



Performance testing  
Product guide



PHYSICAL  
PROPERTIES  
TESTERS  
GROUP

[jamesheal.com](http://jamesheal.com)





# The growth of performance wear

In recent years, the sportswear industry has influenced mainstream fashion in a significant way. Factors such as the growing portion of the population seeking healthier lifestyles, needing more protective workwear and PPE, and technological developments designed to improve comfort, means performance wear is a trend that is predicted to grow substantially over the next decade.

Compared with mainstream fashion garments, which are about aesthetic appearance or decorative characteristics; performance fabrics have a primarily technical/functional benefit such as 'comfort' e.g. keeping the wearer warm/cool/dry by regulating the body temperature, and/or 'safety' e.g. protecting the wearer from the environment, and hazards such as fire-proofing the outer layer of the garment. The rise in performance wear has resulted in the need for new and improved technology to test and substantiate the claims that are made about these garments.

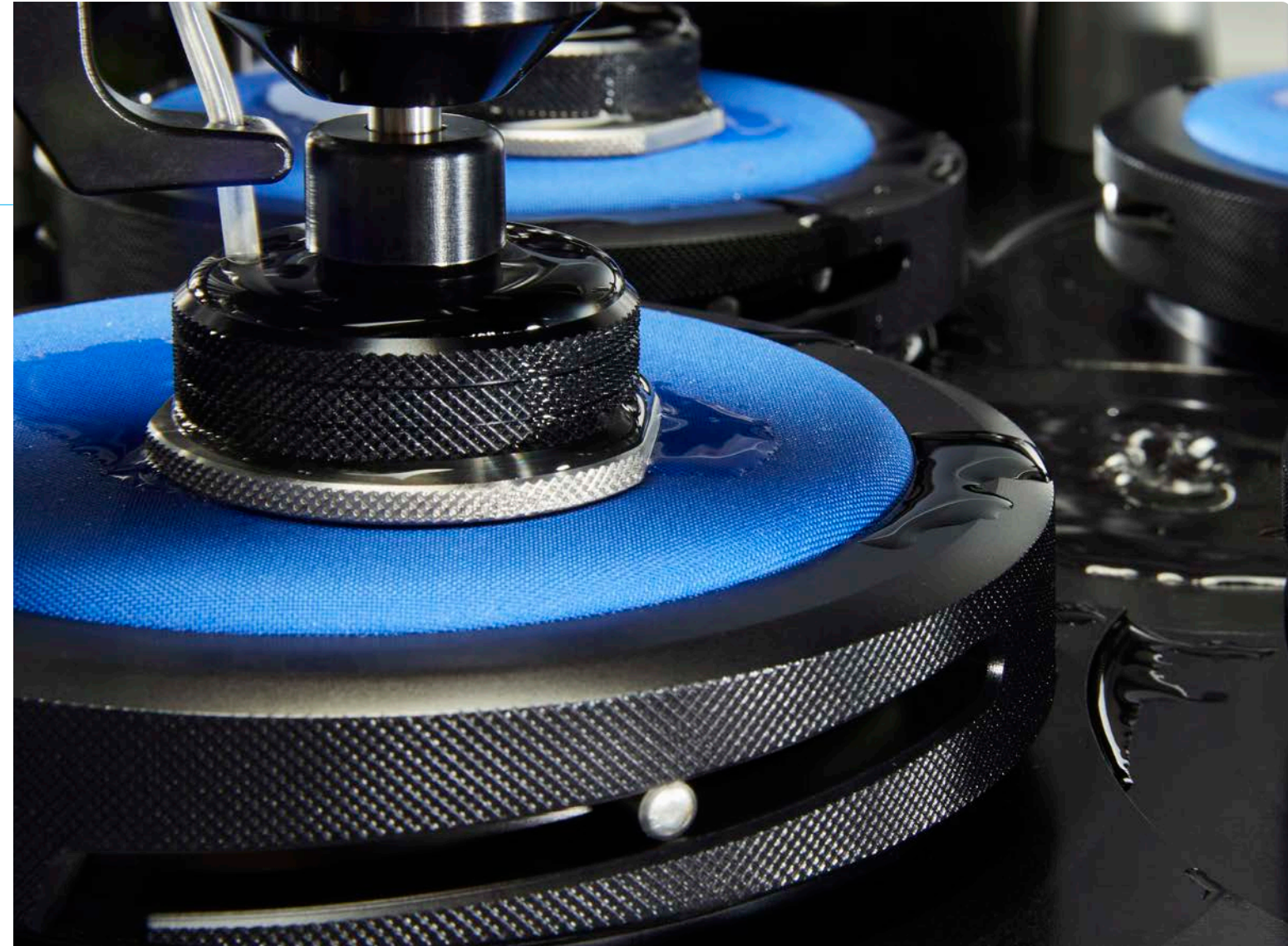
Introducing the James Heal Performance Testing collection, a growing range of instruments designed for testing performance wear and technical textiles.

