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EPL-UV-20W

Explosion Proof Black Light - 365nm UV cut off lens - Class 1 Division 1 - Class 2 Division 1

Product ID: 1983



Larson Electronics LLC manufactures a wide variety of products, including custom built to spec designs. The pictures displayed for this unit are a general representation of form factor for the product line and may not accurately represent this exact configuration in every detail due to custom builds and changes between similar products in our standard catalog. The specifics for this configuration are listed in the specification table and supporting documentation (CAD files, Dimensional Drawing, Name Plate Diagram, Wiring Diagram, etc.). This means that specific details (receptacles, plugs, wires, connections, mounting brackets, external finishes, etc.) may not be accurately represented in images vs specifications. Please review specifications and do not order based solely on images.

EPL-UV-20W

Lamp Type: HID Bulb
Dimensions: 11.5 "-L
Watts: 20
HID Life Expectancy: 2500 hours
Lumens: 1200 Without UV Lens
Lighting Configuration: HID Bulb/365Nm UV Lens
Materials: Aluminum Housing

Weight: 1.9lbs.

LUX: With Clear Lens :182,000

LUX: With UV Lens: 821
Charging Unit: 100/240VAC 50/60Hz w/overcharge protection, LED indicator

Lens Temp: 186 f

Head Temp: 90 f

Battery: 2600mAh Lithium Ion Battery

Run-Time: 90 Minutes

Approvals

Class 1, Division 1, Groups A, B, C, D
Class 1, Division 2, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class II, Division 2, Groups E, F, G
IP68 Waterproof to 3 Meters
T4A Temperature Rating

Hazardous Location Classifications

Special Orders - Special Requirements

Contact us for special requirements

Toll Free: 1-800-369-6671

Intl: 1-903-270-1187

E-mail: sales@larsonelectronics.com

Buy American Compliant

The Larson Electronics EPL-UV-20W Hazardous Location Approved UV flashlight has a Class 1 Division 1 Groups A-D approval and produces a beam in the ultra violet spectrum capable of reaching 35 feet in length and has a 90 minute run time on a single charge..

This UV HID flashlight features a 365 Nm UV cutoff lens, and a 90 minute run time

on a single charge of its waterproof 2600mAh Lithium Ion battery pack. A single 20 watt UV HID bulb powered by an internal ballast is combined with a 365 Nm UV cutoff lens to produce a UV beam capable of reaching 35 feet in length. This UV light produces 1.48 mW/cm squared, as measured 15 inches from the lens. This flashlight is IP68 rated waterproof, making it capable of withstanding submersion under pressure without damage. The durable aluminum body has a black anodized coating to provide durable protection for this units` internal electronics and an aesthetically pleasing appearance.

This HID flashlight includes a hard carrying case, waterproof battery and separate battery charging stand, AC charger (US/International compatible), and rubber lens/end cap protector. A clear lens is also included to allow this unit to be used as a normal flashlight. With the clear lens, this unit has a 1200 lumen output and produces a beam up to 2500 feet in length.



Certification Marks

Click Photo to Enlarge


Dark roadway with no illumination.

Click Photo to Enlarge

EPL-UV-20W with the clear lens.

Click Photo to Enlarge



Click Photo to Enlarge



The Battery can be removed from the flashlight and charged outside the hazardous area

Click Photo to Enlarge



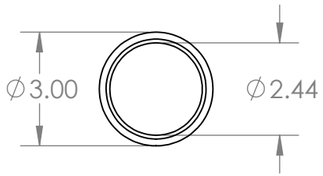
Click Photo to Enlarge

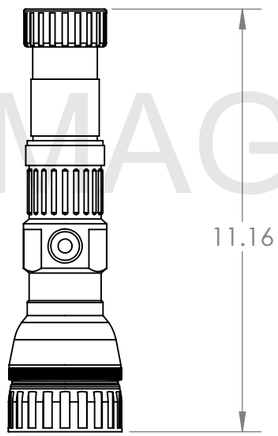
This flashlight is equipped with a UV 365nm cut off lens and is commonly called an explosion proof black light. This UV light produces 821 LUX at the lens and 1.48 mW/cm squared, as measured 15 inches from the lens. The design of this flashlight is ideal for specific types of inspection work within paint spray booths for the aerospace industry as well as specialized military and law enforcement applications.

