Certificate of Calibration

Standard Reference Material 704a

for

Internal Tearing Resistance of Paper

This Standard Reference Material was prepared from paper chosen for its high order of uniformity of strength and its resistance to degradation by aging. Although this material is quite stable, there may be some change in the certified value with time. Therefore, the internal tearing resistance is determined periodically and changes made accordingly in the certified value. When tested by the procedures described on the reverse side of this certificate, the internal tearing resistance in the machine direction at 23 ± 1 °C and 50 ± 2 percent relative humidity is as given below. This value is certified for a period of four months from the date of this certificate.

Date:

Internal Tearing Strength: Grams

Correction for Old Model Instruments: %

Washington, D. C. 20234

W. Wayne Meinke, Chief
Office of Standard Reference Materials

(Over)

INSTRUCTIONS FOR USING
STANDARD REFERENCE MATERIAL 704a

With TAPPI Standard T 414, ASTM Designation D 689, and American Standard P 2.6

INTERNAL TEARING RESISTANCE OF PAPER

Sufficient standard material is provided for 40 or more measurements. Open the sealed package only in a room maintained in accordance with the ASTM-TAPPI-ASA standard, at 50 ± 2 percent R.H. and 23 ± 1 °C. Reseal half the material in the package for future use in the event that it is necessary to repeat the calibration. Precondition and condition the other half of the material in accordance with your usual procedure for high precision work (see ASTM Designation D 685 or TAPPI Standard T 402). The certified value for this standard material was obtained on specimens preconditioned for a minimum of 24 hr at about 12 percent R.H., 23 °C and then conditioned for a minimum of 24 hr at 50 percent R.H., 23 °C.

From the conditioned standard material, prepare at least 20 specimens, each specimen consisting of 16 plies. Take each ply of a specimen from a different sheet, and cut to proper size for tearing in the long direction (machine direction) of the sheet as received.

Before testing, determine that the tearing tester is in proper adjustment, (see T 414/D 689/P 2.6). Then following the prescribed procedure, carefully clamp the 16 plies of a specimen together in the jaws of the tester, and make the tear. Record the scale reading. Repeat for all 20 specimens. Compute the average scale reading. Since the tester is direct reading for a 16-ply specimen, the tear value is equal to the scale reading. Therefore, this average scale reading is your "measured" value of the standard material.

If the measured value of the standard material differs from the NBS certified value by more than 3 percent, compare in detail the procedure used against that prescribed in the standard method. Especially check (a) the relative humidity and temperature conditions (use wet-dry bulb psychrometer or dew-point hygrometer, not hair hygrometer). (b) preconditioning procedure, (c) dimensions of specimen and tear distance, (d) movement of table or instrument during swing of pendulum, (e) bearing and pointer friction, (f) level and zero adjustment, and (g) whether the model instrument used is that specified in T 414/D 689/P 2.6.

In order to determine whether an older model tester is reading correctly (i.e., within 3%) for that model tester, first add to the certified value of the standard material the correction shown on the face of this certificate.

Calibration should, at first, be on a monthly basis. If the result reported in any "initial" month is repeated within 1½% in three succeeding months and this situation is consistently found for several successive initial months, then the frequency of calibration may safely be reduced to a quarterly basis. If not, calibration should be continued on a monthly basis until the cause of the lack of control is found. Further reduction in the frequency of calibration is possible when on three or more successive reports, results remain within 1½ percent, but the frequency should be increased whenever the 1½ percent limit is reached.