

TMI HART MOISTURE METERS

For paper, veneer and other sheet materials, powders, foods, tobacco, chemicals and textiles...

- DIRECT READING
- SPEEDY
- ACCURATE
- LOW COST
- NO WEIGHING NECESSARY



SPOT TEST METHOD

Spot check instruments for moisture measurement are valuable for trouble-shooting and quality control.

Literally hundreds of products can be measured for moisture content. This method has the advantage of giving instantaneous and accurate readings over a wide band of moisture percentages. Operation is so simple... even inexperienced operators can make several readings per minute.

The material to be measured for moisture content is placed between suitable electrodes. An assortment of electrodes is available to meet almost every requirement. The readings are in moisture percentages. The equipment is rugged, portable, housed in sturdy aluminum casting and low in cost. Continuous accuracy is assured, regardless of voltage or other variables. Calibration rechecks and time-consuming weighing of the sample is eliminated. When necessary, the equipment is supplied with a Static Suppressor—which guarantees a perfectly steady needle regardless of atmospheric conditions or stray electrical fields.

In the paper industry, the spot check method of moisture measurement has gained complete acceptance. The meter is often placed in a location close to the production equipment. It is common practice for a grab sample to be taken at the reel... avoiding errors due to transfer of sample to remote areas... and don't forget readings can be made in a matter of seconds.

The equipment outlined is well-known and highly regarded for its accuracy, speed and versatility. There are many units, for special industries and applications. If the equipment you require is not listed, or you have an unusual requirement, please let us know.

K-101 & K-103 SPOT TEST MOISTURE METERS

Over a thousand satisfied users prove the value of this model.

Precise, error-free, effortless moisture measurement in a matter of seconds. These rugged, portable instruments, the basic units of the TMI-HART Spot Test Meter series, are the final result of long and careful development.

Operation is simple. Range and calibration are set to meet individual requirements. The unit is shipped to you CALIBRATED from samples of YOUR PRODUCT.

There are no moving parts—no motors, relays to readjust or realign—these instruments are virtually "self-calibrating" against unchanging standards each time a determination is made.

Plug outlets are furnished for accessory electrodes.

specifications

Model K-101 battery-operated	Easily obtained commercial batteries required.
Model K-103 AC-line	Can be furnished either 110/120V or 220/240V.
Both models	13" L. x 7" W. x 10" H. Weight 10 lbs.

INSTRUCTIONS IN BRIEF

This instrument for measuring the moisture content of paper, textiles, veneer and other sheet materials, should be operated as follows:

- 1- Turn the instrument on and after allowing ten or fifteen seconds for the electrical circuit to stabilize, place one or more thicknesses (see laboratory report herein) of the material to be measured between the discs of the contactor and tighten all the way down by means of the lever action, now adjust the needle to midscale by means of the knob.
- 2- IMPORTANT: When switching from one position of the right-hand toggle switch to another, the ammeter needle must be readjusted to ZERO by means of the rheostat knob. The sample must remain in the electrode when this adjustment is made.
- 3- Open the contactor and remove the material, then with the contactor left in the open position, successively depress the series of buttons until one is found which again results in a needle travel to the midscale position, or most nearly so. The moisture content percentage assigned to this button indicates the moisture content of the material.

NOTE: If it is found that two adjacent buttons bring the needle to points either side of midscale, the moisture content of the material should then be calculated as lying proportionately between their values. This can readily be done by eye without resorting to written calculations.

NOTE:

CAUTION: Under no circumstances, alter the position of any of the controls between the time of adjusting the needle to midscale and the time when the buttons are depressed, since such alteration would defeat the making of a true comparison.

If there is a tendency for the needle to recede to the left when the meter is first turned on, allow the few seconds for the needle to come to rest before making the final adjustment to midscale.



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A SUBSIDIARY OF TESTING MACHINES INC.

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CALCULATING MOISTURE CONTENT

FROM METER READINGS

When a sample is being tested and where two adjacent buttons bring the meter needle to points on either side of midscale, the moisture content may be calculated as lying proportionately between the values represented by the two adjacent buttons.

The percent moisture content in the sample may be calculated as follows:

$$\% \text{ moisture} = \left[\frac{A}{A + B} \right] \times (C) + D$$

Where:

A = No. of scale increments below midscale. This reading occurs when the left button of the two adjacent buttons is depressed.

B = No. of scale increments above midscale. This reading occurs when the right button of the two adjacent buttons is depressed.

C = Difference in % moisture between the two adjacent buttons.

D = Low (left) button moisture content of the two adjacent buttons.

Example:

Assume

D button = 5.2% moisture

E button = 6.4% moisture

Assume a sample was tested and the following readings noted:

A = D - 9 = 9 increments below zero when D button is depressed.

