

# BATTERY APPLICATIONS

## Marine Starting Service

When a battery is called upon to deliver several hundred amps of power to the starting motor, the battery must be able to deliver this power quickly...within a few seconds. This power comes off of the surface of the plates inside the battery. Therefore, a battery with more plate surface area and less resistance will deliver power quicker than one with less plate surface and high resistance.

That's why starting batteries are made with thinner plates...because you only use the power off the surface of the plates for starting the engine.

## Deep Cycle Service

A deep cycle battery is called upon to deliver a long, slow discharge of fewer amps...for several minutes or hours...in a deep cycle application, such as running a trolling motor or heavy marine accessory load (e.g. depth finders, fish finders, radios, radar, lights, coolers, house power, etc.).

In this case, the power comes from deep within the plates, not merely off the surface as in starting. Therefore, deep cycle batteries are specially engineered with heavier, thicker plates, special power-producing active material and special heavy-duty separators.

With these features, the battery can withstand the potentially damaging effects of continual deep discharge and recharge. Thinner plates of a starting battery cannot handle this constant deep cycling, and will fail in short order.

## Dual Purpose Deep Cycle/ Starting Service

Dual purpose batteries are ideal for applications that require starting and deep cycle service. They deliver powerful cranking amperage for easy starting, and low amp draw service for reliable auxiliary power.

Dual purpose batteries are a perfect compromise between the unique demands of starting service and deep cycling, low amp draw service.

## Deep Cycle, Starting, Dual Purpose... Which Should I Choose?†

Ideally, you could have one battery for starting and an auxiliary deep cycle battery for the trolling motor and accessories. If however, you can only have one battery on board, the one you choose depends on the power draw required.

## Which Should I Choose?† (continued)

For light to moderate-duty low amp draw service, choose the dual purpose battery, specially designed to handle both starting and cycling.

For heavy-duty cycling, choose the deep cycle battery. This will give you enough cranking amperage to start your engine, and the most reserve power to keep your trolling motor and accessories running longer. Use the following convenient chart to help you select a battery type appropriate for your specific situation.

† Always be sure that the replacement battery CA and CCA meet minimum engine starting requirements.

Determine your POWER USAGE †		FLOODED			VRLA#	
		STARTING	DEEP CYCLE	DUAL PURPOSE	GEL	AGM
STARTING	TROLLING					
Moderate	None	✓		✓	✓	✓
Moderate	Moderate		✓	✓	✓	✓
Moderate	Heavy		✓		✓	
Heavy	None	✓		✓	✓	✓
Heavy	Moderate			✓	✓	✓
Heavy	Heavy	✓*	✓*		✓*	

† Replacement should meet/exceed O.E. required CCAs

# Valve-Regulated Lead-Acid (VRLA)

\* Use in combination. Consult dealer for more information.

## BATTERY SAFETY

**Proposition 65 Warning:** Batteries, battery posts, terminals, and related accessories contain lead and lead compounds, and other chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. Batteries also contain other chemicals known to the State of California to cause cancer.

### Wash hands after handling!

Always wear safety glasses when working on or near batteries. **BE CAREFUL!** Batteries produce explosive gases. Keep sparks, flames and cigarettes away from batteries at all times.

### Lead-acid batteries are virtually 100% recyclable!

Be sure to return your used lead-acid battery to a retailer. In most states it is illegal to discard a battery in the trash.



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VS.  
AGM  
VS.  
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**Which is  
Right for  
Your Marine  
Application?**

**STARTING  
VS.  
DEEP CYCLE  
VS.  
DUAL PURPOSE  
BATTERIES**

# BATTERY TYPES

## Gel Batteries

Gelled-electrolyte batteries offer many significant advantages over conventional "flooded" batteries. Gel batteries are spillproof\*, and resist over-discharges that can shorten the life of the battery. §

Gel batteries have a self-discharge rate of less than 1% per month (at 68°F). They provide ample cranking amperage for quick, sure starts, and deliver longer trolling time than comparable flooded models. Their VRLA design minimizes gassing, making them safe to install around people and sensitive electronic equipment. Gel batteries offer a viable alternative when you can only choose one battery. Gel batteries are maintenance-free.

