

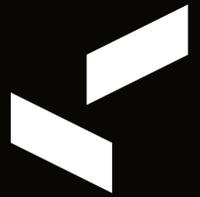


E-BOOK

**SPEED & AGILITY
TESTING**



- 1. Testing: the why.**
- 2. Testing: the options.**
- 3. Testing: the how.**
- 4. Testing: the current pitfalls.**
- 5. Testing: the Ledsreact solution.**



As we all know by now, agility is an important characteristic of team sports athletes. An athlete's physical condition is one thing, but details in reaction speed and agility make the difference. As these details become more important, it's also more important to measure and capture them. Measuring physical improvement is rather easy, compared to measuring improvement on agility. But when difference is often made in the details, the measurement of those details is crucial.

There are a few tests that measure agility, but most of them lack a game-like aspect. The results of those tests are often irrelevant, because they possess a certain amount of predictability. On top of that, there are so many crucial elements when it comes to measuring agility: acceleration, reaction speed, change of direction, decision making, and so on.'

With most current tests, only the total time is taken into consideration. But what would be even more interesting, is the separate metrics for those elements. When you perform a COD test for example, the athlete can have excellent acceleration scores, that compensate his/her lack of deceleration. But because the total time is the only metric available, it's hard to detect such differences.

A lot of current tests also lack the game-like factor. Not that a test has to be fun (although it could be), but with game-like we mean the unpredictability of a test, as mentioned above. Most tests don't take the cognitive aspect into consideration, so the athlete knows exactly where to go. Reaction speed in such a setting is pretty hard to test, since a big part of it is decision making as well.



Testing: the why.

To measure is to know. But besides the obvious, there are a few more reasons why testing (agility) is important. It also depends on the goal of the test. A test always has the goal to test (get it?) but that doesn't mean the end game is the same. For example, young athletes being tested to get certain minimum requirements for top sports is a different thing than athletes being tested to measure their improvement during the season.

Talent detection:

For certain teams there are requirements for being selected, for others it's just good to have a general flatline to compare athletes to. For talent detection, testing is pretty important. You can see if a (young) athlete performs well on tests, or even excels on tests. Obviously agility is only one part of the puzzle. So physical condition, skills, and so on, are also important requirements. It could happen that a young talent doesn't score as good on physical tests, but has exceptional agility scores...That could be a big talent detection. Let's say the athlete tries to put in some extra effort to improve their physical condition, already having exceptional agility skills, that could be a win-win.

Targets:

Setting certain targets with testing can help an athlete to figure out where they are situated in the team, or what the requirements are, to work towards them. Not that targets are the holy grail, obviously it's good to work even harder to outperform certain targets. Yet, having an idea of where the standards are is nevertheless a good motivation.

Otherwise, it's useful info for a coach to see if their athlete is scoring above or beneath certain targets. They can adapt their training schedule accordingly to their results. It's actually easier for a coach to do a better job, when they have targets, because that way they can adapt their exercises & training properly.



Preventing injury

Probably not the first thing you had in mind, but when an athlete starts making more mistakes, scoring less, etc. Sometimes it can be a sign of potential injury. An athlete could be more tired without noticing in for example heart rate, but signs of fatigue might pop up in a lower score than usual on agility tests. Needless to say, there are multiple factors playing in such a story.

Return to play

When a player comes back from an injury, tests can be done to check their current level. Comparing their sprint test (for example) from before the injury, with a sprint test right after injury, can give them a realistic view of where they are now, and what they need to work on. But more importantly, if their acceleration or deceleration is not at an acceptable level, the athlete is not ready to play yet. Giving them the green light to return to play when they are not ready, can easily lead them back to injury.





Testing: the how.

The how is mostly answered by the options. If you just read the different types of agility tests, it's not rocket science. Usually, with measuring tape, a stopwatch, a few cones and a piece of paper, it is possible to accomplish a test. It's important to keep in mind that the better your equipment for testing is, the better the test results will be. It might sound obvious, but often tests are being performed in a careless way, making the results unusable.

When it comes to agility, it literally is all about a matter of seconds, if not hundredths a second. Having a stopwatch from the 1950's might look cool, but for testing, it might not be the most accurate anymore.

Yet, improvements are coming. With timing gates for example, a lot of coaches have eliminated the stopwatch. With timing gates, the accuracy is a lot higher but only the total time is measured. As such, we can't make a difference between measuring points in a test, which often are the most interesting. But we'll get back to that later.





