



## CROSSBIKE LEADS IN LITHIUM-ION BATTERY SAFETY

### UN38.3 CERTIFICATION

At CROSSBIKE, our CEO and Founder Brett Portaro understands the importance of safe lithium-ion batteries. Mr. Portaro ran a high-powered lithium-ion battery company from 2014 to 2017. While most batteries typically deliver a few hundred amps, Mr. Portaro was used to delivering over 10,000 Amps. These high-powered lithium-ion batteries required the best cell technology along with the best battery management system software (BMS).

### WHAT TO LOOK FOR

There are two things to understand when analyzing the quality and safety of a lithium-ion battery. The first is the C-rating, which deals with constant current and boost current. The second is UN 38.3 certification. With UN38.3 Certification, a lithium-ion battery can travel by air. It would be near impossible to pass UN 38.3 Certification without a high C-Rating, which directly correlates to the batteries ability to maintain charge while under performance. A high C-rating and UN38.3 Certification means the cost of the battery dramatically increases. This is the reason most providers do not like to talk about it.

### BATTERY DILEMMA #1: Most ship by sea so to get around the UN38.3 requirement.

The dilemma for most companies is that a lithium-ion battery with a high C-rating and UN38.3 Certification is much more expensive. According to ComplianceGate: "The US requires importers and manufacturers to comply with UN 38.3 requirements when shipping lithium batteries by air." This is why many of the Chinese manufacturers ship their batteries by sea to avoid the air requirement of UN 38.3.

### BATTERY DILEMMA #2: Responsibility falls upon the seller, who typically choose to cut corners due to cost.

According to ReLion: "The responsibility to ensure that batteries meet the UN standard falls upon the seller and unfortunately, some products in the marketplace do not meet the standard. UN38.3 is an extremely important safeguard for you the customer. A lithium battery could see a 15 year or longer lifetime depending on how often it is discharged and UN38.3 certification should be a primary consideration in your lithium battery purchase."





#### THERE ARE 8 TESTS REQUIRED FOR UN38.3 CERTIFICATION

- **T1 - Altitude Simulation:** low-pressure simulation (primary & secondary cells/batteries)
- **T2 - Thermal Test:** integrity testing when batteries undergo extreme and rapid temperature changes (primary & secondary cells/batteries)
- **T3 - Vibration Test:** vibration simulation that may be experienced during transportation (primary & secondary cells/batteries)
- **T4 - Shock Test:** shock test/vibration simulation during transportation (primary & secondary cells/batteries)
- **T5 - External Short Circuit Test:** external short circuit simulation (primary & secondary cells/batteries)
- **T6 - Impact Test:** impact and crush simulations on the cell's casing (primary & secondary cells)
- **T7 - Overcharge Test:** overcharge simulation on rechargeable batteries (secondary batteries)
- **T8 - Forced Discharge Test:** forced discharge simulations (primary & secondary cells)

#### THE CURRENT VERSION OF THE UN38.3 CERTIFICATION STANDARD INCLUDES SEVERAL KEY TESTING CHANGES

- **Integrated Batteries:** Updated to allow testing of batteries within equipment
- **Disassembly:** Allows for additional test criteria; We recommend any cases that may be considered “borderline” disassembly to be treated as test failures
- **Rechargeable Batteries Considerations:** Changes to the cycling requirements reducing to 25 charge/discharge cycles prior to test, from 50 previously; also updates testing tables to reflect these changes
- **Test Summary:** Now clearly defines “battery test summary,” as well as the requirement that the test summary “shall be made available.” Additionally, it notes the requirement for the name and title of the signatory as an indication of validity.



#### CROSSBIKE'S SAFETY AND QUALITY COMMITMENT:

CROSSBIKE will continue to lead the ebike industry in lithium-ion battery safety and quality by ensuring that all CROSSBIKE lithium-ion batteries have a high C-rating and are UN38.3 Certified. It is the lithium-ion battery industry's gold standard. The UN38.3 certification mark can be found written on all its lithium-ion batteries in every ebike.