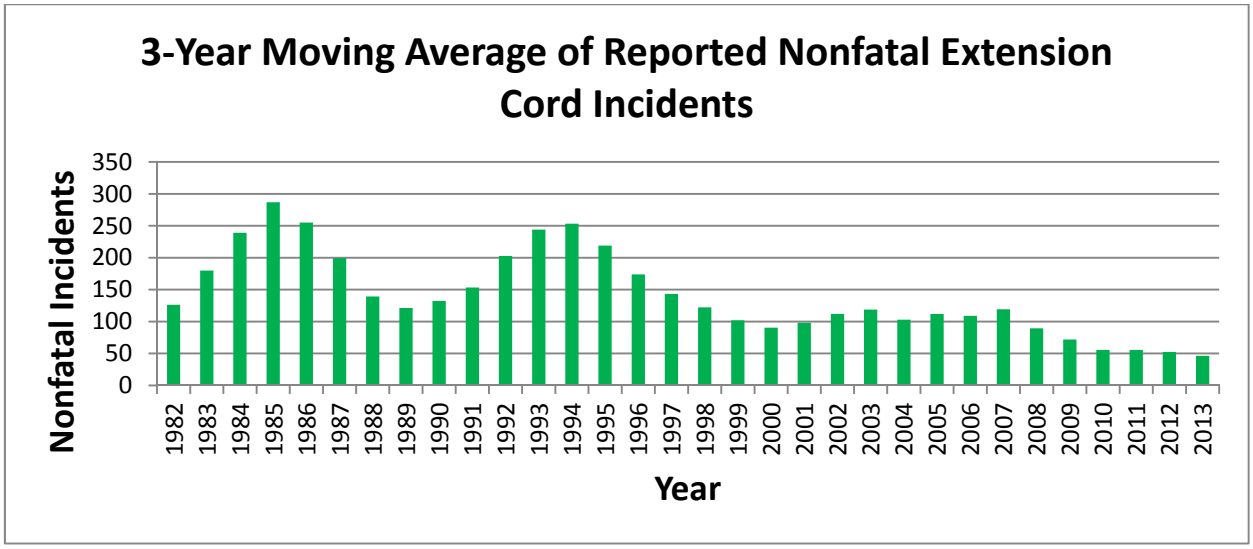


Figure 10. Three-Year Moving Averages of Reported Extension Cord Product Nonfatal Incidents from 1980 to 2013[4]

VII. Substantial Compliance with UL 817

Based on CPSC staff's review of market information and compliance activity, staff estimates that a substantial majority of extension cords sold for consumer use in the United States conform to UL 817. *See* Tab F, Extension Cords: Conformance to UL Voluntary Standard. Direct data on shipments of conforming versus non-conforming extension cords are not available; however, we estimate the likely level of UL 817 conformance based on the following points:

- Staff's review of online catalogs and directories revealed 20 to 25 major national brands of extension cords; such products are likely to represent a majority of all units sold for household use. All of these major brands are advertised to be UL-, ETL- or CSA-listed. CPSC staff has identified two small domestic producers of cord sets that may not conform to UL 817, and no importers or other domestic manufacturers of unlisted cord sets.
- Major retailers appear to offer only products that conform to the UL standard; these retailers and their online affiliates account for an unknown but large proportion of extension cord sales.
- Available CPSC data on recalls and import stoppages[5] suggest a very low incidence of defects and nonconformance, in the range of a few percent. A low number of violations is an indicator that conformance to the UL standard is likely very high.

Based on this information, CPSC staff estimates that the current level of voluntary conformance to UL's standard for extension cords, UL 817, is very high among units sold to consumers in the United States. In view of the very low incidence of observed defects and import stoppages, staff estimates that the conformance level is likely in excess of 90 percent.

VIII. Small Business Considerations

CPSC staff investigated the potential effects of a proposed rule on small entities, primarily small importers; *See* Tab G, Draft Proposed Section 15(j) Rule for Extension Cords: Small Business Considerations. Staff has identified four domestic producers, including one large U.S. manufacturer. Staff also has identified about 20 to 25 leading importers of extension cords. Some of the leading importers are large, general merchandise or building material retailers with their own branded cord sets. Other firms among the top 20 to 25 importers are national brand owners that specialize in wire/cable and related electrical products; these firms are not as large as the major retailers but would not be considered small under U.S. Small Business Administration (SBA) size standards. Most of the remaining firms, including three of the four known domestic manufacturers, are likely small under the SBA size standards. The total number of small firms is unknown but may be in the hundreds or even 1,000.

As noted above, CPSC staff estimates that a very high percentage, probably in excess of 90 percent of products that would fall within the scope of the draft proposed rule, already conform to UL 817. Manufacturers, importers, distributors, and retailers that market only UL 817-conforming products would not be affected and therefore, would experience zero economic impact as a result of the rule. The few small firms that market nonconforming cord sets could either discontinue

[5] "Extension Cords: Product Recalls and Import Stoppages,' M. Kroh, CPSC, 2014.

marketing such products, or produce or acquire conforming cord sets at similar prices. The draft proposed rule represents a continuation of the existing practice of the CPSC's Office of Compliance and Field Operations to designate nonconforming extension cords as SPHs; CPSC staff would continue to seek recalls or other corrective actions for such products. Based on the available information, the Commission could certify that the draft proposed rule to deem nonconforming extension cords to be SPHs would likely not have a significant impact on a substantial number of small businesses or other small entities.

IX. Recommended Effective Date

The staff recommends that a final rule listing extension cords that do not contain one or more readily observable characteristic (minimum wire size, sufficient strain relief, proper polarization, proper continuity, covers for outlets (indoor use), and jacketed cords (outdoor)) as SPHs become effective 30 days after publication of a final rule in the *Federal Register.* A substantial majority of extension cords already meet the requirements of UL 817, and the observable characteristics from UL 817 in the draft proposed rule have long been in effect and are well known. Staff concludes that a 30-day effective date would not likely result in significant impacts on small firms or disrupt the supply of products that would meet the rule's requirements. Additionally, the Office of Compliance sent a letter dated January 9, 2015, to manufacturers, importers, distributors and retailers of extension cords, informing them that the Office of Compliance considers products that do not conform to UL 817, regarding minimum wire size, sufficient strain relief, proper polarization, proper continuity, covers for outlets (indoor use) and jacketed cords (outdoor), to be defective and present an SPH. Accordingly, relevant stakeholders are on notice of the requirements of UL 817.

X. Commission Options

The following options are available for Commission consideration:

1. Publish a notice of proposed rulemaking (NPR), as drafted by the Office of the General Counsel.
2. Publish an NPR, with changes, as directed by the Commission.
3. Other options, as directed by the Commission.

XI. Staff Recommendation

CPSC staff recommends that the Commission publish the NPR, as drafted by the Office of the General Counsel. CPSC staff also recommends an effective date of 30 days after publication of the final rule in the *Federal Register*.

TAB A: Office of Compliance January 9, 2015 Letter to Manufacturers, Importers, and Retailers of Extension Cords

TAB A

U.S. CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

Marc J. Schoem
Deputy Director
Office of Compliance and Field Operations

Tel: 301-504-7520
Fax: 301-504-0359
email: mschoem@cpsc.gov

January 9, 2015

Manufacturers, Importers, Distributors, and Retailers of Extension Cords

Dear Ladies and Gentleman:

The U.S. Consumer Product Safety Commission (CPSC) is an independent federal regulatory agency responsible for protecting consumers from unreasonable risks of injury and death from consumer products. Our authority in this instance is set forth in the Consumer Product Safety Act (CPSA), 15 U.S.C. §§ 2051–2089.

I am writing this letter to urge you to make certain that indoor and outdoor extension cords (collectively "extension cords") that you import, manufacture, distribute, or sell in the United States comply with the currently applicable voluntary safety standard, UL 817 (11th Edition – 2014 revision) – *Standard for Cord Sets and Power-Supply Cords* (the UL standard), which can be purchased from Underwriters Laboratories Inc. (www.ul.com).

Fires or electric shocks can occur, and families and individuals can be seriously injured or killed, if extension cords fail to contain one or more of the following:

- minimum wire size,
- sufficient strain relief,
- proper polarization,
- proper continuity,
- covers for outlets (indoor 2-wire parallel cords with polarized parallel-blade and parallel-slot fittings), or
- jacketed cords (outdoor cords).

Since 1987, these safety requirements have been addressed in the UL standard.

From 1980 through 1987, CPSC received reports of 374 deaths and 1,529 nonfatal fire or shock incidents involving extension cords.[1] This equates to an average of 47 deaths and 191 nonfatal incidents per year. Before 1979, the UL standard established requirements for:

[1] The numbers reflect incidents with extension cords that are within scope and addressable as it pertains to the topics in this letter.

- minimum wire size,
- sufficient strain relief,
- proper polarization, and
- jacketed outdoor extension cords.

Subsequently, the UL standard was strengthened between 1979 and 1987 by adding requirements for:

- minimum wire sizes smaller than 16 AWG to include overcurrent protection,
- covers for outlets (indoor 2-wire parallel cords with polarized parallel-blade and parallel-slot fittings), and
- proper continuity.

Since 1992, as consumers replaced older-design extension cords with extension cords that met the existing UL standard, CPSC data show a decrease in fatalities and incidents involving extension cords. The annual average number of deaths and nonfatal incidents dropped to approximately 25 deaths and 116 nonfatal incidents per year from 1992 to 2013. CPSC staff believes that the changes in the UL standard to incorporate the safety requirements listed above have contributed to the reduction in the number of injuries and deaths associated with extension cords.

Inasmuch as the UL standard has been in place for many years, the CPSC Office of Compliance and Field Operations staff considers indoor and outdoor extension cords that do not meet one or more of the safety provisions referenced above to be defective and to present a substantial product hazard under Section 15(a) of the CPSA, 15 U.S.C. § 2064(a). Should the staff encounter such products, we may seek detention, seizure, destruction, and/or recall of these products.

For the reasons described above, you should not import, manufacture, distribute, or sell indoor and outdoor extension cords that do not meet the UL standard, especially because you are now on direct notice and have direct knowledge of our safety-related concerns, to the extent you were not directly knowledgeable already.

Accordingly, I urge you to review your product line immediately and ensure quickly that all indoor and outdoor extension cords that you manufacture, import, distribute, or sell in the United States are in compliance with the UL standard referenced above. CPSC staff will follow up, as appropriate, to ensure that firms are meeting their obligations in this area.

Section 15(b) of the CPSA, 15 U.S.C. § 2064(b), requires every manufacturer, importer, distributor, and retailer of consumer products to report immediately to the Commission when it obtains information that reasonably supports the conclusion that a product distributed in commerce contains a defect that could create a substantial product hazard or creates an unreasonable risk of serious injury or death. The statute also provides for imposition of civil and criminal penalties for failing to report the required information. CPSC staff shall use all

available tools in furtherance of our efforts to ensure consumers are not placed at unreasonable risk of injury from hazardous products.

