Faster Five

Fitness Assessment

Fitness assessment foundation for masters athletes

The Faster Five Fitness Assessment document details how a complete fitness assessment helps determine your proportional fitness to find the areas that are well developed and the areas that need additional training.

After the initial assessment, regularly scheduled fitness evaluations with objective measurements are important for tracking your progress and adjusting your training program.

The following five parts provide the foundation of Faster Masters fitness assessments:

Appraising general fitness

You use the results of four tests to identify weak areas that determine the types of workouts you need to prioritize in your training program. You will also be able to determine your training paces.

What is proportional fitness?

Proportional fitness is an examination of how the following test measurements compare to one another:

- Peak anaerobic power
- VO2 max uptake
- Anaerobic threshold
- Aerobic threshold

Testing guidelines

- The tests should be conducted approximately within the same week but on different days to allow recovery.
- Each test should be your best effort on the day.
- Except for the peak power test, set your drag factor at the resistance that you typically use in training.
- You may do the tests in any order if needed to accommodate your schedule.
- Day 1 and Day 2 may be done on the same day.
- You may have two rest days between tests if needed.

Suggested test schedule

Day 1: 10 Second Peak Power test

1. Warm up by paddling easy for 5-10 minutes at your regular drag factor.
2. After warming up, set the drag factor to 200, then let the flywheel come to a complete stop.
    - The high drag factor is necessary to provide adequate resistance so that you can hit a true peak power. Lower drag factors do not provide enough resistance and you will get lower peak power numbers.
3. Set the units of your monitor to watts so that you can see the watts for each stroke during the test.
4. Beginning from a complete stop, row as hard and as fast as possible for 10 seconds, recording the highest power you see on any stroke.
    - There is no rate cap but you must row as close to full slide as possible right from the first stroke. Do not use a racing start.
5. Rest for 3-5 minutes and repeat two to three times.
    - There is a slight learning effect when you first do this test so you might want to do it several times to get a true peak power score.

Purpose of the 10 Second Peak Power test

If peak power is more than 45% relative to the 1K Meter VO2 Max test value, it indicates that more strengthening is needed to raise peak power and improve stroke output. The higher the peak power the more room there is to improve

output at various rates and intensities. Low peak power limits the amount of output you can achieve because of strength issues.

Day 2: 75 Minute Aerobic Threshold test

Suggestions for this test:

- Stroke rate: 18-24
- Aim for a pace that you can maintain for the duration of the test, such as your best steady state pace
- Do not stop during the test, but you might want to set a water bottle close by if you need to drink during the 75 minutes

1. Row for 75 minutes.
2. Record your average watts.
3. For future reference, also record the average 500-meter split, the total distance rowed, and the stroke rate.

Purpose of the 75 Minute Aerobic Threshold test

A value below 65% relative to the 1K Meter VO2 Max test value indicates that your aerobic threshold needs improvement. Aerobic threshold fitness forms the base of your fitness pyramid.

The main purpose of a good aerobic base is to improve your ability to recover faster. The ability to recover quickly is critical at regattas when you race more than one race per day, and for training when you are doing more intense interval training. An athlete's training is primarily limited because of the time it takes to recover between sessions. Improving your recovery ability also allows you to do more quality work when racing season comes.

In addition, a good aerobic base is critical for improving metabolism in the muscle cells, burning fat as a fuel, and improving the function of the heart muscle because heart rates are kept low. You do the bulk of technique training at low heart rates.

Many athletes make the mistake of not devoting enough time to aerobic base training, or they train at too high an intensity. Many gains can be made if this level is properly trained. Do not go faster than indicated for your training to get the proper effect. Aerobic base training is Category VI and Category V training category paces.

Day 3: Rest

It's important to take a rest day after the 75 Minute Aerobic Threshold test.

Day 4: 1K Meter VO2 Max test

Suggested stroke rate: 26-28, but it can be as high as 34 or more

1. Warm up properly to ensure you perform at your best.
2. Row 1000 meters at race pace, giving your absolute best effort.
3. Record your average watts.
4. For future reference, also record the average 500-meter split, the total time, and the stroke rate.
5. To help recovery, cool down with at least 15 minutes of easy rowing.

