



OVERVIEW and TRAINING for L91/L92 INTRINSIC SAFETY CERTIFICATION

Contents

GENERAL BACKGROUND.....	1
DETAILS OF ENERGIZER CERTIFICATIONS FOR L91/L92.....	3
PLACING ORDERS FOR PRODUCT	4
HANDLING OF ORDERS AND PRODUCT	4
ADDITIONAL INFORMATION FOR DESIGN/PRODUCTION.....	5

GENERAL BACKGROUND

Energizer Ultimate Lithium AA and AAA batteries have been tested and approved for intrinsically safe applications for the specified hazardous locations listed in tables 6 and 7 below.

Intrinsically safe is a type of protection based on the restriction of electrical energy within equipment and of interconnecting wiring exposed to the explosive atmosphere to a level below that which can cause ignition by either sparking or heating effects.

Requirements for North America certification and ATEX certification differ slightly due to the U.S. National electrical Code and the Canadian Electrical Code requirements. Additionally, ATEX has a requirement for quality assessment of the manufacturer, installation, inspection and maintenance of intrinsically safe products.

Selling product into this market requires OEM and Industrial Sales teams to first fill out and submit the [Critical Applications Form](#) to the Director of Technology within Product Technical Support for approval prior to completion of the sale.

ATEX refers to two separate, but related, European Union (EU) Directives

- 1) 94/9/EC The “Equipment” Directive – Concerned with the manufacturer and sale of intrinsically safe equipment. Testing based on IEC 60079 series.
- 2) 1999/92/ED The “Use” Directive – Concerned with classification of hazardous areas and the correct selection, installation, inspection and maintenance of the intrinsically safe equipment. This Directive requires the ongoing quality audit of the manufacturing site(s).

The following tables outline and compare the codes for intrinsically safe labeling for North America and ATEX.

Table 1 Overall comparison of hazardous location terminology

Definitions for North America		Definitions for ATEX	
Class I, II, III	gas, dust, fiber	Class I, II, III	gas, dust, fiber
Division 1 or 2	always hazardous or sometimes hazardous	Zone 0,1,2	conditions always exist, likely to exist, or not likely
Group A, B, C,D,E,F,G	Specific material (methane, metallic dust, etc.)	Groups I, IIC, IIB	Specific material (methane, metallic dust, etc.)

Table 2 Definitions for Area Classifications

Area Classifications (same for North America and ATEX)
Class I - flammable gases, vapors or liquids
Class II - combustible dust
Class III - ignitable fibers

Table 3 Comparing definitions for Divisions and Zones

Division System (North America)	Zone System (ATEX)
Division 1 - ignitable concentrations, existing under normal operating conditions or may exist frequently due to repair/maintenance	Zone 0 (ia)- ignitable concentrations present continuously or present for long periods of time
	Zone 1 (ib)- ignitable concentrations likely to exist or may exist frequently
Division 2 - volatile conditions exist under abnormal operation or adjacent to a division 1 location	Zone 2 (ic) - ignitable concentrations are not likely to occur under normal operating procedures
* If your product passes testing for Division 1, it is ok for Zone 0 and 1 locations.	
However if your product passes Zone 1 testing, it is not suitable for Division 1 locations.	

Table 4 Comparing definitions for Division/Zone and Group

Division System (North America)	Zone System (ATEX)
Class I - Group A - Acetylene	IIC Acetylene, hydrogen or gas vapors having MESG < 0.5 mm or MIC ratio < 0.45
Class I - Group B - Gases or vapors having MESG < 0.45 mm or MIC ratio < 0.40	
Class I - Group C - Gases or vapors having 0.45 mm < MESG < 0.75 mm or 0.40 < MIC ratio < 0.80	IIB ethylene, acetaldehyde or gas vapors having 0.50 mm < MESG < 0.90 mm or 0.45 < MIC ratio < 0.80
Class I - Group D gases or vapors having 0.75 mm < MESG or 0.80 < MIC	IIA acetone, ammonia, ethyl, alcohol, or having 0.90 mm < MESG or 0.80 < MIC ratio
Class II - Group E metal dusts	None
Class II - Group F combustible carbonaceous dusts (coal)	
Class II - Group G all other dusts (grain, wood, etc.)	
Class III - no divided groups	None

