

LIFELINE

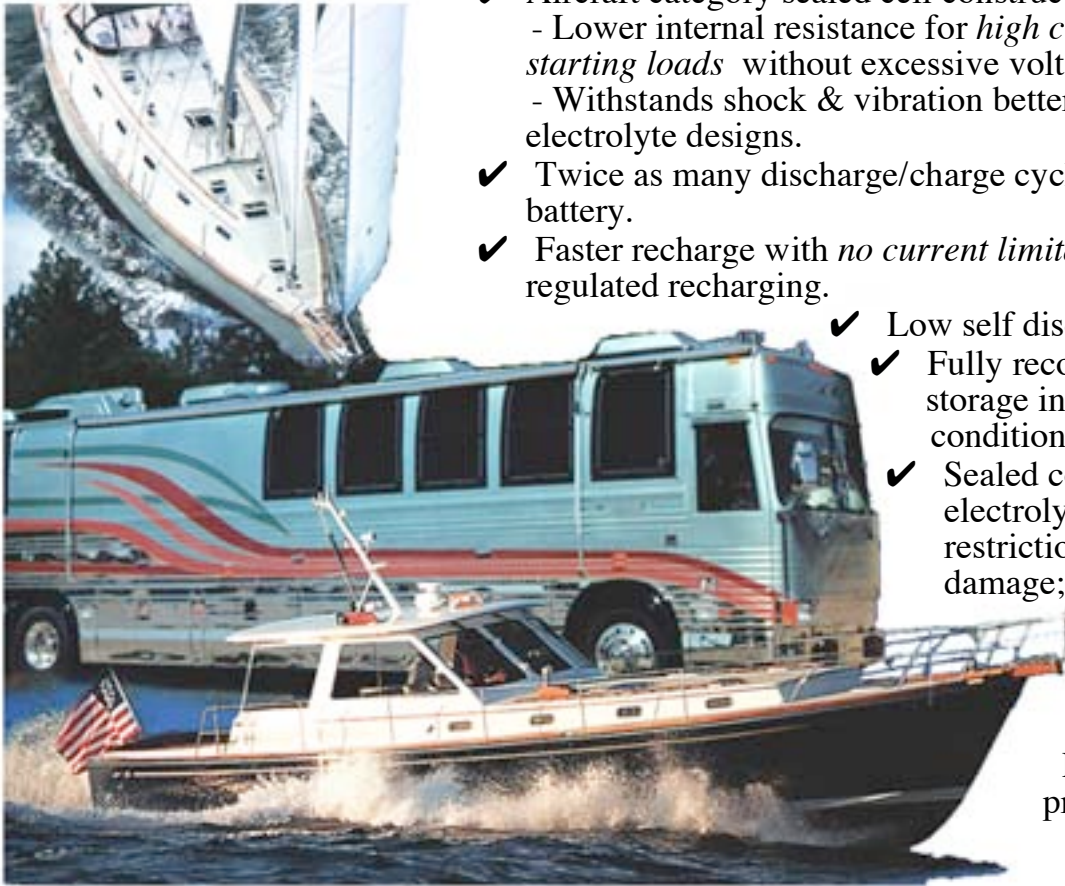
BATTERIES

THE NEXT GENERATION OF SEALED MAINTENANCE-FREE BATTERIES featuring (AGM) ABSORBED GLASS MAT TECHNOLOGY

The new AGM Lifeline technology displaces older gel technology by offering many improvements. Lifeline delivers higher Amp Hours, greater reserve capacity, greater depth of cycle with longer service life with faster recharge rates than previous sealed technology batteries. The sealed construction maintenance free Lifeline battery is tolerant to heat, extreme cold and to vibration and can be installed in any position. Mil Spec with no DOT restrictions.