Purpose of the 1K Meter VO2 Max test

The 1k test is used as a reference to all the other tests because it represents high end fitness, or maximal oxygen uptake. Raising VO2 max is always a priority especially when you race a 1k distance. A higher VO2 max creates more room for improvement in anaerobic threshold and aerobic threshold. VO2 max improves as the other three training factors develop. As VO2 max goes up so will the performance demand for strength, anaerobic threshold, and aerobic base. Regular testing helps determine that you maintain the ideal relationships between the thresholds.

Day 5: Rest

It's important to take a rest day after the 1K Meter VO2 Max test.

Day 6: 20 Minute Anaerobic Threshold (AT) test

This test is used to determine your training paces, according to the reference chart of training categories.

Suggested stroke rate: 24-28 but can range from 22-30

1. Row 20 minutes at the best pace you can sustain for the duration of the test. Aim to achieve a maximum number of meters.
2. Record your average watts.
3. For future reference, also record the average 500-meter split, the total distance rowed, and the stroke rate.

Purpose of the 20 Minute Anaerobic Threshold test

A value below 80% relative to the 1K Meter VO2 Max test value indicates that your anaerobic threshold needs improvement. Anaerobic threshold determines the best pace you can hold before your speed is limited by lactic acid production in the muscles. AT is just below the point when lactic acid is produced faster than it can be cleared from the muscles.

The higher your AT the faster average pace you can hold for a racing distance, especially over a 2k race or a head race. Improvement in this area responds very well to training at the Category IV level, and can improve in a matter of months. It is very important not to overtrain this level (no more than two sessions per week at this intensity) and not to train faster than indicated.

Day 7: Rest

It's important to let your body recover after the 20 Minute Anaerobic Threshold test.

Understanding results

Once you have completed all four tests, calculate the comparisons using watts and identify the areas of fitness that you need to put additional focus on. When you calculate the comparisons, you see which factors are out of the ideal percentage range compared to your 1K Meter VO2 Max test, which serves as the reference point.

Ideal relationships between the fitness thresholds

As mentioned previously, proportional fitness is an examination of how peak anaerobic power, VO2 max uptake, anaerobic threshold, and aerobic threshold compare to one another.

In an ideal situation, you would expect to see the following relationships:

- VO2 max power should be 40-45 % of the peak power
- Anaerobic threshold power should be 80-85% of VO2 max power
- Aerobic threshold power should be 65-70 % of VO2 max power

Sample test results

To view these sample test results in a chart format, see Chart of sample test results.

Suppose that a rower performed all the tests and has the following results:

- 10 Second Peak Power test: 750 peak watts
- 75 Minute Aerobic Threshold test: 180 average watts
- 1K Meter VO2 Max test: 400 average watts
- 20 Minute Anaerobic Threshold test: 295 average watts

From this data we can compare the sample percentage to the ideal percentage:

- VO2 vs. Peak power is 53%. The ideal is 40-45%
- Anaerobic threshold vs. VO2 is 74%. The ideal is 80-85%
- Aerobic threshold vs. VO2 is 45%. The ideal is 65-70%

Analysis of the sample test results

Comparing the sample test results to the ideal shows the relationships between the physiological variables:

- VO2 max is a higher percentage of peak power than it should be. The result is 53% versus the 45% ideal, suggesting that this person needs to improve their peak power or they will have difficulty improving their VO2 max any further.
- Anaerobic threshold is 74% of VO2 max as opposed to the 85% ideal. This percentage means that the rower in the sample test results also needs to raise their anaerobic threshold.
- Aerobic threshold, as measured by the 75 minute test, is 45% of VO2 max instead of the 70% ideal, which indicates a need for more low-intensity, long duration work.

Limitations between physiological thresholds

To understand the data it's important to understand the limitations between physiological markers and the physiological markers above them. The sample test results show the relationship between the physiological markers. Each of these physiological markers can get only so close to the marker above it before you stop seeing progress.

