



KINSBURSKY
BROTHERS
INC



Kinsbursky Brothers

Battery Preparation and
Packaging

Dear Valued Client:

Recent events within the battery, electronics and waste industries have emphasized the potential fire and explosive danger that improperly packaged batteries present. The Consumer Products Safety Commission has even issued recalls for certain lithium chemistry batteries and the products containing them. These events make it obvious that batteries can present unique hazards for the generators, transporters, and facilities that routinely handle them.

The following packaging requirements, when properly implemented, provide a means of ensuring all battery shipments meet current transportation safety regulations, and will reduce the likelihood and severity of an incident.

The following information is provided as guidance only. Existing regulations pertaining to the preparation, packaging and transportation of batteries can be found in 49CFR §173.185, §173.159, §172.101 special provision 130, 40CFR §273 and §261.6 (California Title 22 §66261.6 and §273 et al.). The information contained herein is meant to supplement not replace any other regulation or agency recommendations. This information has been compiled in an effort to help the public manage their batteries in the safest and most environmentally sound manner possible. KBI wants to remind our clients that requirement of 49 CFR §172 and §173 apply to all battery shipments. Please be aware that the Universal Waste regulations do not release generators or transporters from any of the transportation safety regulations. Furthermore, 49 CFR §172.204 requires that each HAZMAT employee complete training described as general awareness/familiarization and function specific. A HAZMAT employee is defined by 49 CFR §173.30 as “any person who loads or unloads hazardous materials into or from a transport vehicle”. It goes on to say, “It is the responsibility of the employer to provide this training and to abide by §172 et al.”

Improperly packaged batteries present potentially volatile hazards. For the safety of our employees and yours, KBI has established the following strict packaging guidelines for companies shipping batteries into our Anaheim Facility.

Packaging Guidelines

1. All batteries must be effectively insulated to prevent battery terminals from coming into contact and subsequently discharging during transportation; this is effectively accomplished by taping or covering the terminals, or by placing individual cells into plastic bags.
2. Proper UN marked containers are mandatory as per 49 CFR 173.
3. All **lithium batteries** must be shipped in UN approved D.O.T. **steel** containers.
4. All containers must have proper D.O.T. labels and markings including the proper shipping name hazard class and ID numbers.
5. In addition to all required D.O.T. labels and markings, all containers should be identifiable by waste stream numbers, shipping paper line items or unique numbers listed within the associated paperwork.

Service Charges

- A \$250.00 service charge will be applied to each container of lithium batteries received in tri-wall boxes.
- Batteries shipped without proper safety precautions or effective insulation will be assessed a \$0.45/lb service fee.

Rejected Materials

As a TSD facility, KBI must insure that batteries are packaged and stored safely and in accordance with all applicable local, State, and Federal regulations. Current regulations prohibit the storage or transportation of improperly packaged batteries. Recent changes to the California Health and Safety Code (§25160.4 and §25160.6) regarding the management of rejected loads, prohibits the partial rejection of a load on the original manifest. Thus, either the entire load (manifest) must be returned to the generator or shipped to an alternate facility or a new manifest must be created for the rejected portion. As the “Offeror” the TSD is responsible for ensuring that the material is properly prepared for transportation and conforms to all requirements pertaining to the manifest use, packaging, labeling, marking and placarding of the rejected materials.

When noncompliant packages (or non-insulated batteries) are discovered, KBI will contact the transporter or appropriate representative of the Generator to inform them of the discrepancies. Prior to returning any partial rejections, KBI will inspect the material for compliance with the transportation safety regulations. All containers

requiring repackaging (including insulation) will be assessed the following handling charges.

Handling Charges

- Manifest Preparation (for rejected materials) – \$25.00
- Sorting - \$ 0.15/lb. gross weight (if > 10% of the containers weight is mixed battery chemistries).
- Repackaging - \$50.00/hr. plus material.
- Insulation/preparation - \$ 0.45/lb.

Spills, fires, and costly service charges can be avoided by following the hazardous materials safety regulations and KBI packaging guidelines.

If you have any questions regarding the packaging, marking or shipping of batteries into KBI, you may contact our offices at (714) 738-8516.

