

Sachet Seal Strength Analysis

Testing the seal strength of sachets is essential for ensuring packaging integrity. This assessment verifies that the seal can withstand forces encountered during manufacturing, transport, and storage, thus maintaining product sterility and quality.

Background:

- Packaging must maintain product cleanliness and sterility across various stages, from production to storage. The seal strength test measures the force needed to separate the seal, reflecting the packaging's ability to provide a barrier against external contaminants. This method evaluates seal durability by pulling the sample apart with dual grips, which clamp the sachet securely for testing.



Equipment:

- CTX Texture Analyzer with 50 kg load cell
- Components: Dual Grip Assembly with rubber inserts for secure clamping
- Software: Texture Pro for controlling parameters and recording data

Settings:

- Test Type: Tension
- Pre-Test Speed: 1.0 mm/s
- Test Speed: 1.0 mm/s
- Post-Test Speed: Return at test speed
- Target Distance: 40 mm
- Trigger Load: 15 g



Sample Preparation:

1. Condition samples at room temperature.
2. Cut sachets vertically to form strips with the seal centered, ensuring each strip is uniform in length and width.

Procedure:

1. Attach the lower grip to the instrument's base and the upper grip to the probe shaft.
2. Align both grips, using a clamped sheet of paper for accurate alignment if necessary.
3. Position and clamp the sachet strip fully within the grips, ensuring no slack.
4. Begin the test once the trigger load is met, pulling the strip until the seal breaks or separates.

Observations:

- Figure 1: Load vs. Time graph illustrates the force needed to initiate and continue tearing at the seal.
 - The peak load marks the initial force required to tear the seal, followed by plateaus as varying seal strength resists tearing.

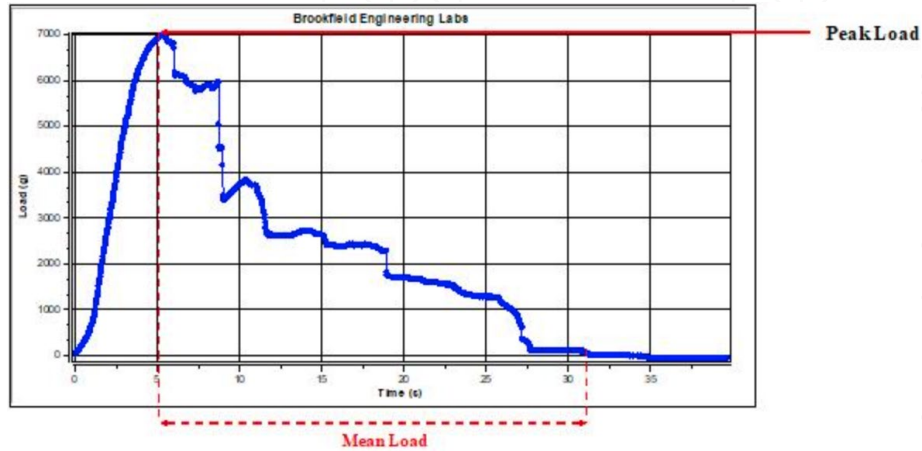


Figure 1

- Figure 2: Load vs. Distance graph shows the work done, calculated as the area under the curve. Fluctuations indicate weaker points within the seal as it stretches and tears.

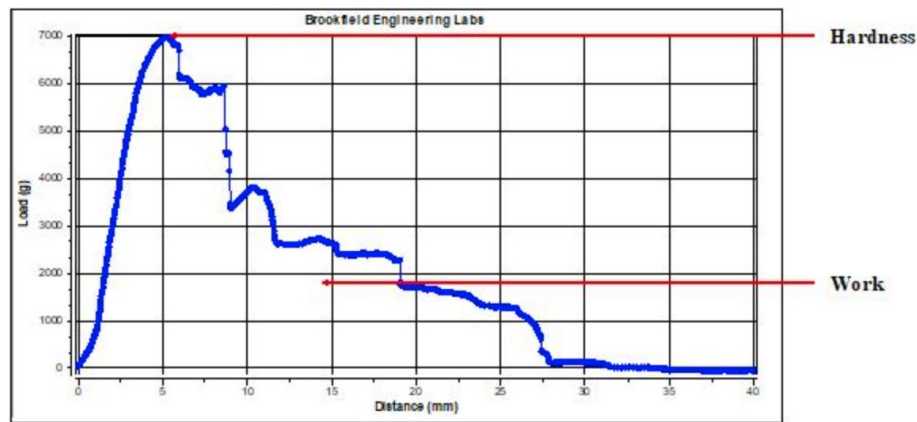


Figure 2

Results:

- Peak Load: 6975 g
- Mean Load: 2376 g (average force over 5.7-31 seconds)
- Work Done: 812 mJ (energy required to separate the seal)

Discussion:

The peak load reflects the initial resistance of the seal, while mean load and work done represent the seal’s overall durability across the distance tested. Consistent seal strength ensures product protection during handling and storage, supporting quality standards for packaging.