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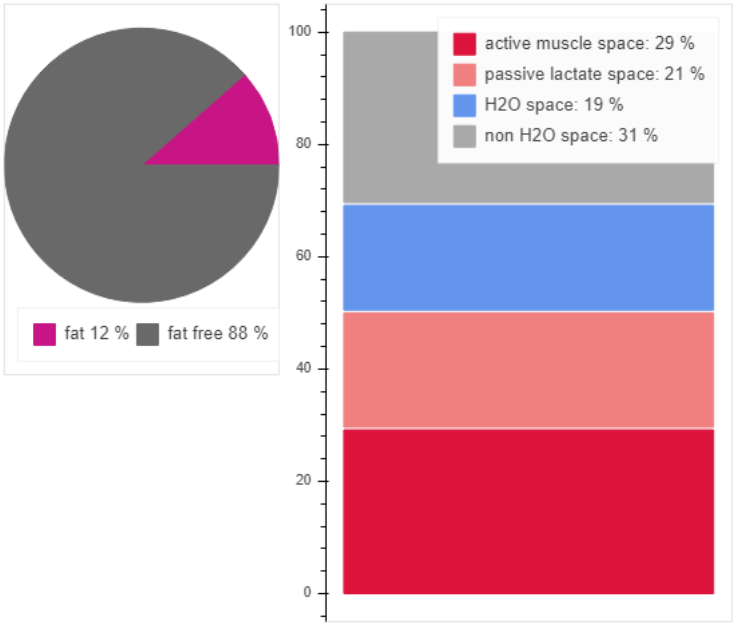
# Performance Test Report

## Body Composition

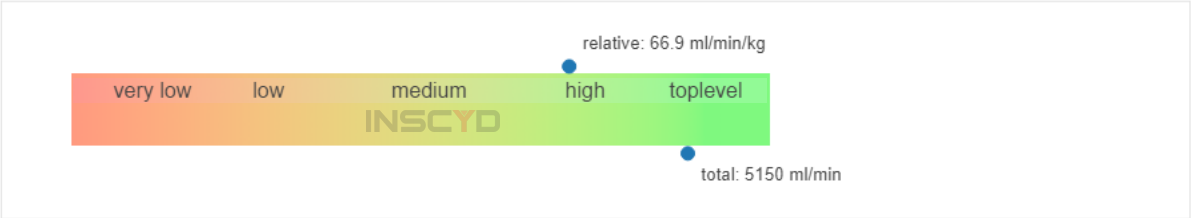



| | |
|---|---|
| Body Mass | 77.0 kg |
| Body Height | 181.0 cm |
| Body Mass Index | 23.5 kg/m2 |
| Projected BSA | 1.960 m2 |
| Body Fat | 11.5 % of body mass / 8.9 kg |
| Fat Free | 88.5 % of body mass / 68.1 kg |

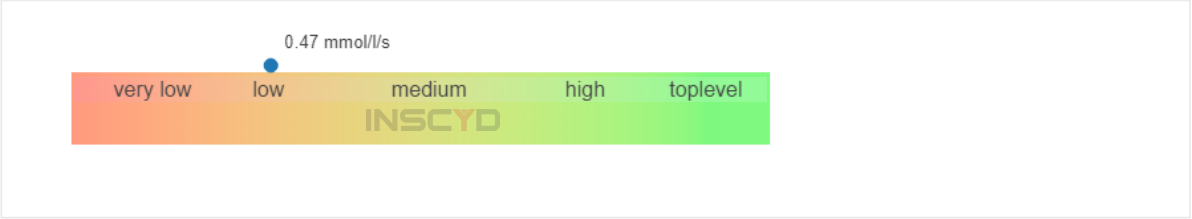
The graphs and the table above show your actual body composition.
Please pay close attention to the body fat, and fat free values. In most sports it is desirable to achieve a low body fat percentage (= high fat free mass). However, with body fat, there are inter-individual differences of what the best value is. The lowest possible value, may not always be the desired goal. Next to the visualization of body fat and fat free mass, you see a visualization of the body compartments. Based on the measured metrics of body composition, the performance related compartments for lactate distribution and active muscle mass have been calculated. These metrics depend on 2 criteria; your body composition, and the involvement in muscle mass. For example, in cycling the percentage of used muscle mass (primarily lower body muscles) is lower compared to rowing (full body workout). These body compartment metrics are used further down in the analysis of performance relevant metrics, such as lactate clearance and production.

