# ATEX DIRECTIVE 2014/34/EU

## EQUIPMENT MARKING OF PELI 3315Z0 LIGHT

A CE mark (ATEX marking)

Explosion protection marking (ATEX marking)

CE 1725 Ex

II 1G Ex ia IIC T4 Ga
II 1D Ex ia IIIC T130ºC Da
TRAC13ATEX0009X

APPROVED FOR USE WITH THREE SIZE "AA" ALKALINE CELLS (DURACELL MN1500, PANASONIC AM-3PA/4B, OR SANYO SEC-AC4AA) WARNING: DO NOT REPLACE BATTERIES WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT. DO NOT MIX CELLS FROM OTHER MANUFACTURERS. REPLACE ALL CELLS AT THE SAME TIME. RISK OF IGNITION-DO NOT OPEN IN HAZARDOUS AREA. SUBSTITUTIONS OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY. PELI™, TORRANCE, CA, USA

B Ex marking for explosive Gas atmospheres
C Ex marking for explosive Dust atmospheres
D EC/EU type examination certificate number
E General safety advises for safe use of the product

The ATEX markings in this document are just for illustration purpose only

PELI™


A

CE 1725 Ex

## ATEX MARKING FOR MINING

**I M1 Ex ia I Ma**

| MINING<br>I M1 Ex ia I Ma | | |
|---|---|---|
| Equipment Group | I | Approved for Mining |
| Equipment Category and Environment | MI | 2 Levels of protection / 2 independant faults |
| | MII | 1 Level of protection / based on normal operation |
| Specific marking | Ex | Explosion protection |
| Type of protection | ia/ib | Intrinsic safety level of the device in Zone 0/1 |
| Gas group (divided by explosive potential) | I | Methane |
| Temperature Class | | n/a |
| Equipment Protection Level | Ma/Mb | High, safe with 2 faults / high, safe with 1 fault |

## B ATEX MARKING FOR GAS

**II 1G Ex ia IIC T4 Ga**

| GAS<br>II 1G Ex ia IIC T4 Ga | |
|---|---|
| I | Approved for mining |
| II | No mining |
| 1G | Category 1, use in Zone 0/1/2 |
| 2G | Category 2, use in Zone 1/2 |
| 3G | Category 3, use in Zone 2 |
| Ex | Explosion protection |
| ia/ib/ic | Intrinsic safety level of the device in Zone 0/1/2 |
| IIA | i.e. Propane |
| IIB | i.e. Ethylene |
| IIC | i.e. Hydrogen |
| T1/T2/T3 | Maximum surface temperature of 450°C / 300°C / 200°C |
| T4/T5/T6 | Maximum surface temperature of 135°C / 100°C / 85°C |
| Ga/Gb/Gc | Rare failures / predictable failures / regular use |

## C ATEX MARKING FOR DUST

**II 1D Ex ia IIIC T130ºC Da**

| DUST<br>II 1D Ex ia IIIC T130ºC Da | |
|---|---|
| I | Approved for mining |
| II | No mining |
| 1D | Category 1, use in Zone 20/21/22 |
| 2D | Category 2, use in Zone 21/22 |
| 3D | Category 3, use in Zone 22 |
| Ex | Explosion protection |
| ia/ib/ic | Intrinsic safety level of the device in Zone 20/21/22 |
| IIIA | i.e. Flammable fibres |
| IIIB | i.e. Non conductive dust |
| IIIC | i.e. Conductive dust |
| T | Maximum surface temperature level is to be indicated |
| Da/Db/Dc | Rare failures / predictable failures / regular use |

## D EC/EU TYPE EXAMINIATION CERTIFICATE NUMBER

Ex **TRAC 13 ATEX 0009 X**

- TRAC: Notified body responsible for EC/EU-Type Examination (Test House)
- 13: Year Certificate Issued
- ATEX: ATEX Certificate
- 0009: Serial Number
- X: Certificate Number Suffix

**X** Suffix denotes special conditions of certification – refer to certificate. **U** Suffix denotes Ex component approval.

