

**MODEL 2460 / 3660
FOR USE
IN
HAZARDOUS (CLASSIFIED) LOCATIONS**

from

**Pelican Products
23215 Early Avenue
Torrance, CA, 90505**

I INTRODUCTION

- 1.1** Pelican Products requested an re-examination of the apparatus listed in Section 1.5.1 for compliance with the following standards as Non-incendive for use in Class I, Division 2, Groups A, B, C, and D; Temperature Class T4A, Tamb = -20°C to +40°C; Suitable for use in Class II and III, Division 2, Groups F and G; Temperature Class T4A, Tamb = -20°C to +40°C.
- 1.2** Pelican Products requested a re-examination of the apparatus listed in Section 1.5.2 for compliance with the following Canadian standards as Non-incendive for use in Class I, Division 2, Groups A, B, C, and D; Temperature Class T4A, Tamb = -20°C to +40°C; Suitable for use in Class II and III, Division 2, Groups F and G; Temperature Class T4A, Tamb = -20°C to +40°C.
- 1.3** This report supplements FM Approval Report J.I. 3023989 and 3023990 and any subsequent revision reports.

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1.4 Standards

1.4.1 FM Approvals

| Title | Class No. | Issue Date |
|--|------------------|-------------------|
| Electrical Equipment for use in Hazardous (Classified) Locations | 3600 | 1998 |
| Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Division 1 and 2, Hazardous (Classified) Locations | 3611 | 2004 |
| Electrical Flashlights and Lanterns for Use in Class I, II, and III, Division 2 Hazardous Locations | 3613 | 2006 |

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1.4.2 Canadian

| Title | Class No. | Issue Date |
|--|-----------------------|------------|
| Non-incendive Electrical Equipment for use in Hazardous Locations | CAN/CSA C22.2 No. 213 | 1999 |
| Enclosures for use in Class II, Groups E, F & G for use in Hazardous Locations | CAN/CSA C22.2 No. 25 | 2000 |
| Canadian Electrical Code, Part 1 | C22.1 | 2009 |

1.5 Listings – Listings are revised as indicated below to reflect:

- The addition of battery pack # 2479
- Changes to the lamp module identifier
- Changes in the convention for identifying the applicable types of protection

Changes are identified by striking through deleted text and underscoring new text.

1.5.1 U.S. Listing - The products will appear in the Approval Guide, an online resource of FM Approvals, as follows;

2460 StealthLite Recoil LED Rechargeable Sealed Handheld Flashlight.

NI / I / 2 / ABCD / T4A; Ta = -20°C to +40°C; S / II, III / 2 / FG / T4A Ta = -20°C to +40°C

Special Conditions of Use:

1. When used with NiMH battery pack Cat # 2469 or 2479 and Lamp Module Cat # 2414C.

3660 Little Ed LED Rechargeable Sealed Handheld Flashlight.

NI / I / 2 / ABCD / T4A; Ta = -20°C to +40°C; S / II, III / 2 / FG / T4A Ta = -20°C to +40°C

Special Conditions of Use:

1. When used with NiMH battery pack Cat # 2469 or 2479 and Lamp Module Cat # 2414C.

1.5.2 Canadian Listing - The products will appear in the Approval Guide, an online resource of FM Approvals, as follows;

2460 StealthLite Recoil LED Rechargeable Sealed Handheld Flashlight.

IPA / I / 2 / ABCD / T4A; Ta = -20°C to +40°C; DIP / II, III / 2 / FG / T4A Ta = -20°C to +40°C

Special Conditions of Use:

1. When used with NiMH battery pack Cat # 2469 or 2479 and Lamp Module Cat # 2414C.

3660 Little Ed LED Rechargeable Sealed Handheld Flashlight.

IPA / I / 2 / ABCD / T4A; Ta = -20°C to +40°C; DIP / II, III / 2 / FG / T4A Ta = -20°C to +40°C

Special Conditions of Use:

1. When used with NiMH battery pack Cat # 2469 or 2479 and Lamp Module Cat # 2414C.

II DESCRIPTION

Models 2460 and 3660 are identical in body style to the models 2460 and 3660 approved under projects 3023989 and 3023990 respectively in accordance with FM Approvals Class Standards

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3613 and 3611. These flashlights are sealed for underwater usage and contain a vent for pressure relief. The flashlight bodies are ABS molded with either an ABS shroud or a polyurethane photoluminescent shroud. The new lamp, tested and approved under this project (3042056), is a 1W LED manufactured by Luxeon Emitter as p/n LXHL-PW01. The lamp assembly containing the LED is manufactured by Carley for Pelican products. The lamp is identified by Pelican Products as p/n 2413-359-000 and Cat. #2414C. The lamp is activated by a switch.