## Metabolic Capacities

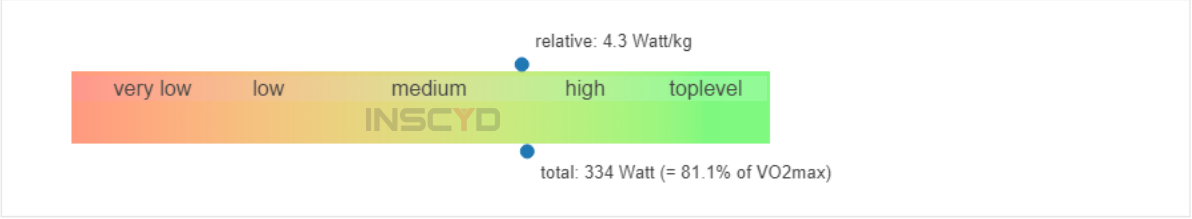
**VO2max - aerobic capacity**



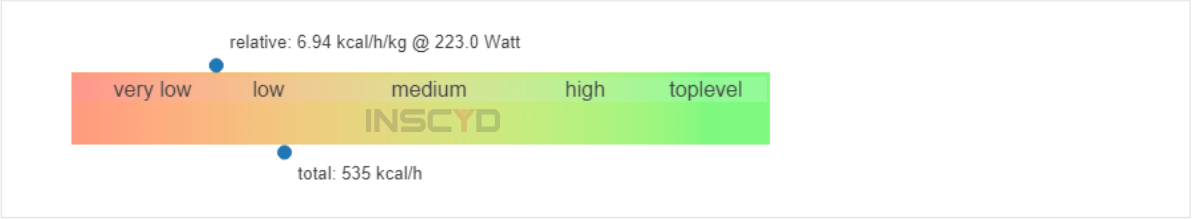

**VLamax - anaerobic capacity**



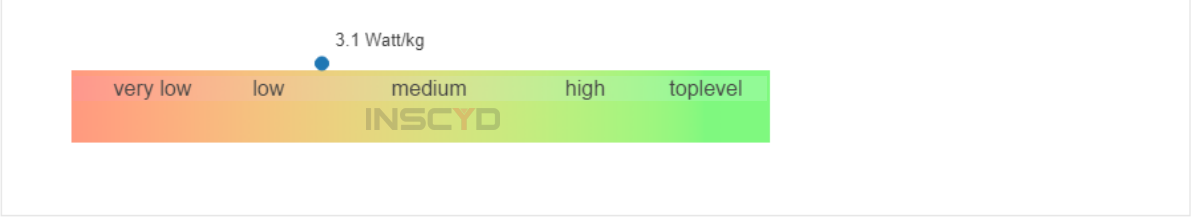

**AT - anaerobic threshold**




**FatMax - maximum fat metabolism**




**CarbMax - carbohydrate metabolism**

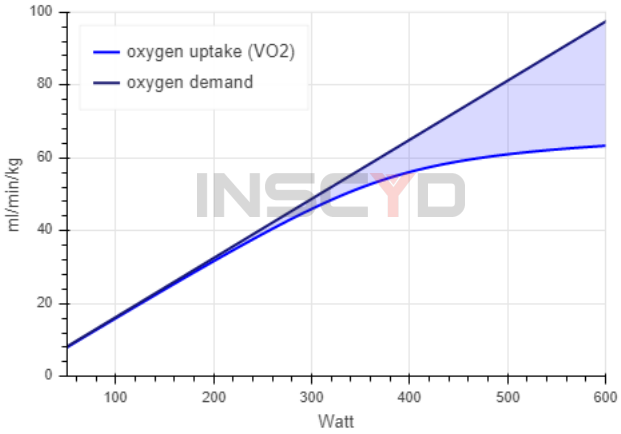



The visualization above shows the most important performance benchmarks. It shows your maximum aerobic capacity or VO2max. With every milliliter of oxygen your body is able to take up and use in the metabolism, energy is produced. A higher VO2max means higher energy turnover, and therefore more power. In almost all sports it is desirable to have a high VO2max, enabling a high power production by aerobic metabolism.
Vlamax is the maximum lactate production rate. With every bit of lactate produced, the muscle also produces energy. Therefore VLamax can be viewed as maximum glycoltic power (fluxrate), or simplified as anaerobic capacity. For endurance events, such as an Ironman, or a Marathon, a low VLamax is desirable. A comparable low VLamax allows for higher anaerobic threshold, higher fat combustion and better carbohydrate sparing. On the other hand a lower VLamax means lower glycolytic energy production, which compromises the performance in sprints. Therefore, in events which include sprinting or short intense bouts, a higher VLamax is associated with higher performance.
Anaerobic threshold (AT) has long been known as one of the most important benchmarks in endurance sports. AT marks the intensity (speed or power) at which the production rate of lactate in the muscle equals the clearance rate of lactate. AT marks the