If you have any questions or if we can be of any assistance, you may contact Mary Kroh, CPSC Compliance Officer, at 301-504-7886 or mkroh@cpsc.gov.

Sincerely,

Marc J. Schoem

TAB B: Extension Cords: Abbreviated History and the Associated UL Standards

TAB B

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: December 17, 2014

TO : Arthur Lee
Project Manager, Extension Cord 15J Project
Directorate for Engineering Sciences
Division of Electrical Engineering

THROUGH: Joel Recht , Associate Executive Director, Directorate for Engineering Sciences

Andrew M. Trotta, Division Director, Electrical Engineering Division

FROM : Robert T. Garrett, Electrical Engineer, Electrical Engineering Division

SUBJECT : Extension Cords: Abbreviated History and the Associated UL Standards

This memorandum provides an overview of the historical use of indoor and outdoor extension cords (also called extension cord sets) in the United States, and the development of associated voluntary standards established by Underwriter's Laboratories (UL).

The first documented use of a power cord plug was in 1904, when Harvey Hubbell developed an adaptor plug to eliminate the need to manually connect an appliance or luminaire to screw terminal posts on an electric distribution wiring system. The first extension cord is, so far, lost in history, as is the development of safety standards covering the cords. UL published the first edition of *UL 817—Standard for Cord Sets and Power Supply Cords* (UL 817) in October 1937.

According to the website Hubbell, Inc.,[6] in the late 19th century, when electrical wiring was first installed in buildings, it was to provide lighting. The lights were usually installed in the same locations where gas fixtures had been installed. As electricity usage became more accepted, wiring terminals were installed to power electrical appliances, but they were awkward to use. Sometimes, the user created a dangerous short circuit. In 1904, Harvey Hubbell invented an electrical plug and socket adapter. The adapter, which was fitted with a pair of recessed female terminals, was screwed into the lamp socket, and the separable plug, which was fitted with male pins or blades, was wired to the appliance power cord.

UL published UL 62, its standard for Flexible Cord and Fixture Wire,[7] in May 1918, to establish descriptions, ranges of use, and requirements for the construction and performance of the insulated sets of conductors that were used to carry power from its source to the equipment or apparatus that used the power. However, the safety requirements for Cord Sets and Power Supply Cords, which developed as a result of the growing use of cords fitted with plugs and

[6] http://www.hubbell.com/Investor/History.aspx © 2009 Hubbell Incorporated.
[7] UL 62, now in its 19th Edition (March 14, 2014), is currently titled, *Flexible Cords and Cables.*

receptacles, were not standardized until two decades later, in 1937, when UL 817 was first published. Tracing the history of more recent changes in UL 817, currently in its 11th Edition, is difficult, primarily because U.S. Consumer Product Safety Commission (CPSC) staff does not have access to old printed editions of the UL standard since UL converted to digital publishing.

A CPSC staff search for dates when polarized fittings were required produced little except an observation that grounded plugs were developed as early as 1911, and polarized plugs became available in 1914. Most of the safety requirements for power cord sets predate the existence of CPSC. In 1948, the National Electrical Manufacturers Association (NEMA) promulgated requirements in the National Electrical Code (NEC) that new residential construction must include polarized electrical outlets. In 1962, the requirement for grounded 120-volt receptacles was added to the code. Presumably, UL 817 was also revised in that time frame to include polarized (and grounded) plugs and receptacles on cord sets.

Polarization and grounding provide important protection against electrical shock and fire. Polarization is essential to protect users from accidental contact with energized conductors. Polarization clearly identifies the energized wire in the cord set and keeps lighting, appliances, and other utilization equipment that employ power switches in the energized side of the power supply circuit from leaving electrical circuits energized when the switch is turned off. Grounding provides a path for current to flow in the event of an electrical fault (for example, a short-circuit) between energized conductors or components and the conductive housing of an appliance. The fault current is typically large enough to trip a circuit breaker or open a fuse before it can produce enough heat to cause a fire.

The requirement for 16AWG flexible cord (or 17-18AWG with overcurrent protection) on general use cords, including extension cords, became effective in the late 1980s. Overcurrent protection on smaller sized extension cords is essential to prevent overheating and fires when an excessive load (that is, more than 1200 to 1400 Watts) is connected to the cord.

TAB C: Extension Cords: Readily Observable Safety Characteristics

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: December 17, 2014

TO : Arthur Lee
Project Manager, Extension Cord 15J Project
Directorate for Engineering Sciences
Division of Electrical Engineering

THROUGH: Joel Recht , Associate Executive Director, Directorate for Engineering Sciences

Andrew M. Trotta, Division Director, Electrical Engineering Division

FROM : Robert T. Garrett, Electrical Engineer, Electrical Engineering Division

SUBJECT : Extension Cords: Readily Observable Safety Characteristics

The Underwriters Laboratories' (UL) *Standard for Safety for Cord Sets and Power Supply Cords*, UL 817, 11th Edition, 2014 (UL 817)[1] provides guidance when CPSC staff evaluates the general use of indoor and outdoor use extension cords (collectively referred to as extension cords) for safety defects that might present risks of electrical shock or fire to consumers. The standard describes essential and readily observable characteristics of extension cords that must be incorporated into extension cords for their safe use. This memorandum describes these characteristics and identifies the pertinent sections of UL 817 that define the requirements.

I. Products Within the Scope of the Rule

A. Definition of "Extension Cords"

Staff's draft proposed rule uses the term "extension cords" to specify the cord sets that are within the draft proposed rule. Accordingly, an "extension cord" is defined in the draft proposed rule as:

> *Extension cord (also known as a cord set)* means a length of factory-assembled flexible cord with an attachment plug or current tap as a line fitting and with a cord connector as a load fitting. Extension cords are used for extending a branch circuit supply of an electrical outlet to the power-supply cord of a portable appliance in accordance with the National Electrical Code.® For purposes of this rule, the term applies to extension cords that are equipped with National Electrical Manufacturer Association (NEMA) 1-15, 5-15 and 5-20 fittings, and that are intended for indoor use only, or for both indoor and outdoor use. The term "extension cord" does not

[1] The UL mark and logo are trademarks of UL, Inc. (formerly known as Underwriters Laboratories, Inc.).

include detachable power supply cords, appliance cords, power strips and taps, and adaptor cords supplied with outdoor tools and yard equipment.

The proposed rule applies to cord sets equipped with National Electrical Manufacturer Association (NEMA) 1-15, 5-15 and 5-20 fittings, as shown in Figure 1, and intended for indoor use only, or both indoor and outdoor use. Indoor use cords include seasonal indoor extension cords as a subset. Outdoor use cords marked for outdoor use must contain a jacketed cord.

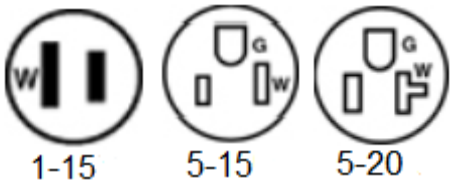


Figure 1. In-Scope NEMA Configurations for extension cord fittings

Not included in this rule are detachable power supply and appliance cords and adaptor cords supplied with outdoor tools and yard equipment because these are specific-purpose, rather than general-use, cords.

B. Cord Sets Covered by the Rule

Staff proposes that the rule cover extension cords for indoor use only or both indoor and outdoor use. UL 817 contains requirements for each cord type. The construction of an extension cord determines the environment where it can be used. Section 20 of UL 817 describes a wide range of flexible cords that can be used for indoor extension cords. General-use cords or indoor extension cords are typically two- or three-wire cords with or without a jacketed insulation/protection. The cords contain no more than three outlets.

Section 30 of UL 817 requires that cords marketed for outdoor use be made of jacketed flexible cable; that is, cable made using two or more insulated stranded conductors (called "wires" for simplicity) bundled together and covered with an additional layer of insulating material. The more rugged, double-layer insulated wire construction for outdoor use cords helps to protect the current-carrying wires from accidental damage. The additional layer of insulation also helps to prevent mechanical damage to the primary insulation around the wires, which reduces the risk of electrical shock or short-circuit and adds mechanical strength, which protects the wires from breakage and subsequent overheating. Outdoor cord connectors typically may have up to three outlets; although a 12 AWG cord may be fitted with up to six outlets.

A subset of indoor extension cords are indoor seasonal extension cords. Section SB of UL 817 contains requirements for indoor, seasonal-use extension cords and all follow the requirements for general use indoor cords. Seasonal-use extension cords are identifiable by the maximum length of 15 feet, a fused plug, and a maximum of nine outlets fitted along the length of the cord. Seasonal-use extension cords are intended only for use with seasonal decorative lighting. Figure 2 shows examples of extension cords within the scope of the rule.

Outdoor Extension Cord

Indoor Extension Cord

Indoor Seasonal Extension Cord

Figure 2. Extension Cords

Sections 23, 27, and 35 of UL 817 specify how safety-certified indoor and outdoor extension cords are to be marked to identify their electrical ratings (*e.g.,* "125 Volts" and maximum wattage and/or amperage) and their intended usage location (wording such as "For Indoor Use Only" or "Suitable For Use With Outdoor Appliances"). When such information is observed on retail package labeling for a cord or on the cord itself, CPSC staff will use this information as the applicable description of the cord's electrical ratings and intended use, and to identify which specific requirements derived from UL 817 apply to the cord set.

If a cord set is not marked with its intended use, CPSC staff will look to the cord's construction to estimate the intended use. This approach is consistent with staff's current approach in analyzing the safety of a cord set sample. CPSC staff considers cords that are not labeled for outdoor use and that are manufactured without jacketing to be indoor-use extension cords. The presence or absence of jacketing can be visually observed and is usually confirmed by cutting the cord apart. CPSC staff may treat unlabeled cords with jacketing as outdoor use cords because of their foreseeable use, due to their appearance similarities to outdoor cords.

II. Readily Observable Safety Characteristics of Extension Cords

UL 817 requires that extension cords meet the following safety requirements:

<u>All Extension Cords</u>
(1) minimum wire size,
(2) sufficient strain relief,
(3) proper polarity,
(4) proper continuity

<u>Indoor 2-Wire Parallel Extension Cords with polarized parallel-blade and -slot fittings</u>
(5a) covers for outlets

<u>Outdoor Extension Cords</u>
(5b) jacketed cords

CPSC staff believes that each characteristic is readily observable by making a simple measurement or by observing the product for the presence or absence of a feature. Table 1 lists the characteristics associated with indoor and outdoor use extension cords and summarizes the requirements in UL 817.