LIFELINE FEATURES

- ✓ Aircraft category sealed cell construction:
 - Lower internal resistance for *high current inverter and starting loads* without excessive voltage drop.
 - Withstands shock & vibration better than flooded or gelled electrolyte designs.
- ✓ Twice as many discharge/charge cycles as the leading gel battery.
- ✓ Faster recharge with *no current limitations* with voltage regulated recharging.
- ✓ Low self discharge rate.
- ✓ Fully recoverable after 30 days of storage in 100% discharge condition.
- ✓ Sealed construction with absorbed electrolyte - no shipment restrictions; submersible without damage; install in any position; no need to add water.
- ✓ Safety - even during severe overcharge the LIFELINE AGM battery produces less than 2% hydrogen gas (4.1% is required for flammability).
- ✓ 60 Month Warranty



Available through:

DC BATTERY SPECIALISTS

So, you're looking for the perfect battery for your important system. You already know it's not like buying a battery for your car and you want to know what's available, what would operate best, and what's the best value.

If you are looking for a battery or bank of batteries for marine or RV house service, inverter operation, renewable energy, UPS/Telcom or home power back-up, the Lifeline would be a correct choice. Lifeline batteries are constructed with the new AGM technology (see back jacket). These batteries are the promises you read about in Popular Science years ago. They have arrived!

What characteristics are offered in the Lifeline AGM technology batteries? What are their strengths and what segregates them from other types of batteries?

Since all batteries have different strengths and weaknesses, the key is to match the right battery construction and technology with your specific needs.

First and foremost, the Lifeline battery is a deep cycle battery. Essentially it can be discharged and recharged over and over again without shortening its service life or reducing its capacity. Lifeline batteries have proven themselves in cycling applications with service life lasting well into 5 and 6 years.

In addition, Lifeline batteries perform these tasks as a sealed maintenance free battery and will not leak, even if punctured. The Lifeline AGM technology does not produce explosive or corrosive gas and is safe for indoor or tightly enclosed installations (in-

cluding marine submersibles). These Mil-Spec batteries, have passed stringent military testing for combat enclosed installations, therefore, they are safe enough to sleep on.



RENEWABLE ENERGY

Lifeline batteries are dual purpose. Since deep cycle batteries can be used for starting (the reverse is not true), Lifeline batteries are used for dual purpose start and house service in marine applications.

In mobile applications such as marine, RV or surveillance vehicles, where cycling takes place, the battery is immune to shock and vibration. It also can be installed and operated at 100% capacity in any attitude including inverted or stacked.

Lifeline AGM batteries have a very low internal resistance. This generates some very interesting charging and discharging characteristics. During high continuous rates of discharge, such as inverter operation, the Lifeline maintains a high terminal voltage thus providing a higher operating efficiency for the inverter. During recharge, the Lifeline batteries take full advantage of the new multi-stage charging technology which is standard on large inverters, and have become commonplace in marine and RV chargers and alternator regulators. Charge accep-



STAND-BY INVERTER

tance is faster than any other lead acid battery technology. Lifeline batteries can accept high current input thus reducing recharge time. This is ideal for marine, RV and inverter applications. Lifeline's high (99%) charge absorption rate, offers recharge improvements over previous marine/RV batteries and is especially advantageous in renewable energy (including solar) applications.