Testing: the options.

Before we dig into different agility tests and how we can actually measure, let's have a look at the meaning of agility before we expand. Agility is a rapid whole-body movement with change of velocity or direction in response to a stimulus (Sheppard & Young, 2006). Agility itself is not made of one component, it's a combination of things, which makes it more difficult to measure.

Regarding the 'how many times do I test' question there is no right or wrong. When you don't test enough, comparing tests is not relevant... if you test too much, the test becomes a habit, and the predictability of the test makes the test irrelevant. Testing too much, and tests becoming a habit is exactly what you want to avoid when testing agility. Predictability makes an agility test less useful. Testing once a year is not enough, but every 6 weeks is a standard which we can agree on.

Most tests measure agility. But do they really? It's very important to keep in mind, to measure agility we need certain components. With most current tests, as you will read, that is not the case. The most important components that tests are missing today:

- There is no external stimulus, the game-like aspect is missing.
- There is only a total time, and no measurements in between. So the things that define agility are not measured (reaction speed, acceleration, deceleration, change of direction, decision making).

The current test that is most known for testing agility is the T test. Which tests are used the most depends on the coach, the country, and the sport. For example in soccer the arrowhead agility drill is often used, but in basketball it's the lane agility drill. Overall, measuring agility is necessary but hard. But it does not have to be (you will see what we mean when you get to the end of our e-book).

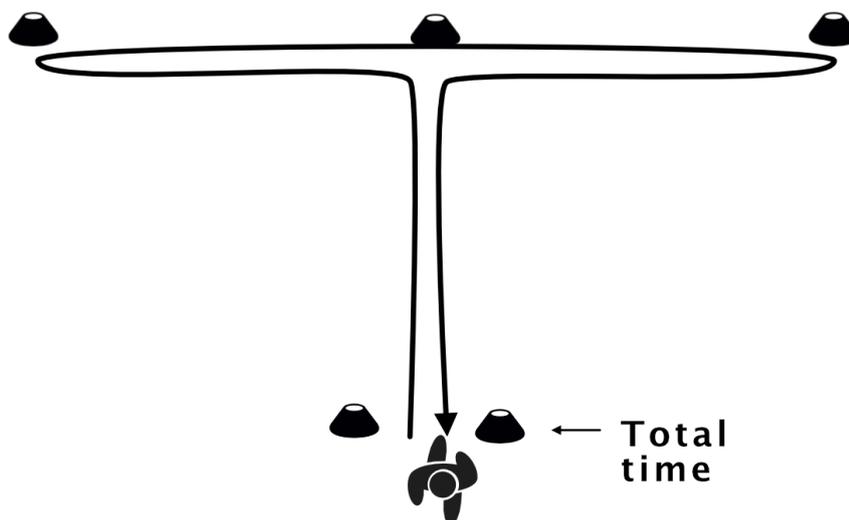


T TEST

The T test is a test to measure agility and speed. As well forward, sideways, and backward speed is being tested. It's important to test both sides, once to the left, and once to the right. That way, differences between the left and right side can be detected.

What do you need? Measuring tape, 4 cones, timing gates (or a stopwatch)

How it works? First there's a warming up in which the athlete makes a couple accelerations. Then, they stand behind the starting line, sprint forwards to the first cone, move sideways to the left or right with their face looking straight forward, to move back to the middle through the other side. From the middle, the athlete moves backwards back to the starting line. The time will stop as soon as you pass the starting line again.

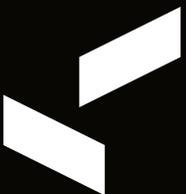
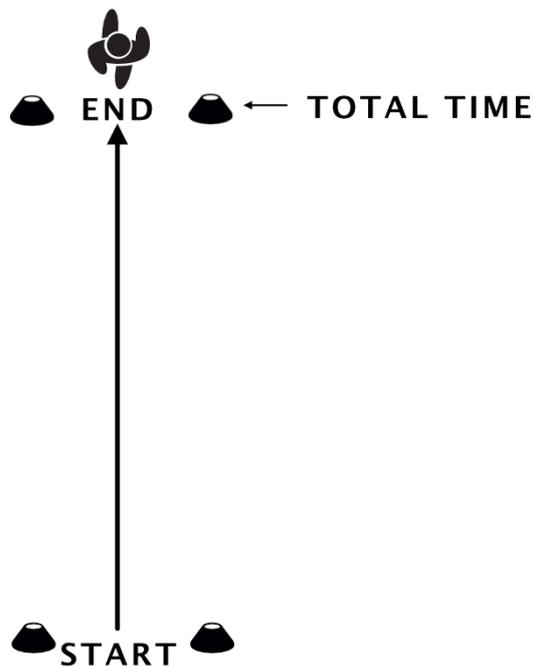


