

Facial Powder Hardness Test

Understanding the hardness or "cake strength" of facial powders is essential for maintaining product quality and customer satisfaction. Proper hardness ensures the powder does not crumble, crack, or dust during transport and use, providing a consistent texture and application experience.

Test Principle:

- Evaluate the hardness of a facial powder using a 2 mm cylindrical probe to measure the force required to penetrate the compressed powder.

Background:

- Facial powders primarily consist of talc (up to 70%), which provides a soft feel and ease of application. Binders and other ingredients add color, scent, and stability, preventing the powder from crumbling or cracking. Consistency in texture is critical for repeat purchases, and the penetration test helps maintain this consistency by measuring hardness.



Equipment:

- Instrument: CTX Texture Analyzer with 5 kg load cell
- Accessories: 2 mm Cylinder Probe (TA39), Round Base Table (TA-RT-KIT)
- Software: Texture Pro

Settings:

- Test Type: Compression
- Pre-Test Speed: 0.5 mm/s
- Test Speed: 1.0 mm/s
- Post-Test Speed: 4.5 mm/s
- Target Type: Distance
- Target Value: 2 mm
- Trigger Force: 5 g

Procedure:

1. Attach the round base table to the instrument and loosely tighten for mobility during alignment.
2. Attach the cylinder probe to the load cell.
3. Lower the probe close to the sample surface and align centrally.
4. Tighten the thumbscrews of the base table.
5. Start the penetration test.
6. Clean the cylinder probe with a dry cloth after each test.

Observations:

- Figure 1: Force increases as the probe penetrates the powder until the surface crumbles (first peak value). The force continues to rise until a second peak is measured, indicating the compactness of the powder.

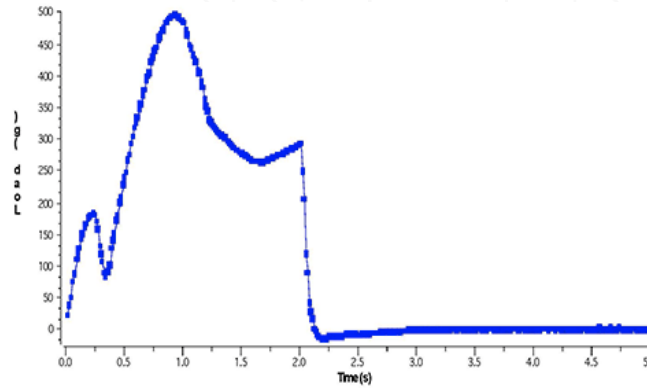


Figure 1

Figure 1: Graph shows the hardness of a facial powder using a 2 mm cylinder probe tested at 21C.

- Figure 2: Load vs. Distance graph shows the probe penetrating to 2 mm and then retracting.

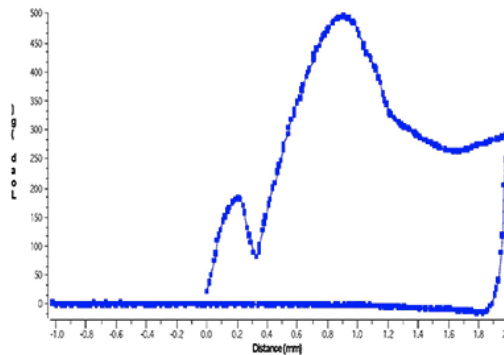


Figure 2

Figure 2: Graph shows the load versus distance for the hardness of a facial powder. The probe starts a millimeter above the same, penetrates the sample to a distance of 2 mm after which it withdraws from the sample at a post-test speed of 4.5 mm/s and returns to the starting position above the sample surface.

- The test helps compare different formulations or batches by analyzing penetration force variations, which may reflect manufacturing differences.

Results:

Typical Mean Values:

- Hardness: 505.2 g ± 10.1
- Hardness Work Done: 6.60 mJ ± 0.27

Conclusion:

The test ensures product consistency and quality by measuring the hardness of facial powders, providing valuable data to maintain the desired texture and performance in different formulations and batches.