## E ATEX COMPLIANT BATTERIES

Hazardous location safety approvals for explosive areas, also affect the batteries that run the equipment. Different batteries might perform differently, so the ATEX certificate might be different as the tests deliver a different result (i.e. on Temperature Rating).

Therefore, it is very important to ONLY use batteries that have performed the tests to obtain the ATEX certificate.

The use of any other batteries invalidate the Ex Certificate.

| BATTERY TYPE AA | TEMPERATURE CLASS |
|---|---|
| Panasonic LR44 | T4 |
| Energizer LR44 | T6 |
| Duracell LR44 | T6 |

i.e. Approved batteries for Peli L1 1930 LED Zone 0 light

## IP RATING CHART

**IP 6 7**
Ingress Protection

IP ("Ingress Protection") ratings are defined in international standard EN 60529 and rate the degree of protection provided by electrical enclosures against intrusion from solids and liquids (objects, particles, dust, water, etc.). The higher the value of each digit, the greater the protection.

| SOLIDS | DEFINITION |
|---|---|
| 0 | No Protection against contact and ingress of objects |
| 1 | Protected against solid objects greater than 50mm in size, like a hand |
| 2 | Protected against solid objects greater than 12.5 mm in size, like a finger |
| 3 | Protected against solid objects greater than 2.5 mm in size like a screwdriver |
| 4 | Protected against solid objects greater than 1 mm in size, like a thick wire |
| 5 | Dust protected. Limited ingress of dust permitted. Will not interfere with operation of the equipment |
| 6 | Dust tight. No ingress of dust |

| LIQUIDS | DEFINITION |
|---|---|
| 0 | No Protection |
| 1 | Protected against water drops |
| 2 | Protected against water drops at a 15 degree angle |
| 3 | Protected against water spray at 60 degree angle |
| 4 | Protected against water splashing from any angle |
| 5 | Protected against water jets from any angle |
| 6 | Protected against powerful jets of water |
| 7 | Watertight against the effects of temporary submersion in water. Test requires 30 minutes at 1 meter depth |
| 8 | Watertight against the effects of continuous submersion in water (up to 4 hours) |

## ATEX ZONES AND CATEGORIES CLASSIFICATION

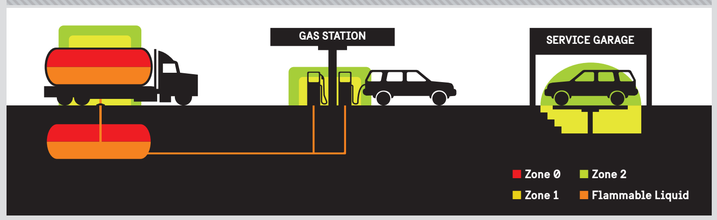
**Potentially hazardous locations are divided into Zones:**
- 0, 1, 2 for Gas, Vapor, Mist
- 20, 21, 22 for Dust

Torches approved for usage in these zones are divided in Categories (1, 2, 3).

| PRODUCT | Category 1 | Category 2 | Category 3 |
|---|---|---|---|
| USER ZONE | Zone 0 / 20 | Zone 1 / 21 | Zone 2 / 22 |
| Zone Criteria | Where an explosive atmosphere is continuously present, or present for long periods of time. ( > 1000 h./year) Still safe with two faults. | Where an explosive atmosphere is likely to occur in normal operation. (Between 10 > 1000 h./year) Increased safety under abnormal operating conditions. | Where an explosive atmosphere is not likely to occur in normal operation and if it does occur it will exist only for a short period of time. (< 10 h./ year) Equipment which is appropriate under normal conditions. |
| Hazard | Certain to occur | Likely to occur | Not likely to occur |
| Approved categories | 1G<br>1D | 1G / 2G<br>1D / 2D | 1G / 2G / 3G<br>1D / 2D / 3D |

Above criteria is only a rough guidance. A local, authorised supervisor should decide the ATEX Category for each Zone after strict evaluation and should decide which safety equipment is required.