§ *Charge/Absorption/Equalize between 13.8 – 14.6 Volts @ 77°F (25°C).*

*Float/Standby between 13.4 – 13.6 Volts @ 77°F (25°C). Temperature corrected charging required.*

\* *Rated non-spillable by International Commercial Airline Association (ICAO), International Airline Transport Association (IATA) and DOT definitions.*

## AGM Batteries

Absorbed Glass Mat (AGM) batteries use special absorbed electrolyte technology that is superior to flooded lead-acid batteries.

Fine, highly porous microfiber glass separators absorb the electrolyte, increasing efficiency by lowering internal resistance and boosting capacity.

Lower internal resistance also means that the batteries can be recharged faster than conventional batteries, § allowing the user to put them back into operation sooner.

The valve-regulated AGM battery virtually eliminates gas emissions and acid leakage for longer and safer battery operation. AGM batteries are also completely maintenance-free.

§ *Charge/Absorption/Equalize between 13.8 – 14.6 Volts @ 77°F (25°C).*

*Float/Standby between 13.4 – 13.6 Volts @ 77°F (25°C). Temperature corrected charging required.*

## Flooded Batteries

Flooded lead-acid batteries are the most widely used batteries both in automotive and marine applications.

They are usually less expensive than either the Gel or AGM batteries, but do not provide the same cycle life and convenience.

## Marine Starting, Deep Cycle Trolling and Dual Purpose Batteries

***Our complete line of marine starting, trolling and dual purpose batteries deliver the highest performance and reliability. Available in flooded, gel and AGM, these batteries provide maximum power for fast, sure starts and hours of trouble-free deep cycle trolling and/or accessory power...***

### **COMPARE THESE FEATURES AND BENEFITS:**

#### **FLOODED STARTING BATTERIES**

- Up to 1000 cranking amps @ 32°F . . . . . For highest performance
- Maintenance-free construction . . . . . For hassle free starting and reliability
- Combination terminals . . . . . For easy installation and hook-up
- Flame-retardant, chambered vents . . . . . Keep battery dry and corrosion-free
- Envelope separators . . . . . For longer life
- Flush covers . . . . . Easier to keep clean
- Broad coverage . . . . . For a wide variety of applications
- Power optimized grid design . . . . . Directs more energy to terminal posts

#### **FLOODED DUAL PURPOSE BATTERIES**

- Full-frame grids and plates . . . . . Won't short circuit, for long life
- Deep-pocket envelope plate separators . . . . . Help prevent internal shorts
- Exclusive high density plate paste . . . . . Delivers more power-per-pound
- Exclusive demineralized electrolyte . . . . . Reduces water loss, for long life
- Power optimized grid design . . . . . Directs more energy to terminal posts
- Molded-in stainless steel dual top terminals . . . . . Keep battery top corrosion-free.
- 300 quality control checks . . . . . Assures best performance, longest life

#### **FLOODED DEEP CYCLE TROLLING BATTERIES**

- Combination terminals . . . . . For easy installation and hook-up
- Special oxide on computer-cured plates . . . . . For maximum performance
- Computer-cast, heavy-duty grids . . . . . For longer life
- Chambered pod vents . . . . . Reduce electrolyte spillage
- Convenient carrying handles . . . . . For easy transport
- Greater reserve capacity . . . . . More time on the water, more accessory power

#### **GEL STARTING/DEEP CYCLE BATTERIES**

- 100% maintenance-free . . . . . No need to check fluid levels
- Ideal for both starting and trolling . . . . . Great multipurpose battery
- Faster recharge than flooded designs . . . . . For quicker turnaround time
- Heavy-duty grids and high density oxide . . . . . Provide maximum durability, power and life
- Spillproof construction . . . . . Eliminates dangerous gassing § and leaks
- Self-discharge rate less than 1% per month (@ 68°F) . . . . . Recharges to full power, even if left discharged for weeks
- Broad line of sizes . . . . . For all marine power needs

#### **ABSORBED GLASS MAT DUAL PURPOSE / DEEP CYCLE BATTERIES**

- Maintenance-free construction . . . . . Eliminates the need to add water
- Spillproof, valve-regulated design . . . . . Eliminates acid leaks and terminal corrosion
- Lower electrical resistance . . . . . Provides higher discharge rates, quick starts
- Resists vibration damage . . . . . Provides longer operation over time
- Faster charging rates . . . . . Faster turnaround times
- Glass mat separators . . . . . Spillproof
- Safety relief valve system . . . . . Safer operation and safer charging
- Combination terminals . . . . . For easy hook-up
- Handles . . . . . For easy installation