



C-Tech
Laboratory equipment co.,limited

SPEEDY MOISTURE TESTER

PRODUCT MANUAL



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SINCE 2006


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I. TEST PROCEDURE

The test procedure is simple to follow and takes a just few minutes for most materials. To ensure accurate and consistent results the procedure should be followed precisely.

1. Clean the Speedy Vessel. Prior to using the speedy tester ensure that the inside of the Speedy cap and vessel are empty and clean. Use the bristle brush to remove any residues from previous tests as shown.



2. Select and prepare the sample. Ensure that the sample to be weighed and placed in the Speedy is representative of the material that is under investigation. Some materials, such as free-flowing powders and sands, need no preparation whereas others may need to be ground prior to testing or pulverised during the test – please refer to the Sample Preparation Table for further information.

3. Weigh the sample. Place the empty measuring beaker on the electronic scale and zero the scale – Refer to the electronic balance user instructions for further details. Add small amounts of material from the sample until the correct sample weight is reached. The sample weight is determined by the size and measurement range of the Speedy that is being used as detailed below:

Vessel Size	Measurement Range H2O%W/W	Sample weight (g)
Large	0 - 20	20 gr.



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4. Add the sample to the Speedy vessel. Pour the sample into the chamber of the Speedy vessel as shown. Place pulverising balls into the chamber if required – refer to Sample Preparation Table.



5. Add the reagent to the Speedy cap. Using the metal scoop, add a minimum of two full scoops of reagent to the Speedy cap cavity as shown.



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6. Seal the Speedy. Hold the Speedy horizontally and position the cap as shown. Swing the stirrup into position and tighten the top screw to seal.



7. Mix the sample with the reagent. Hold the Speedy vertically with the pressure gauge facing the ground and shake vigorously for 5 seconds. Rotate the Speedy through 180° so that the pressure gauge faces the sky, tap the sides of the Speedy to ensure the sample falls into the cap cavity and prop or hold the Speedy in this position for 1 – 2 minutes. Alternatively, if the pulverising balls are being used, hold the Speedy horizontally and shake it in an orbital motion to make the balls spin around the inside of the Speedy vessel. Do this for 20 seconds and then rest for 20 seconds. Repeat



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this process two or three times. The spinning balls pulverise the sample to give a more reliable measurement.

8. Take the reading. Hold the Speedy horizontally and at eye level and take the moisture content reading directly from the pressure gauge.



9. Release the pressure. Hold the Speedy vertically with the pressure gauge facing the ground. Locate the arrow on the flange of the cap and point this away from yourself and other people in your vicinity. Unscrew the top screw slowly to vent the gas that may have been generated within the Speedy.



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10. Remove the sample and reagent. Tip the contents of the Speedy directly into a clean and dry open container.

11. Clean the Speedy. Clean the Speedy vessel and cap and measuring beaker in preparation for the next moisture measurement.

II. TEMPERATURE

For optimum performance the Speedy tester and sample should be at 20°C (68°F) when used. If this is not practical, take at least three tests in quick succession to equilibrate temperatures as far as possible. Ignore the first and second test results and record the later results.

III. CORRECTION FACTORS

When compared with oven test results, Speedy readings may be low if the material under investigation contains volatile components other than water as these may evaporate with the water at elevated temperatures. Correction factors for given materials can be established by plotting graphs of Speedy test results against oven test results.

IV. MEASURING LIQUIDS

Speedy testers may be used to measure the moisture content of certain liquids (most commonly oils) by adapting the test procedure as follows:


1. Weigh the liquid sample as normal
2. Place the liquid in a clean mixing vessel and add two to four scoops of dry sand. Mix thoroughly and place the mixture in the Speedy vessel.
3. Continue with the test as detailed in the Moisture Test Procedure


V. WET WEIGHT TO DRY WEIGHT CONVERSION


The pressure gauges used with the Series 2000 Speedy testers are calibrated to give the moisture content expressed as a percentage of the sample's wet weight. If required, the measured value (MWW) can be expressed as a percentage of the sample's dry weight (MDW) by using the following



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formula:

$$MDW = \frac{100 \times MWW}{100 - MWW}$$

VI. FAULT DIAGNOSIS


Suspect Low Reading


If gauge readings are lower than you expect or anticipate check the following:


1. Test procedure has not been followed correctly. Ensure correct sample weight is used. Ensure sample is placed in the Speedy vessel and reagent is placed in the Speedy cap. Ensure Speedy vessel and cap are united and sealed in the horizontal plain to prevent premature contact of reagent and sample.
2. Inadequate cleaning of Speedy vessel and cap between tests. Ensure all residues from previous tests have been removed from the cap and vessel before starting a new test.
3. Insufficient reagent. Repeat the test using an additional scoop of reagent.
4. Ineffective reagent. Ensure that the reagent is fresh. Note that the colour of fresh reagent is dark grey; ineffective reagent (that has been exposed to moisture in the air or other sources) will have turned light grey in colour.
5. Inadequate sample preparation or sample-reagent mixing. Consider grinding the sample prior to weighing and/or (for Large Speedy only) using pulverising balls.
6. Temperature effects. Low readings may be recorded if the Speedy is used in very low temperatures. Take numerous readings in quick succession to raise the operating temperature of the Speedy.
7. Pressure loss. Visually check the cap washer for signs of holes or leak paths. Remove pressure gauge and visually check pressure gauge washer. Visually check Speedy vessel and cap for hairline cracks.
8. Defective pressure gauge. Does the needle sweep smoothly across the scale plate? If not, replace the gauge, or return the Speedy tester to an authorised distributor for service.



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Suspect High Reading

If gauge readings are higher than you expect or anticipate check the following:

1. Ensure correct sample weight is used.
2. Ensure Speedy is held in the horizontal plain at eye level when reading the pressure gauge.
3. Temperature effects. High readings may be recorded if the Speedy is used in very high temperatures. If the Speedy is warm/hot to touch as a result of taking many readings in quick succession, allow time for it to cool down before taking more tests.
4. Defective pressure gauge. Does the needle return to zero after releasing pressure from the Speedy? If not, replace the gauge, or return the Speedy tester to an authorised distributor for service.

Recommended Spares and Consumables

It may be wise to consider having the following spares and consumables to hand when using the Speedy tester, especially in remote locations:

Batteries for the electronic scale, 3-off AA/LR6 1.5V

Speedy cap washer

Pressure gauge washer


Pressure gauge (note the measurement range)


Cleaning brushes


Other spares parts for the Speedy vessel are available on request.



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