



# Cells and Batteries marking requirements

Ni-Cd; Ni-MH; Li-Ion

# Marking requirements

- Battery manufacturers have to follow requirements for marking described inside standards:

Standard	Technology	Scope	Voluntary/ Mandatory
<u>MAIN STANDARDS</u>			
❖ IEC 61951-1	Ni-Cd	International	<i>Mandatory</i>
❖ IEC 61951-2	Ni-MH	International	<i>Mandatory</i>
❖ NF EN 61960 / IEC 61960	Li-Ion	International	<i>Mandatory</i>
<u>COMPLEMENTARY STANDARDS</u>			
❖ European directive : 2006/66/CE	All	Europe	<i>Mandatory</i>
❖ IEC 62133	All	International	<i>Voluntary</i>
❖ IEC 60598-2-22 (ELU)	Ni-Cd & Ni-MH	International	<i>Mandatory</i>
❖ IATA UN 3480	Li-Ion	International	<i>Mandatory</i>
❖ UL 2054	All	North America	<i>Voluntary</i>
❖ Saudi Arabia: GTS-PM-KSA-CGV-0237	All	Saudi arabia	<i>Mandatory</i>

# Ni-Cd

## IEC 61951-1

- Each jacketed cell supplied without connections shall carry durable markings giving the following minimum information:
  - ❖ Sealed, rechargeable nickel-cadmium or Ni-Cd;
  - ❖ Cell designation as specified in IEC (in addition, it is permissible for a manufacturer to use his own type designation);
  - ❖ Rated capacity;
  - ❖ Nominal voltage;
  - ❖ Recommended charge rate and time or permanent charge current for “T” cells;
  - ❖ Polarity;
  - ❖ Date of manufacture (which may be in code);
  - ❖ Name or identification of manufacturer or supplier;
  - ❖ Mark for promoting useful use of cell resources.  
NOTE This mark is applied where a recycling program is available.

In general, sealed nickel-cadmium rechargeable single cells with connection tabs need no labels if they form an integral part of a battery, in which case, **the battery itself is marked with the above information.**

# Ni-MH

## IEC 61951-2

- Each jacketed cell supplied without connections shall carry durable markings giving the following minimum information:
  - ❖ Sealed, rechargeable nickel-metal hydride or Ni-MH;
  - ❖ Cell designation as specified in IEC (in addition, it is permissible for a manufacturer to use his own type designation);
  - ❖ Rated capacity;
  - ❖ Nominal voltage;
  - ❖ Recommended charge rate and time or permanent charge current for “T” cells;
  - ❖ Polarity;
  - ❖ Date of manufacture (which may be in code);
  - ❖ Name or identification of manufacturer or supplier;

In general, sealed nickel-metal hydride rechargeable single cells with connection tabs need no labels if they form an integral part of a battery, in which case, **the battery itself is marked with the above information.**

# Li-Ion

## NF EN 61960

- Each battery shall be legibly and permanently marked with:
  - ❖ Rechargeable Li or Li-ion;
  - ❖ Battery description compliant to the description of the standard (refer to paragraph 5.1 of the NF EN 61960 for details):  
Example: N1 A1 A2 A3 N2 / N3 / N4 – N5 => 5 ICR 19/66-2 (5 cells in series, 2 parallels, Li-Ion, positive electrode with cobalt, cylindrical, 18650 type)
  - ❖ Polarity;
  - ❖ Manufacturing date or date code
  - ❖ Name or identification of the manufacturer.
  - ❖ Rated capacity;
  - ❖ Nominal voltage.

# COMPLEMENTARY STANDARDS

- Main standards have to be respected.
- Complementary standards are for specific markets or applications:

Like for :

- ❖ ELU application,
  - ❖ safety standards,
  - ❖ Li-Ion air transportation,
  - ❖ European market,
  - ❖ American market,
  - ❖ Saudi Arabia market ...
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- ❖ Markings are in addition to those required inside the previous slides.

# Ni-Cd, Ni-MH and Li-Ion

## Europe: European Directive n° 2006/66/CE (06th September 2006)

### ➤ Member States shall ensure that:

- ❖ All batteries, accumulators and battery packs are appropriately marked with the **trash symbol**.

This symbol shall cover at least **3 % of the area** of the largest side of the battery, accumulator or battery pack, up to a maximum size of 5 × 5 cm. In the case of cylindrical cells, the symbol shall cover at least **1,5 %** of the surface area of the battery or accumulator and shall have a maximum size of 5 × 5 cm.

