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1.0 INTRODUCTION

The Check-Line TEM-1 textile moisture meter determines the residual moisture in yarn bobbins, fabric folls, filaments, fiber flocks, etc.

The measuring principle of the TEM-1 is based on the electrical conductivity of the material which always bears a fixed relation to the moisture. All changes in resistance inside the measuring ranges of interest are sufficiently pronounced to ensure a high degree of accuracy for the readings obtained with the TEM-1.

NOTE: The distribution of moisture is never uniform, but varies both over the entire surface and also inside the material. Therefore, different probes types, referred to here as electrodes, are used to measure the moisture content and detect differences in moisture content.

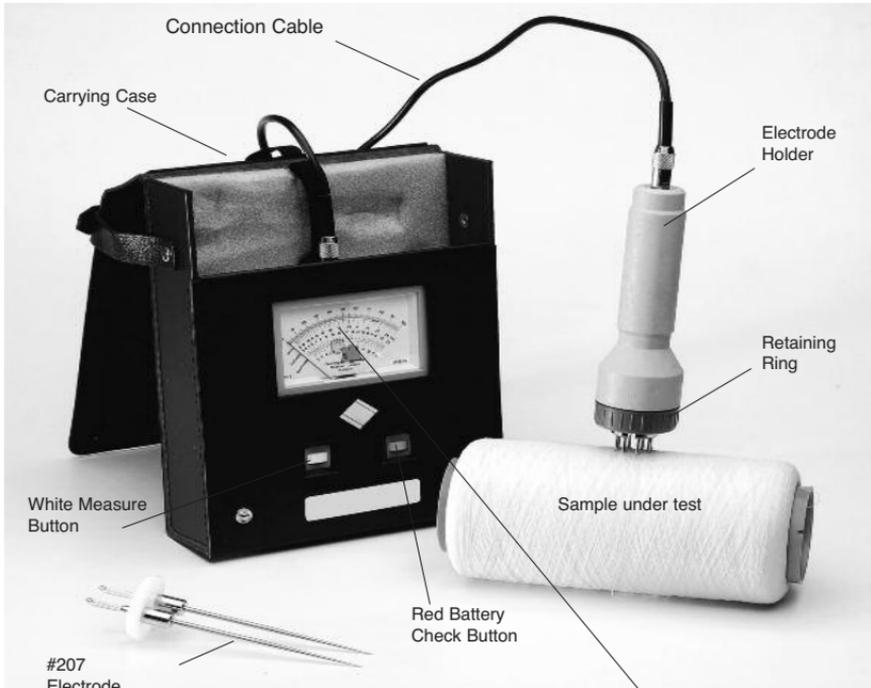
NOTE:The TEM-1 is a high-quality instrument. However, over time, even the best product is subject to a certain amount of wear. We recommend that you return the meter and accessories every twelve months for a routine check-up. The meter and its calibration will be thoroughly examined, so that you can be sure that the meter is operating correctly.

1.1 Complete Kit

The TEM-1 is supplied as a complete with leather carrying case, electrode holder (p/n # 204) electrodes (p/n #'s 205, 207) and connecting cable (p/n # 200)

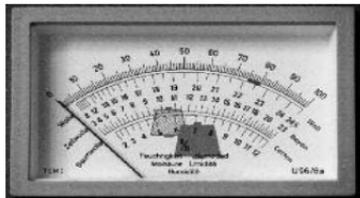


1.2 Overview



The TEM-1 Display provides direct readings for wool, rayon and cotton.

For other materials, the 0-100 scale is used in conjunction with the tables found in Appendix B.



2.0 TEM-1 SETUP

1. Open the carrying case and carefully remove the TEM-1 moisture meter.
2. Locate the cable receptacle on the top of the TEM-1 and insert either end of the connection cable. You will hear a click when the plug is seated. See A
3. Insert the opposite end of the cable into the receptable in the base of the Electrode Holder. Press until you hear a click indicating the the plug is seated. See B.
4. Uncrew and remove the dark grey retaining ring. See C.
5. Select the proper electrode for your application. See Section 5.0 for a list and descriptions of the electrodes available for the TEM-1.
6. Once the proper electrode has been selected, insert the two connecting pins on the bottom of the electrode into the two receptables on the top of the Electrode Holder. See D.

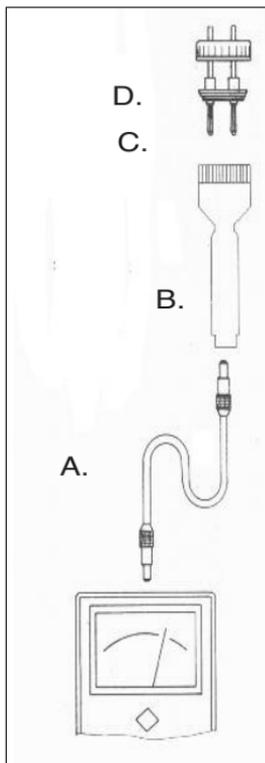
IMPORTANT NOTE: Inserting electrodes

The pins on the electrodes are very sharp. When inserting an electrode, grasp it by the white plastic base, keeping your hand away from the ends of the pins and press it into position.