The Models 2460 and 3660 are powered by a NiMH battery pack designated as p/n 2453-302-004, Cat. #2469. The battery pack is manufactured by Harding Energy as p/n AASPLCN04. The battery consists of 4 cells, p/n HS-AA1650, and a polyswitch for current limitation. The polyswitch is PTC Devices p/n TAC210. An alternate NiMH battery pack was tested and approved under this project (3042056) having a p/n of 2463-302-004, Cat. #2479. The battery pack is manufactured by Harding Energy as p/n AASPCAN04 consisting of 4 cells, p/n HS-AA1500. The battery pack also contains a polyswitch for current limiting with p/n VTP-210 (RAYCHEM) or VTD-210SF (KUNSHAN).

The 2460 flashlights are marked with the Pelican Products name for the North American market and with the Peli Products name for the European market. Peli Products is owned by Pelican Products and was established solely for the purpose of distributing the flashlights in Europe. The Model 3660 does not have a Peli brand version.

III EXAMINATION AND TESTS

- 3.1 General** - Approval of the updates to Models 2460 and 3660 is based on testing conducted under previous projects listed in section 1.3 and the tests conducted under this project (3042056). The examination included a spark-ignition test, overcharging test, temperature test, and drop test as well as a review of the manufacturer's documentation. All data is on file at FM Approvals along with other documents and correspondence applicable to this program.
- 3.2 Non-incendive / Ignition Protection / Class I, Division 2 Examination** - Equipment acceptability for use in a Class I, Division 2 hazardous location for the US and Canada is based on the inability of the apparatus to release sufficient electrical or thermal energy under normal operating conditions to cause ignition of specified hazardous atmospheres. The following is a summary of testing conducted under this project and those listed in 1.3 and verifies acceptability of the Models 2460 and 3660 flashlights for use in a Class I, Division 2 hazardous location.
- 3.2.1 Enclosure Pressure Testing** - Testing that was conducted on Model 2450 under project I.D. 3002388 satisfies the enclosure pressure testing for Models 2460 and 3660 in accordance with FM Approvals class standard 3613. Pressure testing was conducted on a series of six samples of the 2450 to determine the maximum internal pressure prior to venting. Testing was conducted on fully assembled samples void of batteries and yielded a maximum venting pressure of 3.0 psi. Based on these test results, the maximum allowable vent pressure of 3.0 psi is marked on assembly drawings 2460-016-CLR for Model 2460 and 3660-016-CLR for Model 3660.
- 3.2.2 Make/Break Evaluation** - Spark ignition testing was conducted using a 21% hydrogen-in-air mixture pressurized to 1.1 times the maximum venting pressure. A series of six spark ignition tests were conducted using fully charged battery packs. Results were satisfactory and are acceptable for both the US and Canada in that there was no ignition of group A, B test gas.

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- 3.2.3 Overcharge Testing of Rechargeable Cells** - One sample of the Harding AASPCAN04 battery pack was subjected to 3.0A across the charging terminals. The polyswitch opened when a temperature of 42.1°C was obtained. Results were satisfactory and are acceptable in that there was no degradation of the battery's insulation or deformation of the cells.
- 3.2.4 Drop Test** - One fully assembled sample of each Model 2460 and 3660 with the ABS shroud was preconditioned to -30°C. The sample was then dropped from a height of 1m onto a concrete surface. For the first five drops the sample was allowed to drop freely from a horizontal position. For the remaining five drops the angle of the sample was varied so as to impact various points. The test was also conducted under projects 3023989 for the Model 2460 and 3023990 for Model 3660 with the same photo luminescent polyurethane shroud installed and the sample preconditioned to -30°C. The results are acceptable for the US and Canada in that there was no ejection of the batteries and no cracking, breaking or damage to the enclosure that would affect safety or the enclosure's ability to exclude dust.
- 3.2.5 Enclosure requirements; Class I, II, III** - The flashlights enclosures were examined for protection required for class I, II, III, Division 2 for US and Canada. Impact testing on the lens, mold stress relief testing and dust exclusion testing were conducted on Models 2400 and 2450 respectively under project J.I. 0D2A8.AX and I.D. 3002388 is applicable to the 2460 and 3660. Dust exclusion testing was also conducted under project I.D. 3023990 and is applicable to the Model 3660.

IV MARKING

The marking is molded in and meets standard requirements for the US and Canada as illustrated by the attached label drawing.