Table 5: Comparing Temperature Codes

Temperature code (North America)	Temperature code (ATEX)
T1 <450 C	T1 < 450 C
T2 <300 C	T2 < 300 C
T2A,B,C,D <280 C, <260 C, <230 C, <215 C	
T3 <200 C	T3 < 200 C
T3 A,B,C <180 C, <165 C, <160 C	
T4 <135 C	T4 < 135 C
T4A <120 C	
T5 <100 C	T5 < 100 C
T6 <85 C	T6 < 85 C
* T5 and T6 are optional markings. If a product does not reach over 100C it does not have to be marked.	

DETAILS OF ENERGIZER CERTIFICATIONS FOR L91/L92

Certifications

Energizer Ultimate Lithium AA and AAA batteries have two certifications for intrinsically safe locations. These certifications are:

- 1) SGS certificate number USTC/14/FAI/00929 for North American applications.
 - a. Standards tested were UL 913 7th edition and CAN/CSA C22.2 No. 157-92
- 2) ATEX Ex ia IIC Ga Baseefa 14ATEX0107U for all locations outside of North America.
 - a. Standards tested were IEC 60079-0 and 60079-11.

Testing

The following tests were run per the applicable requirements in the standards referenced above:

- 1) Spark ignition test (using a 1.5 safety factor using additional cells)
- 2) Short circuit (for determining maximum surface temperature)

Table 6 Intrinsically safe hazardous location certification approval for North America*

Product types	AA and AAA primary batteries
Product description	The battery cells are AA and AAA Energizer Lithium Ultimate types
Model numbers	L91 and L92
Electrical ratings	AAA, 1.5V, 1250 mAh AA, 1.5V, 2900 mAh
Standards tested	<ol style="list-style-type: none"> 1. UL 913 7th Edition Dated 7/31/06 Rev. 9/23/11 2. CAN/CSA- C22.2 No. 157-92 (R2012) +Upd1 +Upd2
Hazardous location	<ol style="list-style-type: none"> 3. 1-2 AA cells in series or in parallel: Class1, Division 1, Groups A-D, T4, -40C to +60C 4. 1-2 AAA cells in series or in parallel: Class1, Division 1, Groups A-D, T4, -40C to +60C 5. 3-4 AA cells in series or in parallel: Class1, Division 1, Groups C and D, T4, -40C to +60C 6. 3-4 AAA cells in series or in parallel: Class1, Division 1, Groups C and D, T4, -40C to +60C

*U.S. and Canada Reference Identifier on product: Exi

*For serial numbers refer to MMY code laser etched on the label and production day on can of battery under label.

Table 7 Intrinsically safe hazardous location certification approval for ATEX*

Product types	AA and AAA primary batteries
Product description	The battery cells are AA and AAA Energizer Lithium Ultimate types
Model numbers	L91 and L92
Electrical ratings	AAA, 1.5V, 1250 mAh, internal resistance 55 mΩ AA, 1.5V, 2900 mAh, internal resistance 55 mΩ
Standards tested	1. EN 60079-0:2012 2. EN 60079-11:2012
Hazardous location	3. 1-2 AA cells in series or in parallel: Group IIC, T4, -40C to +60C 4. 1-2 AAA cells in series or in parallel: Group IIC, T4, -40C to +60C

*ATEX Reference Identifier on product: Ex ia IIC Ga Baseefa 14ATEX0107U  II 1 G 1180

*For serial numbers refer to MMY code laser etched on the label and production day on can of battery under label.

PLACING SALES ORDERS FOR PRODUCT

FORMS

A Product information Form (PIF), Go To Market form (GTM) and Product Authorization Form (PAF) have been created to create new Master Data Governance (MDG) code. These forms detail the specific shipping requirements for Intrinsically Safe orders.

MDG CODE

Use the following MDG codes when ordering intrinsically safe products. It is very important all IS orders are placed under this MDG to ensure we adhere to strict requirements of the certification.