IMPORTANT NOTE: Removing electrodes

The pins on the electrodes are very sharp. To remove the electrode, first uncrew and remove the retaining ring. Grasp the white plastic base of the electrode and carefully push up while wiggling the electrode from side to side until it is free. **DO NOT** place your hand above the pins and attempt to pull the electrode out as an injury may result.

7. Replace the grey retaining ring and hand tighten.
8. Perform a Battery Check and described in Section 3.0

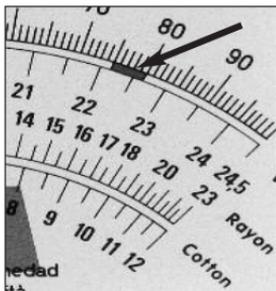


3.0 BATTERY TEST AND REPLACEMENT

To ensure an accurate reading, it is necessary to test the strength of the battery before each measuring session.

3.1 Battery Test

1. Press and hold the red test button on the front of the meter. If the measuring needle swings up and stops in the red area of the dial power for accurate measurements.
2. If the meter needle stops below the red area, the battery needs to be replaced before measurements can be taken.

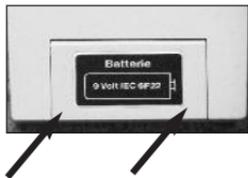


3.2 Battery Replacement

1. Remove the gauge from the carrying case. Turn over locate the battery compartment.
2. Insert the tip of a small flat-head screwdriver (or similar instrument into the slot shown at left and gently twist open the lid.

NOTE: The battery compartment lid is attached to the case.

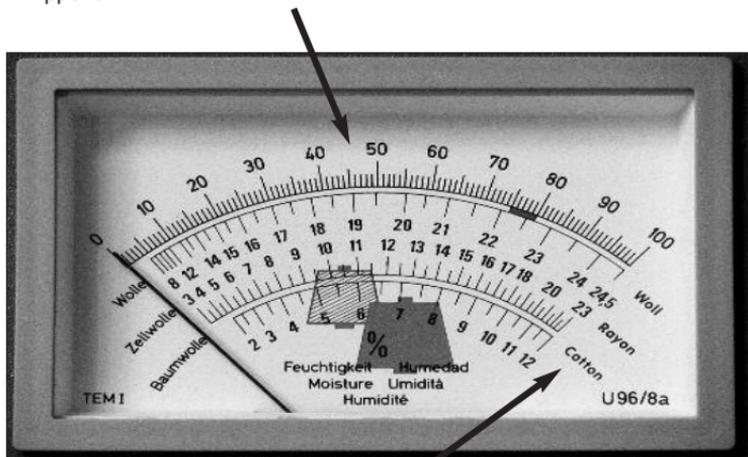
3. Remove and disconnect the old 9V battery and replace with a new one (alkaline or rechargeable).
4. Carefully close the lid by pressing on the two corners until the lid snaps back into position.
5. Repeat the Battery Test. If successful the TEM-1 is ready for use.



4.0 TAKING A MEASUREMENT

1. After completing the setup and battery check, insert the ends of the selected electrode into the test material.
2. **Press the white Test Button.** The measuring needle will swing up and stop. Reading are made on the upper or lower scale depending upon the material being tested as follows:
 - **Wool, rayon, cotton:** The three lower scales indicate the moisture content of the sample directly in percent.
 - **Other materials:** Note the reading on the upper scale then refer to the conversion charts in Appendix B to cover the meter reading into an accurate measurement of percent moisture.

Upper scale. Conversion tables for 36 fiber types are included in Appendix B.



The three lower scales provide direct readings for wool, rayon and cotton

5.0 ELECTRODES

A variety of measuring electrodes are available for the TEM-1 to accommodate different applications.

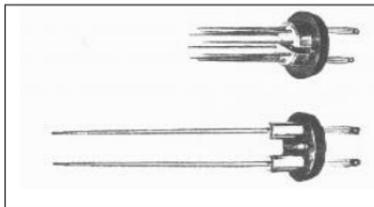
Needle Electrodes

Needle Electrodes are used for making measurements of cops, bobbins or hanks or yarn

205 = 25mm length

206 = 45mm length

207 = 100mm length



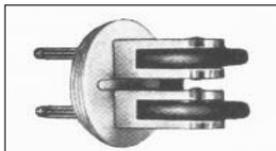
Knife Electrode #210

The Knife Electrode is for measuring on webs, rolls and bales of textile fabrics and bulk fibers by applying the blades to or inserting them between the plies of fabric.



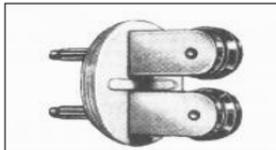
Roller Electrode #211

The Roller Electrode is used for measuring moving webs of material.



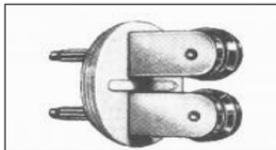
Flow Electrode #212

The Flow Electrode is used for measuring threads and yarns.



Surface Electrode #213

The Surface Electrode is used for measuring threads and yarns.



