

VO2 max: Training your physiological adaptations



VO2 max testing performed at Ergo Performance Cycling Fitness

272 Pulteney Street, Adelaide SA 5000

The VO2 Max is test one of Cycology Lab's most popular metabolic tests. VO2 max is the gold standard in cardiorespiratory fitness analysis and gives athletes a direct measurement of their maximal oxygen consumption. The physiological efficiency in transporting oxygen to skeletal muscles is scored in ml/Kg/min.

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RECOVERY
Sport: Increase lactate breakdown, reduce muscle aches & spasms.
BounceBack: prevention of DOMS (delayed onset of muscle soreness)

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VO2 max test explained: The protocol

The cycling VO2 max test follows a stepped-test protocol whereby resistance is gradually increased over time until exhaustion. The test is 'fine tuned' depending on your age and sex. A typical cycling VO2 max test begins with a 5 minute warm up with a resistance of 100 watts. The first increment increase will ramp up to 175 watts of resistance, and continue to increase by 25

watts every minute until the test subject can no longer maintain a constant cadence between 90-105 rpm. The test itself is intense, and generally lasts anywhere from 10-20 minutes depending on aerobic fitness. We like to think of the test as *small pains for large gains...*!

VO2 max: Training your physiological adaptations

Heart rate training zones are also calculated during the test. This means that you can target specific heart rate zones in order to achieve specific goals.

Heart Rate Zones	Recovery Zone	Training Zone 1	Training Zone 2	Training Zone 3	Training Zone 4	Training Zone 5
	Recovery	Aerobic	Extensive Endurance	Intensive Endurance	Threshold	VO2 Max
% Max Heart Rate	<65%	65-75%	75-80%	80-85%	85-92%	92-100%
Beats per min	<115	115-133	133-142	142-151	151-163	163-178

Training in your VO2 max zone for example requires extended periods of recovery due to the intensity of the training. Individual tolerances will vary depending on the athlete's 'training age,' fitness level and predisposition to injury. At most, 2 x sessions at VO2 max intensity per week should be used with easy recovery work in between. Physiological adaptations that occur in this training zone include:

- Increased lactic acid tolerance
- Elevated VO2 max
- Improved endurance speed



A big thank you for conducting my VO2 test. It will prove invaluable in ramping up my training for the coming year. It was great to be walked through the test from start to finish.

For anyone who hasn't had a test (never or not that recent) I thoroughly recommend you to do so with Cycology Lab. Their professionalism and setup is second to none.

Nic Zuraw

Anaerobic threshold analysis: Understanding your lactate threshold and exploiting your biometrics



Anaerobic threshold analysis is one of the most useful tools that Cycology Lab has to offer. The test is designed to accurately measure the precise exercise intensity whereby an athlete can deliver their best performance over a long period of time.

The test is similar to the VO2 max test, except that the intervals are a little longer to allow adequate time to reach 'steady state' and capillary blood to equilibrate. Blood samples are taken every three minutes and blood lactate accumulation in mmol/L is recorded.

The results of the test reveal the maximum heart rate (bpm) or maximum power (watts) an athlete can sustain over a long period of time before feeling the effects of overexertion. Knowing your lactate threshold is key to producing maximum performance whilst still efficiently recycling and utilising lactate as a fuel source.



Stef Trigatti – Trak Cycles



Amber Heft & Aaron Buchan – Cross Training Systems

Athletes sponsored by Cycology Lab

Cycology Lab is currently sponsoring three gifted athletes: Stef Trigatti (Trak Cycles) and Amber Heft & Aaron Buchan (Cross Training Systems).