Battery Preparation/Packaging Guidance

All batteries should be handled, packaged and stored in a manner that prevents short-circuiting. When handled or packaged incorrectly, certain batteries may short and could create an electrical circuit. This type of un-grounded circuit can generate heat sufficient to ignite surrounding plastic or paper packaging materials. Batteries with external terminals are more susceptible to shorts since the terminals can contact each other, metal banding used to secure them to pallets, metal drum walls, or even the transport vehicle itself. Lithium and lead acid batteries should be insulated and/or otherwise stored in a manner that prevents the terminals from creating a circuit. This is accomplished effectively by taping the terminals, bagging or stacking the batteries in a uniform manner where the terminals cannot contact each other, and securing them to prevent movement during transportation.

Some battery chemistries, like lithium, are susceptible to catching fire internally when shorting and require additional precautions to prevent fires. Insulating terminals and avoiding flammable packaging materials can limit the hazards associated with these battery chemistries. Poly or fiberboard packaging should be avoided whenever possible, lithium batteries should be segregated from other battery chemistries and stored in metal containers whenever practical.

Sealed Lead Acid Batteries



Gel Cell Style Sealed Lead Acid Batteries

These photos show several types of small *Sealed Lead Acid Batteries*. They may also be referred to as *absorbed glass mat* batteries (AGM). This type of lead-acid battery is designed for both mobile and stationary applications. The battery name (sealed lead-acid) is derived from the design characteristics that include a sealed maintenance free container. Sealed lead-acid batteries electrolyte is absorbed in a gel and is not a free flowing liquid.

When properly insulated, the metal contact points are completely covered with a non-conductive material, usually something as simple as “duct tape,” this prevents improper discharging or a short circuit.



Gel Cell Style Sealed Lead Acid Batteries Insulated

Gates Style Sealed Lead Acid Batteries



The Gates Style Sealed Lead Acid Battery is another type of sealed lead acid battery again designed for mobile and stationary applications. Similar to gel cell batteries, its characteristics include a sealed maintenance free container and an absorbed electrolyte layered between the anode and cathode plates.

As with all lead acid batteries, when properly insulated, the metal contact points of the Gates Style are completely covered with duct tape or other non-conductive material to prevent improper discharging or other reaction from resulting. Sometimes, these batteries are manufactured in banks or multi-celled units. In these instances, cutting and removing the terminals may provide adequate insulation. Some of the larger batteries may be sufficiently insulated by stacking them in a manner that prevents short-circuiting



Wet Alkali Batteries



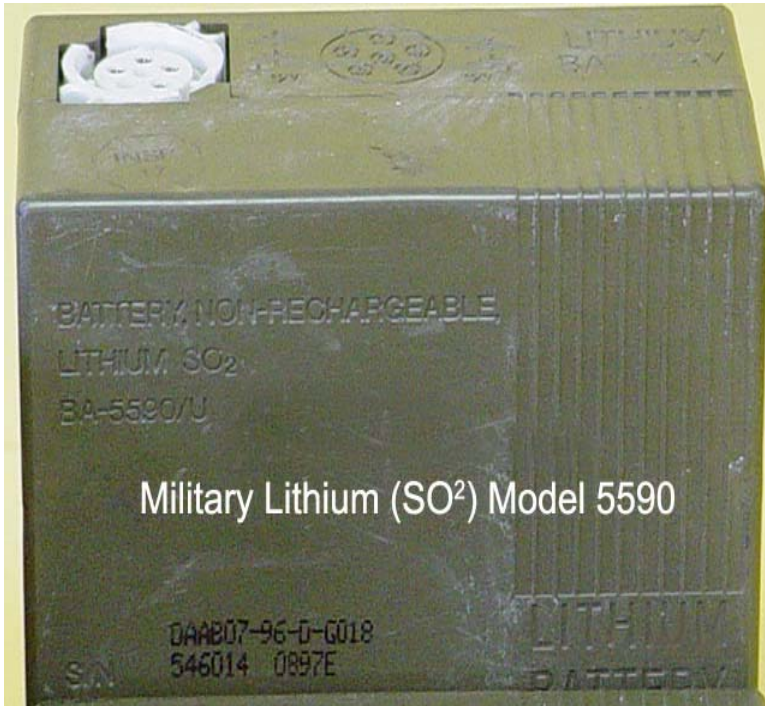
Nickel Iron and nickel cadmium batteries are alkali-based batteries that commonly use potassium hydroxide as an electrolyte. These batteries contain free flowing liquid electrolyte and should be managed in a manner that prevents spills and leaks.