Table 1. Readily Observable Characteristics for Extension Cords

General Extension Cord Usage	Readily Observable Characteristics				
	Minimum Wire Size (AWG)	**Sufficient Strain Relief**	**Proper Polarization**	**Proper Continuity**	**Protective Feature**
Indoor ***UL 817 Section 20***	16AWG, or 17/18AWG with integral overcurrent protection *UL 817 Sections 2.10, 21*	18AWG or larger must withstand 30 pound force *UL 817 Section 84*	Cord fittings must be polarized (NEMA1-15) or have a grounding pin (NEMA5-15) *UL 817 Sections 9, 19*	Plug and outlet terminals must be connected in identical configuration (*i.e.,* Hot-to-Hot, likewise for Neutral and Ground) *UL 817 Sections 16, 105*	Outlet covers must be provided on unused outlets on 2-wire parallel cords *UL 817 Section 26.7*
Outdoor ***UL 817 Section 30***	SAME *UL 817 Section 2.13, 30*	SAME	SAME *UL 817 Sections 31, 32*	SAME	Jacketed flexible cord *UL 817 Section 30*

A. Minimum wire size

Using the correct wire size in an extension cord is important to avoid the hazards of electrical shock and fire. The electrical resistance of copper wire decreases as the size of the wire (the conductor) increases. Resistance, measured in "ohms," is the characteristic of a conductive material that impedes the flow of electrical current when a voltage is applied to the material. The smaller wire *resists or impedes* the flow of current more than the larger wire. One consequence of resistance is that, when electrical current passes through a wire, heat is generated. The generated heat increases proportionally with the resistance. Electrical current passing through a 16AWG cord will generate about two-and-a-half times more heat than the same current passing through a 12AWG cord, which has larger wires.

When an extension cord is overloaded by carrying more current than it is supposed to carry, it becomes hot and the insulation is degraded. Damaged insulation can fail by sagging, melting, or hardening and breaking apart, which can expose the energized wire inside the extension cord. Exposed energized wires present a risk of electrical shock. Additionally, if the cord is covered, such as by home furnishings or a rug, heat can quickly build up enough to melt and ignite the insulation along with whatever combustibles are close by, causing a fire.

Section 2 of UL 817 specifies a "general-use cord set" using flexible cord as described in Table 20.1 of UL 817 with conductors sized 18, 17, 16, 14, 12, or 10AWG terminated in a plug and outlet. Cord sets using flexible cord with conductors sized 18 or 17 AWG require the addition of overcurrent protection. Minimum wire size is readily observable by measuring the

bare conductors. Before measuring the wire size, staff must expose the conductors within the wire. The act of exposing the wire is done quickly and easily by using a small, handheld tool to strip the electrical insulation from the wiring. One method of measurement is to use a circular wire gauge, which can determine if the wire meets the minimum size as specified in UL 817. Minimum wire size can be readily observed using a wire gauge, as shown in Figure 3. In this example, the 16 AWG wire passes through the 16 AWG slot but not through any of the thinner (numerically larger) AWG slots.

Figure 3. Measuring AWG of copper wire

In CPSC staff's experience, extension cords that do not meet the minimum wire size requirement typically fail by using wiring that is substantially undersized for the product, for example, products that use wiring that is more than six wire sizes smaller than the minimum required.

Minimum Wire Size Smaller than 16 AWG

Cord sets using flexible cord with conductors sized 18 or 17 AWG also require overcurrent protection. Overcurrent protection keeps the wiring of smaller gauge extension cords from overheating and melting, occurrences that would present risks for fire and electrical shock. Except with seasonal-use extension cords, very few manufacturers produce extension cords with wire smaller than 16AWG and overcurrent protection.

Section 21 of UL 817 specifies that cords having 17 AWG or 18 AWG conductors must be provided with overcurrent protection that does not exceed the ampacity of the flexible cord. The replaceable fuse or resettable protective device must be located in the plug or current tap, which is a plug with a directly connected outlet, and must provide protection only to the ungrounded, energized wire in the cord. This requirement applies to both indoor and outdoor extension cords. Compliance with the requirement can be readily observed by visual inspection of the plug.

Sections 114 and 115 in UL 817 specify the current-carrying capacity (*ampacity*) of all types of flexible cord. Table 114.3 requires that indoor extension cords should have no smaller than 16 AWG conductors; although 17 AWG or 18 AWG conductors may be used only if overcurrent protection (*e.g.,* a fuse) is provided.

C. Sufficient Strain Relief

Strain relief on extension cords, which must be handled (pulled, twisted, etc.) during use, protect the connections against separation of wires from their terminal connections, which could expose bare energized conductors and lead to electrical shock and fire.

Section 84 of UL817 describes the strain relief test required for all extension cords. Section 84.2.1 specifies that cords with 18AWG or larger conductors must withstand a 30-pound pull force on the connection between the fitting and the cord for 60 seconds.

Section 84.2.2 specifies that a weight must be steadily suspended from the cord for 60 seconds so that the cord is pulled directly from the fitting without bending. CPSC engineering staff has found that equivalent results are accomplished by suspending a weight from the body of the fitting, as illustrated in Figure 4.

Figure 4.Strain relief test with weights suspended on fitting

The strain relief requirement of UL 817 for extension cords is observable visually by hanging a weight on the cord for 60 seconds and observing if the weight drops or stretches the wiring. In CPSC staff's experience, extension cords that fail the strain relief requirement in UL 817 do so immediately, or within a few seconds of suspending the applicable weight.

D. Polarization of Power Supply Conductors

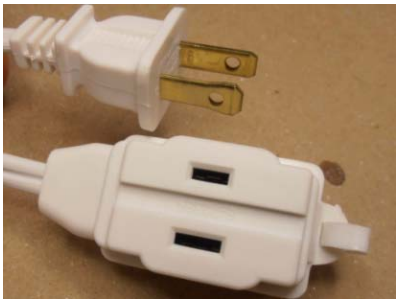
Polarization guarantees identification of the energized conductor and ensures, by means of other required construction, that the risk of accidental contact with an energized conductor is minimized, thereby reducing the likelihood of shock. On extension cords, polarization is accomplished by making the ungrounded, energized (also called "hot") receptacle slot narrower than the non-energized (or "neutral") slot, as shown in Figure 5 with the NEMA 1-15

configuration or by adding a third, round, grounding pin, as shown in Figure 5 with the NEMA 5-15 configuration. The blades on extension cord plugs can be inserted into a receptacle in only one orientation.

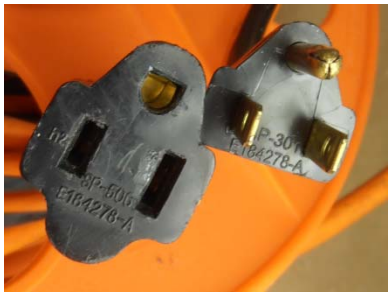
In addition to using a minimum wire size, UL 817 requires that the plug and outlet (called "line and load fittings" by UL) on extension cords must be of the same configuration, *e.g.*, two or three-blade, polarized or non-polarized, and with the same electrical rating.

Section 19 of UL 817 requires that two-wire extension cords must have polarized fittings and be rated 125 volts, 15 amperes. Sections 19 and 32 require that indoor and outdoor extension cords have no more than three outlets, unless the cord is jacketed and has 12 AWG conductors, which increases the limit to six outlets.

Section 31 UL 817 requires that two-wire outdoor extension cords must have polarized fittings rated 125 volts, 15 amperes and specifies that three-wire cords must have grounding fittings. Grounding fittings provide an additional path for current to flow in case the housing of an outdoor tool or appliance becomes energized by an accidental short circuit. A polarized fitting and a three-conductor plug with a grounding fitting are shown in Figure 5.



NEMA 1-15 configuration



NEMA 5-15 configuration

Figure 5 Plug and outlet fittings

Polarized receptacles and plugs are readily observable in two ways. First, the difference in slot and blade width or presence of a grounding pin and matching outlet opening are visually observable. Second, a simple manual test involves trying to insert the plug of the extension cord (or any polarized two-blade plug) into the outlet on the opposite end of the cord using every possible orientation. If the plug fits into the outlet in more than one orientation, then the cord fails the polarization test.

General UL construction specifications on fittings (Section 9.3 of UL 817) require that polarized outlets must reject improper or reversed insertion of polarized plugs, which reduces the risk of shock.

E. Continuity of Conductors

The wires of an extension cord must form continuous paths from one end to the other so the cord can serve the function for which it is intended. Each wire in the cord must also be properly connected on each end so that, for example, the grounding pin of the plug on a three-

wire cord is connected to the grounding socket on the outlet, and the energized blade on the plug is not wired to the non-energized receptacle on the outlet. Ensuring the proper interconnection from end-to end reduces the risk of fire and electrical shock.

Section 16 of UL 817 requires that corresponding terminals of line (plug) and load (outlet) fittings must be connected to the same conductor of the cord. In other words, for example, the energized plug blade must be wired to the energized outlet terminal.

Section 105 of UL 817 imposes mandatory testing requirements on all manufactured extension cords to ensure that the conductors are connected to the intended terminals of the fittings and there is electrical continuity throughout the entire length of the conductor/contact assembly.

Extension cord continuity is readily observable by use of a simple battery-light continuity tester, such as shown in Figure 6. One probe of the tester is inserted into a receptacle contact (slot or hole) of the extension cord and the other probe is touched against each prong (blade or pin) of the extension cord plug. The tester light should glow only when the probes simultaneously touch corresponding conductor terminals (that is, neutral wide blade and neutral wide slot, energized wide blade and energized wide slot, or ground pin and ground hole). If the tester does not light when corresponding terminals of the extension cord fittings are touched by its probes, the extension cord fails the continuity test. If the tester lights when its probes are touched against terminals other than the corresponding terminals of the fitting, then the extension cord fails both continuity and polarity requirements. A portable ohmmeter or multi-meter may also be used in a similar manner. Figure 6 demonstrates observation of continuity on an extension cord. The observation takes less than a minute. Moreover, expensive equipment is unnecessary to test for proper continuity because a simple continuity tester costs $5 to $7 online or in a retail store.

Figure 6. Continuity Testing

F. Protective Feature for Indoor Cords (Outlet Covers)

Outlet covers are readily observable. Section 26.7 of UL 817 requires that an indoor 2-wire parallel extension cord with more than one outlet must have covers for all the additional

outlets, as illustrated in Figure 7. Additionally, section SB of UL 817 requires that indoor seasonal 2-wire parallel use extension cords contain outlet covers. Outlet covers are readily observable by visually verifying that all but one outlet contains an outlet cover.

Figure 7. Outlet cover on unused outlets

An outlet cover is a protective feature that reduces the risk of injury to children, in particular, by minimizing the opportunity for probing with small objects or for chewing on the exposed receptacle surfaces, which can lead to hand or mouth burns and electrical shock.