Battery Model	MDG Code
L91	ENR ULT L91VP.OS B1 D24 V1240H39680 US
L92	ENR ULT L92VP.OS B1 D17 V2350H75200 US

HANDLING OF ORDERS AND PRODUCT

PRODUCT MARKING AND PACKAGING

- The artwork for the OEM label used for all customers contains the approved markings (regardless of intended use).
- Markings are on OEM labels only and not on after-market/blister pack product.
- There are no intrinsically safe markings on the packaging itself.
- Packaging is the same as standard OEM volume pack with the exception of the attachment or inclusion of required User Instructions and Declaration of Conformity.

PRODUCT ORDERS AND TRACKING

- Customers with questions or applications regarding intrinsically safe use should be referred to Carin Stuart, Sr. Technology, Engineer PTS, to ensure that the battery is certified for the intended customer application and that we have proper logging and accounting of these customers
- Orders intended for this use should use the intrinsically safe MDG Code noted above to ensure that proper documentation is provided with the shipment and that customer tracking can be done in the event a recall is needed.
 - The following document must be attached to the smallest unit of every shipment intended for Intrinsically Safe applications. The bill of materials for the pack code for IS product will instruct production to attach this document.
 - [User instructions](#) – available on energizer.com (includes user instructions and Declaration of Conformity)
 - It is necessary to be able to obtain records of customers who ordered product for intrinsic safety use, including customer name, delivery dates, quantities and information that can be used to trace back packaging or raw cell manufacturing dates.

DOCUMENTATION FOR CUSTOMERS

- ENR Datasheets for L91 and L92 on energizer.com have been updated to show this certification
- User Instructions are available on-line (see above)

ADDITIONAL INFORMATION FOR DESIGN/PRODUCTION

ATEX “AUTHORIZED PERSON”

- ATEX requires defining an “Authorized Person” with respect to intrinsic safety who is accountable for ensuring the product continues to meet all applicable standards and is recommended for use appropriately.
- [PI-QM.01.01](#) clearly spells out responsibilities
- Carin Stuart is the Global “Authorized Person” is responsible for coordinating global activities related to this certification. She also represents the “Authorized Person” and coordinator for Westlake, as the design facility
- A local contact in Singapore (Quality Engineer) is also assigned to coordinate activities at the plant and ensure quality and manufacturing systems comply with all requirements. This person is the liaison with the Global ATEX Person (Carin) and is also likely to be the contact for audits in Singapore

ENERGIZER INTERNAL DOCUMENTS

- [PI-QM.01.01](#) ***ATEX ADDENDUM TO QUALITY MANUAL***
 - To ensure compliance with the IECEx standard, document PI-QM.01.01 has been developed as an addendum to our existing quality system. This document is referenced by the WL Quality Manual and SG Quality Manual and ISO documents
 - Energizer is responsible for complying with and auditing against this IEC standard and “ATEX addendum”
- [MI 53.03](#): ***ATEX “schedule document”***
 - Describes the critical characteristics that can impact product safety as agreed to with Baseefa.
 - Changes to parameters on these documents require notification and/or approval of Baseefa
- [MI 53.04](#) ***SGS –North America and /UL documents***

- Lists construction features that appear on the UL document (MH29980), which is the document SGS refers to in their certification. This document was copied into the MI system to ensure it was easily available to all.
- Changes to parameters on these documents require notification and/or approval of SGS (and UL)
- [Form ATEX iacI](#)
 - Internal audit checklist for Singapore and Westlake
- **Other document markings**
 - Bills of Material (MI 53.01) include a note to refer to MI 53.03 and MI 53.04 before changing any items or materials
 - The PEC tester setting spec contains a note indicating that 10kHz lower spec limit cannot be changed without approvals by Baseefa
 - Singapore ISO procedures are updated to reference PI-QM.01.01

PRODUCT MARKING

- The artwork for the label used for all OEM customers will contain the approved markings (regardless of intended use). Thus, ATEX requirements (such as 10kHz testing) must be met for any product bearing an OEM label.
- The label is applied only after the cell has passed 10kHz impedance testing per MI 53.03
- The BOM of the new MDG code for intrinsically safe product will trigger production to attach the appropriate documentation after labeling and boxing.

