

BENDING STIFFNESS TESTER TABER®

The Taber® Stiffness Tester is used to evaluate material stiffness and resilience.

This precision instrument provides accurate test measurement to $\pm 1.0\%$ for specimens from 0.10 to 5.56 mm thickness.

Defining stiffness & resilience

One Taber unit is the bending moment of 1/5 of a gram applied to a 3.8 cm wide specimen at 5 cm length while flexing it to a 15° angle.

A stiffness unit is the equivalent of one gram centimeter.

Resilience is the elastic quality of a material expressed as the ratio of basic stiffness to initial stiffness calculated by the following formula :

$$\text{Percentage of resilience} = \frac{\text{basic Stiffness} \times 100}{\text{initial stiffness}}$$

Initial stiffness is the first reading obtained immediately when flexing the specimen to the end point of deflection and is generally used for comparing relative stiffness qualities.

Basic stiffness is the loss of stiffness caused by realignment of the molecules experienced by the material when the specimen is held at the end point of deflection.

Models

• 150-E

This model features an on-board computer that automatically calculates and records stiffness testing data. Stiffness readings are automatically converted to the appropriate user-selected stiffness range, eliminating the need to manually multiply results by a scaling factor. This unit also calculates average, standard deviation and high/low readings.

With the accessory ports, data can be either printed or downloaded to a PC. Plus, up to 1000 readings can be stored in non-volatile memory. In addition to the internal real-time clock and calendar, stored readings can be identified with an optional user-defined label. Using the 16 button keypad, operators have the ability to select the direction, deflection and number of cycles. The instrument also offers the ability to perform testing in auto or manual mode.

• 150-B

This model is a manually operated instrument. Offering the same accurate, precision test results as the Model 150-E, this instrument requires the user to record stiffness testing data, average the readings and multiply results by a scaling factor. Mounted on telescoping tripod legs, the Model 150-B is lightweight for easy portability.



Model 150-B

Model 150-E

Instrument operation

Taber® Stiffness Testers include three major components :

- a constant speed motor
- a weighted, free-swinging pendulum with a clamping block to hold the specimen at the face
- a powered, gear-driven rotating disc.

On model 150-B test results are read from a scale on the stationary disc. On the model 150-E, test results appear automatically on the display panel and can be downloaded to a PC or printer.

The clamping block is precisely aligned with the center of rotation of the gear-driven disc. The specimen to be tested is held on the top end in the jaws of the clamping block and at the lower end between two adjustable rollers attached to the rotating disc. In this way, 5 centimeters of the specimen are flexed in the standard 10 to 100 unit test range.

When power is applied to the gear-driven disc, a resulting torque is placed on the specimen causing angular deflection in the pendulum. This deflection is indicated directly on the scale or on the digital display.

Cardboard, Non-wovens, Packaging, Paper, Plastics, Textile, ...

Physical specifications

Dimensions

150-B 42 x 22 x 25.5 cm (WxLxH)

150-E 38 x 25.5 x 39 cm “

Net Weight

150-B 5.9 kg

150-E 11.4 kg

Options

- Step down transformer
(for model 150-B when using 230 V)
- Triple cut specimen shear
prepares precise samples for testing - with the interchangeable dies, you can select the appropriate size for your testing (3.8 x 3.8 or 3.8 x 7 cm)
- Sensitivity range attachment
for testing stiffness of extremely lightweight materials incl. cellophane, natural fibers, synthetic filaments, metallic foils, and more - requires the compensator range weight.
- Wire/tube testing apparatus
for testing cylindrical specimen materials
- Range weights
for testing specimens below 10 stiffness units and above 100 stiffness units
- Calibration specimens
- 6 mm clamp jaw upgrade
used for older models stiffness testers

Standards

ASTM D5342, D5650, JIS P8125, ISO 2493, TAPPI T-489 os-92, T-566 om-97, ...

Performance data

Specimen thickness

With the ratchet stop roller (included on all new instruments), the stiffness tester will accommodate specimen thickness up to 12.7 mm. However, regardless of material thickness, if your material exceeds 10000 stiffness units you will need to find an alternative method to test it.

Testing range

A set-up chart is provided with each instrument to help determine which test range should be used for the type of material being testing. When a range needs to be determined for the first time, test a sample in range 3. If the sample deflects immediately and results in a very low stiffness reading of less than or equal to 10 stiffness units, change to range 2. If the results are greater than or equal to 100, use ranges 4 - 9. Values of test ranges overlap. For best accuracy, test in lowest range.

Operation

Mechanical & electrical

Power Supply

115/230 V, 50/60 Hz

“Partners in Quality”