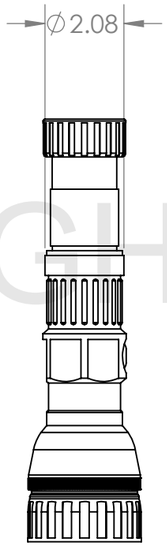
This hazardous location approved flashlight is UL:
Class 1, Division 1, Groups A, B, C, D
Class 1, Division 2, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class II, Division 2, Groups E, F, G

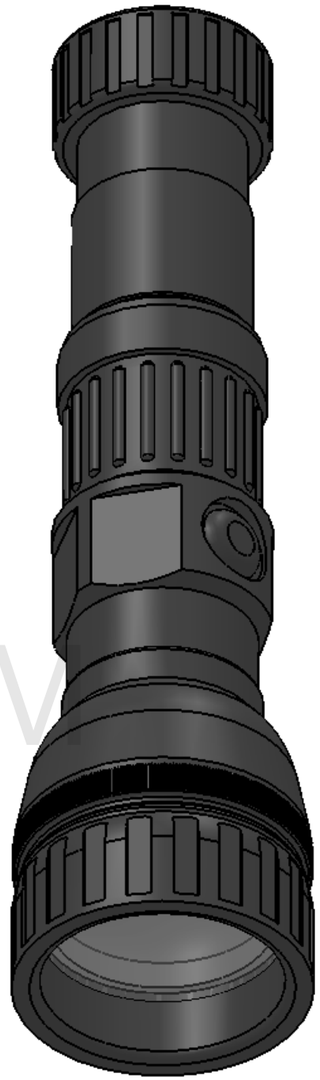
A brief note about High Intensity Discharge (HID) flashlights:

Incandescent flashlights have a bulb with a filament, much like the common household light bulb. A consistent amount of current is fed to the bulb. The filament glows and light and heat are produced. The filament glows because it is a poor conductor of electricity. Eventually the filament breaks due to vibration or diminished capacity. HID flashlights have a globe of gas that contains bounded by electrodes. A spark jumps across the electrodes igniting the gas. Initially, the amount of current required to ignite the gas is higher. Once the gas is lit, much less current is required to keep the gas burning.
A device called a ballast controls the amount of current sent to the bulb. HID flashlights use about 50% less energy than incandescent bulbs, which means longer battery life than halogen incandescent bulbs. More importantly, HID lights have no filament to break. Thus, the HID bulb life is around 2500 hours, compared to several hundred hours of the filament based incandescent bulb. The HID bulb is more efficient, so it produces much more light with less energy over a long period of time. The trade off, however, is that the ballast that sends current to the bulb is an expensive addition, increasing the cost of the flashlight. The bulb itself is also significantly more expensive than halogen bulbs.)









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PROPRIETARY AND CONFIDENTIAL

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NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±

DO NOT SCALE DRAWING
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL
FINISH

	NAME	DATE
DRAWN		
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

COMMENTS:

Magnalight.com

TITLE: EPL-UV-20

SHEET 1 OF 1

SIZE	DWG. NO.	REV
B		

SCALE: 1:4 WEIGHT:









Safety data sheet for product

1. PRODUCT AND COMPANY IDENTIFICATION

- Product name: Lithium ion rechargeable battery cell
- Product code: None
  (All models Sanyo manufactured and whose capacity is less than or equal to 5.4Ah, including the cell branded as Panasonic, excluding the cell whose shape is prismatic and two or more side of short / middle / long side excess 12mm/85mm/110mm.)
- Company name: Sanyo Electric Co., Ltd.
- Address: 222-1 , Kaminaizen, Sumoto City, Hyogo, Japan
- Telephone number: +81-799-24-4111
- Fax number: +81-799-23-2879
- Emergency telephone number: [Weekday] +81-799-23-3931 [Night and holiday] +81-799-24-4131

2. HAZARDS IDENTIFICATION

- Classification : Not Applicable

  For the battery cell, chemical materials are stored in a hermetically sealed metal or metal laminated plastic case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage.

  However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by miss-use, the gas release vent will be operated. The battery cell case will be breached at the extreme, hazardous materials may be released.