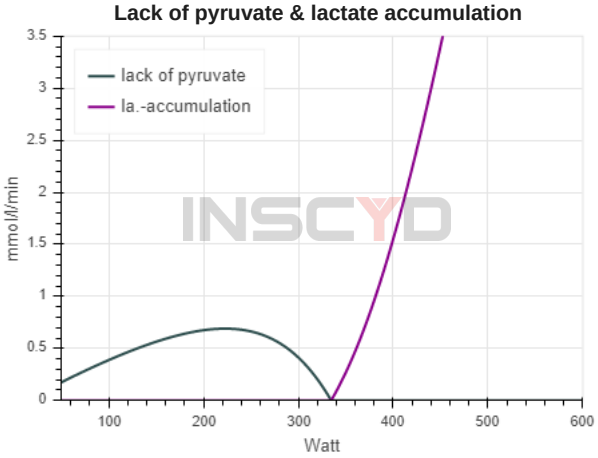
highest possible intensity, which can be sustained without accumulating lactate. The exercise duration in this case is mostly limited by the availability of carbohydrates, which drain quickly at the intensity of AT.
FatMax (if shown) marks the highest fat oxidation rate. Simplified, this is the maximum amount if energy (kcal) from fat combustion per hour. In endurance events, a high FatMax is associated with high endurance performance. Whilst carbohydrate stores (glycogen) are limited, utilizing fat as a fuel can help to spare carbohydrates. FatMax is also a training intensity, which can be helpful to assign individual intensity zones for training.
CarbMax marks the intensity (speed or power) at which the combustion of carbohydrates reaches 90g per hour. This rate of carbohydrate utilization is the non maximum of carbohydrate absorption per hour (this is shown as less than 90 grams per hour).

