Pancake Extensibility & Toughness by Puncture

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

- Toughness
- Extensibility

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

Figure 1: TVT Texture Analyzer

Scope
- Determination of extensibility and toughness of pancakes by single cycle puncture.

Method Description
The recording of the measurement data commences once the probe reaches the pre-set trigger force. The probe will then puncture the sample to a pre-defined distance. After puncture, 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-SP1, Spherical probe 1" (inch) diameter, stainless steel (Figure 2a).
Part number: 67.31.25

Figure 2a: P-SP1

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

<table>
<thead>
<tr>
<th>Setting Parameter</th>
<th>Value</th>
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<tr>
<td>Single Cycle Compression</td>
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<tr>
<td>Sample height [mm]</td>
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<td>Starting distance from sample [mm]</td>
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<td>Compression [mm]</td>
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<td>Retract speed [mm/s]</td>
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<td>Trigger force [g]</td>
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<tr>
<td>Data rate [pps]</td>
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</tbody>
</table>

Sample preparation
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 pancake to avoid any movement of the pancake 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.

Figure 3: Sample set-up

Curve Description
In Figure 4 a typical Force-Distance curve is illustrated. The maximum peak force value is here used for the determination of the toughness/break point of the sample. The greater the distance to the maximum force is the more extensible is the sample.
Figure 4: Puncture measurement of pancake

Data Analysis
The force required to puncture the sample to a certain distance/break is here defined as toughness and can be measured in the units [g] or [N]. The distance to the maximum peak force is the extensibility 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.