

Lipstick Bend Test

Understanding the firmness and flexibility of lipstick is crucial for product quality, user experience, and durability. A lipstick that is too hard may be uncomfortable to apply, while a too-soft lipstick may break easily, compromising its usability and customer satisfaction.

Test Objective:

- To determine the firmness of lipstick by bending samples using a Lipstick Cantilever Fixture (TA-LC) on a CTX Texture Analyzer.

Background:

- Lipsticks contain wax, oils, pigments, and emollients to provide texture, color, and moisturizing benefits. Ensuring the correct firmness and stickiness is essential for maintaining the product's structural integrity and application performance.

Equipment:

- Instrument: CTX Texture Analyzer with a 1.5 kg Load Cell (Figure 2)
- Fixture: Lipstick Cantilever Fixture (TA-LC) (Figure 3)
- Software: Texture Pro

Settings:

- Test Type: Compression
- Target Type: Distance
- Target Value: 7 mm
- Trigger Load: 10 g
- Test Speed: 1 mm/s

Procedure:

1. Attach the TA-LC probe to the CTX Texture Analyzer.
2. Secure the Fixture Base Table and the Lipstick Cantilever Fixture.
3. Insert and align the lipstick sample, extending it 12.5 mm past the tube.
4. Set test parameters using TexturePro software.
5. Begin the test.
6. Clean the probe after testing each sample.
7. Repeat steps for all samples.



Figure 1 - Lipstick



Figure 2 -



Figure 3 -
Lipstick Cantilever
Fixture (TA-LC)



Figure 4



Figure 5

Observations:

- At a trigger load of 10 g, the probe bends the lipstick at a test speed of 1 mm/s to a 7 mm distance and returns to the start position.
- Figure 6: Load vs. Time graph shows sample hardness (Peak Load) and stickiness (Adhesive Force).
- Figure 7: Load vs. Distance graph shows the work done to bend the lipstick and its adhesiveness.

Discussion:

- Peak Load: Indicates lipstick hardness; higher values denote harder samples.
- Adhesive Force: Measures the force needed to overcome bonds between the lipstick and the probe.
- Adhesiveness: Calculated as the work required to pull the sample away from the probe.

Data Report:

Hardness Results (Figure 8):

- Key Me Coral: 372.5 g
- Choco-Liscious: 589 g
- Pink Cloud: 453 g

Hardness Work Done:

- Key Me Coral: 19.2 mJ
- Choco-Liscious: 25.94 mJ
- Pink Cloud: 18.36 mJ

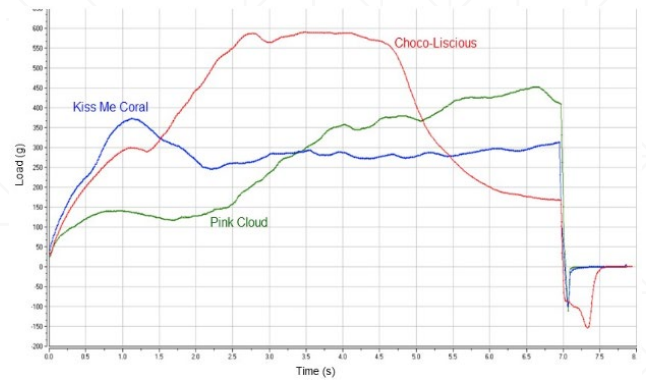


Figure 6: Typical Load vs. Time Plot

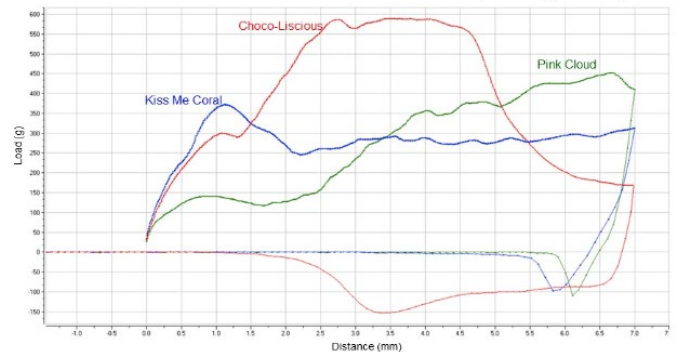


Figure 7: Typical Load vs. Distance Graph

Conclusion:

Test results determine the ideal hardness and stickiness for lipsticks, ensuring reproducible quality. Adherence to the test procedure, sample preparation, and equipment setup is essential for reliable results.

#	Sample Description		Result	Hardness Cycle 1	Hardness Work Cycle 1
	Product Name	Batch Name			
1	Lipstick	Key Me Coral	1	372.50	19.20
2	Lipstick	Choco-Liscious	1	589.00	25.94
3	Lipstick	Pink Cloud	1	453.00	18.36

Figure 8 - Results of the tests performed on three different lipstick samples.