Where the size of the battery, accumulator or battery pack is such that the symbol would be smaller than 0,5 × 0,5 cm, the battery, accumulator or battery pack need not be marked but a symbol measuring at least 1 × 1 cm shall be printed on the packaging.



- ❖ The capacity of all portable and automotive batteries and accumulators is indicated on them in a visible, legible and indelible form. Inscription have to be minimum 1 x 5 mm (H x L) for cells and batteries with biggest area < 70 cm<sup>2</sup> otherwise 2 x 5 mm.
- ❖ Specificity for Ni-Cd: Batteries, accumulators containing more than 0,002 % cadmium, shall be marked with the chemical symbol Cd. This symbol shall be printed beneath the Trash symbol and shall cover an area of at least onequarter the size of that symbol.

NOTE: Symbols shall be printed visibly, legibly and indelibly

# Ni-Cd, Ni-MH and Li-Ion IEC 62133

- Voluntary but mandatory for some markets like medical
- Cells shall be marked as specified in the following applicable cell standards:
  - ❖ IEC 61951-1, IEC 61951-2 or IEC 61960.
- Batteries shall also be marked with an appropriate caution statement.
- The following information shall be marked on or supplied with the battery:
  - ❖ storage and disposal instructions
  - ❖ recommended charging instructions.



# Ni-Cd, Ni-MH

## ELU => IEC 60598-2-22 ed 4

- Self-contained emergency luminaires shall be clearly marked with the details of correct battery replacement including the:
  - ❖ battery technology (e.g. NiMH),
  - ❖ rated voltage,
  - ❖ capacity,
  - ❖ temperature rating,
  - ❖ temperature classification “example: T classification => « +5<T<+40°C »
  - ❖ charge regime.
  - ❖ Space for commissioning date

## Li-Ion

# International transport regulation - IATA Dangerous Goods Regulations

- UN3480:
  - ❖ Batteries must be marked with the Wh rating on the outside case

# Ni-Cd, Ni-MH, Li-Ion

## North America: UL 2054

- A battery shall be legibly and permanently marked with:
  - ❖ The manufacturer's name, trade name, or trademark or other descriptive marking by which the organization responsible for the product may be identified;
  - ❖ A distinctive ("catalog" or "model") number or the equivalent;
  - ❖ The electrical rating;
  - ❖ The date or other dating period of manufacture not exceeding any three consecutive months.
- Exception No. 1: The manufacturer's identification may be in a traceable code if the product is identified by the brand or trademark owned by a private labeler.
- Exception No. 2: The date of manufacture may be abbreviated; or may be in a nationally accepted conventional code or in a code affirmed by the manufacturer, provided that the code:
  - a) Does not repeat in less than 10 years for a household product and less than 20 years for a commercial product, and
  - b) Does not require reference to the production records of the manufacturer to determine when the product was manufactured.
- A battery or the smallest unit package or instructions provided with each battery shall include the following statements or equivalent:
  - ❖ An attention word, such as "Caution," "Warning," or "Danger."
  - ❖ A brief description of possible hazards associated with mishandling of the battery, such as burn hazard, fire hazard, explosion hazard.
  - ❖ A list of actions to take to avoid possible hazards, such as do not crush, disassemble, dispose of in fire, or similar actions.
- The manufacturer's specified charging instructions shall be included.
- A cell or battery that is less than 32 mm (1.25 inches) in diameter by 3.8 mm (0.15 in) thick shall include the following marking or equivalent on the smallest unit package or instructions provided with each cell or battery: "Caution – Never put batteries in mouth. If swallowed, contact your physician or local poison control center."
- Batteries which meet the requirements of the Limited Power Source Test, (refer to UL2054, Paragraph 13.4), may include the Marking "LPS."

# Ni-Cd, Ni-MH and Li-Ion

## Saudi Arabia: GTS-PM-KSA-CVG-0237

- Requirements added to standards for Saudi Arabia:
  - All marking related to warnings and handling safety instruction shall be in Arabic or Arabic and English language
- The instruction manual or pamphlet must be in Arabic language or in both Arabic and English.
- All Products must be marked with the Country of Origin in the format “Made in xxx” or “Manufactured in xxx”. All other format/text for marking the Country of Origin is not acceptable.
- Dual CoO marking such as: “***Designed in xxx, Made in yyy***” or “***Assembled in xxx, Made in yyy***” or “***Engineered in xxx, Made in yyy***”, where xxx and yyy denote different countries of origin, will not be accepted. It will only be accepted if the name of the manufacturer is clearly mentioned in the dual CoO marking text i.e. “***Designed by [Insert Manufacturer's Name] in xxx, Made in yyy***” and likewise for the other two dual CoO variations.