Compression Screw Electrode #201

The Compression Screw Electrode with automatic friction clutch applies constant pressure to assure accurate measurements of individual samples.



Cup Electrode #202

The Cup Electrode is used for measuring compressible material in the form of flocks or tufts. The constant pressure exerted upon the material thanks to the friction clutch assures accurate reproducible readings. The electrode connects to the moisture meter directly, without the use of a universal connecting cable. See Section Appendix A.



7.0 SPECIFICATIONS

Measuring ranges	Wool: 8 to 24.5% moisture content Rayon: 3 to 23% moisture content Cotton: 2 to 12% moisture content
Comparison Measurement	0 - 100 scale
Power	9V battery (alkaline or rechargeable)
Weight	0.88 lbs. (400 g)
Dimensions	7.87" x 9.84" x 2.76" (250 x 200 x 70mm) (L x W x H)

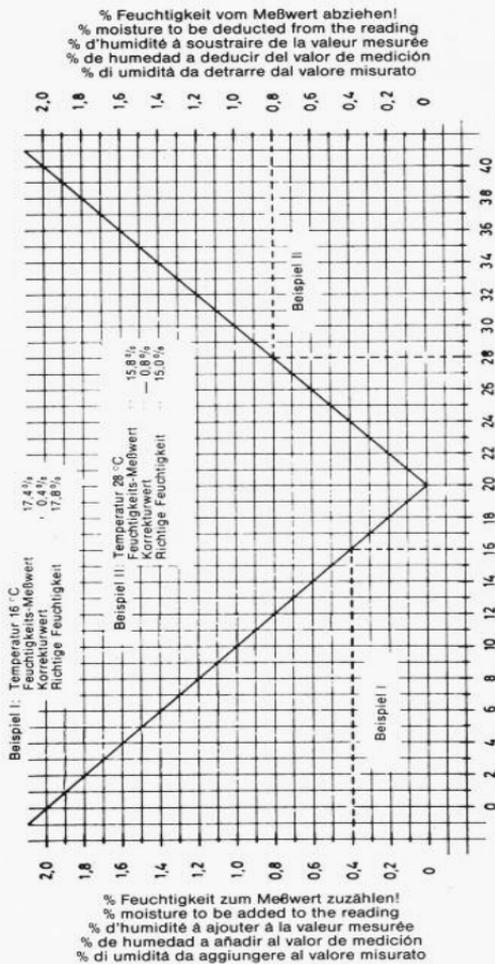
7.1 Temperature Error Compensation

Indicating errors due to differences in ambient temperature as normally encountered are negligible and within the permissible tolerance. For extremely accurate measurements, the temperature error may be corrected as follows:

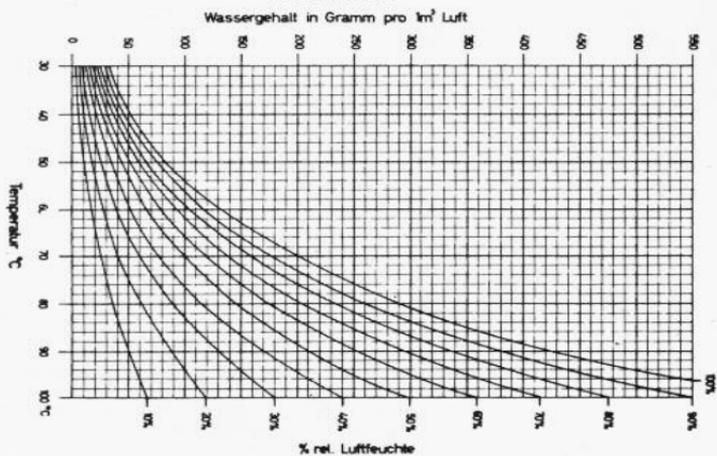
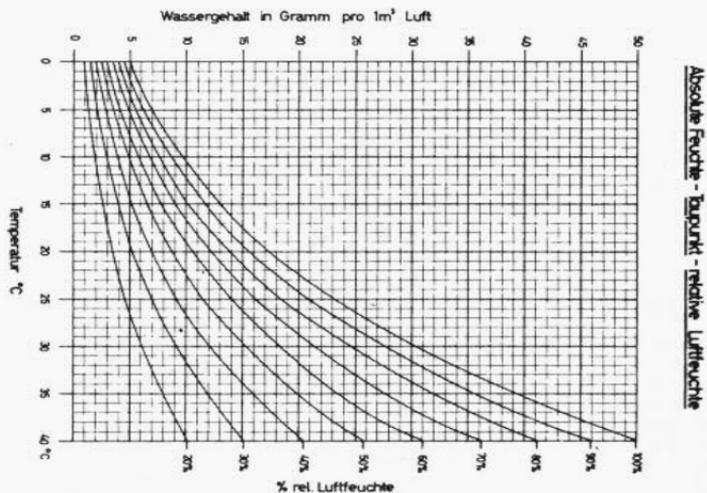
- TEM-10 moisture meters are calibrated at 68 °F (20 °C).
When making measurements at 68 °F, the temperature error is zero.
- When measuring below 68 °F, add 0.1% moisture to the dial reading for every 1.8 °F (1 °C) degree below 68 °F.
- When measuring above 68 °F, deduct 0.1% moisture from the dial reading for every 1.8 °F (1 °C) degree above 68 °F.