  Moreover, if heated strongly by the surrounding fire, acrid gas may be emitted.

- ***Most important hazard and effects***

  Human health effects:

  Inhalation: The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.
  Skin contact: The steam of the electrolyte stimulates a skin. The electrolyte skin contact causes a sore and stimulation on the skin.
  Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and stimulation on the eye. Especially, substance that causes a strong inflammation of the eyes is contained.

  Environmental effects: Since a battery cell remains in the environment, do not throw out it into the environment.

- Specific hazards:

  If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride.
  Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

3. COMPOSITION / INFORMATION ON INGREDIENTS

- Substance or preparation: Preparation
- Information about the chemical nature of product: *1

Portion	Material name	Concentration range (wt %)
Positive electrode	Lithium transition metal oxidate ($Li[M]_m[O]_n$ *2)	20~60
Positive electrode's base	Aluminum	1~10
Negative electrode	Carbon	10~30
Negative electrode's base	Copper	1~15
Electrolyte	Organic electrolyte principally involves ester carbonate	5~25
Outer case	Aluminum, iron, aluminum laminated plastic	1~30

**1 Not every product includes all of these materials.*
**2 The letter M means transition metal and candidates of M are Co, Mn, Ni and Al. One compound includes one or more of these metals and one product includes one or more of the compounds. The letter m and n means the number of atoms.*

4. FIRST-AID MEASURES

Spilled internal cell materials

- Inhalation:
  Make the victim blow his/her nose, gargle. Seek medical attention if necessary.
- Skin contact:
  Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.
- Eye contact:
  Do not rub one's eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

A battery cell and spilled internal cell materials

- Ingestion:
  Make the victim vomit. When it is impossible or the feeling is not well after vomiting, seek medical attention.

5. FIRE-FIGHTING MEASURE

- Suitable extinguishing media: Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.
- Specific hazards: Corrosive gas may be emitted during fire.
- Specific methods of fire-fighting: When the battery burns with other combustibles simultaneously, take fire-extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.
- Special protective equipment for firefighters:
  Respiratory protection: Respiratory equipment of a gas cylinder style or protection-against-dust mask
  Hand protection: Protective gloves
  Eye protection: Goggle or protective glasses designed to protect against liquid splashes
  Skin and body protection: Protective cloth

6. ACCIDENTAL RELEASE MEASURES

Spilled internal cell materials, such as electrolyte leaked from a battery cell, are carefully dealt with according to the followings.

- Precautions for human body:
  Remove spilled materials with protective equipment (protective glasses and protective gloves). Do not inhale the gas as much as possible. Moreover, avoid touching with as much as possible.
- Environmental precautions: Do not throw out into the environment.
- Method of cleaning up: The spilled solids are put into a container. The leaked place is wiped off with dry cloth.
- Prevention of secondary hazards: Avoid re-scattering. Do not bring the collected materials close to fire.

7. HANDLING AND STORAGE

- Handling suggestions
  - Do not connect the positive terminal to the negative terminal with electrical wire or chain.
  - Avoid polarity reverse connection when installing the battery to an instrument.
  - Do not wet the battery with water, seawater, drink or acid; or expose to strong oxidizer.
  - Do not damage or remove the external tube.
  - Keep the battery away from heat and fire.
  - Do not disassemble or reconstruct the battery; or solder the battery directly.
  - Do not give a mechanical shock or deform.
  - Do not use unauthorized charger or other charging method. Terminate charging when the charging process doesn't end within specified time.
- Storage
  - Do not store the battery with metalware, water, seawater, strong acid or strong oxidizer.
  - Make the charge amount 30~50% then store at room temperature or less (temperature= -20~35 degree C) in a dry (humidity: 45~85%) place. Avoid direct sunlight, high temperature, and high humidity.
  - Use insulative and adequately strong packaging material to prevent short circuit between positive and negative terminal when the packaging breaks during normal handling. Do not use conductive or easy to break packaging material.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

- Control parameters
  ACGIH has not been mentioned control parameter of electrolyte.
- Personal protective equipment
  Respiratory protection: Respirator with air cylinder, dust mask
  Hand protection: Protective gloves
  Eye protection: Goggle or protective glasses designed to protect against liquid splashes
  Skin and body protection: Working clothes with long sleeve and long trousers

