

Title: NEON LIGHT ART (UL 2161)

Protocol No.: KOHL'S-315-H Tier 1/Tier 2/Tier 3

Test Property	Test Method	Samples	Test Principle / Requirements	Rating (Section or exec. Summary which failed items can be referenced)
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LABELING				
Labeling / Packaging Review	FPLA 16 CFR 500 & 19 CFR 134	All	Should be legibly marked with the following information: <ul style="list-style-type: none"> - Distributor's name, trademark or other means of identification of the manufacturer or packer & address (City, State & Zip) - Product identification - Net quantity of the contents in terms of weight, measure or numerical count (Metric & US Standard) or a combination so as to give accurate information and facilitate value comparison by the consumer - Country of origin (if imported) 	
Verify Label Claims	Visual Check	All	The labeling must comply and valid with all claims.	
Regulatory Listing Mark	Visual Check	1	Should have valid NRTL Listing mark , e.g. UL , ETL or equivalent	
Instructions	UL 2161 Sect. 49	1	Shall be provided with installation instructions, included in the smallest unit package.	
User Accessible Controls	UL 2161 Sect. 13	1	The operation of a user accessible control or adjustment shall be included in the installation and operating instructions.	
MARKINGS				
General	UL 2161 Sect. 45	1	<ul style="list-style-type: none"> - Unless otherwise indicated, markings shall be permanent. - No markings, ratings, information in the instructions, or any other accompanying information shall make reference to isolated, grounding or grounded, with respect to the output circuitry of a neon supply. 	

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Identification	UL 2161 Sect. 46	1	<ul style="list-style-type: none"> - A neon shall be marked where it is readily visible after intended mounting with : <ul style="list-style-type: none"> a) The manufacturer's name, trade name, or trademark; b) A distinctive catalog number or other marking method determined as equivalent; and c) The date or other dating period of manufacture not to exceed any three consecutive months. - When the product is produced or assembled at more than one factory, each neon supply shall have a distinctive marking to identify it as the product of a particular factory. - A neon supply shall be marked "Complies with Secondary Ground-Fault Protection Requirements in UL 2161" unless it is a cold-cathode supply without ground-fault protection. Such a supply shall be marked "This product is for use in cold-cathode lighting systems intended for installation in accordance with Article 410 of he NEC." 	
Ratings	UL 2161 Sect. 47	1	<ul style="list-style-type: none"> - A neon supply shall be marked with at least the following: <ul style="list-style-type: none"> a) the input ratings in voltage, amps, and frequency; b) The output rating(s) for maximum voltage in DC or RMS ; and c) The output rating(s) for maximum current. - When a neon supply is intended to operate only from a direct-current supply, it shall be marked "direct-current" or "DC". - A neon supply shall be marked to indicate its use location (indoor, outdoor, or both) and type designation - A neon supply intended to be connected to a circuit that complies with the NEC, ANSI/NFPA 70, requirements for Class 2 circuits shall be marked either "Connect ONLY to a Class 2 Transformer or power supply" or "Connect ONLY to a _Volt, Class 2 Transformer or Power Supply." - A ground-referenced neon supply shall have the ground referenced terminal or lead marked "RETURN" - An isolated output mid-point return neon supply shall have the return terminal or lead marked "RETURN." 	

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Cautionary Markings	UL 2161 Sect. 48	1	<p>A cautionary warning shall be prefixed by the word "CAUTION," "WARNING" OR "DANGER."</p> <p>There shall be a legible and durable marking for each user replaceable or serviceable fuse indicating the ampere rating and the voltage rating of the replacement fuse.</p> <p>A neon supply provided with an automatic reset type of secondary ground-fault protection that complies with the exception to Section 20.8 shall be marked with the word "Caution" and the following or equivalent: "This product is provided with an automatic reset device – disconnect power before servicing."</p>	
PHYSICAL CHARACTERISTICS				
Dimensions	FPLA/ UPLR	1	As Claimed/ measured (+3%/ - 0%)	
Weight	FPLA/ UPLR	1	As Claimed/ measured (+3%/ - 0%)	
CONSTRUCTION /WORKMANSHIP				
Workmanship	Visual Check	1	No major defects	
Enclosures	UL 2161 Sect. 7	1	<ol style="list-style-type: none"> 1. All insulated and uninsulated current- carrying parts other than supply and output leads or terminals and the center contact of electrode receptacles shall be enclosed in metal or polymeric material. 2. A metallic enclosure shall have a metal thickness that complies with Table 7.1 3. Except at the edge of cut ends and holes, the internal and external surfaces of an enclosure of iron or steel, other than stainless steel, or an internal surface covered with compound shall be corrosion resistant. 	
Accessibility Barriers	UL 2161 Sect. 8	1	All uninsulated or insulated current-carrying parts operating at a voltage greater than 30 volts RMS (42.4 volts peak) shall be protected against the risk of contact by an accessibility barrier during normal use, maintenance, or servicing.	
Openings and Open Holes	UL 2161 Sect. 9	1	<p>Open holes in an enclosure or accessibility barrier shall comply with the following:</p> <ol style="list-style-type: none"> a) The open holes shall not be larger than the dimensions specified in Table 9.1; b) The open holes shall not be located on a surface intended to face the material to which the neon supply is to be mounted; and c) The open holes comply with the accessibility requirements. 	