Our designers and technical specialists have created state-of-the-art instrumentation for a range of applications including air permeability, moisture management, hydrostatic head, dry rate testing, water repellency and wet abrasion.

The collection includes improvements to existing methods for testing and game changing new technology to meet the requirements of an evolving industry.

The functionality of performance wear must be qualified by evidence, and our instruments have been designed to give brands, retailers and manufacturers confidence in their results.

- 01 **AirPro**
- 02 **AquAbrasion**
- 03 **HydroView**
- 04 **ProDry**
- 05 **TruRain**
- 06 **WickView**







# 01 AirPro

AirPro is a consistent and accurate Air Permeability tester, used to test the resistance of the flow of air through woven, knitted and nonwoven textile materials. It is supplied with TestWise software, making it intuitive and easy to use.

AirPro can be used on a variety of applications, including performance apparel, medical textiles, PPE, infant products such as bedding, nonwovens, geotextiles and more.



## Test Method

Air permeability is defined as 'the velocity of air flow passing horizontally through a test specimen, under specified conditions of test area, pressure drop and time'.

The instrument draws air through a specimen and adjusts the flow of air gradually until a specified pressure differential is achieved.

The measurements will be taken multiple times dependent on the standard, and a mean air permeability would be expressed in millimetres per second or other air permeability unit.

## Why AirPro?

- A quick release mechanism means changing between test heads is quick and easy, speeding up laboratory testing with less down time between tests. Changing the test head can be done without disconnecting any air pipe.
- We have focussed on the quality of the parts used to make AirPro. For example, including medical grade valves like those used in ventilators, to keep the airflow consistent and to prolong the lifespan and maintain instrument performance.

When needed, replacement parts are easy to fit and reasonably priced.

- AirPro's illuminated test bed can accommodate large samples, and is suitable for testing a variety of different materials and finished garments.
- Our intuitive 7" touchscreen and TestWise allows the user to choose a pre-loaded standard or create their own. TestWise detects the test area in use and warns the user if the incorrect test head is inserted.

Test reports are easy to view and analyse on screen and can be customised for export to Excel or PDF.

## Standards

ASTM D737, BS 3424-16, BS 6F 100-3,13 and BS 5636, ISO 9237 and ISO 9073-15, GB/T 5453, JIS L 1096 – test 8.26 Method C, NWSP 70.1, DIN 53887, SANS 5265, BIS 15891-15.





# 02 AquAbrasion

Textile abrasion is the surface wear caused by rubbing with another material. This can be against another fabric, such as a standard abradant, or often against itself to replicate when a garment is on the body. The consumer expects textiles and other products to withstand a certain amount of deterioration, which is tested in dry conditions by the Martindale instrument.

The market for outdoor wear, waterproofs and garments designed to perform while damp or wet is growing, and current testing does not take into account the wet conditions these garments will abrade in. Our tests show that fabrics subjected to wet abrasive stresses degenerate at a faster rate both aesthetically and physically, and AquAbrasion accurately represents these conditions.



