

Dog Dentastix Hardness Analysis

Testing the hardness and break resistance of Dog Dentastix is essential for quality control, ensuring each treat meets the desired firmness. This testing helps verify that the product is not too hard to cause discomfort and not too soft to be ineffective in cleaning between a dog's teeth.

Background:

- Dog Dentastix are designed for dental care, cleaning between dogs' teeth down to the gum line. Hardness and flexibility are crucial for effectiveness and comfort, as a treat that is too hard may cause discomfort while one that is too soft may fail to provide adequate cleaning.
- This test evaluates the hardness and resistance to bending of the Dentastix using a three-point bend accessory, which supports samples up to 70 mm in length and 80 mm in width.



Equipment:

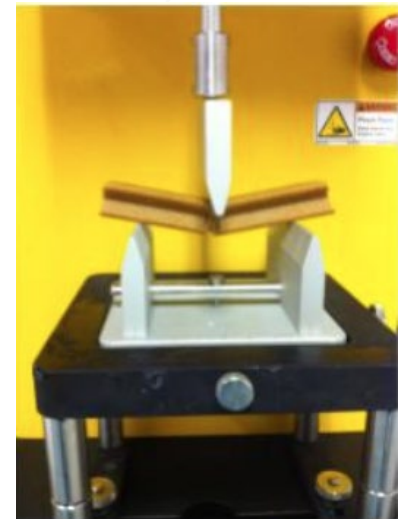
- CTX Texture analyzer with 5 kg Load Cell
- Probe and Fixtures:
 - Three-Point Bend Accessory (TA-TPB) for support
 - Fixture Base Table (TA-BT-KIT) for sample stability
- Software: Texture Pro for controlling parameters and recording data

Settings:

- Test Type: Compression
- Pre-Test Speed: 1.0 mm/s
- Test Speed: 2.0 mm/s
- Post-Test Speed: 2.0 mm/s
- Target Type: Distance
- Target Distance: 20.0 mm
- Trigger Load: 15 g

Sample Preparation:

- Store samples at room temperature, avoiding exposure to moisture to maintain consistent testing conditions.



TA-TPB Accessory deforming a Dentastix to breaking point

Procedure:

1. Attach the flexure probe to the instrument.
2. Place the fixture base table on the instrument base, allowing for slight movement.
3. Insert the three-point bend accessory onto the fixture base table and secure it.
4. Adjust the supports to be equidistant to fit the sample length and align them with the flexure probe.
5. Position the Dentastix sample centrally over the supports and lower the probe close to the surface.
6. Start the test to measure the force required to bend and break the sample.

Observations:

- Figure 1: Load vs. Time graph shows the hardness (breaking point) of Dog Dentastix.
- Figure 2: Load vs. Distance graph demonstrates the break resistance, with the maximum peak force indicating sample hardness and the area under the peak representing work done. The slope reflects flexibility; steeper slopes indicate less flexibility.

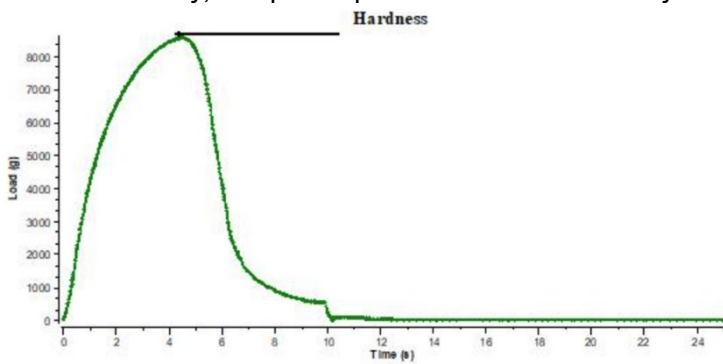


Figure 1

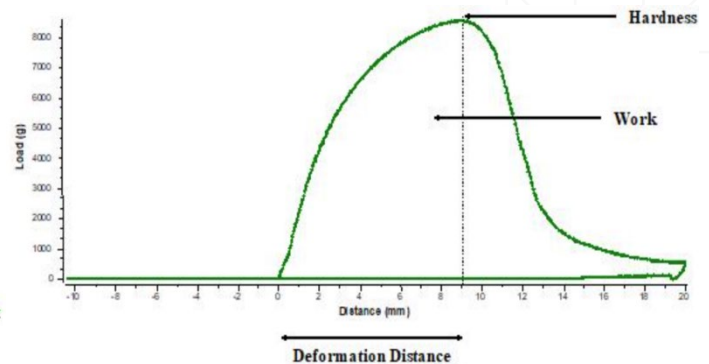


Figure 2

Results:

- Hardness (Maximum Force): Measures the force needed to break the sample.
- Work Done: Calculated from the area under the curve, correlates to the energy required to overcome the internal bonds of the sample.
- Flexibility: Indicated by the slope of the graph before breaking; a gentler slope shows greater flexibility.

Discussion:

The hardness values and work done reflect the strength and brittleness of the Dog Dentastix. Higher hardness values imply firmer products, which are more effective in dental cleaning but must balance comfort. Consistent preparation and positioning are vital for repeatable results, supporting product quality and consumer expectations for dog dental treats.