

Flour Tortilla Stretchability/Flexibility by Penetration

AIB Standard Procedure

TVT Texture Analyzer

The TVT Texture Analyzer (Figure 1) offers rapid and objective analysis all kinds of products. The following parameters can be characterized for your product category:

- Break point
- Stretchability/flexibility
- Rupture force

Both international standard methods as well as customer tailor-made profiles are available.

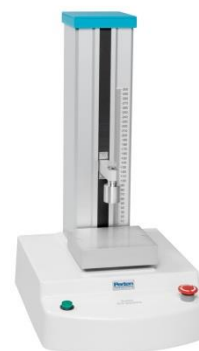


Figure 1: TVT Texture Analyzer

Scope

- Determination of stretchability/flexibility for flour tortilla by single cycle penetration, AIB Standard Procedure(AIB).

Method Description

The recording of the measurement data commences once the probe reaches the pre-set trigger force. The probe will then compress/puncture the sample to a pre-defined distance. After compression, the probe returns to its starting position.

Calibration

Make sure the instrument is correct calibrated before the measurements. How to perform the calibration can be found in the User's Manual.

Load cell (recommended) 5 – 10kg

Probe

P-CY18R, Cylinder probe 18 mm diameter, rounded edges stainless steel (Figure 2a)
Part number: 67.30.18

Figure 2a: P-CY18R



Rig

HDS, Heavy Duty Stand,
2 x HDSIH50, Inserts with 50 mm Ø hole, (Figure 2b).
Part number: HDS: 67.50.80; HDSIH50: 67.50.85 (x2)

Figure 2b: HDSIH50



Profile settings

Setting Parameter

Single Cycle Compression

Sample height [mm]	3.0
Starting distance from sample [mm]	8.0
Compression [mm]	30.00
Initial speed [mm/s]	6.0
Test speed [mm/s]	1.7
Retract speed [mm/s]	10.0
Trigger force [g]	20
Data rate [pps]	200

Sample preparation

After cooling for 30 min., tortillas are double bagged and held at room temperature until further testing. Take the samples from their packaging just before testing and place it centrally over the hole of the rig. Try to avoid any slack of the sample over the hole without stretching it. Place the second holed insert on top of the flour tortilla to avoid any movement of the sample during the measurement, Figure 3. Storage and handling of the samples might influence the result and should thereby be kept constant. Select samples with uniform shape and size. Tortillas are generally tested on days 1, 3 and 7 after baking.

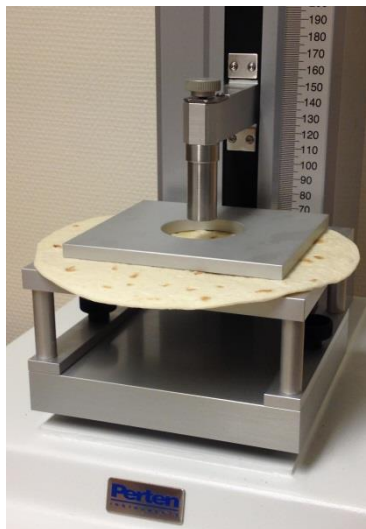


Figure 3: Sample set-up

Curve Description

In Figure 4 typical Force-Distance curve is illustrated. The maximum peak⁺ force value is here used for the determination of the rupture toughness/break point of the sample. The greater the distance to the maximum force is the more stretchable is the sample.

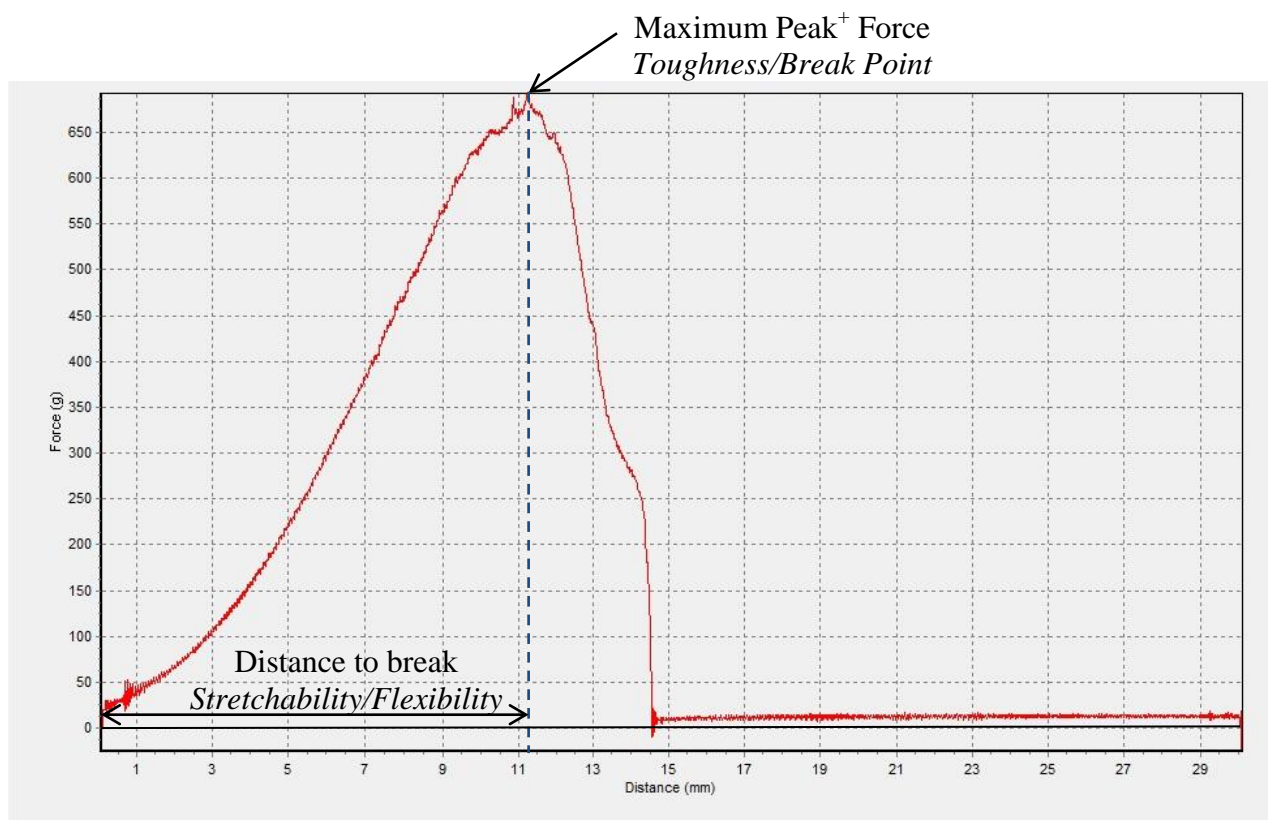


Figure 4: Penetration measurement of flour tortilla

Data Analysis

The force required to puncture the sample to a certain distance/break is here defined as rupture force and can be measured in the units [g] or [N]. The distance to the maximum peak force is the stretchability of the sample and is measured in [mm]. Except raw data (force, time and distance) the program also directly provides calculated results such as *mean value* and *standard deviation*.

Reference

AIB Flour Tortilla Stretchability/Flexibility Measurement. AIB - American Institute of Baking. Lab in Manhattan, Kansas.

<https://www.aibonline.org/aibOnline/Documents/EN/DevelopYourProductSolutions/AIBTextureAnalysisProcedures.pdf> (2017-03-01)