PRODUCT REQUIREMENTS

- All Factory Product L91 and L92- are considered certified regardless of intended customer
- Critical characteristics of the product are noted in MI 53.03 for Baseefa/ATEX and MI 53.04 for SGS for North America. Changes to these documents or the items within them require notification and/or approval of the noted certifying body.
- Two main things are important for intrinsic safety:
 - Control of surface temperature when the cell is shorted (controlled by separator properties)
 - Internal resistance of the cell (controlled by many things, but 100% inspected at the finishing line to meet a specified criteria)
- Critical Raw Materials
 - Separator is considered a critical raw material relative to ATEX so incoming inspection plans must be followed as defined in MI 54.07
 - Separator data/quality must be reviewed at the QSTM
- Product Testing
 - The 10kHz Impedance test and associated tester verification checks have been added to the Test and Label quality plans to comply with MI 53.03. For simplicity, testing is conducted on all product, regardless of label or pack type.
 - Dummy cells with impedance below the minimum value of 55kHz have been provided for verifying the tester ejects properly. These cells must be followed in the calibration system. Records of this check must be maintained 10 yrs.
 - If the tester verification test using impedance dummy cells fails, a deviation form must be issued. If ATEX product was produced in the shift prior to when the failure was detected, product must be contained. If containment is not possible, notify QAD and ATEX authorized person; a recall may be needed.
- Artwork showing the application of the mark
 - MI 53.03 also shows images of the label artwork. These images do not need to be changed for BIUB changes, but significant changes to the artwork should be

reviewed with the ATEX authorized person to determine if we need to obtain approvals and update MI 53.03.

- A separate logbook for ATEX shipments will be maintained at the labeling line.

ADDITIONAL QUALITY SYSTEM REQUIREMENTS

- Quality systems must comply with IEC 80079-4 (see ATEX addendum [PI-QM.01.01](#))
- Audits
 - [Internal audits](#) are required against the IEC standard for explosive atmospheres 80079-34
 - 3rd party audits will be conducted for both North America and ATEX certifications. For Singapore, these audits are every 18 months; for Westlake, these audits are every 12 months
- Management Reviews
 - The QSTM and Management Review following the QSTM will be used to satisfy the ATEX Management Review requirements for both Westlake and Singapore. These reviews must include ATEX related items and attendees. [See PI 03.04.02](#)
 - The agenda for the QST includes review of internal and external ATEX audits, review of separator properties and review of 10KHz testing effectiveness.
- Documents and records
 - Most critical records are maintained by Westlake on the Product Safety and Standards SharePoint site (restricted access). However, Singapore must also maintain their own records of local activities and audit communications.
 - All records related to Intrinsically Safe certifications (such as certificates and audit reports) must be maintained for 10 years after the last product is made (consider this to be indefinitely).
 - Other records related to certified product must be maintained for 10 years. This would include finishing data and checklists and information related to incoming separator (testing, CofAs)
- Change Management
 - The TCA and RSC forms have been updated to trigger approvals by the ATEX Global Authorized Person if needed (such as for design or material changes). This refers to Carin and not the local Singapore contact.
 - When there are questions regarding “does this change affect ATEX product”, the answer is YES for anything impacting **L91 and L92**.
 - For TCA’s,
 - if the change is design or testing related and is expected to impact product that could potentially be used to fill ATEX orders, Carin Stuart should also be added as an approver. It is important we have records that the ATEX Authorized Person reviews all concessions.
 - if product is restricted from OEM, Carin’s approval is not needed. If it later needs to be released to OEM, email approval can be obtained and attached to the TCA

Does the change impact product certified as ATEX intrinsically safe (such as the L91 or L92)? If "Yes", options are: 1) Restrict product from all OEM orders 2) Restrict product from ATEX orders 3) Obtain and/or attach approval from authorized Global ATEX liaison Note the chosen option in the Comments	<input checked="" type="radio"/> Yes <input type="radio"/> No	note which option chosen here
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- **For RSC’s**

- Changes to design or testing require Carin's approval
- Changes to the ATEX addendum requires Carin's approval

IS THIS AN ATEX CERTIFIED PRODUCT?

IF YES, SEE BELOW FOR REQUIRED APPROVALS

Yes No N/A

- **For design/material projects:** The Global ATEX Authorized person (Carin Stuart) must be invited to or provide consultation for all gate reviews of product or material changes.