G. Protective Feature for Outdoor Cords (Jacketed Cord)

A jacketed cord is a readily observable safety characteristic of outdoor extension cords. Section 30 of UL 817 requires that extension cords for outdoor use be manufactured using jacketed flexible cord, that is, a cord consisting of two to four insulated wires covered by an additional jacket of insulation. The jacket is visually observable by the thicker insulation on the cord. The jacket is also observable after the cord is cut. An outer insulator around the individual conductors is easily observed. Figure 8 depicts an example of a jacketed outdoor extension cord.

Figure 8. Jacketed outdoor extension cord

The jacketed cord for outdoor use extension cords protects the individual insulted wires from damage when exposed to weather and other conditions experienced with outdoor use. An unjacketed extension cord used for outdoors is susceptible to damaged wiring, which can lead to exposed conductors, thus presenting a risk of shock and fire.

H. A subset of Indoor Extension Cords (Seasonal Use Extension Cords)

The readily observable characteristics for indoor extension cords apply to indoor seasonal extension cords. Extension cords are often used to provide power to Christmas tree lighting strings and other seasonal decorations. A specially designed seasonal use extension cord provides a means to supply multiple outlets for connecting numerous light strings or decorative outfits, which are covered under *UL 588—Standard for Seasonal and Holiday Decorative Products.*

Supplement SB of UL 817 describes seasonal use cords sets as two-wire, polarized extension cords intended only for indoor use with seasonal decorative lighting. Seasonal extension cords are identifiable by their construction limits:

a) Two-wire cord is limited to 15 feet.
b) Integral overcurrent protection, such as a fuse, must be provided in the ungrounded, energized conductor.
c) They have no more than nine outlets, spaced no more than 3 feet apart.

II. Conclusion

As described in this memorandum, UL 817 Sections 2, 9, 16, 19, 20, 21, 30, 31, 32, 84, and 105 require certain safety characteristics for indoor- and outdoor-use extension cords. Specifically, the absence of minimum wire size, sufficient strain relief, polarization, continuity, and certain protective features in specific usage, including outlet covers, jacketed flexible cord and integral overcurrent protection, from an extension cord creates the potential for electrical shock and fire. CPSC staff can readily observe whether extension cords contain some of these features by visual inspection, such as outlet covers on an indoor extension cord. CPSC staff can readily observe by simple measurements or observations for other features, such as determining minimum wire size by measuring the conductor in the wiring, cutting a cord apart to verify presence of jacketing, verifying polarity and continuity with a test light, and hanging a weight on the cord to check for sufficient strain relief. Accordingly, CPSC staff recommends that the Commission publish the draft proposed rule under section 15(j) to deem the absence of one or more of the described readily observable safety characteristics in an extension cord to be a "substantial product hazard," as defined in section 15(a)(2) of the CPSA.

TAB D: Extension Cords: Product Recalls and Import Stoppages

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: December 17, 2014

TO : Arthur Lee
Project Manager, Extension Cord 15J Project
Directorate for Engineering Sciences
Division of Electrical Engineering

THROUGH: Robert Howell, Acting Assistant Executive Director, Office of Compliance and Field Operations

Marc Schoem, Deputy Director, Office of Compliance and Field Operations

Scott Simmons, Director, Defect Investigations Division

Blake Rose, Lead Compliance Officer Electrical/Fire/Mechanical Hazards Team

FROM : Mary Kroh, Compliance Officer, Defect Investigations Division

SUBJECT : Extension Cords: Product Recalls and Import Stoppages

I. Introduction

This memorandum provides information related to investigations of indoor and outdoor extension cords conducted by the Office of Compliance and Field Operations.

II. Recall and Import Stoppage Data

From 1994 to August 2014, CPSC staff obtained 29 voluntary recalls of indoor and outdoor extension cords involving a total of 3.2 million units, as shown in Table 1. In addition to product recalls, CPSC staff identified 54 shipments at import involving a total of 160,000 units, where such products may not have complied with the relevant UL *Standard for Safety for Cord Sets and Power Supply Cords* (UL 817), as shown in Table 2. Tables 1 and 2 provide the detail on both voluntary recalls and import stoppages by firm (for recalls), year, defect/hazard, and number of units. Table 1 lists voluntary extension cord recalls conducted from 1994 through August 2014. Table 2 lists import stoppages from 2004 through August 2014. Table 2 likely does not capture all import shipments where the products may not have complied with UL 817.

Note that where the information is available, most of the defects/hazards listed in Tables 1 and 2, for which staff made a substantial product hazard preliminary determination, would, if the draft proposal becomes a final rule, be considered a readily observable characteristic; and failure of the cord to meet the applicable requirements of UL 817 would constitute a substantial product hazard under the rule.

Table 1. Extension Cord Products Recall

Firm Name	Product Name	Year	Defect/Hazard	# Units	Tot. by Yr.
USA Maxam, Inc.	EXTENSION CORDS, 6 & 9 FOOT	1994	CPSC testing found that the cords' wires are undersized and the cords' plugs were put together improperly. The cords can catch fire or shock people	230,000	230,000
Sprint International	Extension cord	1996	The cord's wires are undersized present fire, shock, and electrocution hazards.	20,196	20,196
D & M Sales, Inc.	9' Extension Cord (non-U.L. Listed)	1997	The cord's wires are undersized present fire, shock, and electrocution hazards.	2,000	
Division Sales, Inc.	Electric Extension Cord	1997	Undersized wires present fire, shock, and electrocution hazards.	21,000	
Eastern American Trio Products	Extension Cord	1997	The extension cords present fire and shock hazards.	43,500	
Chandur Hasso Inc.	12 Foot Extension Cord	1997	The extension cords present fire, shock, and electrocution hazards.	2,300	
General Cable Corporation	extension cords	1997	An exposed wire near the receptacle end of the cord presents a shock hazard to consumers.	2,700	
In-Mar Trading Inc.	Extension Cords	1997	The cords have undersized wires, plugs that are not polarized properly, poor strain relief and lack of overcurrent protection presenting fire, shock and electrocution hazards.	14,600	86,100
Apollo Electronics	Electrical extension cords	1998	Undersized wires with no overcurrent protection	12,239	
In-Mar Trading, Inc.	6, 9, 12, 15, 20' Extension Cord	1998	The cords have undersized wires, plugs that are not polarized properly, poor strain relief and lack of overcurrent protection presenting fire, shock and electrocution hazards.	115,300	
Okura Hardware & Lumber, Inc.	Extension cords	1998	The extension cords and power strips have undersized wires, plugs that are not polarized properly and no overcurrent protection, presenting fire, electrocution and shock hazards to consumers.	600	128,139
Tools Exchange, Inc.	Outdoor extension cords, 50' & 10'	1999	The cords have undersized wires, lack overcurrent protection and have reverse polarity receptacles that allow plugs to be incorrectly inserted, presenting fire, shock and electrocution hazards.	2,760	
Woods Industries, Inc.	Extension cord reel	1999	The housing of the extension cord reels could become energized, resulting in electrical shock or electrocution.	1,000	
Morton Paper Company	12' Extension Cord	1999	The cords have undersized wires, lack overcurrent protection and are equipped with plugs that are not polarized properly, presenting fire, shock, and electrocution hazards.	75,750	
Wellmax International, Inc.	6, 9, 12, 15 & 20 foot extension cords	1999	The cords have undersized wires and reverse polarity receptacles that allow plugs to be incorrectly inserted, presenting fire, shock and electrocution hazards to consumers.	1,000,000	
BIG ROC TOOLS, INC.	Outdoor Extension Cords	1999	The cords have undersized wires and reverse polarity receptacles that allow plugs to be in inserted incorrectly, presenting fire, shock and electrocution hazards.	38,170	
Raport, Inc.	Extension cord. Note: Product was originally thought to be imported by another firm. Thus, COB was delayed due to need to identify responsible importer.	1999	The wires on these cords are undersized and can be overloaded. They pose a fire and shock hazard.	4,800	1,122,480

Fairlong International Chicago, Inc.	6', 9' extension cords	2000	The cords have undersized wires, incorrect ratings, lack overcurrent protection and allow polarize plugs to be incorrectly inserted into the receptacles. These cords present fire, shock and electrocution hazards to consumers.	149,600	
Woods Industries, Inc.	Two- and three-conductor outdoor extension cords with LockJaw plug retaining system and AC Delco and LumaPro cord reels with the LockJaw plug.	2000	The plastic housing of the locking plug can separate or break, exposing consumers to live wires and posing shock and electrocution hazards	500,000	
Howard Berger Co. Inc.	electric extension cord	2000	The extension cords have undersized wires and lack over-current protection. The extension cords can overheat, presenting electrocution, shock and fire hazards.	10,000	659,600
E-filliate Corporation	Extension cords.	2002	The cords have reversed polarity, which can present electric shock and electrocution hazards to consumers.	30,000	
STK International	Brown & white extension cords	2002	The cords have undersized wires, presenting a shock hazard to consumers.	190,000	220,000
United General Supply Co., Inc.	100 foot Extension Cord ETEC F50Y, 50 Ft Extension Cord ETEC F50Y, 25-ft. Extension Cord ETEC F25Y,9 ft. Extension Cord ETEC 9	2003	The extension cords have undersized conductors and no over- current protection which causes overheating, presenting a shock and fire hazard.	8,200	8,200
Harbor Freight Tools	Heavy Duty Portable Industrial Cord Reel	2004	Electric shock or fire possible because the internal grounding conductor may not be properly secured to the receptacle.	9,390	
Family Dollar Stores, Inc.	25ft. Outdoor Extension Cord	2004	Use of these extension cords could result in an electric shock or electrocution to consumers	60,000	69,390
Greenbrier International, Inc.	extension cord	2006	Undersized Wires	650,573	
Pride Products Corp	Electric Extension Cords	2006	The counterfeit extension cords have undersized wiring and no fuse in the cord to provide over-current protection, which can cause overheating and pose a fire hazard.	42,000	692,573
Dollar Stop Plus	15-foot extension cord	2007	These extension cords have undersized wiring, and fail to connect properly at the plug and receptacle ends. This poses fire, shock and electrocution hazards to consumers.	40	40
Howard Berger Co. Inc.	Extension cord	2010	The extension cords have inadequate coating material around the cords and copper conductors that are smaller than required, posing a fire hazard to consumers.	12,000	12,000
			TOTAL UNITS	**3,248,718**	**3,248,718**