SPRINT TEST

The 35m sprint test is (obviously) a very short test that measures the speed of an athlete over a 35 meter distance. Obviously, the same test can also be performed for 100,200 meters, and so on. It's important to have a decent stopwatch, because without very detailed time measurement, this test is useless. Nowadays, timing gates are the way to go, and they are a lot more accurate.

What do you need for this test? Measuring tape, timing gates (or a stopwatch)

How it works? The sprint test starts with a little warm-up, the athlete positions him or herself behind the starting line and runs the 35 meters as fast as they can. Simple as that.

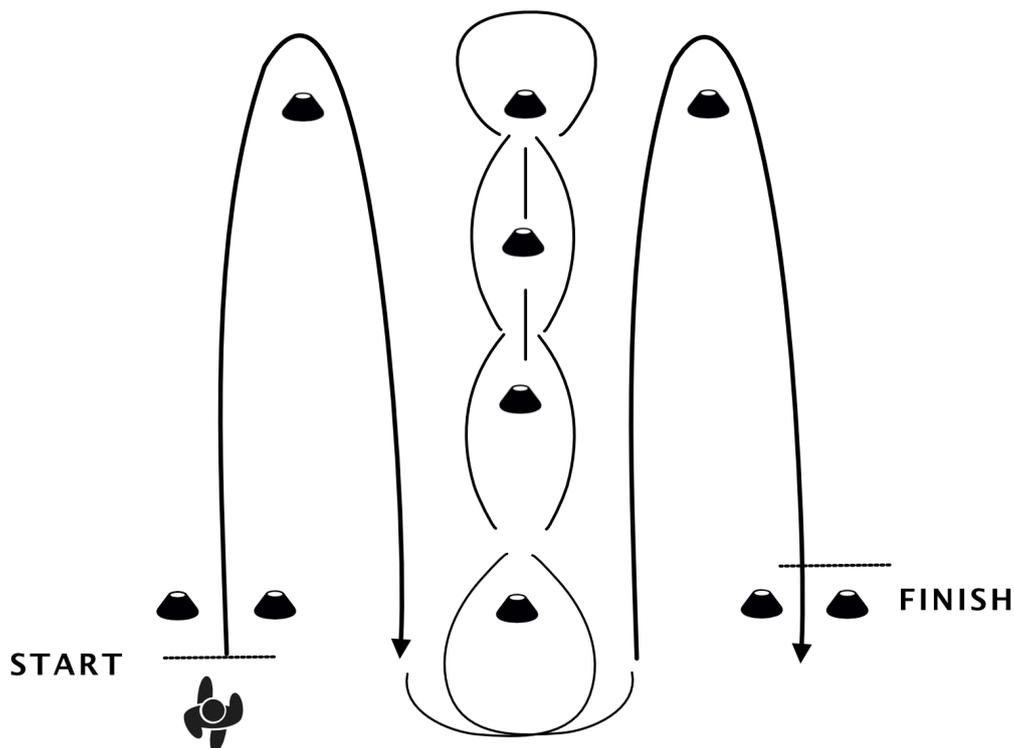


ILLINOIS AGILITY TEST

The name of the test says it itself, in the illionois agility test we test agility and speed combined.

What do you need? Measuring tape, 8 cones, timing gates (or a stopwatch), and the illinois test course.

How it works? The athlete starts laying on the ground with his/her hands next to their shoulders. After the start sign they start the course asap. The focus is on completing the course as fast as they can. The athlete's body can turn during the test in any direction they like, but the cones can't fall over or the test is false. It's important to change the start and finish and switch those 2 up, because every athlete has a preferred side.