## Test Method

AquAbrasion is a Wet Abrasion Tester based on the traditional Martindale instrument. It uses a controlled pump system to dose fabric specimens with liquid which keeps the specimen wet for the duration of the test. Drains are recessed into the main table to prevent overspill when conducting testing. Additional watertight testing pots can be used for testing specimens submerged in solution.

Deionised water can be used to replicate rain, or a perspiration solution can be used to replicate sweat. Chlorinated water and saliva solutions are suitable for use on this instrument.

AquAbrasion can also conduct the full range of dry Martindale testing.

## Why AquAbrasion?

- Moisture is controlled and delivered in a standard dosage, which prevents human error and ensures repeatability and accuracy of results.
- AquAbrasion abrades fabric against itself and other materials while wet to replicate real life situations, such as a sleeve on a cagoule rubbing against the body of a wearer. The testing replicates the use of outdoor wear in inclement conditions, providing a more representative test for brands and manufacturers.
- The instrument can be set up to perform wet and dry abrasion concurrently on different stations, which includes using multiple liquid solutions, across up to 9 beakers. AquAbrasion retains the full functionality of a Martindale 9 station instrument.
- The TestWise Touch software is easy to use by operators of all skill levels.

## Standards

ISO 17704, ISO 20344 Part 6.12 for wet testing. For dry testing, please visit [www.jamesheal.com/instrument/martindale](http://www.jamesheal.com/instrument/martindale) for a full list of standards.









# 03 HydroView

HydroView is used to determine the resistance of fabrics to penetration by water and is a consistent and highly accurate hydrostatic head tester.

HydroView can be used to test many types of fabrics that are intended to be water resistant, in product sectors such as performance wear, tents, medical textiles, PPE, nonwovens, geotextiles and more.



## Test Method

The hydrostatic head test uses water pressure which is applied to one side of the material and gradually increased to determine the force and time it takes for the water to penetrate the specimen.

For example, hydrostatic pressure is important in outdoor applications, such as tent groundsheets, which needs a high resistance to water penetration; especially when placed on saturated ground.

When pressure is applied to the ground sheet by people standing, sitting or sleeping on it, water could then be forced through.

Failure in this area would mean anything in contact with the groundsheet will become wet.

Your product application will define your target hydrostatic pressure. To provide some context, the lower a hydrostatic pressure measurement the more easily water can penetrate under pressure.

## Why HydroView?

- An integrated pump automates the filling/emptying of the instrument for testing and enables fine adjustment of water levels, simplifying water management and increasing overall efficiency.
- HydroView has the ability to test across pressures from 0-10-000 mbar, making it suitable for testing the most high performance waterproof system.
- The integrated wastewater drawer on the base of the instrument removes the need for any additional plumbing, for added convenience, which is both time and cost saving.

## Standards

EN ISO 811, EN 343, EN ISO 9073-16, NWSP 080.6R0, JIS L 1092 – Method A, AATCC 127, AATCC 208, GB/T 4774, BS 2823.





# 04 ProDry

Quick-drying is an important attribute of textiles worn next to the skin, for example during sporting activities where the skin is likely to perspire. Without this characteristic, perspiration does not easily evaporate from the garment, which can leave a wearer feeling uncomfortable. ProDry replicates the conditions of use in order to verify that quick-drying fabrics are performing effectively.

This method is used in the development of quick-drying fabrics and items such as: base layer garments, football kits, running gear, gym gear, socks and footwear fabrics.



## Test Method

ProDry is capable of measuring the rate at which a material specimen dries after being exposed to water. The specimen is placed on a heated plate, which is maintained at 37°C to simulate the temperature at which human skin begins to perspire. Water is dosed to the heated plate underneath the specimen to simulate perspiration.

The temperature drops when the specimen is wet and as the specimen dries, the temperature gradually increases. James Heal's TestWise software records this change in temperature and automatically calculates the drying time and rate of the tested specimen.

