

# USCG GUIDELINES FOR PORTABLE LITHIUM-ION BATTERIES

Recognizing the risks of portable battery powered devices, the U.S. Coast Guard issued guidance in a Policy Letter (CG-CVC Policy Letter 20-03) on how to safely handle lithium-ion batteries on small passenger vessels. These recommendations are just as useful for recreational boaters:

## 1. Safe Storage

- Store batteries in a dry, cool location per manufacturer specifications, and away from anything flammable.

## 2. Charging Precautions

- Charge batteries only in regularly occupied areas or places with smoke detection.
- Never charge batteries in paint lockers or hazardous areas.
- Inspect batteries before charging. Look for signs of damage like bulging, cracking, leaking, or overheating. If something looks or smells off, remove it from service immediately.
- Unplug batteries once they are fully charged—don't leave them sitting on the charger.
- Never charge a battery if contacts are wet or damp.

## 3. Proper Use and Maintenance

- Use batteries and chargers that meet safety standards (e.g., UL 2054).
- Follow the manufacturer's instructions for charging, storage, and maintenance.
- Buy genuine batteries from the device manufacturer or an authorized reseller and avoid cheap knockoffs.
- If a battery is damaged (bulging, cracked, punctured, leaking, or smoking), stop using it immediately. Store it in a fire-resistant container with sand or a similar extinguishing agent and dispose of it according to local regulations.



# MARINE BATTERIES— WHAT TO KNOW



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## BOATING SAFETY AWARENESS SERIES

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## BATTERY TYPES:

- **Starter Batteries:** Supply a high current for short periods to start an engine.
- **Deep Cycle Batteries:** Designed for consistent, long-term energy output to power onboard appliances and systems.
- **Dual Purpose Batteries:** Combines the functionality of both the starter and deep cycle batteries.

## BATTERY CHEMISTRIES:

- **Flooded (Lead-Acid):** Consists of lead plates submerged in a liquid electrolyte solution.
- **AGM (Absorbent Glass Mat):** Consists of a fine glass fiber separator between the positive and negative plates that helps absorb the battery acid.
- **Lithium-Ion:** Contain a lithium-based electrode material plus a graphite electrode and consists of various chemistries. (e.g., lithium iron phosphate (LFP), lithium nickel manganese cobalt oxide (NMC), lithium nickel cobalt aluminum oxide (NCA), lithium cobalt oxide (LCO), lithium titanate (LTO), lithium manganese oxide (LMO)

## STORAGE:

- To maintain the longevity and performance of your marine battery during long term storage always reference the manufacturer's storage instructions.

## BATTERY BASICS—SAFETY:

Charging sources must meet the charging profile recommendations provided by the battery or cell manufacturer.

- Batteries must be restrained and protected from movement, shock and vibration.
- Ungrounded battery terminals and connections must be protected from accidental contact.
- Battery cables and conductors sized 6 AWG and larger cannot be connected to the battery wing nuts.
- Conductor Stacking: Highest ampacity terminals (typically the largest) must be installed closest to the battery (descending order).
- No more than four conductor terminals can be installed on a single battery terminal.
- Battery terminals must be properly tightened and periodically checked for tightness and corrosion build up.
- Do not mix battery chemistries or types in the same battery bank.
- Not all batteries are created equal: Follow manufacturer's recommendations when replacing batteries with OEM when possible.
- Contact the boat manufacturer or check with a certified technician before replacing lead-acid batteries with lithium-ion batteries.
- Always wear safety glasses when working around batteries as batteries can explode. Protect your eyes.

## LITHIUM-ION INFORMATION:

Lithium-ion batteries power various devices. These batteries are commonly used in small electronics, electric cars, scooters, and boats. Lithium-ion batteries store a large amount of energy and can pose a threat if not treated properly (e.g., overheating, fire, thermal runaway, release of toxic gases, and explosion). Failure to follow the manufacturers care and maintenance instructions can lead to overheating conditions, fire, and explosion.

- Remove the battery or charging device from power once charging is complete to avoid overheating.
- Discontinue use of batteries that have an unusual color or odor, are leaking, making odd noises, are excessively hot, or do not keep a charge.
- Follow manufacturer guidance on charging and storage.
- All maintenance on batteries should be completed by a qualified professional.
- Keep batteries away from hot surfaces and flammable materials.
- Call 911 if you see smoke or flames.
- ABC dry chemical or clean agent extinguishers can't be used on lithium fires.
- Disposal: Always have a certified technician dispose of or replace the lithium-ion batteries in your boat.
- Ensure charging locations and chargers are correct and meet manufacturer recommendations.