Table 2. Extension Cord Import Stoppages

Product Name	Year	Defect/Hazard	# Units	Total By Yr.
15 FT. ELECTRICAL CORD	2004	not available	64	
EXTENSION CORD	2004	not available	0	
EXTENSION CORD	2004	not available	3	
EXTENSION CORD	2004	not available	10	
EXTENSION CORD	2004	not available	10	
6' EXTENSION CORD	2004	not available	0	87
EXTENSION CORD	2005	poor/inadequate electrical components can result in overheating	0	
EXTENSION CORDS	2005	not available	0	
EXTENSION CORD	2005	undersized wiring, inadequate strain relief and mechanical connections	2,000	
EXTENSION CORD	2005	undersized wiring, inadequate strain relief and mechanical connections	1,520	
EXTENSION CORD	2005	not available	0	
EXTENSION CORD	2005	not available	1,200	
EXTENSION CORD	2005	not available	36,000	
EXTENSION CORD	2005	not available	5,880	
EXTENSION CORD	2005	not available	6,000	52,600
9 FT. EXTENSION CORD	2006	undersized wires and lacks over current protection, also lacks adequate strain relief.	1,920	
25 FT EXT CORD	2006	undersized wiring and fail the strain relief test and though the product has a polarized plug, the grounded neutral side of the plug can be improperly inserted into the narrow side of the receptacle	1,440	
9-FT EXTENSION CORD	2006	undersized wire, lack over current protection and lack adequate strain relief	579	
12-FOOT EXTENSION CORD	2006	undersized wire, lack over current protection and lack adequate strain relief	1,440	
100 FT EXTENSION CORD	2006	undersized wire, lack over current protection and lack adequate strain relief	240	
20-FT EXTENSION CORD	2006	undersized wire, lack over current protection and lack adequate strain relief	720	
12-FOOT EXTENSION CORD	2006	not available	4,800	11,139
25 FOOT EXT CORD	2007	undersized wires, lack over-current protection, failed the strain relief test and the cords were mislabeled, greatly overstating their capacity,	1,440	
9 FOOT EXT CORD	2007	undersized wires, lack over-current protection, failed the strain relief test and the cords were mislabeled, greatly overstating their capacity,	6,000	
20 FOOT EXT CORD	2007	undersized wires, lack over-current protection, failed the strain relief test and the cords were mislabeled, greatly overstating their capacity,	2,160	
EXTENSION CORD	2007	not available	400	
EXTENSION CORD	2007	not available	240	10,240
EXTENSION CORD	2008	undersized wire	10,200	
EXTENSION CORD	2008	undersized wire	16,560	
EXTENSION CORD	2008	undersized wire	12,400	
EXTENSION CORD	2008	undersized wire	11,580	
EXTENSION CORD	2008	undersized wire	11,150	

EXTENSION CORD	2008	undersized wire	1,656	
EXTENSION CORD	2008	undersized wire	1,812	
EXTENSION CORD	2008	undersized wire, inadequate connections	528	
EXTENSION CORD	2008	undersized wire, inadequate connections	3,000	
EXTENSION CORD	2008	undersized wire, inadequate connections	960	
EXTENSION CORD	2008	undersized wire, inadequate connections	960	
EXTENSION CORD	2008	undersized wire, inadequate connections	960	
EXTENSION CORD	2008	undersized wire, inadequate connections	1,920	
EXTENSION CORD	2008	undersized wire, inadequate connections	1,920	
EXTENSION CORD	2008	undersized wire, inadequate connections	504	
6 OUTLET EXTENSION CORD	2008	severely undersized wires, housing of the power strip is flammable, the circuit breaker is not wired into the circuit, product lacks mechanical stability	1,152	
EXTENSION CORD	2008	severely undersized wires and cross polarized connections	1,800	
EXTENSION CORD	2008	severely undersized wires and cross polarized connections	600	79,662
2FT 3 OUTLET EXT CORD	2010	severely undersized wires, and lack of grounding	576	
25 FT EXT CORD	2010	severely undersized wires, and lack of grounding	576	
50 FT EXT CORD	2010	severely undersized wires, and lack of grounding	288	
12 FT EXT CORD	2010	severely undersized wires, and lack of grounding	1,728	
25 FT EXT CORD	2010	severely undersized wires, and lack of grounding	1,440	
100 FT EXT CORD	2010	severely undersized wires; a grounding pin in the plug does not have ground wire through the power cord, receptacle is configured incorrectly and too soft to prevent a polarized plug being inserted correctly	600	
EXTENSION CORD	2010	undersized wires, allows the plugs to be plugged in reverse polarity, poorly made and lack mechanical and electrical integrity, receptacles allows plugs to be inserted and removed easily, the soldering of the grounding is inadequate	1,000	6,208
AMERICAN POWER EXTENSION CORD	2013	not available	360	
AMERICAN POWER EXTENSION CORD	2013	not available	360	720
		TOTAL UNITS	**160,656**	**160,656**

TAB E: Extension Cords: Fire or Shock Incidents from 1980 to 2013

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: December 17, 2014

TO: Arthur Lee
Project Manager, Extension Cord 15J Project
Directorate for Engineering Sciences
Division of Electrical Engineering

THROUGH: Kathleen Stralka
Associate Executive Director
Directorate for Epidemiology

Stephen Hanway
Director, Division of Hazard Analysis

FROM: David Miller
Mathematical Statistician, Division of Hazard Analysis

SUBJECT: Extension Cords: Fire or Shock Incidents from 1980 to 2013

I. Introduction

The Consumer Product Safety Improvement Act of 2008 (CPSIA) expanded Section 15 of the Consumer Product Safety Act (CPSA). Section 15(j) of the CPSA allows the Commission to specify by rule for a consumer product, or class of consumer products, characteristics whose presence or absence the Commission determines presents a substantial product hazard.

This memorandum provides information about the numbers of fire or shock incidents in CPSC databases involving extension cords (indoor or outdoor) from 1980 through 2013, and reports the numbers of incidents (separately for fatal and nonfatal incidents) by year. Although these incidents do not provide a basis for estimates, they demonstrate that the number of fatal and nonfatal extension cord fire and shock incidents (and the number of resulting deaths) reported to CPSC have declined since 1980.

II. Background

Underwriter's Laboratories (UL) published its voluntary standard for Flexible Cord and Fixture Wire in May 1918. However, the voluntary safety requirements for cord sets and power supply cords were not standardized until 1937, with the publication of UL 817, *Standard for Cord Sets and Power Supply Cords*. Most of the voluntary safety requirements for power cord sets predate the CPSC. It is difficult to track more recent changes to UL 817, which is now in its 11th edition because UL has changed to digital publishing and no longer has printed editions available. CPSC staff knows that a requirement for 16 AWG flexible cord (or 17-18 AWG with overcurrent protection) on general-use cords, including extension cords, was incorporated into

UL 817 in the late 1980s. Since 1987, UL 817 has required indoor extension cords to have plug covers and specifies that outdoor extension cords to have properly jacketed cords. *See* Tab B, R. Garrett, Extension Cords: Abbreviated History and Associated UL Standards, December 17, 2014.

The CPSC Office of Compliance has conducted product recalls of extension cords and conducted port surveillance that has led to numerous stoppages of extension cords upon import. *See* Tab D, M Kroh, Extension Cords: Product Recalls and Import Stoppages, December 17, 2014.

III. Extension Cord Incident Data

CPSC has extension cord incident data from its Injury or Potential Injury Database (IPII) for fatal and nonfatal incidents. CPSC also has data on fatal incidents in the Death Certificate Database (DTHS). Staff searched IPII and DTHS for incidents that occurred from 1980 to 2013, and included the following product code: '0685 – Extension cords.' Staff limited the scope of the incidents considered to fire, burn, and shock hazard incidents. Additionally, CPSC staff excluded incidents in which the narrative named an extension cord as a possible cause but did not determine definitively the extension cord to have caused the incident. In many of the incidents, staff was not able to determine whether an extension cord involved in the incident was responsible for the incident. If staff determined that the incident was out of scope or undetermined, the incident was left out of the incident numbers provided in this memorandum. Thus, the incident numbers reported in this memorandum are limited to incidents in which staff concluded that the extension cord (or extension cords) was the cause of a fire, burn, or shock incident.

Separate product codes do not exist in CPSC's databases for indoor and outdoor extension cords. Moreover, incident narratives often do not make clear which type of cord was involved. Accordingly, indoor and outdoor extension cords are considered together in this memorandum.

The IPII and DTHS databases are not statistical samples so they cannot be used to support national estimates of incidents. The extension cord incidents captured by IPII and DTHS each year, although not sufficient to produce estimates because IPII and DTHS are not probability samples, give annual minimums[9] of extension cord incidents. CPSC is aware that there were *at least this many* incidents.

If, as one might expect, CPSC databases are able to capture a larger proportion of the fatal incidents (if for example, fatalities are more likely to be reported by news media) than the nonfatal incidents, then staff's incident count for deaths and fatal incidents will be closer to the true numbers than staff's incident count for nonfatal incidents. However, CPSC staff does not know the extent to which fatalities and nonfatalities are underreported.

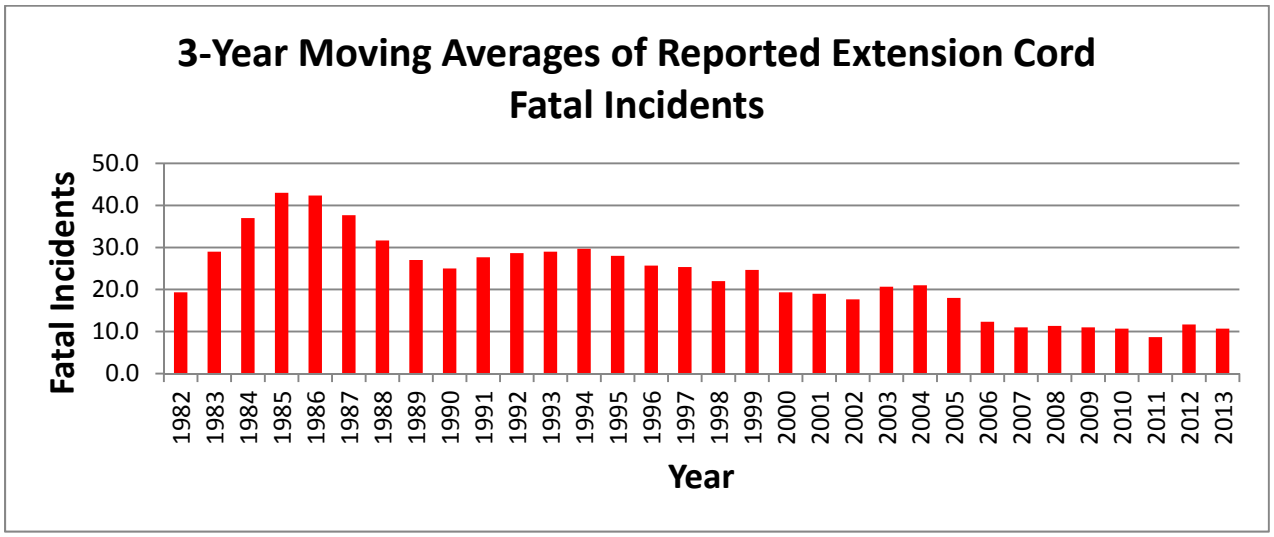
[9] There are some common incidents in IPII and DTHS. CPSC staff finds the duplicates in DTHS and removes them so that each incident only contributes once to the counts. After the data are unduplicated, the counts are indeed minimums.