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance
  Physical state: Solid
  Form: Cylindrical or Prismatic or Pouch (laminated)
  Color: Metallic color or black(without tube if it has tube)
  Odor: No odor

10. STABILITY AND REACTIVITY

- Stability: Stable under normal use
- Hazardous reactions occurring under specific conditions
  - Conditions to avoid: When a battery cell is exposed to an external short-circuit, crushes, deformation, high temperature above 100 degree C, it will be the cause of heat generation and ignition. Direct sunlight and high humidity.
  - Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.
  - Hazardous decomposition products: Acrid or harmful gas is emitted during fire.

11. TOXICOLOGICAL INFORMATION

Organic Electrolyte

- Acute toxicity:
  LD_{50}, oral - Rat 2,000mg/kg or more
- Irritating nature: Irritative to skin and eye

12. ECOLOGICAL INFORMATION

- Persistence/degradability:
  Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment.

13. DISPOSAL CONSIDERATIONS

- Recommended methods for safe and environmentally preferred disposal:

Product (waste from residues)

Specified collection or disposal of lithium ion battery is required by the law like as "battery control law" in several nations. Collection or recycle of the battery is mainly imposed on battery's manufacturer or importer in the nations recycle is required.

Contaminated packaging

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial wastes subject to special control.

14. TRANSPORT INFORMATION

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

UN regulation

- ***UN number: 3480 (3481 when the battery is contained in equipment or packed with equipment)***
- Proper shipping name:
  Lithium ion batteries (“lithium ion batteries contained in equipment” or “lithium ion batteries packed with equipment”)
- Class: 9 *
- Packing group: II *

** However this product is defined as above, it is **not** recognized as "DANGEROUS GOODS" or is treated as almost non-DANGEROUS GOODS when its transport condition accords with instructions or provisions depend on region and transportation mode.*

About the instructions or provisions, please see descriptions in box brackets of following regulations.

Regulation depends on region and transportation mode

- Worldwide, air transportation:
  IATA-DGR [As non-DANGEROUS GOODS: "packing instruction 965 section II" /
  Almost as above however displayed as DANGEROUS GOODS: "packing instruction 965 section IB"]
  (When batteries are packaged with equipments or contained in equipments, refer packing instruction 966 or 967 instead of 965.)
- Worldwide, sea transportation:
  IMO-IMDG Code [special provision 188]
- Europe, road transportation:
  ADR [special provision 188]

15. REGULATORY INFORMATION

- Regulations specifically applicable to the product:
  Wastes Disposal and Public Cleaning Law [Japan]
  Law for Promotion of Effective Utilization of resources [Japan]
  US Department of Transportation 49 Code of Federal Regulations [USA]

** About overlapping regulations, please refer to Section 14-TRANSPORT INFOMATION.*

16. OTHER INFORMATION

- ***This safety data sheet is offered an agency who handles this product to handle it safely.***
- The agency should utilize this safety data sheet effectively (put it up, educate person in charge) and take proper measures.
- ***The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.***
- This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

Reference

Dangerous Goods Regulations – 56th Edition Effective 1 January 2015: International Air Transport Association (IATA)
IMDG Code – 2014 Edition: International Maritime Organization (IMO)
The European Agreement concerning the International Carriage of Dangerous Goods by Road – 2015: The United Nations Economic Commission for Europe (UNECE)

First edition: Apr. 28, 2010
Prepared and approved by
Technical Administration Group
Portable Rechargeable Battery Business Division
Sanyo Electric Co., Ltd.

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CERTIFICATION TEST REPORT

CERTIFICATION TEST REPORT
17961-1
OF
ATX20 Series (ATX-20-S, EPL-UV-20W, EPL-UV-20W-G2)
and ATX25 Series (ATX-25-S)
TO
PERFORMANCE REQUIREMENTS OF UL-783
ELECTRIC FLASHLIGHTS IN HAZARDOUS LOCATIONS

CUSTOMER:

Larson Electronics

9419 East US HWY 175

Kemp, TX 75143 USA

MANUFACTURER OF TEST ARTICLE: Larson Electronics
9419 East US HWY 175
Kemp, TX 75143 USA
sales@larsonelectronics.com

DATE: MAY 20, 2008

REPORT NO.: 17961-1
IMANNA JOB NO.: 17961
CUSTOMER P.O. NO.: VERBAL
CONTRACT: N/A
PAGES IN REPORT: 8

STATE OF FLORIDA

ROBERT L. WHITE, being duly sworn, deposes and says: The information contained in this report is the result of complete and carefully conducted tests and is to the best of his knowledge true and correct in all respects.