Temperatur-Korrektur

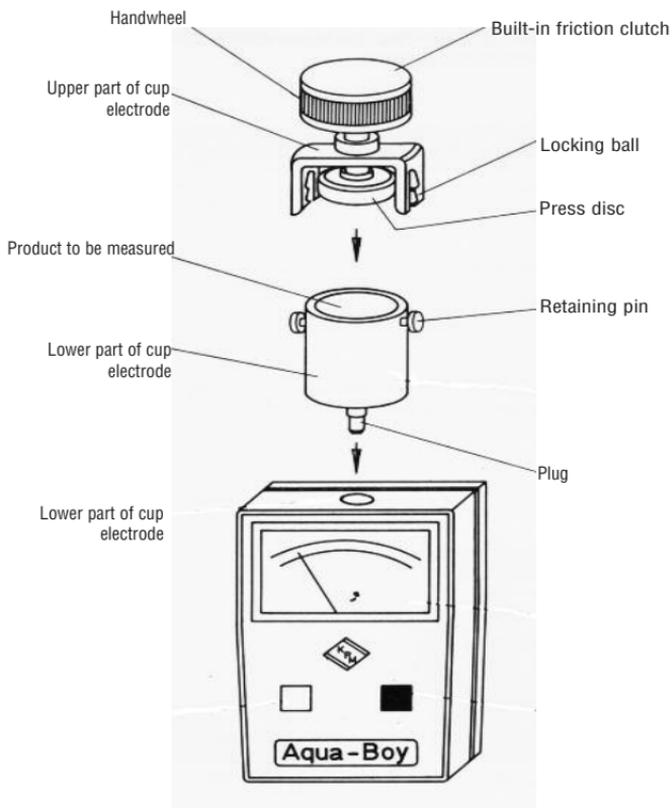
Die Prozentskalen sind bei 20 °C geeicht. Bei 20 °C ist der ermittelte Feuchtigkeitswert ohne Korrektur richtig.
Bei abweichender Temperatur ist für jedes °C unter 20 °C zum ermittelten Feuchtigkeitswert 0,1% zuzuzählen,
oder für jedes °C über 20 °C vom ermittelten Feuchtigkeitswert 0,1% abzuziehen. Siehe nachfolgende Beispiele
I und II:



Temperatur des Meißwertes
Temperature of material being measured
Température du matériau
Temperatura del materiale
Temperatura del materiale



9.0 USING THE CUP ELECTRODE (P/N 202)



NOTE: Before beginning, perform a battery check, see section 3.0

1. Unlock the upper part of the electrode and pull up and away.
2. Fill the lower part or cup with the product to be measured up to the level mark.
3. Turn the handwheel of the upper part counterclockwise to move the press disc up as far as it will go.

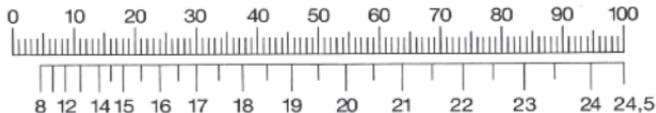
-
-
-
4. Introduce the locking ball of the upper part in the retaining pins of the lower part and lock in the first notch.
 5. Turn the handwheel. If the upper part clockwise to compress the material to be measured, The pressure required for a reliable measurement is reached as soon as the slipping clutch is felt to slip. The measurement can now be made. If the slipping clutch is not felt to slip, turn the pressure screw all the way up again and hook the locking ball into the second notch. If the clutch still fails to slip, the cup has not been filled with enough material. Add more material and proceed once more as described above until the clutch is felt to slip.
 6. Now, plug the cup electrode into the measuring jack in the upper side of the TEM-1.
 7. Depress the white measuring button and read the moisture content directly using the 3 lower scales; or note the upper scale reading and refer to the conversion tables in Appendix B.
 8. The material measured must be fully removed from the cup electrode after each measurement. in case of a pulpy or pasty substance, the cup electrode must be removed from the meter for a more thorough cleaning.

10.0 COMPARISON TABLES

The procedure for using the conversion tables in this section is as follows:

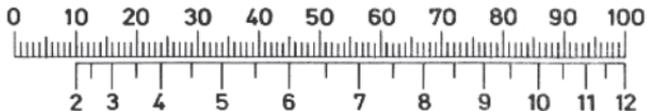
1. Follow the direction in section 4.0 Taking a measurement.
2. Note the reading on the upper scale of the TEM-1
3. Find that number on the upper scale of the appropriate conversion table. The lower scale provides a conversion to percent moisture for that reading.