The search of IPII data found 716 in-scope fatal extension cord incidents between 1980 and 2013. These incidents caused 1,078 deaths. The search of DTHS found 47 unique (not duplicates of incidents found in IPII) fatal, in-scope incidents that occurred between 1980 and 2013. These 47 incidents led to 47 deaths. In total, the two databases have 763 fatal in-scope extension cord incidents that caused 1,125 deaths between 1980 and 2013.

As mentioned earlier, UL 817 has required plug covers on indoor cords and properly jacketed cords on outdoor cords since 1987. From 1980 to 1987, CPSC databases contain 261 fatal extension cord incidents leading to 374 deaths, representing an annual average of 32.6 reported fatal incidents and 46.8 deaths. From 1988 to 2013, CPSC databases contain 502 reported fatal extension cord incidents leading to 751 deaths, representing an annual average of 19.3 fatal incidents and 28.9 deaths.

Figure 1 shows the number of reported fatal extension cord incidents that were reported in 1980 to 2013.[10] Figure 2 shows the number of deaths from these incidents. A single incident can result in multiple deaths, hence the distinction. The graphs use 3-year averages to smooth out short-term fluctuations.

Figure 1. Three-Year Moving Averages[11] of Reported Fatal Extension Cord Incidents from 1980 to 2013[12]



[10] There is a lag between when an incident occurs and when it appears in the data. The most recent years may be incomplete. For the IPII extension cord data, 99 percent of the nonfatal incidents have a lag time of less than 1 year. For the fatal IPII incidents, 96 percent of the data have a lag time of less than 1 year. For DTHS, as of December 31, 2014, the database is 76 percent complete for 2013, 97 percent complete for 2012, 98 percent complete for 2011, and 99 percent complete for 2009 and 2010.

[11] The year refers to the average for the three years leading up to and including that year. For example the number for 1992 (28.7) is the annual average number of fatal incidents from 1990 to 1992.

Figure 2. Three-Year Moving Averages of Reported Extension Cord Deaths from 1980 to 2013[12]

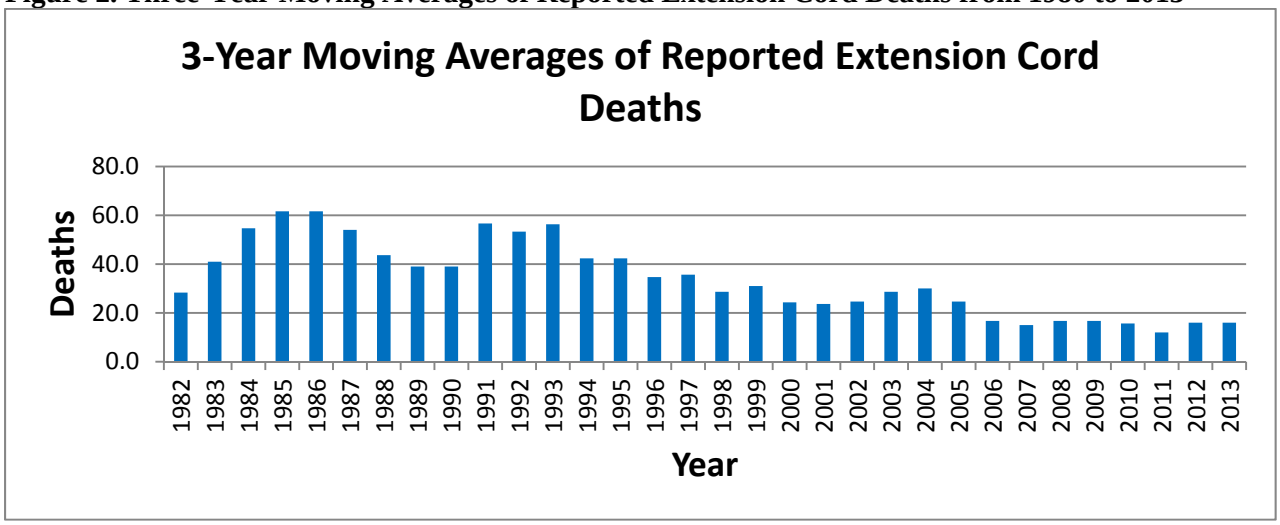
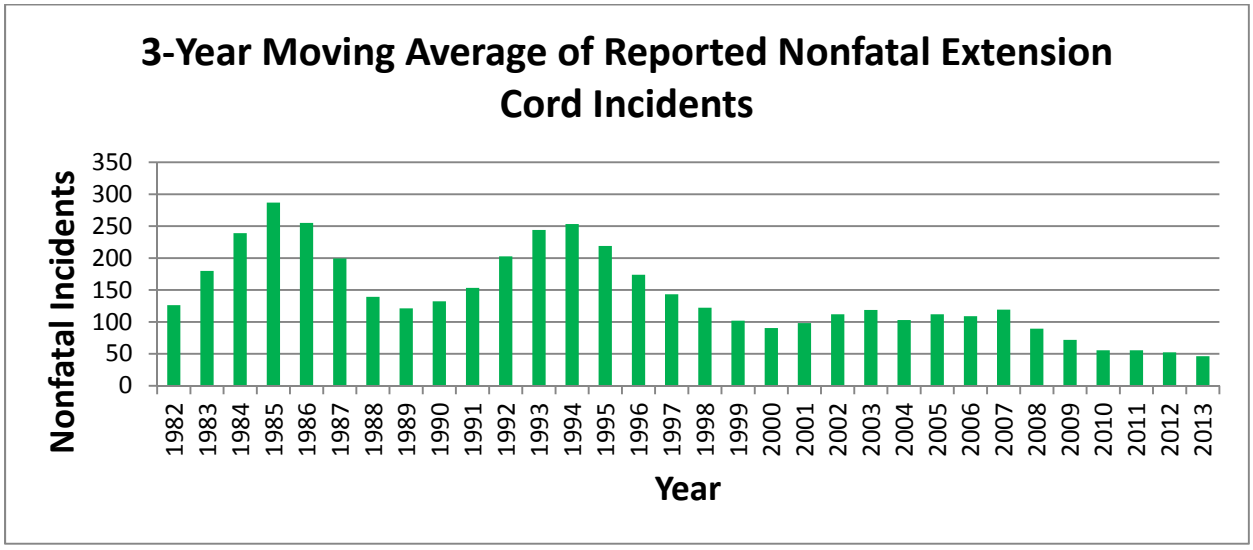


Figure 3 shows the number of reported nonfatal incidents from IPII. Some of the incidents involve injuries, and some do not. An incident is only included in the count if staff concluded that an extension cord caused the fire, burn, or shock incident. Staff excluded some incidents because the incident narrative suggested that the incident was not addressable by the provisions of the voluntary standard relied upon (*e.g.*, the extension cord was in a puddle of water). The numbers of incidents provided are not *estimates* of extension cord incidents, but are *minimums* in that they are all of the reported incidents that CPSC captured in its IPII database in this period.

[12] Incidents can take years before appearing in the data. For DTHS, as of December 31, 2014, the database is 76 percent complete for 2013, 97 percent complete for 2012, 98 percent complete for 2011, and 99 percent complete for 2009 and 2010. For the fatal IPII cases in the data, the lag time between the incident and its appearance in the data is less than one year 96 percent of the time.

Figure 3. Three-Year Moving Averages of Reported Non-fatal Extension Cord Incidents from 1980 to 2013[16]



The tables and graphs make clear that more fatal and nonfatal incidents were reported to CPSC in the 1980s and the early 1990s than in subsequent years. The numbers of reported incidents have declined over time. Table 1 shows the annual average number of incidents for five different periods for each of fatal incidents, deaths, and nonfatal incidents. The 34-year period is broken up into four 7-year periods and a 6-year period. Reporting may not be complete for the most recent period as sometimes CPSC receives reports of incidents years after they have occurred.

Table 1. Extension Cord Annual Average[13] of Fatal Incidents, Deaths, and Non-fatal Incidents from 1980 to 2013[16]

Years	Fatal Incidents	Deaths	Nonfatal Incidents
1980–1986	32.7	47.7	201.0
1987–1993	27.7	46.6	178.7
1994–2000	23.6	31.1	131.6
2001–2007	15.9	21.7	112.3
2008 - 2013[14]	10.7	15.8	51.0

Table 1 shows something similar to what the graphs show. More reported extension cord fire, burn, and shock fatal incidents, deaths, and nonfatal incidents appear in CPSC databases in the 1980s and early 1990s than have been reported more recently.

[13] The numbers are given as annual averages instead of totals because there are four seven-year periods and one six-year period.

[14] There is a lag between when an incident occurs and when it appears in the data. The most recent years may be incomplete. For the IPII extension cord data, 99 percent of the nonfatal incidents have a lag time of less than 1 year. For the fatal IPII incidents, 96 percent of the data have a lag time of less than 1 year. For DTHS, as of December 31, 2014, the database is 76 percent complete for 2013, 97 percent complete for 2012, 98 percent complete for 2011, and 99 percent complete for 2009 and 2010.

IV. Conclusion

The voluntary standard for extension cords, UL 817, *Standard for Cord Sets and Power Supply Cords*, was implemented in 1937 and has been updated many times since then. Requirements for 16 AWG flexible cords (or 17-18 AWG with overcurrent protection) and plug covers (for indoor cords) and properly jacketed cords (for outdoor cords) were implemented in the late 1980s. A search of IPII and DTHS databases shows more incidents, more reported fatal incidents, and more deaths per year in the 1980s than more recent time periods. A decline in the number of reported incidents and deaths is consistent with the idea that UL safety requirements would reduce the number of extension cord fire and shock incidents and deaths. However, the extent to which these safety requirements are responsible for this reduction is not known.