## GAS ENVIRONMENT




## GAS

### GAS GROUP

Gases are divided into two groups based on the LEL and UEL values.

**Ex II 1G ia IIC T4 Ga** Typical Equipment Marking for Gas Atmospheres

| INDUSTRY | GAS GROUP | SUBSTANCE | MIE MINIMUM IGNITION ENERGY | SELECTION OF EQUIPMENT |
|---|---|---|---|---|
| Mining industry Group I | I | Methane | 200 µJ | For mines susceptible to methane. |
| Surface industry Groupe II | IIA | Propane | 180 µJ and higher | For atmospheres containing propane/ butane/ oil/ ammonia or gases of an equivalent hazard. |
| | IIB | Ethylene | 60 µJ - 180 µJ | For atmospheres containing ethylene/ ether or gases of an equivalent hazard. |
| | IIC | Hydrogen | 20 µJ - 60 µJ | For atmospheres containing hydrogen/ acetylene or gases of an equivalent hazard. |

### TEMPERATURE CLASS

- The Auto-Ignition Temperature is the temperature, in ºC, at which a gas will ignite spontaneously without another source of ignition.
- Because there is NO correlation between Ignition Energy and Ignition Temperature for the gas groupings, a temperature code was established:
- The Temperature Class is based on use in an ambient temperature of -20/+40ºC (no need to be shown). If the ambient temperature differs from that range, it needs to be shown.

**Ex II 1G ia IIC T4 Ga**

| TEMPERATURE CLASS | IGNITION TEMPERATURE | EXAMPLES |
|---|---|---|
| T1 | ≥ 450ºC | Propane, Lighting gas, Hydrogend |
| T2 | ≥ 300ºC | Ethyl alcohol, Ethylene, Acetylene |
| T3 | ≥ 200ºC | Fuel |
| T4 | ≥ 135ºC | Acetaldehyde, Ethylether |
| T5 | ≥ 100ºC | Hydroxylamine |
| T6 | ≥ 85ºC | Carbon disulfide |

## DUST

### DUST GROUP

Dust areas are defined as group III and refers to equipment intended for use in spaces with an explosive dust atmosphere other than mines susceptible to firedamp.

**Ex II 1 D ia IIIC T130º C Da**

Typical Equipment Marking for Gas Atmospheres

| DUST GROUP | SUBSTANCE | SELECTION OF EQUIPMENT | EXAMPLES |
|---|---|---|---|
| IIIA | Flammable fibers > 0,5mm | Explosive surface > 1000 hrs/yr | Wood shaving |
| IIIB | Non-conductive dust with electrical resistivity > 103 Ω2m | Explosive surface between 10 and 1000 hrs/yr | Saw dust, flour |
| IIIC | Conductive dust with electrical resistivity ≤ 103 Ω2m | Explosive surface between 10 and 10 hrs/yr | Metal dust |

### MAXIMUM SURFACE TEMPERATURE

Group III electrical equipment is marked with a temperature with 'T' prefix detailing the actual maximum temperature that may be found on any surface accessible by a potentially explosive dust atmosphere. Ignition temperature of a specific dust hazard must be higher than maximum surface temperature displayed on electrical equipment.