100, Skala - 100, scale - 100, échelle - 100, escala - 100, scala



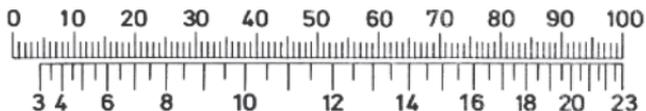
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

Wo = Wolle - Wool - Laine - Lana



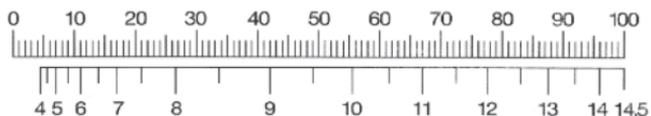
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

**Bw = Baumwolle - Cotton - Coton
Algodón - Cotone**



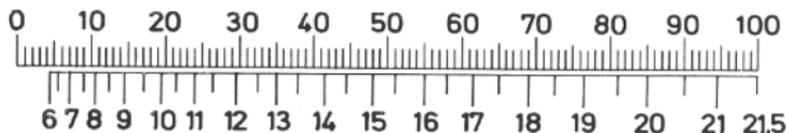
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

**ZW (Cv) = Zellwolle - Viscose - Viscose
Lana celulosica - Fibra tessile artificiale**



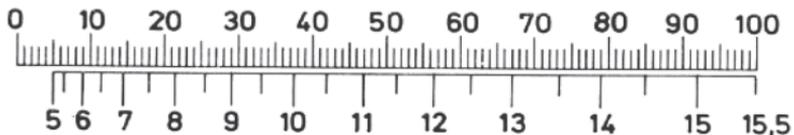
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

Fl (Li) = Flachsgarn - Flax yarn - Fi de lin
Hilo de lino - Filo di line



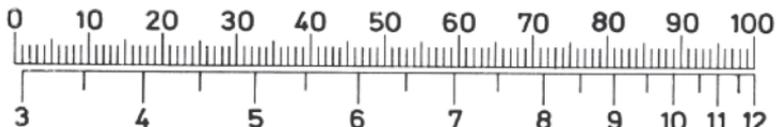
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

Ju = Jutegarn - Jute yarn - Fil de yute
Hilo de yute - Filo di iuta



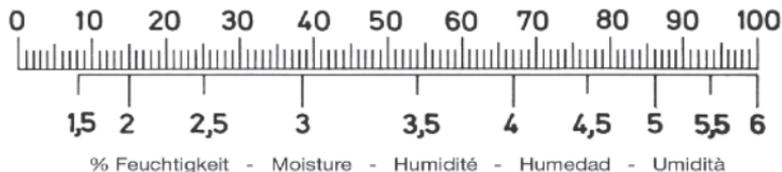
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

Ha = Hanfgarn - Hemp yarn - Fil de chanvre
Hilo de cáñamo - Filo di canapa

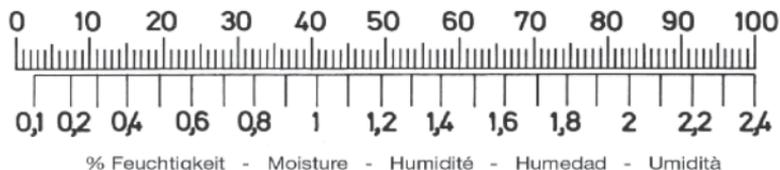


% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

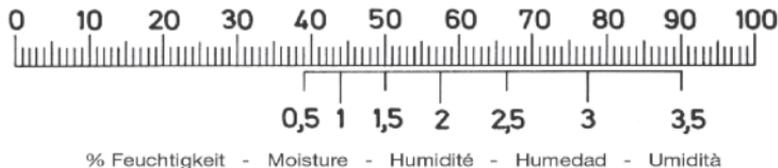
CA = Acetatgarn - Acetate yarn - Fil d'acétate
Hilado de acetato - Filo acetato



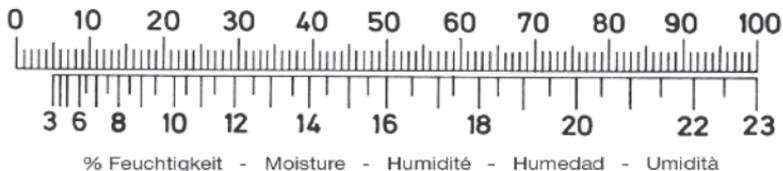
PA = Polyamid



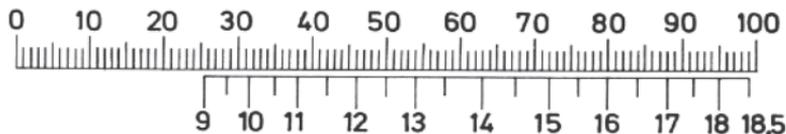
PAC (PAN) = Polyacrylnitril



PES = Polyester

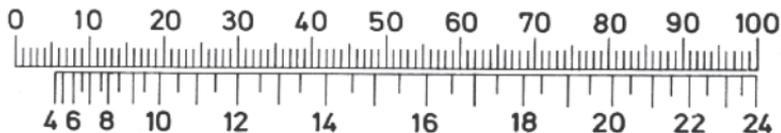


70 Wo / 30 Zw



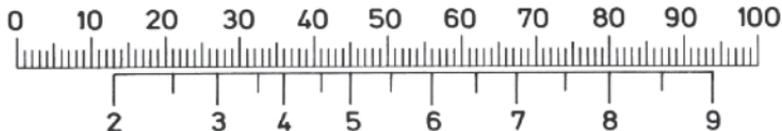
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