V REMARKS

- 5.1** Only the specific batteries and lamps tested shall be used with this apparatus. The batteries are to be installed according to the manufacturer's instructions.
- 5.2** Batteries shall not be charged in a hazardous location.
- 5.3** The flashlight is not to be opened in a hazardous area.
- 5.4** Tampering or replacement with non-factory components may adversely affect the safe use of the apparatus.

VI FACILITIES AND PROCEDURES AUDIT

The manufacturing site in Torrance, CA is subject to follow up audit inspections. The facilities and quality control procedures in place have been found to be satisfactory to manufacture product identical to that tested and Approved. A Form 797 shall be submitted to FM Approvals for requesting any additional manufacturing facilities which are not listed below.

Pelican Products

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23215 Early Avenue
Torrance, CA, 90505

VII MANUFACTURER'S RESPONSIBILITIES

Documentation that is applicable to this approval is on file at FM Approvals and listed in the Documentation File, Section VIII, of this report. No changes of any nature shall be made unless notice of the proposed change has been given and written authorization obtained from FM Approvals. The Approved Product - Revision Report, FM Approvals Form 797, shall be forwarded to FM Approvals as notice of proposed changes.

VIII DOCUMENTATION

The following documentation is applicable to this Approval and is on file at FM Approvals under Blue Print File J.I. 3023989.

| <u>Drawing No.</u> | <u>Rev.</u> | <u>Drawing Title</u> |
|--------------------|-------------|---|
| 2003-343-000 | B | Valve, PUV |
| 2003-942-CLR | C | CAP, PUV |
| 2401-911C-CLR | D | CAM Stealthlite Switch |
| 2401-911L-CLR | E | Lever Stealthlite Switch |
| 2403-323-000 | A | O'ring |
| 2403-349-000 | C | 2400 Spring, Switch |
| 2413-359-000 | B | LED Module 2414C |
| 2456-621-110 | E | 2450 Contact Module Rechargeable Assembly |
| 2460-002 | A | 2460 Approval |
| 2460-016-CLR | A | Pelican 2460 Stealthlite LED Rechargeable Light Assembly |
| 2461-943-CLR | A | Body, Pelican 2460 Rechargeable |
| 2461-943-CLRE | A | Body, Peli 2460 Rechargeable |
| 2463-302-004 | B | CAT #2479 NIMH Battery Pack Zone 1 |
| 3660-016-CLR | A | Pelican 3660 Little ED LED Rechargeable Light Assembly |
| 3662-941-CLR | A | Body, 3660 Rechargeable |
| 3663-366-110 | B | 3660 Little Ed LED Rechargeable Pelican Logo Decal |

IX CONCLUSION

The apparatus described in Section I meets FM Approvals requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this report.

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EXAMINATION AND TESTS BY: D. Caissy – FM Approvals

PROJECT DATA RECORD 3042056 (Filed With 3023989, 3023990)

ATTACHMENTS: Drawing 2460-002 Rev. A

| REVISIONS | | ECO # | DATE | DRFTR | APPRVD |
|-----------|-----------------|--------|-----------|-------|--------|
| REV. | DESCRIPTION | | | | |
| A | DRAWING RELEASE | 5-0837 | 7/29/2010 | TT | GK |

ACTUAL SIZE

INSCRIBE INSERT PART# AND REVISION AS SHOWN

WEEE SYMBOL 5mmX5mm MIN.

APPROVAL DRAWING

| | | | | |
|---|---------------|---|-----------|---------|
| | TITLE | | APPROVALS | DATE |
| | 2460 APPROVAL | | DRAWN | TT |
| | | | CHECK | 7/29/10 |
| | | | APPR | |
| This Drawing contains information proprietary to Pelican Products Inc. Any reproduction, disclosure or use of this drawing requires the written permission of Pelican Products Inc. | | PELICAN PRODUCTS INC. 22215 EARLY AVE, TORRANCE, CA 90505 (310) 326-4700 | | |
| DO NOT SCALE DRAWING | | TOLERANCES DECIMAL ANG .01 .005 .005 1/4 SIZE MATERIAL DRAWG # REV A SH1 1 OF 1 SCALE 1:1 2460-002 A | | |

6 PRODUCT SHALL BE RoHS COMPLIANT

5 FM-LETTERS ARE 2.0 MM HIGH & RAISED BY 0.5 MM MIN.

3 INSCRIBE INSERT PART# AND REVISION IN BACK OF INSERT FOR MOLDING REFERENCE

2 EMBOSS LETTERS 0.015 MAX. HEIGHT, 0.010 MIN.

1 DO NOT CHANGE WITHOUT FM APPROVAL.

NOTES UNLESS OTHERWISE SPECIFIED

WRITTEN BY:

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REVIEWED BY:

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