## Why ProDry?

- Our internal testing found that increasing the number of data points used to calculate the test end time improved the accuracy and consistency of the results. ProDry records the temperature every second of the test and these points can be added into the graph once the test is complete.
- TestWise software can automatically set up the parameters of the test, find the end point of the test and calculate the results for the user. There is also a real time presentation of results on the test screen as the test takes place. There are two modes for water dosage to suit the user – automatic and manual.
- An adjustable temperature sensor ensures that ProDry complies with the AATCC standard regardless of how thick the fabric tested is. Setting gauges are provided for quick set up.
- Multiple fans, an air filter and positioning of air flow sensors provide consistent air flow which is measured and controlled by an integrated airflow sensor.

## Standards

AATCC Test Method 201 Drying Rate of Fabrics: Heated Plate Method.





# TestWise for ProDry



## Home Screen

- 1 Real time presentation of results. Increased data points can be added to the final graph to improve the accuracy of the test
- 2 Visual warnings are displayed when the Air Speed and Hotplate Temperature are out of tolerance
- 3 All test parameters visible and controlled from the home screen
- 4 TestWise software automatically finds the end point and stops the test
- 5 Test Status Bar
- 6 Settings menu to change language, units and display settings



## Specimen Menu

- 1 Results can be displayed in a graph
- 2 Pinch and zoom functionality on graph, our most advanced TestWise Touch software
- 3 Up to six specimens displayed at the same time on the same graph
- 4 Option to focus on one specimen in more detail, and increase the data points used to plot slopes
- 5 Flexibility of determining results based on fabric behaviour
- 6 Test Start Time (average when multiple results are selected)
- 7 Test End Time (average when multiple results are selected)







# 05 TruRain

Water repellency is an important function of technical fabrics, which are intended to protect the user in wet and rainy conditions. The TruRain water repellency tester replicates the conditions of use and therefore provides an accurate indication of fabric performance.

This method is used in the development of water repellent garments and accessories such as outdoor jackets, over trousers, walking boots, backpacks, tents and awnings.



## Test Method

TruRain is an artificial rain shower testing instrument for determining the water repellency of textiles. It measures three aspects of water repellency in a single test:

- 1 Surface water repellency is assessed by visually comparing the tested specimen with a photographic grading scale (similar to the Spray Rating Tester).
- 2 Resistance to water absorption is evaluated by weighing the specimen before and after the test. The measurement is taken after the specimen has been centrifuged to remove any excess surface water.
- 3 Resistance to water penetration is determined by collecting and recording any water which passes through the test specimen into the specimen holder cups.

## Why TruRain?

- The definitive Bundesmann tester, designed with precision in mind to reduce inconsistency and improve the accuracy and repeatability of results.
- An integrated, automated shower guard diverts the water flow before and after each test to keep the operator dry when inserting and removing the specimens. Water can be switched on and off with one button, and a water pressure regulator guarantees consistency wherever in the world the test takes place.
- Our TestWise software is user friendly, automating the process of testing and alerting the user of when to grade the specimens based on the ISO standard.
- The 304 evenly distributed nozzles which produce the rain drops for the test are easy to clean and maintain.
- The cups can be easily removed individually using a twist motion, minimising the amount of space required for set up. All four cups can be removed together on their carousel.
- Recirculation Unit saves 99% water usage compared to the traditional system, with reduced energy consumption, and total operating costs reduced by 83% making TruRain overall a more sustainable water repellency tester.

## Standards

ISO 9865 – Determination of water repellency of fabrics by the Bundesmann rain-shower test.









# 06 WickView

Wicking is the transportation of liquid moisture within a textile by capillary action. It is an important characteristic of textiles which are likely to encounter liquid moisture during use. For sports and outdoor clothing, fabrics with good wicking ability can help to keep the wearer feeling cool and dry by effectively transporting perspiration away from the body to the outer surface of the garment where it can evaporate. WickView measures this movement of liquid moisture within a textile to give an accurate indication of its moisture management performance.

This method is beneficial in the development of wicking fabrics such as: base layer garments, football kits, running gear, gym gear, socks and footwear fabrics.