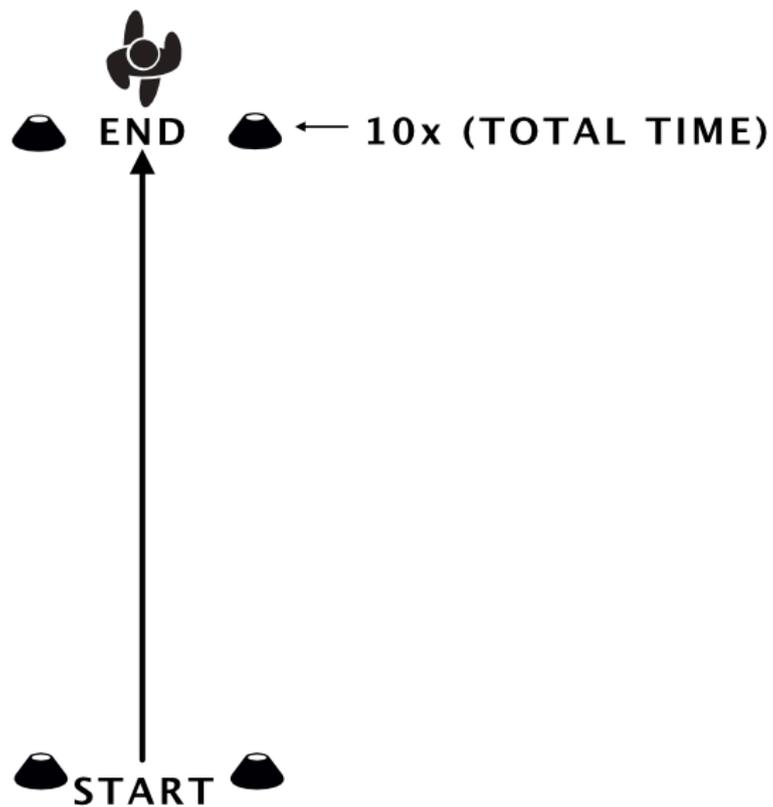


10 x 5 M SPRINT TEST

Measuring speed. This test is an indicator of the athlete's agility since there are lots of turns.

What do you need? Measuring tape and timing gates (or a stopwatch)

How does it work? The athlete starts behind the starting line and waits for the start sign. They then sprint 5 times, as fast as they can, back and forth. The end goal is to finish the course as fast as possible (the body can turn in whatever way feels comfortable).

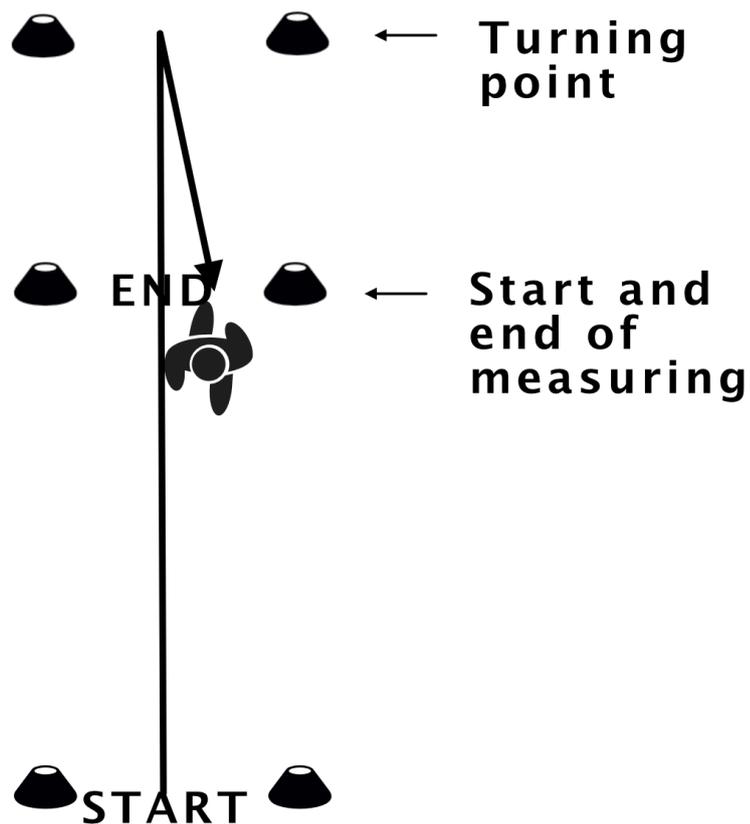


505 COD TEST

This test is made to test agility in the horizontal plane. It's mainly a test to measure change of direction. The test is supposed to measure the difference between the left and right leg, but that's a difficult one.

What do you need? Measuring tape, 4 cones, and timing gates (or a stopwatch)

How does it work? The athlete first runs 10 meters from A to B, then 5 meters from B to C, and then 5 meters from C to B. The first half (from A to B) is made to build up some speed, so it's the second half that counts, from B to C.