Potassium hydroxide is very caustic and should be handled with caution.



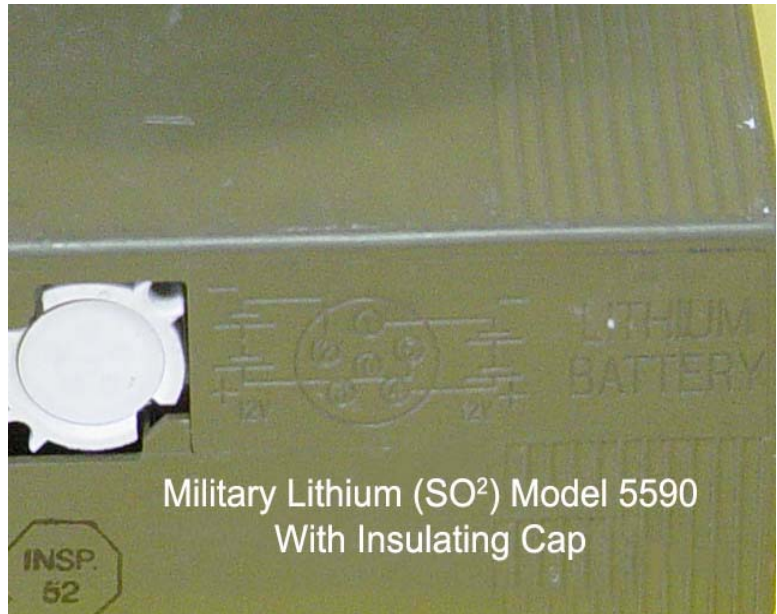
Again, when properly insulated, the metal contact points of the batteries are completely covered with a non-conductive material to prevent shorting.

Military Lithium (SO₂) Model BA5590



Aggressive development of high-energy and high-density batteries began in the 1960's. Lithium, alloys, and/or lithium salts, used as the anode, quickly became the material of choice due to its lightweight, high electrochemical equivalence, high voltage and good conductivity. Most lithium batteries were first used in the 1970s for specific military applications, but their use was limited, as suitable cell structures, formulations, and safety had to be considered.

The most widely used battery in the military today, the model 5590, contains two strings of 5 LiSO₂ “D-size” battery cells. Each individual cell is capable of generating 3 Volts of electricity. Although it is commonly referred to as a 12-volt battery, it has an actual output of 15 Volts. The SO₂ in this type of battery is pressurized to about 3 atmospheres (45 PSI) in order to remain liquid and act as an electrolyte. The military typically uses these batteries in radios and other communications devices.





Military Lithium (SO²) Model 5590

Although these batteries come equipped with an insulating cap, they may also be insulated using standard methods such as duct tape.



Military Lithium (SO²) Model 5590
Capped, Insulated & Open

Assorted Small Style Lithium Batteries

Today's lithium batteries have been designed utilizing different chemistries for usage in a variety of applications. These photos show just a sample of the diversity of types and styles managed at KBI from a myriad of household and commercial applications.



Again, tape
effective insulator to guard against shorts.

can be an



General battery safety



Batteries come in different, shapes colors and sizes. If you cannot identify your batteries the Internet can be a great resource for information. Most batteries have the chemistry clearly marked somewhere on the outer packaging; you can also use part numbers, a manufactures name or even a model numbers to help you identify them via a web search.



Remember **all** batteries should be handled with care and packaged in a manner that prevents shifting during transportation. Large batteries should be uniformly stacked, layered with insulation and banded.





Batteries should never be stored on the open ground, stacked in loose piles or mixed with other batteries chemistries.

Poor housekeeping can lead to spills, reactions, shorts and fires. Failure to adhere to all hazardous materials safety and environmental regulations can lead to costly clean ups, fines and even imprisonment.



If you have any questions regarding battery identification, package or recycling please contact our offices at (714) 738-8516.