

RST / Turbo Studio FAQ #05

Performance Testing at the Turbo Studio.

At Turbo Studio we conduct various performance tests using our Computrainers – which enable us to test and record your power output while you ride your own bike. Two standard tests we regularly perform are for establishing **Functional Threshold Power** and **Maximal Aerobic Power**.

Functional Threshold Power (FTP) is the highest power a rider can maintain in a quasi-steady state without fatiguing for approximately 1-hour. When power exceeds FTP, fatigue will occur much sooner, whereas power just below FTP can be maintained considerably longer.

Threshold power is the single most important *physiological* determinant of endurance cycling performance (covering events from individual pursuits of 2 km, up to stage racing lasting several weeks). Hence improving threshold power needs to be the primary focus of our training.

Maximal Aerobic Power (MAP) is the maximal power maintained for 1-minute during an incremental test to exhaustion, with power increasing at a linear rate of between 15 to 25 watts per minute (rate chosen depends on type of athlete). Typically a rider could sustain their MAP for only a few minutes.

Why test FTP/MAP?

FTP and MAP are practical and readily measurable indicators of a rider's aerobic fitness. Through testing, one can objectively determine if training is having the desired impact.

They are also excellent tests for other reasons, in particular for anyone that is training with a power meter. Tracking FTP and MAP has a number of benefits:

- Knowing either enables a rider to define and measure intensities of riding (or power levels) *relative to their own current level of fitness*, expressed in a manner that relates to the primary physiological adaptation that occurs at each intensity (power) level. This is very useful for guiding training and making sure that the mix of intensity and duration during a workout or training cycle is appropriate for gaining the specific fitness required for a rider's target events.
- The relationship between FTP and MAP provides additional insight into a rider's physiology and state of fitness and so knowing both is helpful for a coach exploring what a rider's development needs are and which elements of training require emphasis.
- FTP is a key input into other metrics which enable a rider/coach to monitor overall training stresses, both long term training loads and recent fatigue levels and helps to guide appropriate changes in training loads.
- They also provides an excellent guide to how a rider should most effectively pace themselves, especially in races such as time trials (or during a breakaway in a road race or criterium)

Should I do blood lactate testing and/or a VO2max test?

There is nothing wrong with performing blood lactate and/or VO2max tests, however if you are using power monitoring regularly in your training, then such tests are largely redundant. Testing

your FTP is the power meter equivalent of a testing for your lactate threshold, and testing MAP is the power meter equivalent of assessing VO2max. The former tells us what we are capable of sustaining for a long period; the latter indicates our aerobic potential.

For riders that want to track changes in their fitness, performing tests for FTP and/or MAP is ideal since they are objective, use a readily repeatable protocol, results can be directly related to training with power and are a lot less expensive compared to blood lactate testing and VO2max testing.

Indeed they are more practical than blood lactate and VO2max testing since they measure what we can actually do (i.e. power output), which is a combination of the various underlying physiological markers that influence our abilities (VO2max, percentage of VO2max sustainable at threshold and metabolic efficiency). VO2max per se is not a particularly good predictor of performance. FTP and MAP are.

How do we test for FTP/MAP?

Of course if you have a power meter and you want to know your FTP, just go out and ride your bike as hard as you can for an hour and see what the average power was. In essence this is the gold standard measure of a rider's FTP. Unfortunately it is neither always possible nor practical for everyone to do a one hour time trial test. And not all such tests are well paced. A poorly paced effort may result in a lower average power than a well paced effort.

That's why at Turbo Studio we provide repeatable standard testing protocols. No cars, no traffic, no stops. No rain or wind. No difficult undulating terrain.

For FTP testing we use a standard long and vigorous warm up followed by a 20-minute¹ time trial. Riders can see their power output as they ride and will learn about pacing. During MAP test (after a standard warm up) the resistance is automatically controlled by the ergometer and the rider simply continues until exhaustion (with some encouragement).

The results are then assessed with our specialist software and provided.

How often should I test?

It depends on a few things but in general testing every 6-8 weeks is recommended as that's sufficient time for a training block to have had good impact. Just ask us here at Turbo Studio and we can provide sound advice on what test is best for your needs and when it's best to perform one.

Alex Simmons
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¹ We can also do 60-minute time trial, although it is usually not necessary.