

TIP 0304-20

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TIP Category: Automatically Periodically Reviewed (Five-year review)

TAPPI

Calibration of flexible beam crush tester

Scope

The flexible beam type crush tester is commonly used when performing a number of different types of laboratory and production quality tests. Among the procedures performed on the tester are edge crush, flat crush,

ring crush, CMT, CLT, and pin adhesion tests.

The flexible beam tester most commonly used to perform these tests consists of an upper platen driven down

at a constant speed onto a specimen placed on a lower platen. The lower platen is centrally mounted on a flexible

bending beam. The deflection of the flexible beam depresses a plunger mounted to a dial indicator or an electronic

load cell. The dial indicator or load cell is designed to read the force required to crush or separate the specimen

being tested.

The flexible beam crush tester will consistently give reliable results if calibration is properly maintained.

There are a number of daily, weekly, monthly, semi-annual, and annual checks that, if done, will ensure accuracy of

the tester. A general summary of those checks by frequency is as follows:

Safety precautions

There are no safety requirements at this time.

Daily checks

1. V-Belts.

a. Adjust if loose.

b. Replace if worn or frayed.

2. Dial indicator plunger contact with flexible beam.

a. Ensure that plunger is making contact with bending beam.

1) Loosen the holding screw that secures indicator to its mount and move indicator up until plunger comes into contact with beam.

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II. Calibration procedure to check platen parallelism.

A. Remove crocus cloth from both platens.

1. Clean any adhesive residue from platens.
2. Remount platens to tester.

B. Procedure

1. Place four ball bearings of equal size, approximately 3/8 in. (10 mm) in diameter, between platens.

a. Locate them directly over the lower platen contact points approximately 1/4in. (6 mm) away from front and rear platen edges.

b. To prevent the ball bearings from falling off the lower platen, they may be placed inside 1-in. (25- mm) flat washers.

2. Turn the chive (drive pulley) by hand until 40 lb. (178 N) of pressure is applied to the bearings.

a. Platens are parallel if all ball bearings hold securely in place.

b. If one or more ball bearings move freely, the upper crosshead must be adjusted.

3. To adjust upper crosshead, slightly loosen cap nuts located in the four corners of the crosshead.

a. Loosen caps nuts until all bearings are held tightly between the platens. Loosen cap nuts adjacent to bearings that are held tightly first.

b. Locate set screws and adjust until all four screws are tight with crosshead.

1) Set screws are located in the corner posts directly below contact points with crosshead.

2) Older model testers do not have set screws and must be shimmed once crosshead is positioned correctly.

4. Mark front of both upper and lower platens. If they are removed, they should be installed in the exact position they were in when calibrated for parallelism.

III. Calibration procedure for load sensing indicator.

A. Dead weight procedure.

1. Position upper platen approximately 1.5 in. (38 mm) above lower platen.

2. Remove motor and top chive (drive pulley).

3. Place a metal plate 4 x 20 x 1/4 in. (100 x 400 x 6 mm) centrally on the lower platen at right angles to the bending beam.

4. Zero indicator gauge with bar in position.

a. Loosen locking screw located on the side of the indicator dial face and turn dial face until dial and zero correspond.

b. Secure locking screw.

5. Place a matched pair of weights on the plate at exactly the same time and note the reading on the dial indicator.

6. Continue to add weights to the tester and noting indicator values until dead weight totals 80% of tester capacity.