Throughout ROTOR’s history, many professional cyclists and triathletes have chosen Q-Rings. Their victories, like gold at the Olympics, the podium’s top spot in the Tour de France, more than twenty-five wins in Ironman races, and more than twenty mountain bike, road, time trial and cyclocross world championship titles speak for themselves.

Biomechanical research indicates that with Q-Rings, the effort is translated into performance and pedaling efficiency. Q-Rings compensate for inefficiencies in the pedal stroke by maximizing muscular engagement through the most powerful portion of the pedal stroke and minimizing it through the dead spots. In scientific, 1 km time trial studies, Q-Rings resulted in a 1.6 second advantage compared to round rings.\(^1\)

Some of the benefits of Q-Rings include improved overall performance, a greater ability to accelerate or sprint, a delay in the sensation of muscular fatigue, smoother torque, and better grip off road.

Q-RING ZONES

- The maximum diameter of the Q-Ring occurs where the greatest amount of power is produced in the pedal stroke.
- Minimum diameter of the Q-Ring occurs where the “dead spots” are located.
- Q-Rings can be oriented around pedaling characteristics to take advantage of the moment when the rider applies the maximum strength in a pedal stroke.

FORCE VARIATION

- A leg can’t deliver a constant amount of power throughout the pedal stroke as shown by the green lines (average torque curve for a cyclist’s left and right leg).
- Circular chainrings try to create a constant resistance level, as shown by the dotted line. Comparing the varying green lines to the linear dotted line it is clear that pedaling will never be smooth.
- A Q-Ring offers chainring resistance (as shown by the purple line) that best corresponds to one’s actual power output.

SPIN SCAN

- Q-Rings maximize use of the effective zones (increasing positive work) and reduce the intensity of the weak and inefficient zones (thereby creating less negative work).
- In the “round vs. Q-Rings spin scan” you can see clearly how Q-Rings’ force during the spin is maximized and the transition between high and low peak is smoother.

MUSCULAR ACTIVATION

- Here is a conceptual image showing distribution of muscular effort during each part of pedaling.
- Colors from both the spin scan and muscular activation graphs match the muscles in the human figures.