## Load Characteristics

**Metabolic demand & VO2**

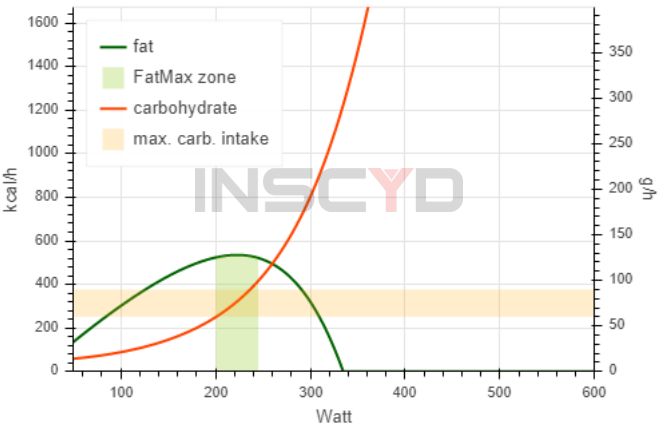



**Lack of pyruvate & lactate accumulation**

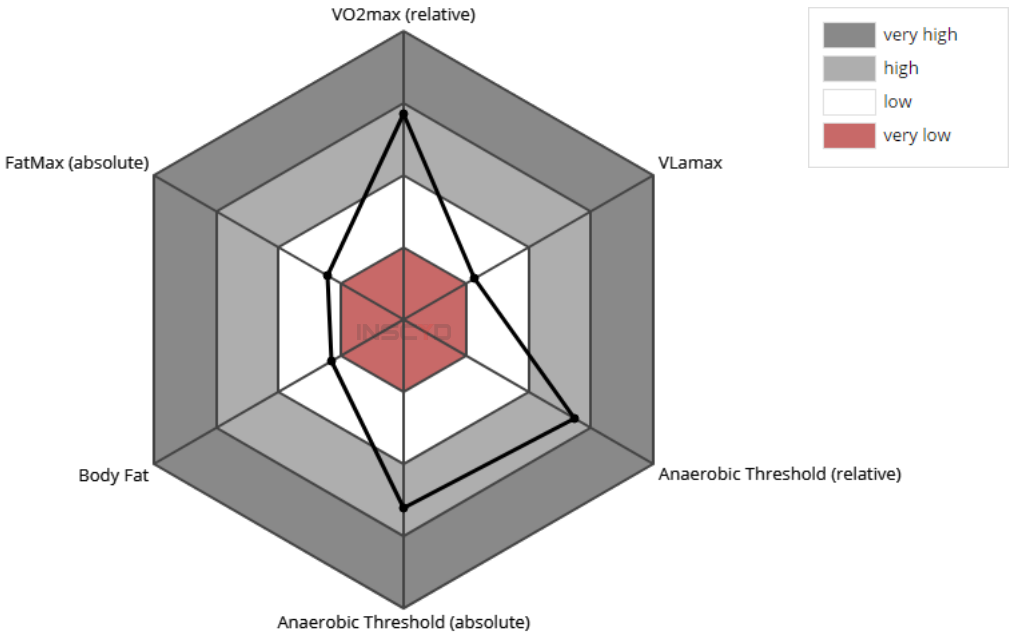



**Lactate – production & max. oxidation & concentration**

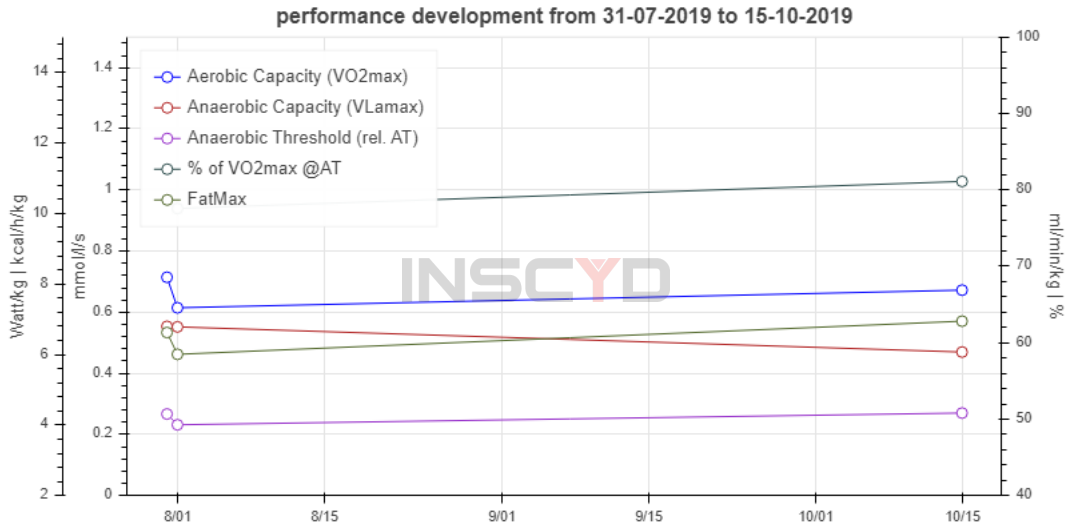

**Fat & carbohydrate combustion**



## Metabolic Fingerprint



## Performance Development



## Training Zones

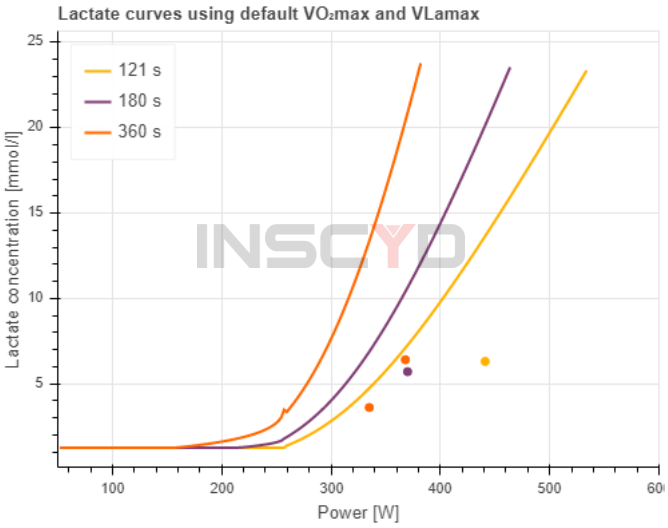
| Name | | Code | Power | | respect to target value | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | lower | upper | target | energy cons. | %fat | %carbo | fat abs | carbo abs |
| | | | Watt | Watt | Watt | kcal/h | % | % | g/h | g/h |
| **Zone 1** | recovery | rec | 122 | 173 | 142 | 553 | 76 | 24 | 44 | 32 |
| **Zone 2** | base | bas | 173 | 223 | 203 | 785 | 67 | 33 | 56 | 62 |
| **Zone 3** | medio | med | 246 | 311 | 279 | 1053 | 41 | 59 | 46 | 148 |
| **Zone 4** | FATmax | fmax | 201 | 245 | 223 | 858 | 62 | 38 | 56 | 77 |
| **Zone 5** | anaerobic threshold | AT | 311 | 358 | 334 | 1225 | 0 | 100 | 0 | 293 |
| **Zone 6** | aerobic maximum | aemax | 413 | 455 | 433 | | | | | |
| **Zone 7** | high anaerobic | anmax | 428 | 484 | 457 | | | | | |
| **Zone 8** | lactate shuttling | LaEx | 223 | 370 | | | | | | |
| **Zone 9** | custom 1 | C1 | | | | | | | | |
| **Zone 10** | custom 2 | C2 | | | | | | | | |
| **Zone 11** | custom 3 | C3 | | | | | | | | |
| **Zone 12** | custom 4 | C4 | | | | | | | | |
| **Zone 13** | custom 5 | C5 | | | | | | | | |