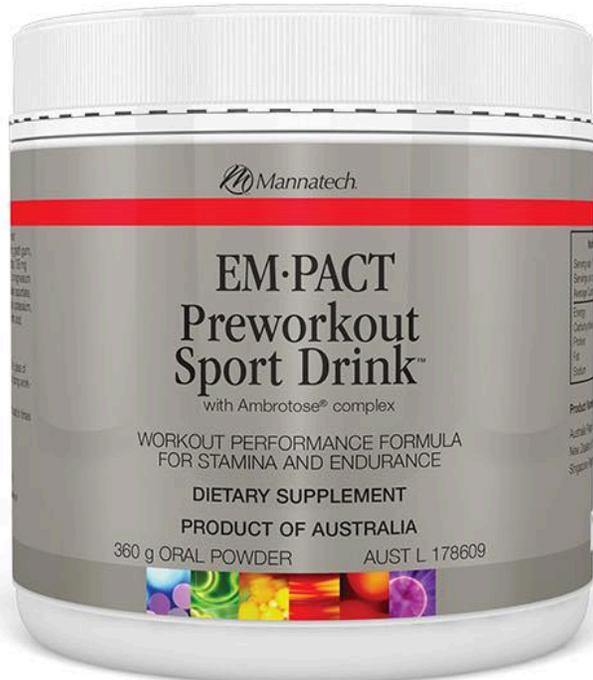
Stef placed 2nd in the 2015 Alpine Classic 200km race and now has his eyes set on arguably one of the most physically-demanding bike races in the world: The Red Bull Otztaler Radmarathon. Set in the majestic Austrian Alps, the course totals a distance of 238km with 5,500 meters of altitude! “The glacial conditions can really catch you out, especially at the beginning of the course where it is all downhill before you hit the first climb. Staying warm is very important, that is why I am wearing 3 pairs of gloves!” Nutrition and hydration points have been carefully planned along the course to optimise Stef’s maximal performance. With 2 years of training preparation and dedication to this particular event, he is in perfect form for a very strong result.

Aaron & Amber have been bringing in consistent well-placed results all season and were very strong performers in the recent Gatti Triathlon Series. Both will be representing Australia in the World Triathlon Championships in Chicago. “The biggest challenge in training for an event like this is allowing for adequate rest and recovery. The key is to focus on the quality, not the quantity of training.” Aaron has demonstrated his confidence by taking on 3 disciplines in Chicago: sprint, aquathlon & standard distances. “My post-Chicago goal is to be very competitive in the ITU Duathlon competition and maintain my strong form in the 2015-2016 triathlon season.”

Our athletes are armed with the latest advanced glyconutrient technology to help them maximize their performance and recovery time. We wish them the very best as they represent us on the international stage.

Advanced Glyconutrient Technology

Performance



EM-PACT increases your VO2 max.

How does EM-PACT work?

Glyconutrients are essential for enabling our cells to communicate effectively with one another. Our cells are lined with cell surface receptors, which are the “gate keepers” of cell-to-cell communication. To activate cellular communication, glycoproteins must bind to these cell surface receptors. Cellular glycosylation is essential to enable clear cellular communication so that nearby (or distant) target cells know exactly what’s happening in the body and can ‘be ready’ to perform any tasks at hand. So how does this relate to increased performance? Imagine your skeletal muscles working at an intensity where they are screaming for more fuel (in the form of oxygen). If the surface receptors of your skeletal muscle cells were all activated by glyconutrients a flurry

Recovery

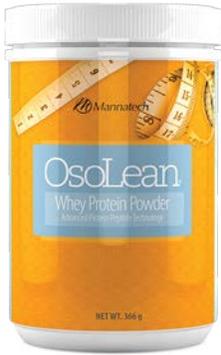


of messages would go out to your erythrocytes (red blood cells) and ‘guide’ them to your eagerly awaiting skeletal muscle cells. Your ability to effectively transport oxygen now makes you more efficient, which puts less stress on your heart, keeping your heart rate lower and your athletic performance output higher!

SPORT assists with the body’s natural recovery process. Benefits from taking sport include relief of muscular aches & pains, as well as muscular cramps and spasms.

BounceBack reduces DOMS (delayed onset of muscle soreness). Benefits from taking BounceBack include reducing bruising, swelling & inflammation from minor injuries, & decreasing recovery time from overexertion or physical activity.

Coming up in our next newsletter...



OsoLean: Inhibit fat absorption and promote healthy lean muscle mass



Resting Metabolic Rate: Calculate your daily energy expenditure to implement a successful weight management plan



Haematocrit & haemoglobin analysis: How to maximize oxygen delivery to your skeletal muscles



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