Robert L White

SUBSCRIBED and sworn to before me this 23rd day of May, 2008

Marydel Kramer

MARYDEL KRAMER
Notary Public - State of Florida
My Commission Expires Jul 15, 2008
Commission # DD 338209
Bonded By National Notary Assn.

Imanna shall have no liability for damages of any kind to person or property, including special or consequential damages resulting from Imanna's providing the service covered by the report.

IMANNA LABORATORY, Inc.
TEST BY

Robert L. White
PROJ. MANAGER

1. TEST ARTICLE

Representative samples of two different size flashlight assemblies were received. One design operates with a 20 watt light source and the other with a 25 watt light source. The different lamp sizes require different size battery packs, making the 25 watt light a larger light in overall dimensions. The flashlights are designed with separate sections that thread together and are sealed at the threaded interface. One section is the battery section, another section is the electronics section, and the third section is the lamp source section.

Photographs of the lights are shown below.



Figure 1 View of the 20-wat and the 25-watt flashlights.

The lights are activated by a switch placed under a flexible rubber pad that is sealed to the housing body of the flashlight. The switch is a “push-to-ON” and “push-to-OFF” switch that is not exposed to the outside atmosphere due to the seal of the rubber pad over it.

The lamp lens is covered with a slip-over rubber ring that forms a cushion around the edge of the lamp lens assembly and protects the lens from high force impacts at the edge of the lens plate.

The opposite end of the flashlight is covered with a rubber boot that forms a bridge for the light is dropped on its side. The force would be absorbed by the front lens cover and the rear end cover instead of the metal body.

The primary body structure material of the light assembly is a metal cylinder made of Aluminum. O-Ring gaskets at each threaded interface joint seals the connection from water or air intrusion.

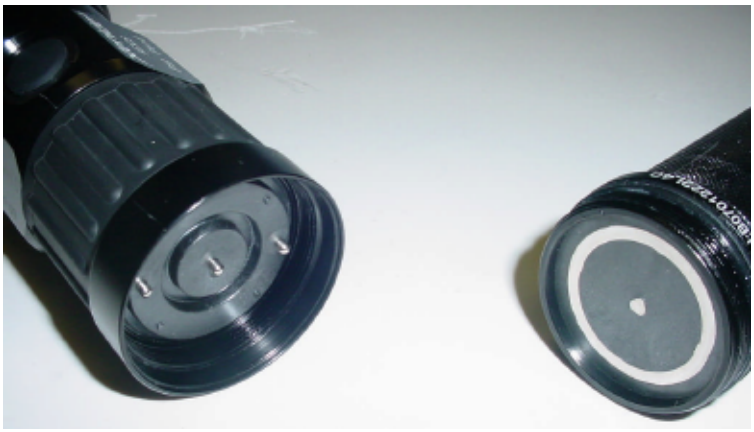


Figure 2 View of the threaded interface and the gasket O-Ring.

The battery connection is made with a continuous ring, a center contact and post pins so that once the contact is made, there is continuous contact of the terminals.

The light source is a Xenide® bulb that is threaded into the lamp housing. Electronics housed in the light case, activate the lamp and deactivate the lamp under severe shock impacts (lamp disconnect mechanism based on shock level) to prevent power to the bulb should internal fracture occur at the bulb. This design prevents overheating that could possibly exist if an open short occurred at the bulb location.

Each flashlight is provided with a serial number for the battery pack. The serial number is stamped on the battery section housing in White letters on the Black background. The battery pack is a rechargeable LI-ION battery. The contact for the charger connection is under the rubber cap at the end of the flashlight away from the bulb end, and is protected with a secondary rubber cover that remains on the battery pack after the end cap is removed for charger contact access.

