

ELC vs. Wh

When requirements for lithium ion batteries were first adopted into the HMR, it was necessary to provide an indication of the lithium content in each cell and battery. Since lithium ion batteries do not contain metallic lithium, an expression of lithium content analogous to lithium metal batteries was devised. This term became known as equivalent lithium content (ELC), also known as lithium equivalent content.

The ELC of a lithium ion cell measured in grams is calculated to be 0.3 times the rated capacity in ampere hours. The ELC of a lithium ion battery equals the sum of the grams of ELC contained in the component cells of the battery.

Although the term equivalent lithium content is used in the HMR, this term is not widely used or understood and can lead to confusion when calculating the ELC of a battery. For example, the aggregate ELC for a lithium ion battery consisting of multiple cells within a battery can be difficult to calculate based solely on the amperehour capacity of the battery.

Information on the ampere-hour capacity of the component cells within a battery is not normally provided and the ampere-hour capacity of a battery can change depending on the configuration of component cells within a battery.

The term watt-hour, expressed as (Wh) is commonly used in electrical applications. The watt-hour value of a lithium ion cell or battery is determined by multiplying a cell or battery's rated capacity in ampere-hours, by its nominal voltage.

Therefore, watt-hour (Wh) = amperehour (Ah) × Volts (V).

This product is easy to calculate for both cells and batteries and the watt-hour measurement is independent of how the component cells within a lithium ion battery are connected.