For example, if your anaerobic threshold reaches 85% of your VO2 max, it becomes very difficult to move it any higher. This is not to say that you couldn't get it to 90%, but it might take years. You will probably get better race results by focusing your training elsewhere.

Chart of sample test results

This chart shows the sample test results in a different format. As shown in the “Percent from Ideal” column, all areas can be improved, but aerobic threshold should be the initial focus in training. At 20%, the aerobic threshold percentage is the farthest from the ideal range.

Watts	vs	Watts	Your percent	Ideal Range	Percent from Ideal	Your long term goal
VO2 Max 400w	vs.	Peak Power 750w	53%	40-45%	8%	890w (1:13)
Anaerobic Threshold 295w	vs.	VO2 max 400w	74%	80-85%	6%	320w (1:43)
Aerobic Threshold 180w	vs.	VO2 max 400w	45%	65-70%	20%	260w (1:50)
VO2 Max 400w	x	5% increase 20w	=	=	=	420w (1:34)

Your training focus

Now that you have the data from your tests and calculated the comparison percentages, you can set training priorities. Identifying your training priorities through proper testing and data interpretation will help you focus your training on the areas that will give you the biggest return on your time investment.

Your first priority

Train the area with the biggest percentage difference between your score and the ideal.

In the case of the sample test results, the biggest percentage difference is the aerobic threshold, which is 25% away from where it should be. The second priority is anaerobic threshold and the third is peak power. Fortunately, training at low intensity to improve aerobic threshold has some positive carryover effects on the anaerobic threshold.

What do you do if the percentages are relatively close?

If all the variables are close to the same percentage points away from the ideal, use the following guidelines to determine your training priorities:

- Work aerobic threshold first, particularly during the winter months. Aerobic base training helps you get ready for the higher intensity work to follow.
- Peak power is the second priority because it limits everything below it. Raising peak power creates more room for everything else to move up. Keep in mind that it doesn't take long to see improvements in peak power. If combined with a year-round strength training program, four to six weeks of short sprint training should show improvements in peak power.
- Anaerobic threshold is improved through the low-intensity long duration work and only needs to be trained one to two times per week for rowers below the elite level.
- VO2 max is improved through all the other training categories and therefore doesn't need a lot of focused training.

The fitness assessment framework was developed by Marlene Royle, adapted from her work with Ed McNeely.

Reference Chart for Determining Training Paces

This chart shows the paces at which you should be training to achieve the proper training effect for Category VI through Category II workouts.

500m Split from the 20 Minute AT test	VI +13-18 Well-trained	VI +18-23 Club-level	V +08-12	IV+02	III –02	II –5 % Rounded off
1 :40	1:53-1:58	1:58-2:03	1:48-1:52	1:42	1:38	1:35
1 :41	**1:54-1:59**	**1:59-2:04**	**1:49-1:53**	**1:43**	**1:39**	**1:36**
1 :42	1:55-2:00	2:00-2:05	1:50-1:54	1:44	1:40	1:37
1 :43	**1:56-2:01**	**2:01-2:06**	**1:51-1:55**	**1:45**	**1:41**	**1:38**
1 :44	1:57-2:02	2:02-2:07	1:52-1:56	1:46	1:42	1:39
1 :45	**1:58-2:03**	**2:03-2:08**	**1:53-1:57**	**1:47**	**1:43**	**1:40**
1 :46	1:59-2:04	2:04-2:09	1:54-1:58	1:48	1:44	1:41
1 :47	**2:00-2:05**	**2:05-2:10**	**1:55-1:59**	**1:49**	**1:45**	**1:42**