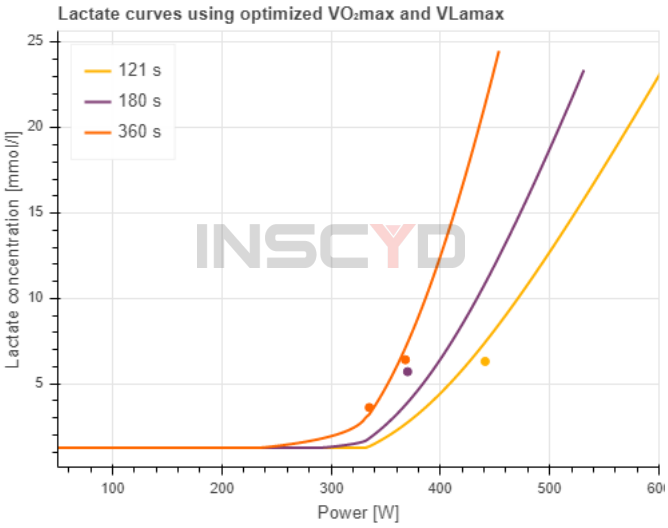
The table above shows your individual training zones. These zones are not generated as fixed percentages of anaerobic threshold, FTP, or other static metrics, like you get elsewhere. Each zone listed here has its own individual origin, and is related to an actual performance metric = your current status. For each zone, you will find an upper and lower intensity limit, plus the target value, which you should focus on when training in this zone. Where applicable the energy consumption per hour is listed and the distribution of fat and carbohydrate – both in percentage and as absolute consumption in grams per hour. You can use these numbers to better understand how you fuel yourself while training in those zones. Furthermore, you can see how much total fat you can burn in each zone.
Zones defined: Zone 1 – recovery: the lowest intensity zone. Used mostly used for easy trainings, rest days and in between intervals. Zone 2 – base: this is the “bread & butter” zone for endurance training. Zone 2 is the zone in which the long endurance trainings are to be completed. Zone 3 – medio: a mid intensity zone, between the base endurance, and anaerobic threshold. Zone 4 – FatMax: the intensity at which the consumption of fat as a fuel is highest. Zone 5 – anaerobic threshold: the intensity at anaerobic threshold (lactate production rate equals lactate clearance rate). Zone 6 – aerobic maximum: an intensity at which your oxygen uptake will raise to its maximum rate in very short time. Zone 7 – high anaerobic: the intensity at which 25% of the needed energy comes from glycolytic energy supply (in steady state condition). Zone 8 – lactate shuttling: the lower value shows the intensity at which you can clear lactate at the maximum rate. The upper values shows the intensity at which lactate accumulates at the same rate.

# Test Data

**Determination of lactate accumulation**

Sum of squared errors before optimization: 369.70 , after optimization: 5.19




# Raw Test Data

| Measured Values | | | Calculated Values | | | |
|---|---|---|---|---|---|---|
| Run | Time (mm:ss) | Power (W) | Max Lactate (mmol/l) | VO2tot (ml/min/kg) | % aerobic (%) | % anaerobic (%) |
| 0 | 06:00 | 335 | 3.6 | 54.38 | 92.23 | 7.77 |
| 1 | 06:00 | 368 | 6.4 | 59.74 | 89.55 | 10.45 |
| 2 | 03:00 | 370 | 5.7 | 60.06 | 89.36 | 10.64 |
| 3 | 02:01 | 441 | 6.3 | 71.59 | 61.04 | 38.96 |