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Securement of Parts	UL 2161 Sect. 10	1	A neon supply shall be formed and assembled so that is has the strength and rigidity required to resist the abuses to which it is to be subjected, without increasing the risk of fire, electric shock, or injury to persons due to total or partial collapse which results in a reduction of spacings, loosening or displacement of parts, or other serious defects.	
Sharp Edges	UL 2161 Sect. 11	1	An edge, projection, or corner of a enclosure, frame, barrier, guard, or similar parts that are accessible to contact during and after installation or as part of user maintenance and servicing shall be smooth and rounded to reduce the risk of a cut-type injury when contacted during installation, intended use, or maintenance.	
User Accessible Controls	UL 2161 Sect. 13	1	A user accessible control or adjustment of a neon supply shall: a) Be accessible without removing the enclosure and b) Be located where uninsulated live parts are guarded by accessibility barriers.	
Supply Connections	UL 2161 Sect. 14	1	<ul style="list-style-type: none"> - A neon supply that is not provided with means for permanent connection to a source shall have either a connector and detachable power supply cord or non- detachable power supply cord. They shall be of the grounding (three-conductor) type. - A power supply cord shall be minimum No. 18 AWG and Type SP-2, Type SPE-2, Type SPT-2, or heavier usage. - A flexible supply cord shall be minimum 6 feet (1.83 m) and maximum 15 feet (4.57 m) length. - Strain and push-back relief shall be provided to reduce the risk of mechanical stress on the power supply cord from being transmitted to terminals, splices, or interior wiring. - An insulating bushing shall be provided at the point where a flexible supply cord passes through an opening in a metal enclosure or through a non-rounded opening of a polymeric enclosure. It shall be secured in place and have a smooth, rounded surface against which the cord bears. 	

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Equipment Grounding	UL 2161 Sect. 15	1	All conductive parts of a neon supply that: a) Are not intended to be electrically live; b) Are accessible to the accessibility probe in the Accessibility Barriers, Section 8; and c) Are capable of becoming energized Shall be grounded through a direct connection to equipment grounding or shall be bonded to a point on the neon supply that connects to equipment grounding.	
Equipment Grounding Means	UL 2161 Sect. 16	1	- A neon supply having parts that are required to be connected to equipment grounding or are required to provide a grounding connection when cord-connected shall be provided with the means to connect to that ground. The means shall be by terminal or lead. - For a neon supply that is required to be grounded, the grounding conductor of a flexible power supply cord shall be connected to the grounding blade of a grounding type attachment plug and shall be connected to dead-metal parts within the frame or enclosure of a neon supply by means such as welding, soldering, a screw or stud, nut, and lock washer.	
Bonding	UL 2161 Sect. 17	1	All parts required to be grounded shall be conductively connected to the grounding terminal, lead or pin of an attachment plug.	
Internal Wiring	UL 2161 Sect. 18	1	A conductor provided with insulation shall have insulation rated for the voltage, temperature, and condition of service to which it is subjected to under conditions of intended use. Conductors shall be securely routed at least 1 ¼ inch (6.35 mm) from, or protected to prevent contact with, any sharp edge, burr, fin, or similar abrading surface that is capable of damaging the conductor insulation.	
Internal Electrical Connections (Other than Output Circuitry)	UL 2161 Sect. 19	1	An electrical connection shall be electrically and mechanically secure.	
Spacing	UL 2161 Sect. 24	1	The minimum spacing between parts shall be as described in this section.	
Insulation	UL 2161 Sect. 25	1	An insulating material that is not an integral part of a separately investigated component shall comply with the requirements in Table 25.1	

