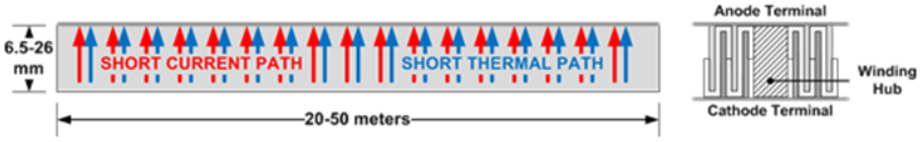
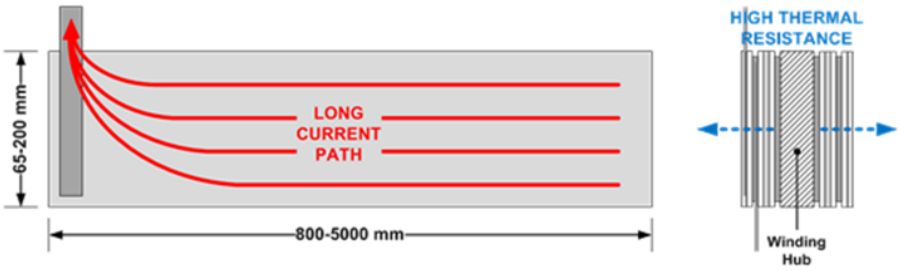
Rolled-Ribbon Cell Structure



Rolled-Ribbon cells have narrow electrodes (typically 13-26 mm). One edge of each electrode is in direct contact along its entire length (typically 20-50 meters) with its associated cell terminal. From an electrical perspective, this creates a very short, low impedance path to the cell terminal. From a thermal perspective, this creates a very short path with very low thermal resistance to the very large cell terminal. This is because heat travels along the electrode foil rather than through multiple layers of electrode material, foil and separator. The thermal resistance along an electrode foil is on the order of 100-200 times lower than that for crossing electrode layers.

Conventional Wound-Tabbed Cell Structure



These cells have long current paths (typically 800-5000 mm). This long path length result in much higher impedance. Further, the heat generated from this impedance will not be uniformly distributed across the electrode. There will be much more current flowing as you approach the tab on the left-side than on the right-side in the illustration, so there will be much more heat generated on the left than the right. Next, you have very poor thermal properties. Heat generated at the core must travel along a long longitudinal path of electrode foil through the highest heat portion of the electrode or overcome high thermal resistance through layers of electrode, including the highest heat portion of the electrode. This causes hotspots and thermal gradients that accelerate aging and can lead to unsafe conditions.

Excerpt from http://rolled-ribbon.com/technology.html (accessed March 31, 2021)