## Test Method

WickView is used to analyse the movement of moisture in multiple directions through a fabric.

A textile specimen is secured in place with a clamp ring so that the skin and face sides of the specimen are both exposed. Water is applied to the skin side of the fabric and spreads out as it is absorbed.

High definition cameras are positioned on either side of the specimen to record the movement of the water as it spreads out and through the fabric.

Images are processed and interpreted by James Heal's TestWise software, which provide useful information such as the Maximum Wetted Area, Maximum Wetted Distance and Spreading Speed.

The test chamber can be rotated in order to test a specimen in a vertical or horizontal orientation, providing more insightful results that just one orientation alone.

## Why WickView?

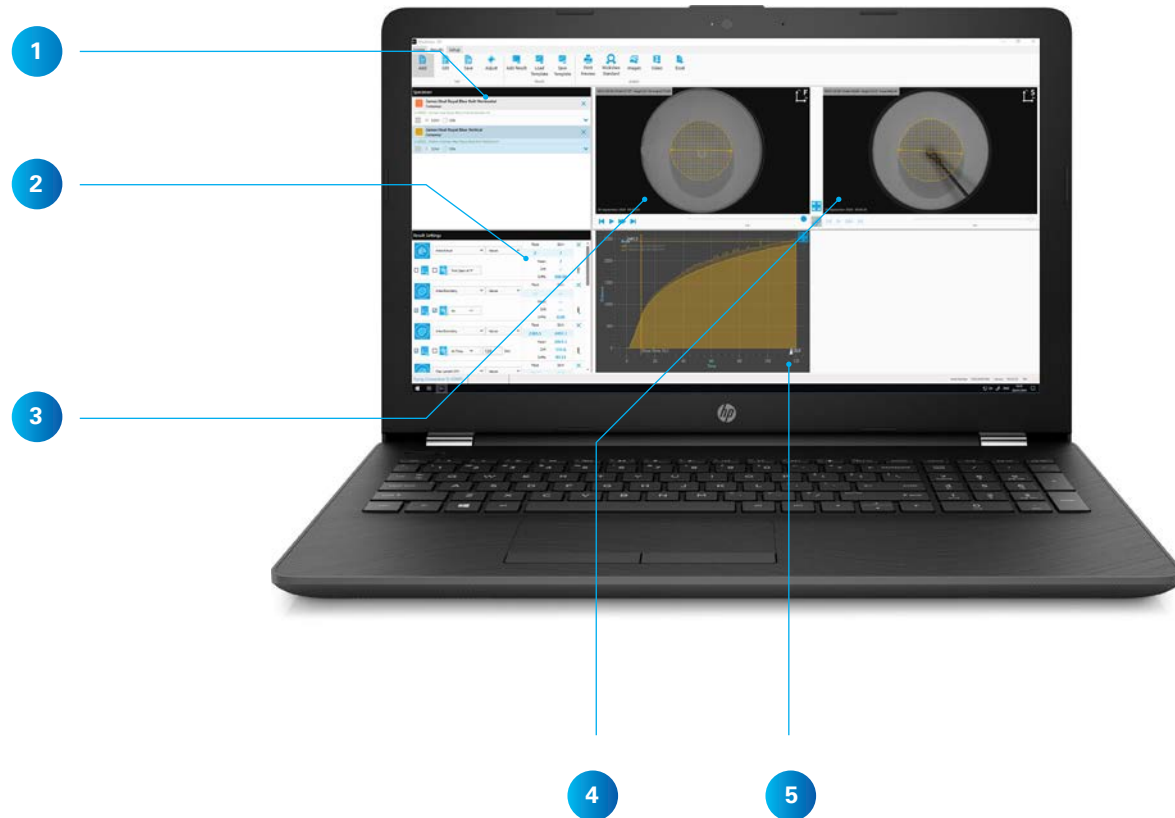
- WickView can be rotated to test specimens both vertically and horizontally, to better replicate how clothes are worn on the body, or how nonwovens are deployed in real-life usage.
- The way WickView records and calculates results is a truer representation of real life, in comparison to existing methods of moisture management testing. By examining the direction, shape, speed and actual wet area of a fabric, WickView is accurately measuring how sweat is drawn away from a wearer's body.
- TestWise for WickView shows the wicking process in detail, including live capture of the test, wet region boundary comparison and video playback of how the moisture spreads. The software can measure many different metrics, and results templates can be applied to show the user the information relevant to them.
- Results can optionally include or exclude gravity, and are presented visually and in graph format. The software measures 16 different data points, and our newly developed grading matrix enables a more precise end result, with a distinct '1-10' scale.
- WickView is easy to clean and maintain, to ensure accurate testing every time.