### IGNITION TEMPERATURES FOR COMMON COMBUSTIBLE DUSTS

| DUST TYPE | DUST GROUP | DUST LAYER (5MM) MINIMUM IGNITION TEMPERATURE (°C) | DUST CLOUD MINIMUM IGNITION TEMPERATURE (°C) |
|---|---|---|---|
| Aluminium | IIIC | 450 | 560 |
| Blasting Dust (Paint Shreds) | IIIB | 270 | 390 |
| Coal | IIIB | 380 | 560 |
| Flour (Wheat) | IIIB | 450 | 430 |
| Grain | IIIA | 290 | 490 |
| Iron Powder | IIIC | 450 | 520 |
| Paper Fibre | IIIA | 335 | 470 |
| PVC | IIIB | 440 | 680 |
| Resin (Epoxy) | IIIB | 240 | 532 |
| Rubber | IIIB | 450 | 470 |
| Soot | IIIB | 450 | 720 |
| Starch (Maize) | IIIB | 490 | 430 |
| Sugar | IIIB | 460 | 360 |
| Wood (Flour) | IIIB | 305 | 470 |

## US UL FM VERSUS EUROPEAN CE Ex CLASSIFICATION

**HAZARDOUS AREA ELECTRICAL GUIDELINES**

| | SUBSTANCE | TYPICAL ENVIRONMENTS | US CLASSIFICATIONS | EUROPEAN CLASSIFICATION | VOLATILITY* |
|---|---|---|---|---|---|
| CLASS I | **Flammable Gasses, Vapors or Liquids** (Acetylene, Hydrogen, Ethylene, Propane) | Oil Refinery<br>Paint Warehouse<br>Offshore Oil Rig<br>Spray Booth | **Division 1** (Hazard Likely) | **Category 1 / Zone 0** (Hazard Certain) | MOST |
| | | | | **Category 2 / Zone 1** (Hazard Likely) | |
| | | | **Division 2** (Hazard Not Likely) | **Category 3 / Zone 2** (Hazard Not Likely) | |
| CLASS II | **Combustible Dusts** (Metals [Div.1 only], Coal, Grain) | Coal Mine<br>Grain Silo<br>Munitions Factory<br>Hay Storage Facility | **Division 1** (Hazard Likely) | **Category 1 / Zone 20** (Hazard Certain) | |
| | | | | **Category 2 / Zone 21** (Hazard Likely) | |
| | | | **Division 2** (Hazard Not Likely) | **Category 3 / Zone 22** (Hazard Not Likely) | |
| CLASS III | **Ignitable Fibers & Flyings** (Machined Magnesium) | Paper Mill<br>Woodworking Facility<br>Textile Mill<br>Cotton Gin | **Division 1** (Hazard Likely) | N/A | |
| | | | **Division 2** (Hazard Not Likely) | N/A | LEAST |

* A torch certified to Category 1 (Zone 0) is safe for use in areas rated Category 2 (Zone 1) and Category 3 (Zone 2). Conversely the opposite is not possible. This information should be taken only as a guideline. Contact us for specific details on both, US and European Directives.

## DIRECTIVE 2014/34/EU


The ATEX Directive is a Directive adopted by the EU for products intended for use in Potentially Explosive Atmospheres. ATEX Directive 1994/9/EC became mandatory for manufacturers and end users on the 1st of July 2003. The new Directive, 2014/34/EU, was released on the 26th of February 2014 and has been applicable since the 20th of April 2016.

The ATEX Directive 2014/34/EU regulates that manufacturers are forced to supply properly certified electrical equipment to be used in potentially explosive areas. From the workers side there is another ATEX Directive (1999/92/EC) that regulates the requirements for improving the safety and health protection of workers, of the potential risk from explosive atmospheres. Both Directives are mandatory.

These Directives state that each area needs to be classified according to the potential hazardous risk so that only appropriate certified equipment can be used there. With the old CENELEC (previous Directive), different areas were divided into three classifications: Zone 2, Zone 1, and Zone 0 depending on the level of risk. With the ATEX Directive, every Zone is associated to a Category, and every electrical equipment is classified according to these categories, certifying in which areas it can be safely used.

Under the reviewed ATEX Directive for Zone 0 & 1 areas, the standard EN 60079-0:2012 came into effect in April 2015. The most significant change was the need to mould in anti-static material or apply anti-static coating to the products in order to successfully pass the strict ATEX test.