



Frequently Asked Questions and Answers

This is a brief compilation of frequently asked technical questions with answers to help you in assisting customers. If you find there are questions that have been left out, please reach out to the engineering department at Braille Battery for clarification, and to allow us to add the question and answer to the list for better customer service in the future.

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By: Sean Kasson
Manufacturing Engineer
Engineering@braillebattery.com

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Technical Keywords & Phrases

Pulse Cranking Amps (PCA)

Definition- *a measurement of the current a fully charged battery, at a temperature of 70°F or higher, can deliver for 5 seconds while maintaining a voltage greater than or equal to 7.2V.*

Importance- One of the key aspects of a starter battery is its ability to provide a large number of amps to turn over the engine (usually between 250 – 600 amps), and to provide energy for the electrical systems of the car.

Cold Cranking Amps (CCA)

Definition- *a measure of the current a fully charged battery, at a temperature of 0°F/-18°C, can deliver for 30 seconds while maintaining a voltage greater than or equal to 7.2V.*

Importance- Cold cranking amps (CCA) shows the ability of a starter battery to turn over a car at temperatures around freezing. Since lithium-ion batteries do not perform optimally at these temperatures, CCA does not give an accurate representation of the power of a lithium-ion battery.

Voltage Under Load

Definition- *The voltage a battery is able to maintain while subjected to a power draw.*

Importance- Many electrical systems require a certain voltage to continue operating. If the voltage drops below a certain threshold, the electrical system will shut off. This is especially important for capacity-based batteries.

C-Rate (Charging and Discharging)

Definition- *The rates at which a battery/cell is able to be charged and discharged in relation to its Ah rating (ex. charging a 5 Ah battery at 10A is the equivalent of a 2C charging rate $\rightarrow 10/5=2C$).*

Importance- The C-rate of the battery, both in relation to charging and discharging, is important as it tells us about the speed at which we can charge and discharge a battery without causing damage to the cell internals. For total-loss systems (no alternator), this means either a shorter or longer recharge time between races.

Lifespan

Definition- *The number of times a battery is able to be charged to 100% SOC (14.4V) and then discharged to 0% SOC (8V) before 20% of the starting capacity is lost.*

Importance- Lifespan is an important factor when selling to any consumer. Being able to provide a battery that lasts 3-5x longer than a competitor's battery is more incentive for them to choose our battery over the competitor's.

Impedance

Definition- *The resistance the current experiences as it flows through the battery.*

Importance- Cranking amps and impedance are inversely proportional, so decreasing the impedance of a battery increases the cranking amps.

Safety Questions

Will this battery catch on fire/explode/ is it dangerous?

No. Under normal operating parameters this battery will not catch on fire, explode, etc. Under abnormal operating conditions, Braille batteries are equipped with an integrated safety device known as a Current Interrupt Device (CID) that will mechanically disconnect the cells inside of the battery to ensure catastrophic failures such as fires and explosions do not occur.

Can this battery damage my car?

If the battery is attached in the wrong way (positive to negative cable, negative to positive cable) it can cause serious damage to your car and its electrical system. Ensure you look at the markings on the battery label and check the polarity with a voltmeter, if possible, by touching the positive lead to the positive terminal of the battery, and the negative lead to the negative terminal. If the voltage registers as positive, you have the correct polarity.

What tests have been run to ensure this battery is safe?

All Braille battery models have undergone rigorous internal testing for quality and safety assurance. The internal cells are tested to UL 1642 standards and are individually tested at our factory in Sarasota, Florida for quality assurance before being built into a battery. The batteries are also tested to UN 38.3 safety standards to ensure they are safe for transportation by any method (land, air, and sea), and are packaged in accordance with all applicable packing standards to ensure they do not receive any damage during transportation.

Can I shock myself?

You cannot shock yourself by touching the terminals, as the voltage/ampereage is not high enough. You can, however, be shocked if you are attaching the battery cables in an improper/dangerous way. If you are not comfortable attaching your battery to your car, seek assistance from a professional to ensure you do not harm yourself, or cause unnecessary damage to the battery or your vehicle.