1 :48	2:01-2:06	2:06-2:11	1:56-2:00	1:50	1:46	1:43
1 :49	**2:02-2:07**	**2:07-2:12**	**1:57-2:01**	**1:51**	**1:47**	**1:44**
1 :50	2:03-2:08	2:08-2:13	1:58-2:02	1:52	1:48	1:45
1 :51	**2:04-2:09**	**2:09-2:14**	**1:59-2:03**	**1:53**	**1:49**	**1:45.5**
1 :52	2:05-2:10	2:10-2:15	2:00-2:04	1:54	1:50	1:46
1 :53	**2:06-2:11**	**2:11-2:16**	**2:01-2:05**	**1:55**	**1:51**	**1:47**
1 :54	2:07-2:12	2:12-2:17	2:02-2:06	1:56	1:52	1:48
1 :55	**2:08-2:13**	**2:13-2:18**	**2:03-2:07**	**1:57**	**1:53**	**1:49**
1 :56	2:09-2:14	2:14-2:19	2:04-2:08	1:58	1:54	1:50
1 :57	**2:10-2:15**	**2:15-2:20**	**2:05-2:09**	**1:59**	**1:55**	**1:51**
1 :58	2:11-2:16	2:16-2:21	2:06-2:10	2:00	1:56	1:52
1 :59	**2:12-2:17**	**2:17-2:22**	**2:07-2:11**	**2:01**	**1:57**	**1:53**
2 :00	2:13-2:18	2:18-2:23	2:08-2:12	2:02	1:58	1:54
2 :01	**2:14-2:19**	**2:19-2:24**	**2:09-2:13**	**2:03**	**1:59**	**1:55**
2 :02	2:15-2:20	2:20-2:25	2:10-2:14	2:04	2:00	1:56
2 :03	**2:16-2:21**	**2:21-2:26**	**2:11-2:15**	**2:05**	**2:01**	**1:57**
2 :04	2:17-2:22	2:22-2:27	2:12-2:16	2:06	2:02	1:58
2 :05	**2:18-2:23**	**2:23-2:28**	**2:13-2:17**	**2:07**	**2:03**	**1:59**
2 :06	2:19-2:24	2:24-2:29	2:14-2:18	2:08	2:04	2:00
2 :07	**2:20-2:25**	**2:25-2:30**	**2:15-2:19**	**2:09**	**2:05**	**2:01**
2 :08	2:21-2:26	2:26-2:31	2:16-2:20	2:10	2:06	2:02
2 :09	**2:22-2:27**	**2:27-2:32**	**2:17-2:21**	**2:11**	**2:07**	**2:03**
2 :10	2:23-2:28	2:28-2:33	2:18-2:22	2:12	2:08	2:03.5
2 :11	**2:24-2:29**	**2:29-2:34**	**2:19-2:23**	**2:13**	**2:09**	**2:04**
2 :12	2:25-2:30	2:30-2:35	2:20-2:24	2:14	2:10	2:05
2 :13	**2:26-2:31**	**2:31-2:36**	**2:21-2:25**	**2:15**	**2:11**	**2:06**
2 :14	2:27-2:32	2:32-2:37	2:22-2:26	2:16	2:12	2:07
2 :15	**2:28-2:33**	**2:33-2:38**	**2:23-2:27**	**2:17**	**2:13**	**2:08**

2 :16	2:29-2:34	2:34-2:39	2:24-2:28	2:18	2:14	2:09
2 :17	**2:30-2:35**	**2:35-2:40**	**2:25-2:29**	**2:19**	**2:15**	**2:10**
2 :18	2:31-2:36	2:36-2:41	2:26-2:30	2:20	2:16	2:11
2 :19	**2:32-2:37**	**2:37-2:42**	**2:27-2:31**	**2:21**	**2:17**	**2:12**
2 :20	2:33-2:38	2:38-2:43	2:28-2:32	2:22	2:18	2:13

Faster Five pieces of advice

1. Do not train faster or slower than indicated for a given training category. To get the proper training effect, you need to train fast enough for Categories II through IV, and slow enough for Categories V and VI.
2. To get the most accurate test results, take a rest day after the 75 Minute Aerobic Threshold test, the 1K Meter VO2 Max test, and the 20 Minute Anaerobic Threshold test.
3. After the initial fitness assessment, do regular assessments to ensure that you continue to work at the correct training paces.
4. Don't skimp on aerobic base training. It takes time but has many benefits. Training harder is not always the solution to going faster.
5. With proper training all areas of fitness can be improved.

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