TAB F: Extension Cords: Information about the Product and Level of Conformance to UL Voluntary Standard

TAB F

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: December 5, 2014

TO : Arthur Lee
Project Manager, Extension Cord 15J Project
Directorate for Engineering Sciences
Division of Electrical Engineering

THROUGH: Gregory B. Rodgers, AED, Directorate for Economic Analysis

Deborah V. Aiken, Senior Staff Coordinator,
Directorate for Economic Analysis

FROM : Dale R. Ray, Directorate for Economic Analysis

SUBJECT : Extension Cords: Information about the Product and Level of Conformance to UL Voluntary Standard

This memorandum provides information about the likely extent of conformance to the voluntary standard, UL 817, *Standard for Cord Sets and Power Supply Cords*,[1] for flexible electrical cord sets (commonly called extension cords, or the industry term, "cord sets"). Readily available information suggests that the level of voluntary conformance among products on the market is high.

I. Background

The Consumer Product Safety Commission (CPSC) staff is preparing a draft proposed rule under Section 15(j) of the Consumer Product Safety Act (CPSA). Under the draft proposed rule, extension cords that do not have one or more of the five readily observable characteristics, all of which are described in UL 817, would present a substantial product hazard (SPH). UL 817 incorporates performance tests, labeling specifications, and other requirements to address fire and electrocution risks. CPSC staff considers UL 817 effective at reducing fire and electrocution risks associated with extension cords. UL 817 has been in place since 1937, and is currently in its 11th edition. Since the 1960s, UL has gradually incorporated upgrades into the standard; the observable characteristics in the draft proposed rule were generally implemented by the late 1980s. CPSC staff has since observed a general downward trend in fire and shock incidents involving extension cords.[2]

UL 817 applies to indoor and outdoor extension cords. Some requirements apply to all cord sets, while other requirements are specific to products intended for indoor or outdoor use. The

[1] The UL mark and logo are trademarks of UL, LLC. (formerly Underwriters Laboratories, Inc.).
[2] Extension Cords: Fire or Shock Incidents from 1980 to 2013, D. Miller, CPSC, 2014.

draft proposed rule identifies the following five readily observable characteristics each for indoor and outdoor extension cords, as described in UL 817:

All Extension Cords	Indoor 2-Wire Parallel Extension Cords with polarized parallel-blade and -slot fittings
(1) minimum wire size,	(5a) covers for outlets
(2) sufficient strain relief,	
(3) proper polarity,	
(4) proper continuity	Outdoor Extension Cords
	(5b) jacketed cords

Extension cords that fall within the scope of UL 817 and the draft proposed rule, and that do not conform to one or more of these provisions, would present an SPH and be subject to appropriate enforcement action, such as a product recall, or seizure and forfeiture, upon importation.

II. Product & Market Information

A. Products

The draft proposed rule would apply to indoor and outdoor general-use extension cords that can be used with many different types of electrical appliances. Extension cords are factory-assembled flexible, insulated wire cords, used to extend a 120-volt branch circuit to the power supply cord of a portable appliance or other electrical device. Indoor cord sets are intended for general household use, and typically incorporate the least costly components. The category of indoor extension cords includes seasonal indoor extension cords, *i.e.*, cords that are intended only for use with seasonal decorative lighting. Outdoor cord sets generally are constructed with heavier-gauge wire and an abrasion- and chemical-resistant insulating jacket material. All in-scope products are covered by UL 817; some examples are depicted below.

Typical Indoor Cord Set (no external jacket)

Typical Outdoor Cord Set (with external jacket)

Seasonal Indoor Cord

Subsets of products would be included in, or excluded from, the scope of the rule, as described below in Table 1. The products that are outside the scope of the draft proposed rule are not subject to UL 817, or they do not present the same risks of injury.

Table 1: Extension Cords:
Products Within and Outside the Scope of the Proposed Rule

In Scope: Household extension cords, factory-assembled, 120 volts AC, including: • Indoor or general use cord sets, including seasonal indoor cord sets • Outdoor cord sets
Out of Scope: • Detachable power cords, either with appliance or other nonstandard plugs (*e.g.*, accompanying electronic or other electrically powered items), or with fittings of different configurations (*e.g.*, a clothes washer replacement cord with a plug at one end and individual wire terminals at the other end) • Unassembled components, such as flexible cord or fittings, that may be assembled into extension cords or installed in permanent branch circuit wiring systems • Cord sets intended for use with non-branch-circuit household current, *i.e.*, greater or less than nominal 120 volts AC (*e.g.*, for use with 220 volt appliances, or for 15-50 ampere/125–250 volt recreational vehicles) • Power strips, power taps, and surge protectors

Various sections of UL 817 specify how certified cord sets are to be marked for their intended use, either by packaging labels or by markings on the cords themselves. CPSC staff intends to use such markings in determining whether requirements for indoor or outdoor cord sets apply. CPSC staff will use this information as the applicable description of the cord's electrical ratings and intended use, and to identify which specific requirements derived from UL 817 apply to the cord set.

If a cord set is not marked with its intended use, CPSC staff will look to the cord's construction to estimate the intended use. This approach is consistent with staff's current approach in analyzing the safety of a cord set sample. CPSC staff considers cords that are not labeled for outdoor use and that are manufactured without jacketing to be indoor use extension cords. The presence or absence of jacketing can be visually observed and is usually confirmed by cutting the cord apart. CPSC staff treats unlabeled cords with jacketing as outdoor use cords because of its foreseeable use due to its appearance similarities to outdoor cords.

B. Market Data

Limited information is available about the market for extension cords and about producers and sellers. A substantial majority of products that would be subject to the proposed rule appear to be imported, primarily from the People's Republic of China. Other exporting nations named in International Trade Commission (ITC) reports include Mexico, Germany, the Republic of China (Taiwan), and Canada. Some cord sets are produced domestically, and some of these are household products subject to UL 817; however, most domestically produced items appear to be intended for industrial or other commercial use. Based on contacts with industry

representatives, CPSC staff has identified four domestic producers of extension cords that would be subject to the draft proposed rule.

Imports of extension cords are enumerated under the ITC's Harmonized Tariff System of the U.S. (HTS) code 8544.42.9000, "insulated electric conductors, for a voltage not exceeding 1,000 volts, fitted with connectors, not elsewhere specified or included." This category includes a wide variety of communication and energy transmission cables, components, and related products; data for extension cords are not reported separately. The HTS grouping is analogous to the North American Industry Classification System (NAICS) code 335999 for domestically produced miscellaneous electrical equipment and components; this NAICS code includes 40 distinct product subcategories, including many that are industrial or commercial products. The ITC reported that in 2013, the declared value of imports under this HTS code was about $2.8 billion, comprising about 775,000 entry lines (*i.e.*, individual shipments) by nearly 11,000 importers (including brokers and shipping companies that file bills of lading). Monthly ITC reports indicate that the category will increase by about 6 percent in 2014, to approximately $3.0 billion in import value. Although no breakdowns of these published aggregate statistics are available, the large number of products involved suggests that it is likely that only a small proportion of the volume and value of shipments under this HTS code is comprised of products that would be subject to the draft proposed rule.

The ITC tariff database shows that the largest number of import shipments in 2013 originated from China. An online wholesale directory, GlobalSources.com, identified 77 suppliers (including trading companies) in China, Hong Kong, or Taiwan that export extension cords to the United States. Another product directory, Made-in-China.com, identified 798 Chinese suppliers of extension cords and other flexible cords. About 10 to 15 members of the National Electrical Manufacturers Association (NEMA) produce or import extension cords, almost all from China. NEMA reports that all of its members market only UL-conforming products.

Given the large number of firms involved in trade for the wide variety of products in the category, it is likely that a small minority of the approximately 11,000 firms engaged in trade during 2013 for the aggregate HTS category mentioned above import extension cords subject to UL 817; however, even if only 10 percent were subject to the draft proposed rule, the number of firms would still be substantial at more than 1,000. Some importers market products only to wholesalers and retailers; other importers are also retailers that market directly to consumers, either online or through physical stores. CPSC staff has identified about 20 to 25 leading importers, most of which appear to be large, multinational firms; it is likely that a great majority of the importers of extension cords are small businesses. Three of the four known domestic producers also appear to be small firms.

Some of the leading importers market multiple brands of extension cords that would be covered by the draft proposed rule. Roughly 20 to 25 national brands (including those of several major retailers) are dominant in the consumer market. Some of the lowest-priced products are unbranded.

C. Usage and Pricing

According to the U.S. Census Bureau, there are roughly 115 million U.S. households. Extension cords are ubiquitous; a substantial majority of households likely owns at least one cord set. Although no published estimates of usage are available, the number of extension cord-owning households may exceed 100 million. Furthermore, in view of the large number of electrical items found in homes, it is likely that many households have multiple cord sets for indoor and outdoor use.

Extension cords are generally low import value items. Based on the range of observed retail prices, most items probably have an import value (before distribution chain mark-ups) in the range of $1.00 to $10.00 per unit. Observed retail prices of extension cords range from a few dollars (for the least expensive indoor cord sets) to more than $100 (for the largest outdoor cord sets). Prices for industrial market cord sets equipped with ground fault interrupters or other costly features can easily exceed $100. CPSC staff observed that typical per-unit retail pricing is roughly $5.00 to $10.00 for indoor cord sets, and $15 to $30 for outdoor cord sets. Extension cords represent a minor expenditure for most households.

Information on the numbers of indoor versus outdoor extension cords in use, and on the relative market share of each type, is not available. The indoor cord set dollar value market share is undoubtedly much smaller than the unit share, because indoor cord sets are, on average, much lower in price than outdoor cord models.

III. Estimated Voluntary Conformance

A. CPSC Compliance and Enforcement Data

Recent data on extension cord recalls and import stoppages[3] over the past decade show that relatively few of these products have been affected by enforcement actions. Fewer recalls occurred since 2004 (6 recalls involving 6 importers and 775,000 units) compared to the previous decade (23 recalls involving 22 importers and 2.5 million units); this is generally consistent with the decline in reported fire and shock incidents observed since the late 1980s. The 54 reported import shipment stoppages since 2004 involved 23 importers, but only about 160,000 units. Assuming that the Compliance data present a reasonably accurate view of nonconformance, the 29 importers and roughly 1 million products that were either involved in recalls or otherwise identified as potentially violative over the entire last decade represent less than 3 percent of the possible 1,000 importers, and an unknown, but small percentage of all units sold.

[3] "Extension Cords: Product Recalls and Import Stoppages,' M. Kroh, CPSC, 2014.

B. Testing and Certification to UL 817

Three testing organizations certify U.S. market extension cords as conforming to UL 817: UL; Intertek Co. (ETL); and CSA Group (CSA, formerly known as the Canadian Standards Association). All three companies perform tests in accordance with the UL standard and sell listing mark rights to manufacturers, importers, or private labelers. Although some products may be defective and fail to conform, even though the products carry a listing or certification mark, such incidents appear to be rare. Of the enforcement actions over the past decade described above, only one of the recalls and two of the import stoppages involved extension cords from importers that claim to offer only UL-conforming goods. For purposes of this analysis, all products carrying the UL, ETL, or CSA marks are presumed to be in conformance with UL 817.

