

Treadmill Test to Set Run Training Zones

This field test will help you determine your heart rate and pace at lactate threshold, which you can then use to set your run training zones for use with an [ENDURANCEWORKS](#) training plan

Please note that if you are new to triathlon training, have been inactive for a prolonged period of time or are not yet able to maintain a sustained 30-minute effort, we recommend that you use Rate of Perceived Effort during the first 4–6 weeks of your training program before performing this field test.



Preparation

1. Use a treadmill that accurately displays speed and has a top speed exceeding your best one-mile time and/or has variable incline. If the treadmill's top speed does not exceed your ability, set it at a sufficient grade to make the fastest speed quite difficult. Note this grade in your log.
2. You will need an assistant to record your data and operate the treadmill controls. He will stand so as to easily reach the speed and stop controls on the treadmill panel.
3. Do not eat for 2 hours before the test. You'll have the best results if the previous day was light exercise or a rest day. Warm-up for 10-20 minutes before the test. Note in your log what the warm-up procedure was.
4. If at any time you feel lightheaded or nauseous, stop the test immediately. You are not looking for a maximum heart rate on the test, but will be necessary to attain a very high effort level.

Test Protocol

1. Start at a slow speed (such as 6 mph) and increase by 0.2 mph every minute until you can no longer continue.
2. At the end of each minute tell your assistant how great your exertion is using Borg's Rate of Perceived Exertion (RPE scale of 12 easy effort to 20 max effort).
3. At the end of each minute, your assistant will record your speed, exertion rating and heart rate and increase treadmill speed to the next level (+0.2 mph).
4. The assistant listens closely to your breathing to detect when it first becomes labored, marking this point as "VT" for ventilatory threshold.
5. Continue until you can no longer hold the speed for a minute then slow the treadmill gradually down to a walking pace.
6. The data collection sheet should be completed like this:

MINUTE	SPEED (MPH)	HEART RATE (BPM)	EXERTION (RPE)
1	8.2	147	12
2	8.4	154	13
3	8.6	161	13
4	8.8	166	14
5	9.0	172	15
6	9.2	179	17 VT
7	9.4	182	19
8	9.6	185	20

Data Collection Sheet

MINUTE	SPEED (MPH or KPH)	HEART RATE (BPM)	EXERTION (RPE)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Option 1: Calculate Your Training Zones Using Heart Rate

For the purposes of this test, assume that VT corresponds to Lactate Threshold (LT) and that your heart rate at VT is equivalent to your heart at LT (LTHR).

Calculate training zones using LTHR as follows:

	HEART RATE (BPM)	
ZONE	FROM:	TO:
Z1		< 85% * LTHR
Z2	85% * LTHR	89% * LTHR
Z3	90% * LTHR	94% * LTHR
Z4	95% * LTHR	99% * LTHR
Z5	>100% * LTHR	

Example: LTHR = 179

	HEART RATE (BPM)	
ZONE	FROM:	TO:
Z1		< 152
Z2	152	159
Z3	161	168
Z4	170	177
Z5	>177	

Option 2: Calculate Your Run Training Zones Using Pace

The average pace that you maintain for 30 minutes is equivalent to your pace at Lactate Threshold (LT-Pace). We can use LT-Pace to calculate your run training zones.

Calculating training zones using LT-Pace:

PACE ZONES (PACE PER MILE or KM)		
ZONE	FROM:	TO:
Z1		Slower than 129% LT-Pace
Z2	129% * LT-Pace	114% * LT-Pace
Z3	113% * LT-Pace	106% * LT-Pace
Z4	105% * LT-Pace	99% * LT-Pace
Z5	Faster than 99% * LT-Pace	

Example: LT-Pace = 6:31 min/mile pace

1. First convert minutes to miles to seconds per mile (6:31 min/mile = 391 sec/mile)
2. Calculate each zone in seconds per mile as % of LT-Pace:

RACE RANGE (SEC PER MILE)		
ZONE	FROM:	TO:
Z1		> 504 sec per mile
Z2	504 sec per mile	446 sec per mile
Z3	442 sec per mile	415 sec per mile
Z4	411 sec per mile	387 sec per mile
Z5	< 387 sec per mile	

3. Convert sec/mile back to min/mile:

RACE RANGE (PACE PER MILE)		
ZONE	FROM:	TO:
Z1		> 8:24 min per mile
Z2	8:24 min per mile	7:26 min per mile
Z3	7:22 min per mile	6:55 min per mile
Z4	6:51 min per mile	6:27 min per mile
Z5	< 6:27 min per mile	

Please note: You can use the same process for determining minutes per kilometer.

Additional Notes

Finally, be sure to cross-reference your training zones with Rate of Perceived Effort (RPE) to ensure that your training zones make sense:

ZONE	RPE (6-20 SCALE)	DESCRIPTION
Z1	10-12	Fairly light effort
Z2	12-14	Moderate effort
Z3	14-16	Moderately Hard
Z4	16-18	Hard
Z5	18-20	Very Hard

Do your training zones match the description of perceived effort for each zone?

If not, you may need to adjust your training zones up (or down) slightly to better match RPE. Keep in mind that setting training zones is not an exact science – as long as you are in the ballpark for your training zones then you will get the desired training effect.

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