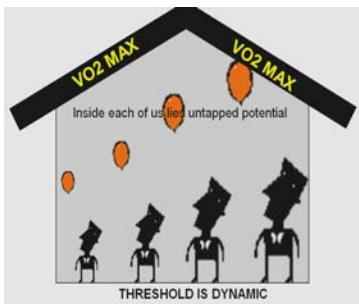


## Boosting Threshold & VO2 Max to Achieve Fitness & Performance

To keep the pedals turning, focus on boosting your threshold power and VO2max. These markers are the major predictors of endurance and performance and needed markers to determine accurate training zones.

Maximal oxygen consumption (VO2max) is the maximum amount of oxygen that can be used by the body for maximal sustained power output, and is determined by gas analysis assessment. Oxygen consumption is your ability to extract oxygen from the air, ability to ventilate, ability of heart to pump out blood and ability of tissues to extract oxygen from the blood. The body uses oxygen to convert nutrients into energy. Therefore the more oxygen you can consume, the more energy you can produce (the more power, speed, and work you can do). VO2max is your fitness ceiling, or like a car, it is the size of your engine.

Threshold reflects the balance between lactate production and removal, meaning it is the highest workload at which you can still nourish the muscles with O2 and remove lactate for energy production. In practical terms, it is the highest sustainable effort or the highest amount of work you can sustain before lactate begins to pile up in your blood. Like a car, it is your gas mileage. Your threshold power can easily be determined by taking the Power Test [www.cycleops.com](http://www.cycleops.com)



By raising your Threshold Power and VO2max, you will be able to produce more work and maintain the activity for a greater period of time. As the diagram shows, VO2max is a ceiling, determined primarily on the size of the left ventricle. Since the volume of the heart chamber doesn't change drastically, you have a genetic ceiling you can obtain through training. After you have been training for a while, VO2 values may only increase a little (or not at all). However, threshold is quite dynamic and will respond well to appropriate training.

Therefore the goal is to boost your threshold as far 'to the right' or as close to your peak as possible. In other words, VO2max is the puzzle and threshold is the main piece of the puzzle.



To drive those markers to the right, it will require high intensity work to build strength and power PLUS high mileage to build endurance and stamina to carry on the effort. If you want to increase VO2max, you have to train near it. This is very short bouts of your highest power outputs. To boost threshold, you will focus on training around it, and progressively increasing your training volume. By putting "near threshold" time in the saddle you will build powerful, long lasting muscles.



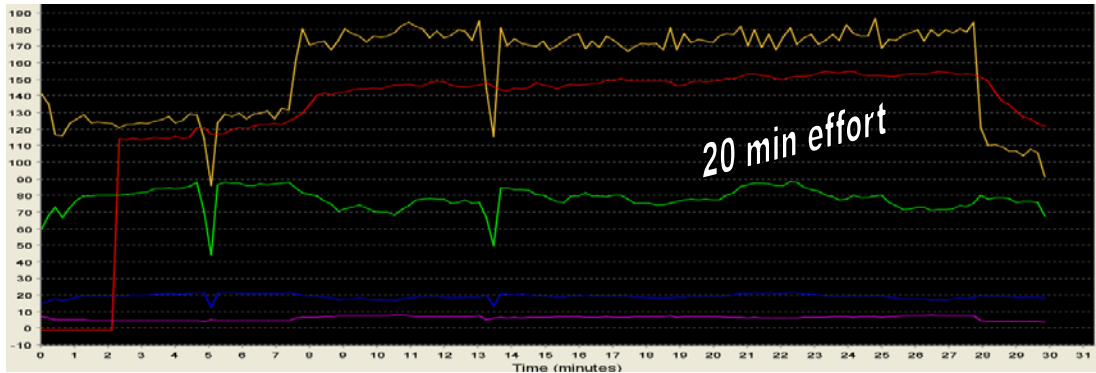
Although there are many workouts to achieve this goal, I can give you one workout that will get it all done at once. This workout focuses on boosting VO2max & threshold power within a 60-70 min period of time. Like a car, you'll develop the max strength of a dragster engine and sustain the speed like an Indy car. Before doing the following workout, take the Power Test to determine your Threshold Power. You will then need to know 80-90% and 110% of Threshold Power.

- After 10:00 warm-up, gradually ramp yourself up to 80% of Threshold power
- Sustain 80-90% Threshold Power 10:00 to 20:00 (work your way up to 20:00)
- 5:00 Easy

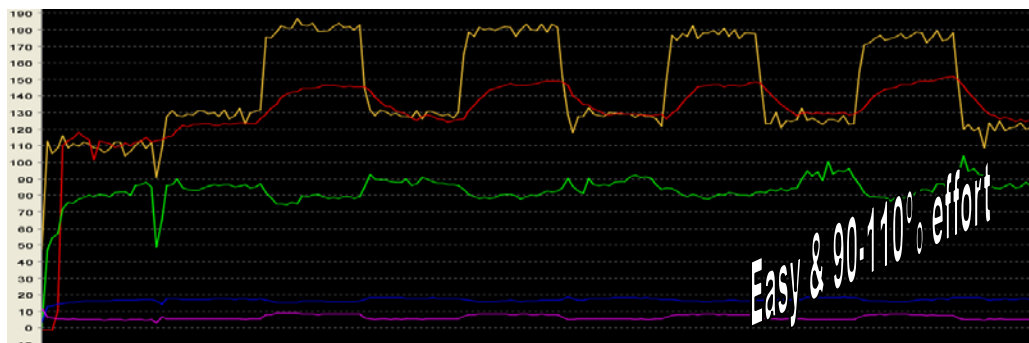
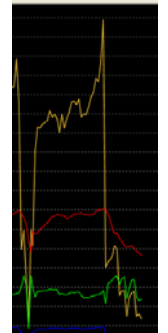
- 3:00-5:00 90-110% Threshold Power - Finish with all out 10-20 sec effort
- 5:00 Easy
- 5:00 90-110% Threshold Power - Finish with all out 10-20 sec effort
- 5:00 Easy
- 3:00-5:00 90-110% Threshold Power - Finish with all out 10-20 sec effort
- Cool Down 10:00

Adjust times and intensity based on your current fitness level.

The details below show each focus separately.



**VO2max effort**



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