## Standards

JHTM-017 WickView.

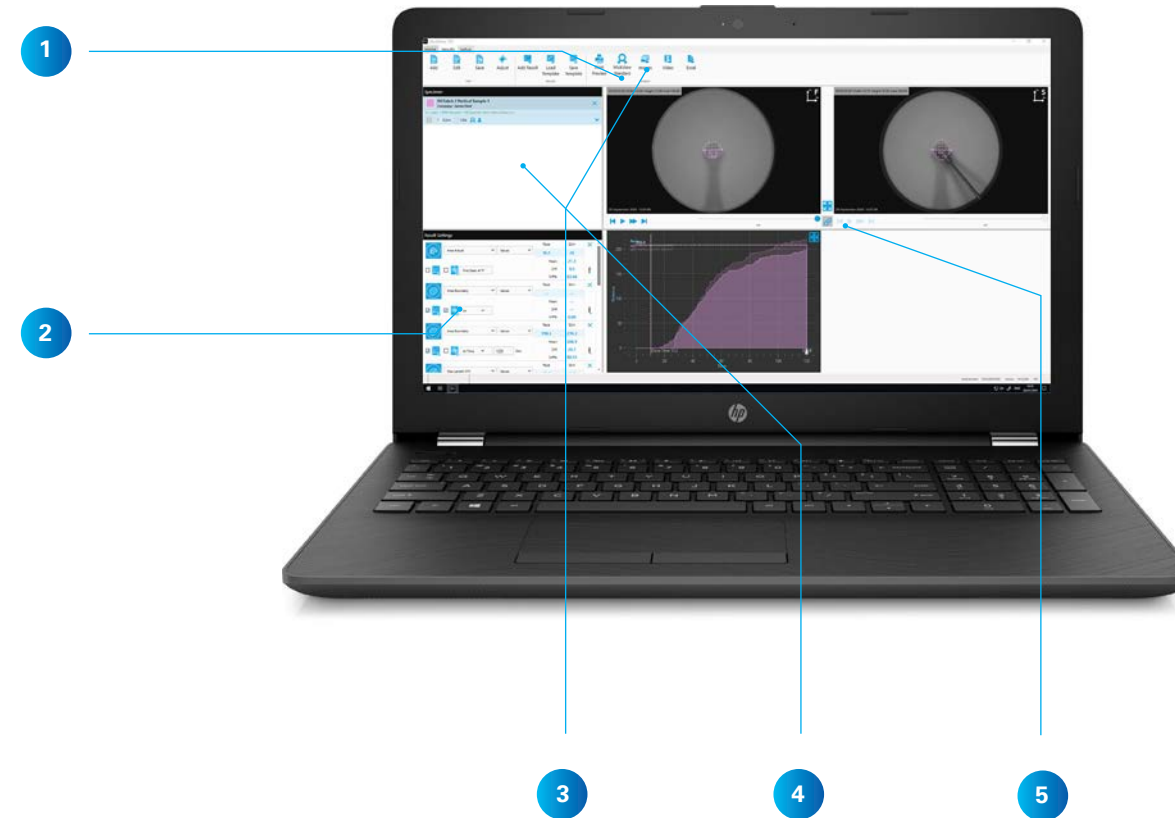


# TestWise for **WickView**



## Home Screen

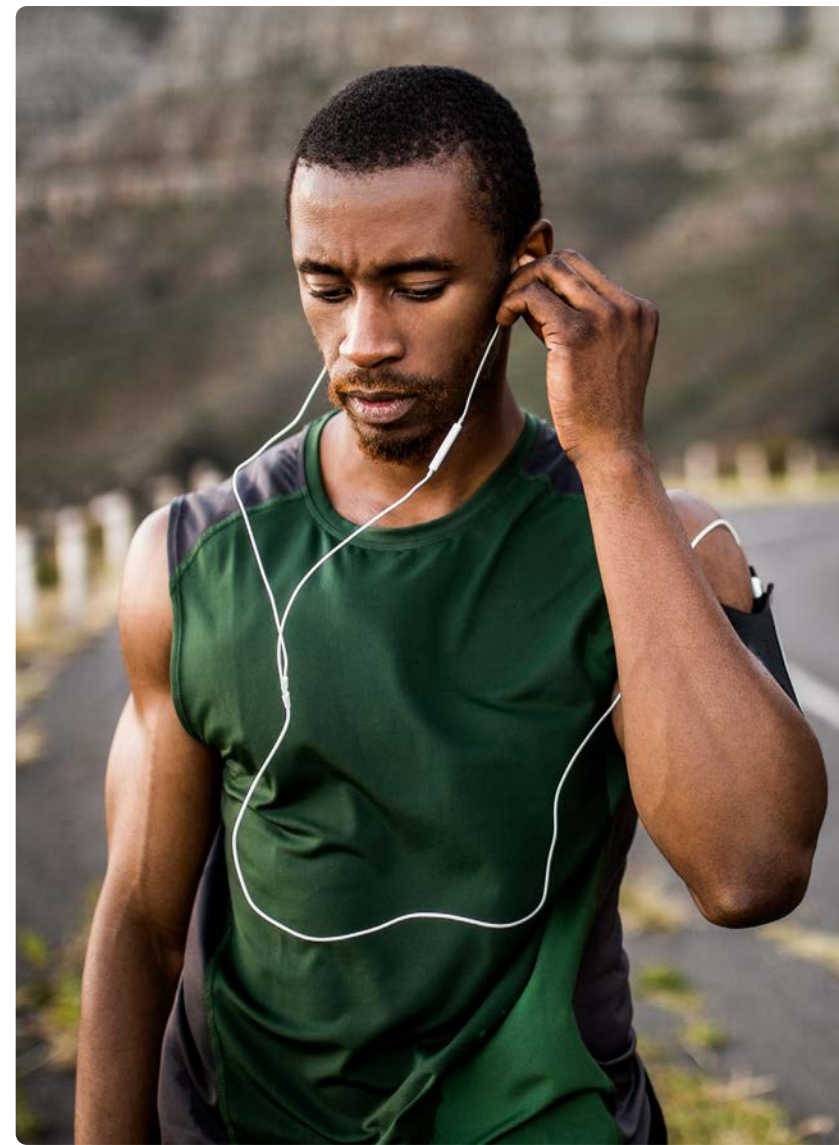
- 1 Specimen details – user defined
- 2 Test result switch for choosing the face and skin sides
- 3 TestWise automatically determines optimum light and exposure settings to capture images of the test, and a live preview is displayed here
- 4 A range of metrics can be calculated by TestWise, including Wetting Time, Absorption Rate, Maximum Wetted Diameter, Maximum Spreading Speed, Spreading Length, Wicking Area and Overall Wicking Grade
- 5 Data graph detailing the curvature from the point of dosing, measured in seconds



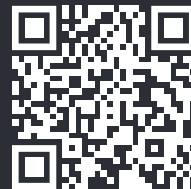
## Results Screen

- 1 James Heal Test Method – JHTM-017 – provides an Overall WickView Grade
- 2 A number of data points can be selected from the drop down menu
- 3 Optional gravity switch (in the setup tab) for discounting/including gravity
- 4 Multiple test specimens can be compared, including saved results from previous tests
- 5 Playback control bar









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