Will this battery release any carcinogens/toxic substances?

Braille batteries do not release any carcinogens or toxic substances under normal operating conditions. If abnormal operating conditions occur and the battery is breached, it is possible that a small amount of lithium gas will be released, but it will not be in a high enough concentration to harm you, or those around you.

Technical Questions

How long do your batteries last (lifespan)?

Braille batteries have an average lifespan of 8-12 years under normal conditions. Through proper care and maintenance (not over-discharging, charging when not in use, using a Braille charger), some customers have seen as high as 15 years of life in their batteries.

Do I need to change my alternator/charging system for these batteries?

No. All our batteries are drop-in replacements and can be used with you existing system. Exceptions apply when you add in aftermarket alternators/recharging systems, so consult Braille Battery's engineering department if you know the specifications of your system and aren't sure.

What is the charging profile for your lithium-ion batteries/chargers?

Lithium-ion batteries have a slightly different charging profile than AGM. The batteries should be charged up to 14.4V, and then should be reduced to 13.8V for continued charging/maintenance.

Can these batteries be mounted in any direction/are they spillable?

Braille batteries can be mount in any position, including upside down. They are non-spillable lithium-ion batteries, meaning there are closed cells inside the battery that prevent any matter from spilling out of the battery.

Can the battery be used in cold weather?

Temperatures above 32°F/0°C are fine for lithium-ion batteries. Temperatures below 32°F/0°C can cause rapid degradation of the cells when charging lithium-ion batteries, so we recommend creating a small power draw (such as turning on the headlights) for a few minutes to heat up the cells before turning your car over.

How should I store lithium-ion batteries during cold weather?

We recommend, at a minimum, disconnecting your battery from your car to ensure there is no draw during extreme cold weather. Charging or discharging lithium-ion batteries when they are cold decreases the lifespan of the battery and can lead to permanent damage if done at an extreme rate during the cold.

Can the battery be used in hot weather?

As long as the exterior of the battery does not exceed 140°F/60°C, the battery will work perfectly in hot weather. Make sure to keep the battery out of the sun for extended periods of time, as this can heat the case up dramatically.

Do I need a special charger for this battery?

You will need to purchase a charger specifically made for lithium-ion batteries. Some chargers have the capability to change between lead-acid and lithium-ion, but that will depend on the charger that you purchase. We recommend purchasing a Braille Battery charger, as we know the program is specifically set for proper charging and maintenance of lithium-ion batteries.

[Can you overcharge this battery?](#)

Most lithium-ion chargers have maintenance modes that will prevent overcharging. We recommend looking for this specification (also known as trickle charging, float charging, or maintenance) to ensure you do not damage the battery during the charging. We recommend purchasing a Braille Battery charger, as we know the program is specifically set for proper charging and maintenance of lithium-ion batteries.

[Can I over-discharge this battery/can I kill this battery?](#)

Yes. As our batteries do not include a BMS system, you can over-discharge the battery and cause permanent damage, and possibly make the battery inoperable. The minimum voltage you can discharge the battery to is 8V for a 12V battery, or 10V for a 16V battery. Anything below these levels can damage the cells and lower the lifespan of the battery drastically.

[What is the weight reduction from lead-acid/AGM batteries to lithium-ion batteries?](#)

Most lithium-ion batteries will see a weight reduction of approximately 75% compared to lead-acid/AGM batteries of the same size.

Further Educational Resources

[Batteryuniversity.com](#)

Battery University is a free online resource with easy-to-follow lessons ranging from beginner to intermediate levels. It has information regarding the differences between different chemistries of batteries, safety features, shipping regulations, and much more. This should be your first resource if you want to learn more about anything regarding batteries.

[Braille Battery Engineering Team](#)

The Braille Battery engineering team is always available to assist you with any technical questions or concerns regarding our products. Feel free to reach out to us at:

Engineering@braillebattery.com