B = E + 7 = 7 increments above zero when E button is depressed.

Then using the above formula:

$$\begin{aligned} \% \text{ moisture} &= \left(\left(\frac{9}{9 + 7} \right) \times (6.4 - 5.2) \right) + 5.2 = \left(\frac{9}{16} \times (1.2) \right) + 5.2 \\ &= .7 + 5.2 = 5.9\% \end{aligned}$$

Therefore the moisture content of the sample is 5.9%.

To determine the sample's moisture content when the meter reading is between two adjacent buttons, proceed as follows:



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Note the no. of dial divisions below and above zero.

Find that combination in the columns below to determine the fraction of the moisture percentage between buttons.

Once this fraction is determined, multiply it by the percent moisture between buttons and add the result to the percent moisture represented by the lower button.

Refer also to the instructions entitled, "Calculating Moisture Content From Meter Readings."

MOISTURE PERCENTAGE TO 1/10 PART BETWEEN BUTTONS

+ = No. of divisions to the right (above) of midscale zero.
- = No. of divisions to the left (below) of midscale zero.

+ -	+ -	+ -	+ -
19/1=.9	10/6=.6	1/19=.1	6/10=.4
18/1=.9	10/7=.5	1/18=.1	7/10=.5
18/2=.9	10/8=.5	2/18=.1	8/10=.5
17/1=.9	10/9=.5	1/17=.1	9/10=.5
17/2=.8	10/10=.5	2/17=.2	10/10=.5
17/3=.8	9/1=.9	2/17=.2	1/9=.1
16/1=.9	9/2=.8	1/16=.1	2/9=.2
16/2=.8	9/3=.7	2/16=.2	3/9=.3
16/3=.8	9/4=.6	3/16=.2	4/9=.4
16/4=.8	9/5=.6	4/16=.2	5/9=.4
15/1=.9	9/6=.6	1/15=.1	6/9=.4
15/2=.8	9/7=.5	2/15=.2	7/9=.5
15/3=.8	9/8=.5	3/15=.2	8/9=.5
15/4=.7	9/9=.5	4/15=.3	9/9=.5
15/5=.7	8/1=.9	5/15=.3	1/8=.1
14/1=.9	8/2=.8	1/14=.1	2/8=.2
14/2=.8	8/3=.7	2/14=.2	3/8=.3
14/3=.8	8/4=.6	3/14=.2	4/8=.4
14/4=.7	8/5=.6	4/14=.3	5/8=.4
14/5=.7	8/6=.5	5/14=.3	6/8=.5
14/6=.7	8/7=.5	6/14=.3	7/8=.5
13/1=.9	8/8=.5	1/13=.1	8/8=.5
13/2=.8	7/1=.8	2/13=.2	1/7=.2
13/3=.8	7/2=.7	3/13=.2	2/7=.3
13/4=.7	7/3=.7	4/13=.3	3/7=.3
13/5=.7	7/4=.6	5/13=.3	4/7=.4
13/6=.7	7/5=.5	6/13=.3	5/7=.5
13/7=.6	7/6=.5	7/13=.4	6/7=.5
12/1=.9	7/7=.5	1/12=.1	7/7=.5
12/2=.8	6/1=.8	2/12=.2	1/6=.2
12/3=.8	6/2=.7	3/12=.2	2/6=.3
12/4=.7	6/3=.6	4/12=.3	3/6=.4
12/5=.7	6/4=.6	5/12=.3	4/6=.4
12/6=.6	6/5=.5	6/12=.4	5/6=.5
12/7=.6	6/6=.5	7/12=.4	6/6=.5

+ -

12/8=.6
11/1=.9
11/2=.8
11/3=.7
11/4=.7
11/5=.6
11/6=.6
11/7=.6
11/8=.5
11/9=.5
10/1=.9
10/2=.8
10/3=.7
10/4=.7
10/5=.6

+ -

5/1=.8
5/2=.7
5/3=.6
5/4=.5
5/5=.5
4/1=.8
4/2=.6
4/3=.5
4/4=.5
3/1=.7
3/2=.6
3/3=.5
2/1=.6
2/2=.5
1/1=.5

+ -

8/12=.4
1/11=.1
2/11=.2
3/11=.3
4/11=.3
5/11=.4
6/11=.4
7/11=.4
8/11=.5
9/11=.5
1/10=.1
2/10=.2
3/10=.3
4/10=.3
5/10=.4

+ -

1/5=.2
2/5=.3
3/5=.4
4/5=.5
5/5=.5
1/4=.2
2/4=.4
3/4=.5
4/4=.5
1/3=.3
2/3=.4
3/3=.5
1/2=.4
2/2=.5
1/1=.5