70 Wo / 20 Zw / 10 PA



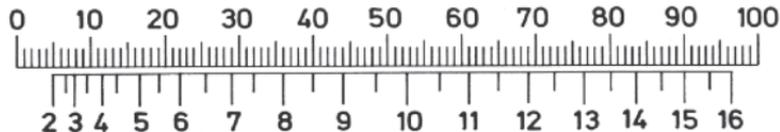
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

50 Wo / 50 Zw



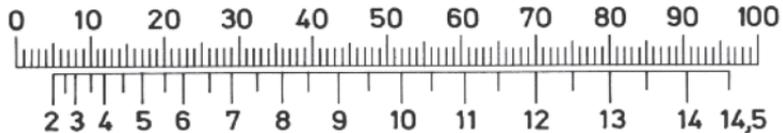
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

60 Bw / 40 PES



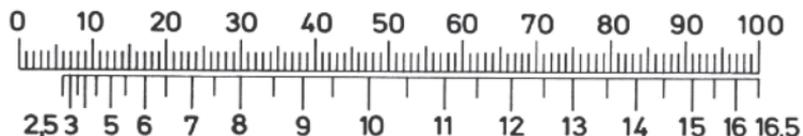
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

50 Bw / 50 Polynoxic (PON)



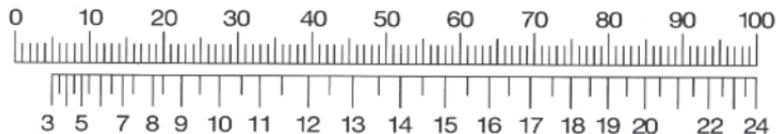
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

40 Bw / 60 Li



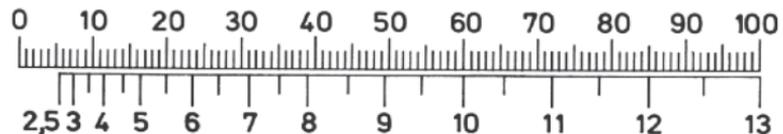
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

84 Zw / 16 Polypropilen (PP) • 56 Zw / 44 Bw



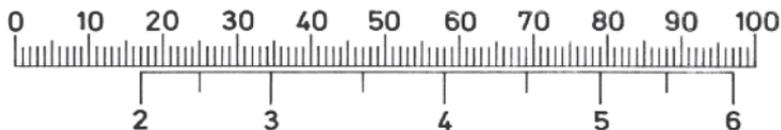
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

80 Zw / 20 Wo



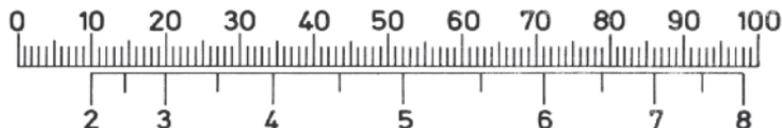
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

33 Zw / 67 Bw



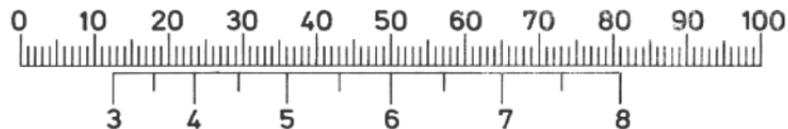
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

80 PAC / 20 Wo



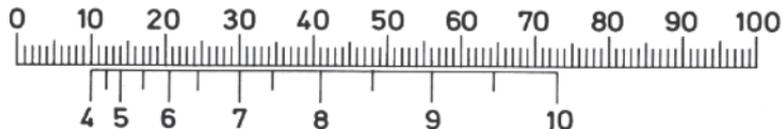
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

75 PAC / 25 Wo



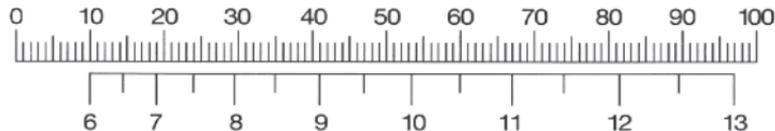
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

70 PAC / 30 Wo



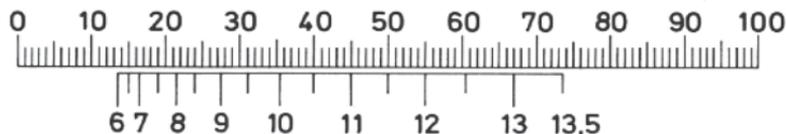
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

60 PAC / 40 Wo



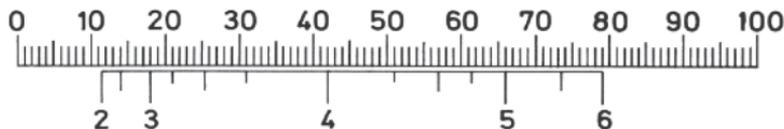
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