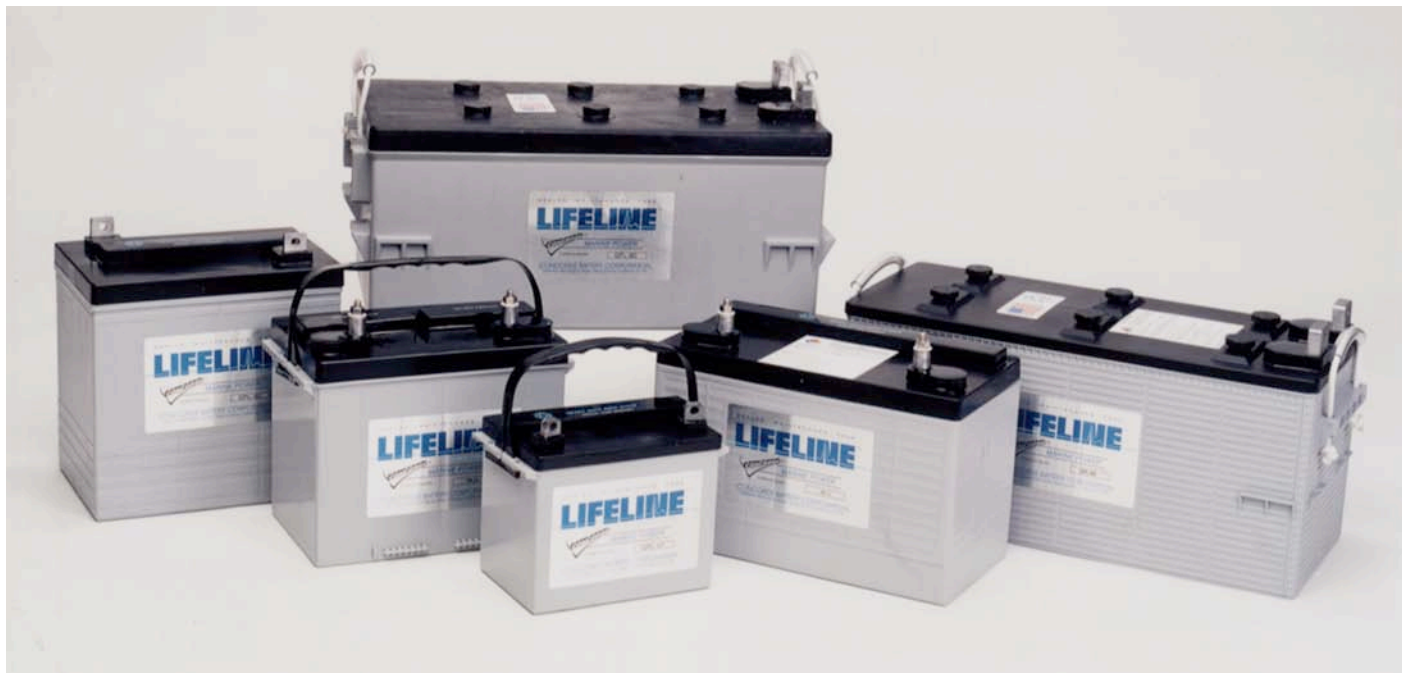
SOLAR HOME

Lifeline batteries have a low self discharge rate and can sit uncharged for months and still retain their charge. When used in long term stand-by applications, their float charge maintenance is very economical due to the lower float voltage they require. Lifeline batteries are used in temperature ranges from the South Pole through the Tropics and back into the cold of Alaska without degradation of performance.

Lifeline batteries perform with these characteristics and still offer higher Amp Hours, Reserve Capacity, and Cranking amperage than other sealed technology batteries.

Capacity, and Cranking amperage than other sealed technology batteries.

So, if you are looking for a safe, maintenance free, deep cycle battery which can stand unattended for months, charge fast, power devices more efficiently than ordinary batteries, and last for years, then Lifeline batteries will fit your requirements.



Lifeline makes a broad line of sizes, including two for electric wheel chairs.

LIFELINE

Battery Type	Amp Hrs	BCI Group	Volts	Cranking Amps	Reserve Capacity	Dimensions			Weight
						L	W	H	
Lifeline 1234	34	U1	12	325	50	7.7	5.2	7.0	24
Lifeline 24	80	24	12	550	149	10.9	6.6	9.3	53
Lifeline 27	95	27	12	575	186	12.6	6.6	9.3	63
Lifeline 31	105	29/31	12	600	195	12.9	6.7	9.3	68
Lifeline 4D	210	4D	12	1100	390	20.7	8.7	10.3	130
Lifeline 8D	255	8D	12	1350	475	20.6	11.0	10.2	158
Lifeline GC4	220	GC2	6	760	465	10.4	7.1	11.6	55

Lifeline batteries are not restricted by the US Department of Transportation or the FAA and can be carried on board or shipped via air.