2. PART NUMBER

Flashlight with the 20-watt lamp: ATX-20-S, EPL-UV-20W, EPL-UV-20W-G2
Flashlight with the 25-watt lamp: ATX-25-S

3. REQUIREMENTS

The flash light assemblies are to be tested to the performance test procedures contained in the UL 783, “Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations”. These requirements cover battery-operated flashlights and lanterns for use in hazardous locations, Class I, Division 1, Groups A, B, C and D; Class I, Division 2, Groups A, B, C, and D; Class II, Division 1, Groups F and G; and Class II, Division 2, Groups F and G as defined in the National Electric Code, NFPA 70. This Standard does not cover flashlights of the Explosion-proof type or of the Intrinsically Safe Type. The tests conducted are for flashlights intended for use in hazardous locations to verify the applicability of the design for future production.

4. PROCEDURE

The procedures used to accomplish the tests are specified in UL 783.

Upon receipt, the test article was inspected for damage and any obvious signs of noncompliance with the requirements of the UL 783 standard.

The flashlights were tested for the parameters listed in the UL 783 standard.

4. RESULTS

The results of the tests performed indicate that the ATX20 flashlights tested meet the performance requirements of UL 783 for all parameters with the exception of the Explosive Dust Combustion test. This test has not been conducted to date due to the difficulty of obtaining the explosive dust needed for the test.

The results of the tests performed indicate that the ATX25 flashlights tested meet the performance requirements of UL 783 for all parameters except for the maximum temperature rise and the Explosive Dust Combustion test. The 25 watt bulb generates sufficient heat to cause the surface temperature of the flashlight to exceed a 100°C upper limit at the lens directly above the lamp (actual temperature is 116°C). Additionally, the Explosive Dust test has not been conducted to date due to the difficulty of obtaining the explosive dust needed for the test.

4.1 Explosive Atmosphere

The 20-watt and the 25 watt flashlights contain the energy of induced ignitions of Propane, Acetylene, Ethylene, and Hydrogen mixed with air. Explosive mixtures of each gas in air were introduced into the flashlight at the bulb cavity and remotely ignited while

the flashlight was totally surrounded with an explosive mixture of the same gas in air. Two hundred (200) separate internal ignitions were performed for each gas. Some of the ignitions were weak and some were strong in their energy release as a result of varying the mixture from “lean” to “Optimum” to “rich” through the explosive mixture range, based on the conditions at the test site at the time of the tests. The majority of the explosions (100 minimum) were conducted at a mixture that gave the most severe ignition.

4.2 Construction – Enclosure

The enclosure shell is made of Aluminum. The lens is made of Lexan® Polycarbonate. An additional rubber ring is placed at the lens, midway the light (at the switch location), and at the battery end to absorb impact energy if dropped or mishandled.

4.3 Construction – Protection Against Corrosion

In addition to being made of Aluminum, the flashlight is Black hard anodized to further protect the unit from corrosion in harsh environments.

4.4 Construction – Cells and Batteries

The battery pack is placed in a separate cylinder that is threaded onto the flashlight bulb and electronics module. The batteries are held tightly in place in their compartment and take up the entire space of the battery module, leaving no open space for air or liquid. The battery packs are sealed devices. There is no path for short-circuiting of the batteries inside the flashlight as they are rigidly held in place inside the battery pack module. The open circuit voltage of the ATX20 or the ATX25 is a nominal 12 VDC. The lights have rechargeable batteries and may hold 12.8 VDC immediately after a full recharge. The battery packs in the flashlight are provided with short circuit protection preventing continued current flow under short circuit conditions. Short circuit protection is provided at the battery charger circuit to prevent current flow should the battery charger contacts be shorted.

4.5 Construction – Internal Conductors

Internal conductors are sized suitably for the current application of the flashlight. The electrical conductivity is carried though stainless steel pins that are approximately 1mm in diameter and are approximately 2mm long. The ampacity of the connection is higher than the 2 amps draw for the highest energy lamp.

