

TA-BLS – Bi-Layer Shear

The Bi-Layer Shear Test Fixture is used to measure the strength of the interfacial bond of compressed tablets that are made up of two separate components. The BLS fixture is a guillotine-like device that applies a shearing force between the two components until the bond separates.

Fixture Base Table (TA-BT-KIT)

The Bi-Layer Shear base fixture replaces the insert in the fixture base table. For the most convenient use, the height of the base table should be adjusted by using only 1” extension legs. Turn the base table upside down, remove the four Phillips head screws, and install the 1” extension legs to achieve the desired height. Place the fixture base table back onto the CT3, but leave the locking T-bolts loose until alignment is complete.

Install the Bi-layer Shear Fixture

The Bi-Layer Shear Blade probe attaches directly to the M6 thread in the probe shaft using the coupling device and a locking nut. Screw the coupling device fully into the probe shaft. Position it so that the blade slot is perpendicular to the back wall of the CT3.

Install the Bi-Layer Shear Fixture base in place of the insert in the fixture base table. There are two thumbscrews on adjacent sides of the perimeter of the fixture base table. Alternately tighten both of them to lock the fixture insert into the base table.

Alignment of the Base Table in Stand Alone Mode

The easiest way to align the BLS base under the BLS Blade probe in the standalone mode is by using the Tension test. Rotate the select scroll knob until Tension test appears on display. After depressing the start button two times, the select scroll knob can be used to lower the Blade probe into the slot



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in the BLS base fixture. Depressing and holding the Select/Scroll knob will continuously lower the probe, and rotating the Select/Scroll knob will lower the probe 1 mm for each click of the knob. Bring the probe down gradually so that the blade is centered in the slot, alternately adjusting the position of the base table then lowering the blade. When the fixture is properly aligned, the BLS blade will slide cleanly into the slot of the BLS base fixture. After the fixture is aligned, lock the base table by tightening the T-bolts.

Use of the Bi-Layer Shear Fixture

Once the Bi-Layer Shear Fixture is aligned, tests can be run in either standalone mode or with Texture Pro CT Software.

In standalone mode, choose the Compression test. Set a Trigger value appropriate for the load cell in your instrument, usually 20 to 50 grams. The Deformation distance should be set large enough to completely shear the tablet. For example, if your tablet is 8 mm in diameter, choose a deformation distance of 10 mm. A slow test Speed of 0.5 to 2 mm/s is usually chosen. The BLS Blade contains an oval slot. Lowering the Blade to about 68 mm should align the oval slot in the Blade with the oval slot in the white nylon adjustable plug in the BLS base fixture. Place your test tablet into the slot and adjust the white nylon plug so that the interface of the two layers in your tablet is located in the plane of the shear blade. When the test starts, the BLS Blade probe will shear the tablet, so proper positioning of the tablet in the fixture is critical to the test result. When the test is finished, the Peak Load to shear the Bi-Layer Tablet is displayed. The deformation at Peak indicates the shearing distance from the trigger load to the Peak Load. This will usually be a very short distance and indicates when the tablet is initially broken. The Work result shown in the display will be the amount of work required to shear the tablet and the final load in this test is usually irrelevant because it is the load force at the end of the travel.

When doing the Bi-Layer Shear Test using the Texture Pro CT Software, the test method may either be compression or tension, depending upon whether you prefer shearing the tablet in the upward or downward direction. Normally it will make no difference to the test result. Use the Adjust Beam buttons to lower the blade to the starting position, so your tablet can be inserted. Set the Target Distance. Choose the distance according to the description in the standalone mode above. A Hold Time is irrelevant for this test, so it should be set to zero. The Trigger value should be appropriate for the load cell, and the Test Speed should be set as described above.

The following screen shows the test parameters. The second screen shows the measured and calculated values from the test.



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Tests | Graph | Data | Results | Setup | Custom

Run Test | Stop Test

Bi Layer Shear Test

Sample Identification

Product Name: Tablet A

Batch Name: Lot No -

Sample: Increment Automatically Set Manually :

Sample Dimensions

Measure Length Length: 0.00 mm

Shape: Block Cylinder

Width: 0.00 mm

Depth: 0.00 mm

Diameter: 0.00 mm

Sample Notes

Use of the Bi-Layer Shear Fixture

Test Type

Compression Tension TPA Rupture

Test Target

Load % Deformation Final Distance

Target Type: Distance

Target Value: 10.0 mm

Hold Time: 0 s

General Test Parameters

Trigger Load: 20.0 g

Test Speed: 0.50 mm/s

Return at: Test Speed Post Test Speed

Probe: TA3/100

Fixture: TA-BT-KIT

Multiple Cycle Tests

Cycle Count: 1

Recovery Time: 0 s

Always measure target distance from trigger point of first cycle.

Adjust Beam

0 mm

Return to Home

Return to Start

Locate Base

Tests | Graph | Data | Results | Setup | Custom

View Report

Bi Layer Shear Test

Report Options

Calculate results for:

Current Data Set

Pass/Fail Options

Show Raw Data

Statistics over multiple Data Sets

Choose Data Sets

Tension Calculations

Peak Load

Deformation at Peak Load

Sample Length

Work

Final Load

Mean Load between

Start Time: 0 s

End Time: 0 s

First Cycle Calculations

Hardness Load at Target

Deformation at Hardness Deformation at Target

% Deformation at Hardness % Deformation at Target

Sample Length Apparent Modulus from

Hardness Work Done 0 % of slope to

Recoverable Deformation 0 % of slope

Recoverable Work Done Peak Stress

Total Work Done Strain at Peak Load

Rigidity at: 0.0 mm Adhesive Force

Distance Adhesiveness

% Deformation Resilience

Rigidity at: 0.0 mm Stringiness Length

Distance Stringiness Work Done

% Deformation Relaxation Time

Fracture Calculations

Sensitivity: 1 % of load

Quantity of Fractures 1st Fracture Work Done

Fracturability 1st Fracture Deformation

1st Fracture Load Drop Off 1st Fracture % Deformation

For further information, please see the application study on Bi-Layer Shear Testing on our web site.