ABOUT AGM BATTERY TECHNOLOGY

AGM (Absorption Glass Mat) sealed battery technology was developed in 1985 in response to a request by the US Department of Defense. Originally for military performance aircraft, where power, weight, safety, and reliability were paramount considerations, the bid soon broadened to other military sectors. Specifically, the DOD wanted a sealed, explosion proof, deep cycle battery which was compatible with ordinary lead acid charging systems. Cycling requirements were for 1,000 cycles at 50% discharge and with no damage to the battery at 100% discharge. They wanted a high power to weight ratio and insisted on a battery technology which could be operated inverted and function without spillage, even if ruptured, and void of explosive gassing. Additional shock and vibration requirements were placed on the request.

The Lifeline AGM battery was designed and accepted to fill these requirements and continues in military applications today. The aftermarket was not able to be supplied until the 1990's, when initial military contracts were completed and plant production increased.

AGM battery technology has continued to develop and offer improvements over other sealed battery technologies. AGM technology has become the next step in the evolution of both starting and deep cycle sealed batteries for marine, RV, aviation, commercial and domestic back-up and off grid inverter, UPS, Telcom, and renewable energy applications. This "next generation" technology delivers increased safety, cycle performance, and service life over all other existing sealed battery types, including gel technology.

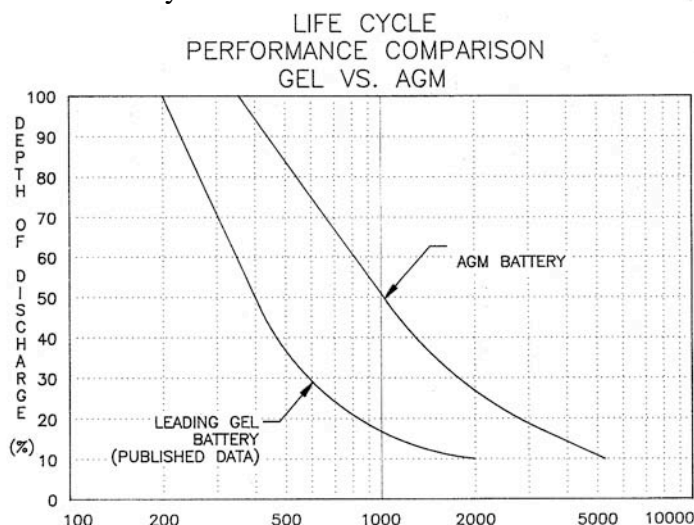
In Lifeline AGM sealed batteries, the acid is absorbed between the plates and immobilized by a very fine fiberglass mat. No silica gel is necessary. This glass mat absorbs the acid while keeping the acid available to the plates. During discharging and recharging, this allows a fast reaction between acid and plate material. Recombination gasses are processed internally.

The Lifeline battery has an extremely low internal electrical resistance. This, combined with faster acid migration, allows the AGM batteries to deliver and absorb higher rates of amperage than other sealed batteries during discharging and charging. In addition, AGM technology batteries can be charged at normal lead-acid regulated charging voltages, taking full advantage of the new multi-stage chargers standard on most inverter systems. Under high loads common with inverters the Lifeline maintains a higher terminal voltage and thus increases inverter efficiency.

DC Battery Specialists is currently distributing LIFELINE and OPTIMA AGM technology batteries. We have replaced our gel lines by upgrading to these AGM technology batteries. OPTIMA batteries are specifically used for high performance starting while LIFELINE batteries offer more versatility and are used in starting and in deep cycle applications.

Documents of Interest:

Lifeline AGM "How they Work"
Sail Magazine Feb. 99 "The Perfect Battery!"
UL compliance report
Cruising World June 97 "Take It to the Bank"
US Coast Guard Bulletin #78
US DOD Shock Vibration and Rupture Report
Material Safety Data Sheet
US Navy Crain Laboratory Gas Safety Test
for MIL-Spec B-856



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