4.6 Temperature rating

The flashlight was thermally soaked in a temperature chamber set for 40°C. After stabilizing at the set temperature, the flashlight was turned on and the temperature at the hottest spot on the flashlight (point immediately above the light source on the lens) was measured during normal operation of the flashlight. The maximum temperature on the 20-watt light was 97°C and for the 25-watt light the maximum temperature was 116°C. Both lights are given a T-rating of T4A (temperature below 120°C). NOTE: since the bulb is located inside a sealed compartment, the temperature on the exterior of the compartment was taken as the exposure temperature for the T-rating.

4.7 Drop Test – 3 feet

One sample of each of the flashlight designs (20-watt and 25-watt) was dropped from a height of 3 feet onto a smooth concrete floor. Six drops were conducted on each light using various impact positions on the flashlight. None of the drops caused a compromise in the integrity of the lamp envelope.

4.8 Drop Test – 30 feet

One light sample was dropped from a height of 5, 10, 15, 20, 25, and 30 feet on a smooth concrete floor such that the light impacted on the lens (the worst case position). The lens did not break, and the light functioned after reestablishing the lamp disconnect mechanism contacts through switch positioning. One sample was used for each drop height.

4.9 Dust-Tight Enclosure Test (Atomized water spray)

The enclosure was sprayed with atomized water by using a nozzle that produces a round pattern that is 3-4 inches in diameter when measured 12 inches from the nozzle tip. The air pressure for the suction feed was adjusted to 30 PSI and the suction height of the water was set to 6 inches. Based on the length of the longest light (14 inches) the lights were sprayed with water at a rate of 3 GPH for a period of 5 minutes using a total of more than 6 fluid ounces for the test (actual consumption was approximately 33 fluid ounces). The spray was directed at all point on the light enclosure. There was no sign of water ingress to the enclosure following the test period. The test results indicate that the enclosure can be considered to be dust tight.

4.10 Dust-Tight Enclosure (Additional Test per customer request)

An additional test, similar to the Dust-Tight Test) was conducted on the light assembly. The light was placed under a 15" head of water with the water held at +50°C for 15 minutes. During this test, the internal temperature of the light is escalated causing an internal pressure. If there are leaks in the enclosure, air bubbles will form and escape from the enclosure during the test. No bubbles were seen coming from the enclosure during the submergence test. Additionally, the light was placed under a 15-foot head of water (6.4 PSI) for a period of 15 minutes. Following the submerged pressure test, there was no sign of water ingress to the enclosure.

4.11 Impact Test

Two samples of the flashlight design were impacted by a falling weight with a 1-inch diameter steel ball face. The impact dart was dropped onto the lens of the light from a height of 6 inches. No fracture of the lens was noted after the impacts and no compromise to the enclosure was detected on the lights tested. Each light was impacted only once for the test.

4.12 Thermal Endurance to Heat

One flashlight was subjected to 28 days of thermal conditioning at a condition of 80°C and 95% RH. Following the exposure, the light was inspected for deterioration and any compromise in the enclosure. No degradation effects were observed on the tested light.

4.13 Thermal Endurance to Cold

One flashlight was subjected to 24 hours of cold storage in a chamber held at a temperature of -40°C. Following the exposure none of the plastics parts showed any signs of deterioration and the light functioned properly. No compromise to the enclosure was observed as a result of the cold storage.

5. OBSERVATIONS AND COMMENTS

The results presented herein apply only to the test specimen as prepared and as tested. All equipment used in the performance of these tests was calibrated to standards traceable to the N.I.S.T.

INSTRUMENTATION EQUIPMENT SHEET

Date: Jan 7, 2008 **Job No.:** 17961 **Customer:** Larson Electronics

Technician: Connell **Test Area:** Explosion Test Cell

Test Item: Flashlight

INSTRUMENT	MFG	MODEL	RANGE	ACCURACY	CAL DATE	CAL DUE
Hydrocarbon Analyzer	Summit Industries	703D2	0 to 10%	0.1%	Each Use	Each Use
Temperature Indicator / Controller	Omega Eng'ring	i-Series	Multi	0.03%	10-10-07	10-10-08
RH Indicator	Omega Eng'ring	RH70	0 to 100%	0.1%	11-26-07	11-26-08
Digital Multimeter	Fluke	12 S/N: 81240025	Multi	0.2%	1-20-07	1-20-08

Instrumentation Information Verified by: 

Frequently Asked Questions (FAQ)