Testing: the current pitfalls.

The limited value of data.

When testing and collecting data, what are your conclusions? Or better, what answers are you looking for? When doing the tests as mentioned above, we have to ask ourselves what the value of this data is. As a coach, you are limited to total times. Imagine, you have a player that has a lower score on the T-test compared to the team's benchmark. What are you going to do to improve this? Is the problem in his acceleration phase? Or is his acceleration great, but he's slow in changing direction? A lot of questions, without answers. And without these insights, it's hard to make the right decisions.

Testing to test. But nothing happens with the results.

We see it all the time, test results are in, but nothing happens with the results. Wait, what? Yes, it's a shame but often test results are not put into practice. Thinking about 'the why' of a certain test is the solution to this problem. Looking at test results; adapting certain things in athletes technique (for example use of arms during sprint) and train them on what they are scoring poorly on, is the way to go. An athlete can come a long way when they get more eccentric exercises for example to get a faster change of direction, or more plyometric exercises to get a better acceleration.

Coaches can also search for correlations between different test results and compare data points. Often, specific sport performance management platforms are being used for this. They might not see any changes pop up in one test result, but when putting different test pieces in one big puzzle, trends might show up.



Predictability of tests.

The problem with a lot of tests is: the athlete knows what's coming. Often tests are not game-like, which makes them predictable. For example in the T test, the athlete knows he will run left first. So testing which side they have a faster reaction is hard, because they are aware of what's happening and can plan in their head how they will run through the test.

In competition or a game, you don't know what your opponent will do, so it's unpredictable. You have to anticipate what they will do and then respond in a fast way. If there are only predictable elements in an agility test, is it truly testing agility? There have to be some unpredictable elements to make it a good agility test. Think about giving the athlete a signal where they have to go, standing in the middle, in the T test.





**Testing:
the ledsreact solution.**

Needless to say, we are not calling it the Ledsreact 'solution' without reason. We truly offer a solution for the current measuring problems. There are so many issues, and lack of faith in testing, that we even forget how important it is sometimes, and we miss loads of potential points of improvement.

In a nutshell, these are **the main solutions** that the Ledsreact Pro will bring.

- Unique insights into agility
- Optimizing existing tests
- A game-like solution

Unique insights into agility

With the Ledsreact Pro you can measure all different aspects of agility separately, and we're proud to say we are the only ones who can do this, in the world. With the Pro technology, it's easier to measure differences between acceleration, deceleration, reaction speed, change of direction, decision making, and difference between left vs right.



Optimizing existing tests

You know the saying: never change a winning team. With the Ledsreact Pro we are not reinventing the wheel. We keep a lot of existing tests as is, and optimize some of them. The main difference is the testing process, which nowadays can be a hassle, but with the Pro becomes an easy, fun habit.

With the Ledsreact Pro you can test up to 4 players at the same time, so that's a win when it comes to time efficiency. Players also don't need a wearable since most of the measuring goes automatically with the pro. But most off all, you get relevant insights into differences between acceleration, deceleration, reaction speed, and so on, which are so hard to measure with traditional test methods.

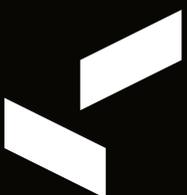
A game-like solution

The Ledsreact Pro brings an external stimulus which makes the test less predictable, hence the game-like solution. The athlete's decision making process is included.

But there is more than meets the eye when it comes to the Ledsreact Pro. Say goodbye to your timing gates or stopwatch, because we measure the exact time from A to B, B to C or... basically everything. You have access to data that has never been accessible before, but it's important to emphasize that it's easy access. No need for huge installations, measurements, and so on. Let the Ledsreact Pro do the work for you.

With a time-efficient set-up, the barriers not to test are fading. A coach can easily test multiple players at once, and the only equipment you need is the Ledsreact Pro.

When practicing in a game-like and scientifically proven way with the Ledsreact Pro, you can track their progress easily with all test data organized in the app.





Wow, you must be really interested in this topic if you made it this far. If you want to learn more about these topics or about how Ledsreact can help you during your testing process, do not hesitate to reach out. We're always happy to help.

If you want to learn more about the Ledsreact pro and how we can help you in testing and improving speed and agility, do not hesitate to reach out and ask a demo!

Vercauteren Koen
koen@ledsreact.be

Lander Vandecaveye
lander@ledsreact.be

Ready?