50 PAC / 50 Wo



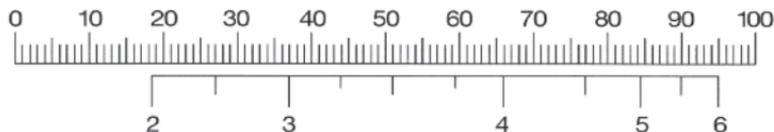
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

40 PAC / 60 Wo



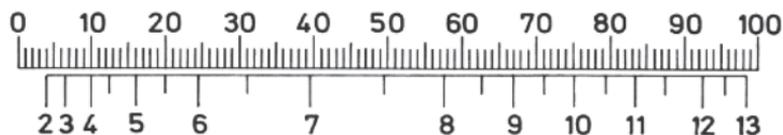
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

70 PAC / 30 Bw



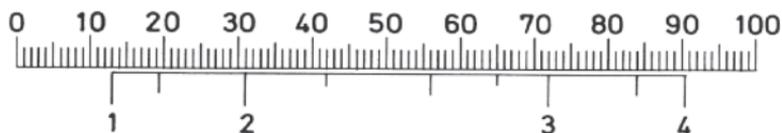
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

67 PAC / 33 Bw



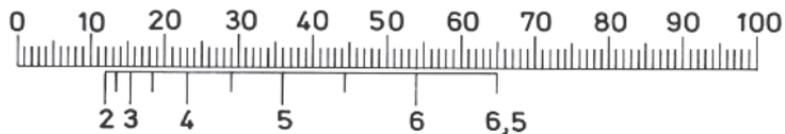
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

55 PES / 45 Wo



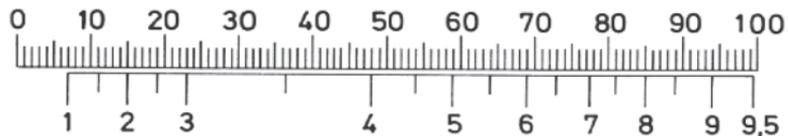
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

80 PES / 20 Li



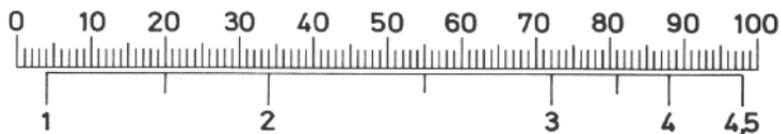
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

70 PES / 30 Wo



% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

70 PES / 30 Zw



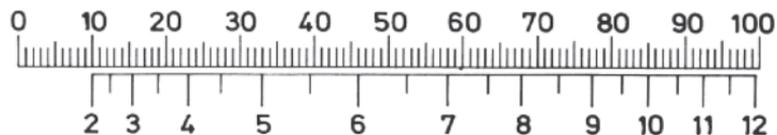
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

67 PES / 33 Bw



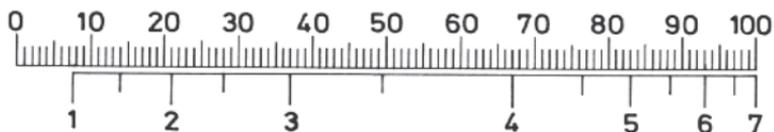
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

65 PES / 35 Zw



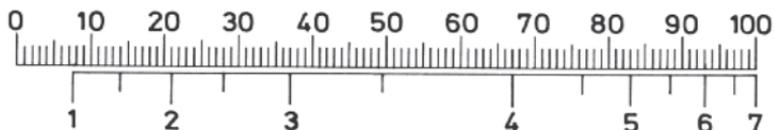
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

55 PES / 45 Zw



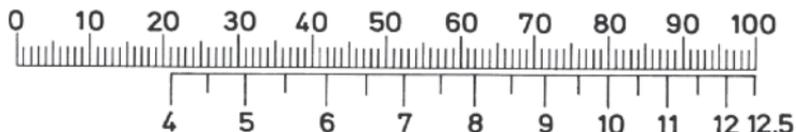
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

50 PES / 50 Bw



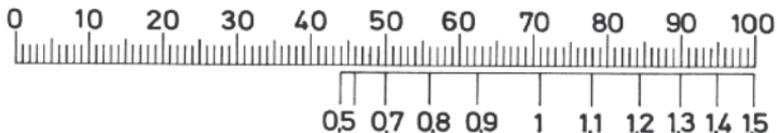
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

50 PES / 50 Bw



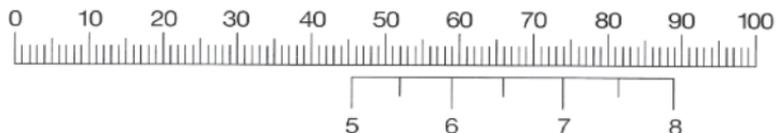
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