The leading major retailers, including Wal-Mart, Home Depot, Target, Costco, Walgreens, Sears, K-Mart, Lowe's, and CVS, appear to offer only UL-conforming electrical products. Retailers' specifications may encourage many suppliers to offer only UL-conforming cord sets. Staff's review of retail store offerings and online catalogs and directories revealed only one seller of unlisted extension cords.

C. Estimated Level of Conformance

Direct data on shipments of conforming versus nonconforming extension cords are not available; however, an approximation of likely UL 817 conformance can be made based on the following points:

- Staff's review of online catalogs and directories revealed 20 to 25 major national brands of extension cords; such products are likely to represent a majority of all units sold for household use. All of these major brands are advertised to be UL, ETL, or CSA listed. CPSC staff has identified two domestic producers of cord sets that may not conform to UL 817, and no importers or other domestic manufacturers of unlisted cord sets.
- Major retailers appear to offer only products that conform to the UL standard; these retailers; and their online affiliates account for an unknown, but large proportion of extension cord sales.
- Available CPSC data on recalls and import violations suggest a very low incidence of defects and nonconformance, in the range of a few percent. A low number of violations is an indicator that conformance to the UL standard is likely very high.

Based on this information, CPSC staff estimates that the current level of voluntary conformance to UL's standard for extension cords, UL 817, is very high among units sold to consumers in the United States. In view of the very low incidence of observed defects and import stoppages, staff estimates that the conformance level is likely in excess of 90 percent.

TAB G: Draft Proposed Section 15(j) Rule for Extension Cords: Small Business Considerations

TAB G

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: December 5, 2014

TO : Arthur Lee
Project Manager, Extension Cord 15J Project
Directorate for Engineering Sciences
Division of Electrical Engineering

THROUGH: Gregory B. Rodgers, AED, Directorate for Economic Analysis

Deborah V. Aiken, Senior Staff Coordinator, Directorate for Economic Analysis

FROM : Dale R. Ray, Directorate for Economic Analysis

SUBJECT : Draft Proposed Section 15(j) Rule for Extension Cords: Small Business Considerations

This memorandum addresses small business considerations related to a draft proposed rule under section 15(j) of the Consumer Product Safety Act (CPSA). The draft proposed rule would determine that flexible electrical cord sets (commonly called extension cords) that do not conform to one or more of five readily observable characteristics each for indoor and outdoor extension cords set forth in a voluntary standard, UL 817, *Standard for Cord Sets and Power Supply Cords,* present a substantial product hazard (SPH).

I. Background

Section 223 of the Consumer Product Safety Improvement Act of 2008 (CPSIA) amended section 15 of the CPSA with the addition of section 15(j), 15 U.S.C. §2064(j). The amendment states that the Commission may specify, by rule, characteristics of products that present an SPH if: (a) the characteristics are readily observable and have been addressed by voluntary standards; and (b) such standards have effectively reduced the risk from the products, and there is substantial compliance with such standards. The Commission is considering a draft proposed rule designating extension cords not conforming to one or more of five readily observable characteristics in UL 817 as SPHs. UL 817 incorporates performance tests, labeling specifications, and other requirements to address fire and electrocution risks. CPSC staff considers the standard to be effective in reducing these risks associated with extension cords. The standard has been in place since 1937, and is currently in its 11th edition. UL has gradually incorporated new shock and fire safety requirements into the standard; the observable characteristics in the draft proposed rule were generally implemented by the late 1980s. Available information suggests that the number of fire and shock incidents has declined since

these requirements in UL 817 became effective.[1] Furthermore, the level of voluntary conformance among products on the market appears to be high.[2]

The draft proposed rule would make the absence of one or more of the following applicable five readily observable characteristics required in UL 817 a reason for deeming extension cords an SPH:

All Extension Cords	Indoor 2-Wire Parallel Extension Cords with polarized parallel-blade and -slot fittings
(1) minimum wire size,	(5a) covers for outlets
(2) sufficient strain relief,	
(3) proper polarity,	
(4) proper continuity	Outdoor Extension Cords
	(5b) jacketed cords

Extension cords that fall within the scope of UL 817 and the draft proposed rule, and that do not conform to one or more of these provisions, would present an SPH and be subject to appropriate enforcement action, such as a product recall, or seizure and forfeiture upon importation.

II. Market & Industry Information

A. Market Data

The draft proposed rule would apply to indoor and outdoor use extension cords. Articles covered by UL 817 and subject to the draft proposed rule would include factory-assembled cord sets, 120 volts AC, with the following general characteristics:

- Indoor extension cord sets are intended for general household use.
- Outdoor extension cord sets generally are constructed with heavier-gauge wire and an insulating jacket to resist abrasion and chemicals.

CPSC staff found limited information about the market for extension cords and about producers and sellers. The National Electrical Manufacturers Association (NEMA) reports that, a substantial majority of products that would be subject to the draft proposed rule are imported, primarily from the People's Republic of China. The imports are enumerated under the International Trade Commission's Harmonized Tariff System of the U.S. (HTS) code 8544.42.9000, "insulated electric conductors, for a voltage not exceeding 1,000 volts, fitted with connectors, not elsewhere specified or included." The 2013 import value for this aggregate category was about $2.8 billion, comprising roughly 775,000 "entries" or shipments. These aggregate numbers overstate, by an unknown but substantial extent, the likely value and volume of extension cord imports.

[1] Extension Cords: Fire or Shock Incidents from 1980 to 2013, D. Miller, CPSC, 2014.
[2] Extension Cords: Information about the Product and Level of Conformance to UL Voluntary Standard, D. Ray, CPSC, 2014.

B. Industry & Small Business Overview

U.S. International Trade Commission (ITC) statistics indicate that about 11,000 companies are involved in import trade of products covered under an aggregate Harmonized Tariff System category (HTS code 8544.42.9000) that includes extension cords. The category includes imports of communications cables and many other electrical products and components, and counts shipping companies, as well as product sellers. An unknown percentage of these 11,000 firms import items that would be within the scope of the draft proposed rule on extension cords. The proportion may be small; however, even if only 10 percent were subject to the draft proposal, the number of firms would still be substantial at more than 1,000. The latest available (2011) Census of Manufactures data from the U.S. Department of Commerce indicates that there are about 400 domestic producers of miscellaneous electrical equipment, including flexible cord and cord sets (North American Industry Classification System (NAICS) code 335999). Based on contacts with industry representatives and a review of online listings, CPSC staff has identified four firms that manufacture consumer-market extension cords in the United States. Three of these four companies appear to be small businesses. Two of the three small firms are producers of vintage-style or specialty products that may not conform to UL 817.

The U.S. Small Business Administration's (SBA) size standards identify "small" businesses in terms of either employment or annual receipts, and vary by business sectors described in NAICS. The following categories of firms potentially subject to the draft proposed rule would be considered "small" under the SBA guidelines:

1. Merchant wholesalers (including importers) of durable goods (NAICS Subsector 423) with fewer than 100 employees;
2. Domestic manufacturers of miscellaneous electrical equipment and components (NAICS code 335999) with fewer than 500 employees (there may be only one in this category for household extension cords);
3. Retail stores (NAICS subsectors 443-453) with average annual receipts of less than $27-30 million (depending on subsector); and
4. Non-store retailers (*i.e.*, online or mail order, NAICS subsector 454) with average annual receipts of less than $30−30.5 million.

Some overlap is likely among the categories. The "merchant wholesalers" category represents most product importers. Many importers are wholesalers that market products only to retailers; however, many other importers are also retailers that market directly to consumers, often via the Internet. Thus, some firms in category 1 may identify as being within category 3 or 4, as well.

CPSC staff has identified about 20 to 25 leading importers and one large U.S. manufacturer of extension cords. Some of the leading importers are large general merchandise or building material retailers with their own branded cord sets. Of the largest 50 U.S. retailers,[3]

[3] *Global Powers of Retailing 2014,* Deloitte Touche Tohmatsu Ltd., 2014.

37 firms are also merchandise importers that may be subject to the draft proposed rule. Other firms among the top 20 to 25 importers are national brand owners that specialize in wire/cable and related electrical products; these firms are not as large as the major retailers, but would not be considered small under the SBA size standards. Most of the remaining firms are likely small businesses. The total number of small firms is unknown but may be in the hundreds, or even a thousand.

Manufacturers and importers of extension cords typically also market various kinds of electrical or other household products. CPSC staff has identified no companies that market only extension cords. Some smaller importers may not consistently market the same brands of cord sets or import from the same supply sources from year to year.

III. Small Business Impact

A proposed rule designating extension cords that do not conform to any one of the five specified provisions of UL 817 as SPHs will not likely have a significant impact on a substantial number of small businesses or other small entities. This conclusion is based on the following evidence:

- CPSC staff estimates that a very high percentage, probably in excess of 90 percent, of extension cords already conform to UL 817. CPSC staff's examination of products sold by physical and online retailers identified only two sellers of products that did not carry a certification mark or label from one of the three certifying organizations. Manufacturers, importers and retailers that market only conforming products would not experience any impacts under the draft proposed rule. Thus, a substantial majority of firms, including small firms, would be unaffected by the rule and experience zero economic impact.

- The few small importers that may market nonconforming cord sets appear to market other flexible cord or related products, as well. CPSC staff is aware of no firms whose revenues are solely dependent on extension cords. Small importers could either discontinue marketing non-conforming extension cords, or acquire conforming products. Conforming cord sets are readily available at similar prices, so small importers' incomes would not be significantly affected by the draft proposed rule if the firms chose to acquire conforming products. Product lines should not be significantly curtailed if the firms ceased marketing extension cords all together. It is unknown whether or how the two small, domestic manufacturers of cord sets that may not conform would be impacted by the draft proposed rule.

- The draft proposed rule represents a continuation of the existing practice of the CPSC's Office of Compliance and Field Operations to designate extension cords that use undersized wiring, have insufficient strain relief, or lack polarized plugs, electrical continuity, overcurrent protection, outlet covers, or cord jackets, as

SPHs. CPSC staff would continue to seek recalls or other enforcement actions for such products, regardless of the rule's existence.

Furthermore, in view of the substantial existing conformance and longstanding knowledge among companies about the UL 817 requirements, importers and manufacturers would likely have ample time and opportunity to acquire conforming products or components, if necessary, from their suppliers within normal business cycles before a final rule is promulgated. Therefore, the proposed effective date (30 days from the publication date of a final rule in the *Federal Register*) would not likely result in significant adverse impacts on importers and manufacturers or disruptions in the supply of conforming products.

For the foregoing reasons, the draft proposed rule on extension cords is not expected to have any significant economic effects. Thus, the Commission could certify that a proposed rule would not have a significant economic impact on a substantial number of small businesses.