PERFORMANCE

Functionality	Actual Use	All	Shall function as intended as received	
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Input Measurement	UL 2161 Sect. 27 (mod.)	1	The measured input current of a neon supply shall not exceed the rated input current by more than 5 percent when used with the neon lamp supplied	
Isolated Output Determination	UL 2161 Sect. 28	1	An isolated output neon supply shall have a current to ground that is 2 milliamps or less.	
Maximum Output Current	UL 2161 Sect. 29	1	The measured output current of a neon supply shall not exceed the rated output current by more than 110 percent when used with the neon lamp supplied	
Temperature Test	UL 2161 Sect. 30	1	A neon supply shall comply with temperature requirements specified in this section when used with the neon lamp supplied	
Dielectric Voltage-Withstand Test	UL 2161 Sect. 31	1	While still warm from the temperature test a neon supply shall withstand for one minute without breakdown the application of a 60Hz sinusoidal potential of 100V plus twice the maximum rated primary voltage (line-to-ground) applied between the primary-circuit and dead-metal parts	
Leakage Current Test	UL 2161 Sect. 32	1	A cord-connected neon supply shall not result in a leakage current in excess of 0.50 milliamp.	
Grounding Continuity Test	UL 2161 Sect. 34	1	The impedance within a grounding or bonding circuit between ground and any accessible point shall be 0.1 ohm or less	
Strain and Push-Back Relief Test	UL 2161 Sect. 35	1	<ul style="list-style-type: none"> - The power supply cord shall withstand for 1 minute, without transmitting stress to internal wiring connections, a force of 35 pounds (156 N) applied to the cord. - The power supply cord provided on a neon supply shall be held 1 inch (25.4 mm) from the point where the cord emerges from the neon supply. The cord shall then be pushed back toward where the cord emerges with a force of up to 6 pounds-force(26.7 N) until the cord buckles. Strain shall not be placed on wiring connections, and the cord shall not : <ul style="list-style-type: none"> a) Be subjected to temperatures or voltages above the specified rating; b) Come in contact with sharp edges or moving parts that can damage the cord insulation; and c) Displace parts resulting in a reduction of spacing. 	

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*Effects Of Extreme Temperature (Environmental)	Kohl's TM 30	1	Tier 1 : 24 Hours @ 30° F (1.1°C) and 24 Hours @ 100° F (37.7°C) - no failure. Tier 2 : 24 Hours @ 0° F (-18°C) and 24 Hours @ 120° F (49°C) - no failure. Tier 3 : 48 Hours @ 0° F (-18°C) and 48 Hours @ 120° F (49°C) - no failure.	
Effects of Humidity	Kohl's TM 31	1	No failure @ 95% RH @ 100° F (38° C) for below defined hours.	
ANALYTICAL				
*Lead In Scrapable Surface Coating	ASTM E1613/ E1645	1	≤90 ppm (0.009% by weight).	
Lead in PVC Power Cord (Test only if No Prop 65 Warning On Package)	EPA SW846 Method #3050	1 Sample	If ≥ 0.020%Pb by weight (200ppm), then the Cal Prop 65 warning should be present  WARNING: This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov	
* CA Prop 65	Refer to Protocol 1300	Alls	Alls shall be reviewed against the requirements of California Proposition 65 to determine if additional testing or labeling is required.	

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PRICING AND ADDITIONAL NOTE:

*: Additional Charge for This Test

**: It is suggested number of samples required for basic package testing only. It may vary depending on the actual samples and no. of tests that are required for testing. Please consult your nearest laboratory for details.

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Protocol Version	Description of Change	Revised by / Date	Approved by / Date
315 – 0	Initial Release	CY Chan Feb 10, 2004	Roger Mayerson Mar 08, 2004
315 – 1	Amend labeling section, to include acceptance of ETL certification and add standard revision no.	Simon Leung Feb 14, 2005	Roger Mayerson Feb 21, 2005
315-2	Updated Workmanship Review and the Prop 65 Warning Label. Price Adjustment.	Simon Leung Oct. 31, 2008	Ro Jain Oct. 31, 2008
315-3	Added Lead in Solder Test	Elizabeth Armstrong June 8, 2009	Ro Jain June 8, 2009
315-A	Changed protocol number from 315-3 to 315-A, price adjustment	Elizabeth Armstrong April 1, 2010	Ro Jain April 1, 2010
315-B	Separate the test line of Prop 65 to supplementary protocol	Winnie Yu Mar 18, 2013	Ro Jain April 15, 2013
315-C	Added tolerance requirements of dimensions and weight Differentiate the performance rating of below test items to Tier 1/Tier 2/Tier 3. Effects of Humidity Effects of Extreme Temperature Adjusted package price	Jeetendra Shelatkar Oct 4, 2013	Ro Jain Dec 16, 2013
315-D	Updated lead content pricing	Candy Chan Jul 30, 2014	Jeetendra Shelatkar Aug 4, 2014
315-E	Renamed all in-house methods	Candy Chan Sep. 4, 2014	Elaine Smaczniak October 30, 2014
315-F	Revised Item “*Lead In Scrapable Surface Coating” from “600ppm” to “90ppm”	Jerry Chen Mar 21, 2016	Jeetendra Shelatkar March 23, 2016
315-G	Updated Prop 65 Warning – New Verbiage	Elizabeth Armstrong June 26, 2018	Elizabeth Armstrong June 26, 2018
315-H	Updated instructions, user accessible controls, markings – general, identification, ratings, cautionary markings, enclosures, accessibility barriers, opening and open holes, securement of parts, sharp edges, user accessible controls, supply connections, equipment grounding, equipment grounding means, bonding, internal wiring, internal electrical connections (other than output circuitry), spacing, insulation, input measurement, isolated output determination, maximum output current, temperature test, dielectric voltage withstand test, leakage current test, grounding continuity test, an strain and push-back relief test	Charlene Swanson November 4, 2020	Charlene Swanson November 4, 2020

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