50 PES / 50 Zw



% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

50 PES / 50 PAC



% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

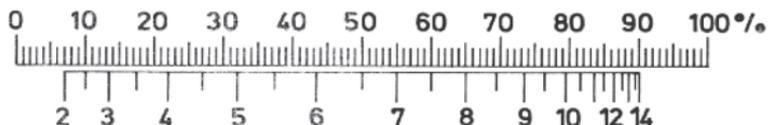
Seed-cotton

Rel. Luftfeuchte - rel. humidity - humidité relative de l'air
humedad rel. del aire - umidità relativa dell'aria



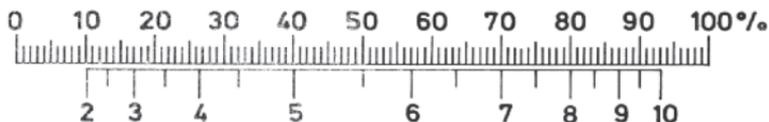
% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

Wolle - Wool - Laine - Lana



% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

Baumwolle - Cotton - Coton - Algodón - Cotone



% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

Leinen - Linen - Lin - Lino

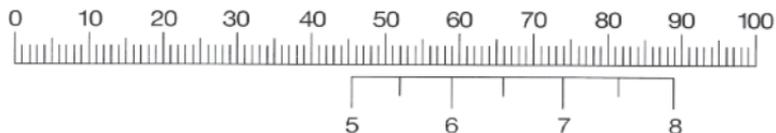
Feuchtigkeitsmittelwerte aus verschiedenen Sorten

Moisture means of different species

Valeurs moyennes d'humidité de diverses espèces

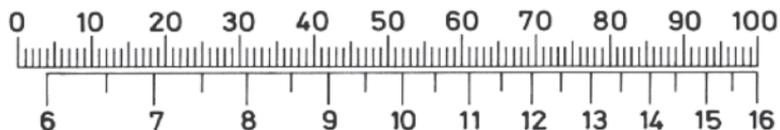
Valores medios de la humedad de diversas especies

Valori medi dell'umidità di diverse specie



% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

Seed-cotton



% Feuchtigkeit - Moisture - Humidité - Humedad - Umidità

Sisal

Weitere Spezialskalen kommen laufend hinzu.

Wir bitten bei Bedarf um Ihre Anfrage.

More special scales are added from time to time.

Please consult us in case of need.

D'autres échelles spéciales s'ajoutent de temps en temps.

Consultez-nous en cas de besoin.

Más escalas especiales se añadan constantemente.

En caso de tener necesidad, les rogamos nos envíen su demanda.

Altre scale speciali si aggiungono di tanto in tanto.

Consultateci in caso di bisogno.

10.0 LIMITED WARRANTY

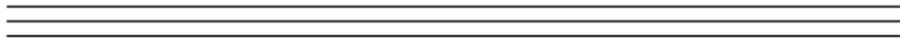
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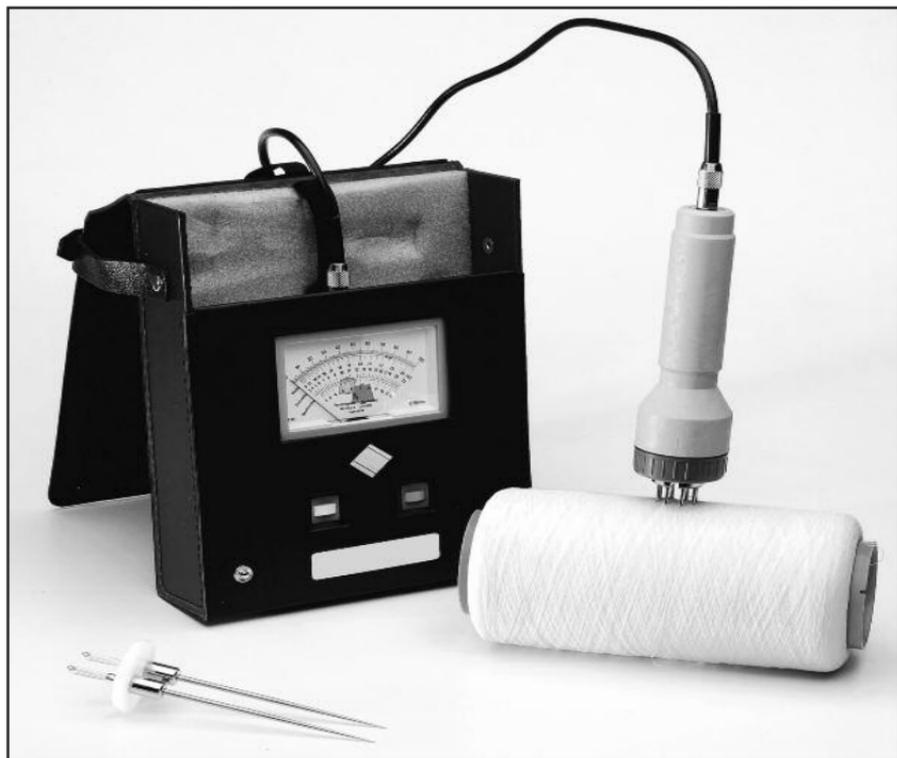
NOTES

NOTES

CHECKLINE®
MADE TO MEASURE

TEXTILE MOISTURE METER

TEM-1



Operating Instructions

