

## 8. How to determine your FTP and your training zones

One of the advantages of power meters such as the Stryd is that you can now determine your own Functional Threshold Power (your FTP, in Watt/kg). Your FTP corresponds to an effort that you can maintain for 1 hour. It is a very important parameter to predict your attainable speed and race time at various distances. Before, you had to go to a Sports Medical Center to get your FTP determined. Now you can do it yourself and as frequent as you like. This means you can keep track how your fitness evolves with time. The FTP is also an important parameter to determine your training zones, as we will explain in this chapter. You can easily adjust these zones when your FTP increases or decreases.

### The Stryd Critical Power test

Stryd uses a standard protocol to determine 'Critical Power' (CP). Stryd defines the critical power for runners as the power at which an athlete transitions from aerobic to anaerobic respiration.

Unfortunately, it is not entirely clear which algorithm they use and to which time period the CP corresponds. Consequently, it is not possible to relate the CP to the FTP, which corresponds to the power which an athlete can maintain for 1 hour.

Stryd recommends to do this test at a running track. You may also use an alternative measured course. The protocol is as follows:

1. Warm up 5 minutes.
2. Easy-pace run 800 m.
3. Easy run/warm up 5 minutes.
4. Max-effort run 1200 m.
5. Recovery 30 minutes (walk/active recovery/easy running).
6. Max-effort run 2400 m.
7. Cooling down 10 minutes.

Based on this test, the Stryd App calculates your Critical Power (CP) and personalized training zones. It is not entirely clear to what extent the results of the 2400 meter are affected by some residual fatigue of the preceding 1200 meter.

### A simple and science-based test

Because it is not clear to which time period the CP corresponds and because we do not know the algorithm of the Stryd, we have developed a simple alternative method.

Our method is based on the physiological science of the time-power relationship as explained in our book *The Secret of Running* ([www.thesecretorunning.com](http://www.thesecretorunning.com)). Remember that the FTP is the amount of power that you can maintain for 1 hour. Of course it is not very practical to perform a test of 1 hour, as this would be too exhausting. But we know the power-time relationship, as we discussed in our book *The Secret of Running*. Let's look at a test of 10 minutes, the power output will obviously be higher than the FTP, by a factor of  $(10/60)^{-0.07} = 1.13$ . So you can determine your FTP by dividing the specific power output during a 10 minutes test by 1.13. Such a test can be easily integrated in a training program, and is in fact a good pace training. We recommend to do this test once every 6 to 8 weeks,

so you keep track of your fitness and assess whether or not your progress proceeds as desired. The following protocol can be used:

1. Warm 10 - 20 minutes (with some accelerations).
2. Max-effort run 10 minutes (note your SP during the run)
3. Cooling down 10 minutes

You can now calculate your FTP with the simple formula:

$$\text{FTP} = 1.13 * \text{SP (in Watt/kg)}$$

By repeating this test regularly, you will get a better grip of how your fitness and performance level evolve in time.

### Determining your training zones

Now you have determined your FTP, you can determine your own training zones. Based on the literature and our own experience, we have compiled the following table, detailing 7 training zones to stimulate and improve the different energy systems of your human engine.

Zone	Training goal	Training form	%FTP
0	Circulation in muscles	Warming up and recovery training	60 - 70
1	Improvement aerobic capacity and aerobic efficiency	Endurance training (10 - 30 km)	<70
2	Improvement transition from aerobic to anaerobic system	Tempo endurance training with long tempo blocs (3 - 5 km)	80 - 90
3	Improvement lactate threshold power and anaerobic efficiency	Extensive interval training with longer blocs (1000 m)	90 - 100
4	Improvement lactate tolerance and VO <sub>2</sub> max	Intensive interval training with shorter blocs (400 m)	100 - 110
5	Improvement anaerobic capacity	Speed training (200 m intervals)	110 - 150
6	Improvement explosive power	Sprint training (50 - 100 m)	>>150

### Explanation

#### *Zone 0: Active recovery*

This zone includes warming up and easy runs with a duration of 30 - 90 minutes and an intensity of less than 70% of your FTP. The goal is to recover from previous hard training sessions or races. Warming up and cooling down are also part of this zone.

#### *Zone 1: Endurance training*

This zone includes both the short daily base runs (around 10 - 15 km) as well as the long weekly run (25 - 30 km). The intensity is 70 - 80% of your FTP. The goal is to stimulate and develop your muscles and aerobic capacity.

#### *Zone 2: Tempo endurance training*

This zone includes the higher intensity brisk tempo blocs (distances 3 - 5 km). The intensity is 80 - 90% of your FTP. The goal is to stimulate and develop the transition zone between the aerobic and anaerobic systems and your pace endurance.

#### *Zone 3: FTP training*

This zone comprises the longer interval sessions (800 - 1000 - 1200 meter, for example 5\*1000 m). The goal is to stimulate and develop your FTP. The intensity is 90 - 100% of your FTP.

#### *Zone 4: VO<sub>2</sub> max training*

In this zone the shorter interval sessions are done (400 - 600 meter, for example 10\*400). The goal is to stimulate and develop your VO<sub>2</sub> max. The intensity is 100 - 110% of your FTP.

#### *Zone 5: Anaerobic capacity training*

This zone consists of very short intensive intervals (200 meter, for example 10\*200). The goal is to stimulate and develop your anaerobic capacity and speed. The intensity is 110 - 150% of your FTP.

#### *Zone 6: Neuromuscular power*

This zone includes the high-speed sprint sessions (50 - 100 meter). They can be done with a flying start. These sessions stress and develop the neuromuscular power. The intensity has to be above 150% of your FTP.

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*Figure: With a running power meter you can easily determine your own FTP. You do not need to perform complicated tests at a physiological lab or with mobile breathing gas analysis equipment (ergo spirometry).*