Soft & Gummy Confectionary, Firmness & Springiness by Hold Until Time Compression

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:

- Firmness
- Springiness
- Cohesiveness
- Resilience
- Chewiness
- Gumminess

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

Scope
- Determination of soft & gummy confectionary, firmness and springiness by hold until time compression.

Method Description
The recording of the measurement data commences once the probe reaches the pre-set trigger force. The probe will then compress the sample to a pre-defined percentage of the sample height, and hold in that position during a pre-set time. 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 – 10 kg

Probe
P-CY35S, Cylinder probe 35 mm diameter, stainless steel (Figure 2)
Part number: 67.30.35
Profile settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hold Until Time</td>
<td>Compression</td>
</tr>
<tr>
<td>Sample height [mm]</td>
<td>15.0</td>
</tr>
<tr>
<td>Starting distance from sample [mm]</td>
<td>5.0</td>
</tr>
<tr>
<td>Compression [%]</td>
<td>20.00</td>
</tr>
<tr>
<td>Hold time [s]</td>
<td>60.0</td>
</tr>
<tr>
<td>Data acquisition time [s]</td>
<td>58.0</td>
</tr>
<tr>
<td>Initial speed [mm/s]</td>
<td>1.0</td>
</tr>
<tr>
<td>Test speed [mm/s]</td>
<td>1.0</td>
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<tr>
<td>Retract speed [mm/s]</td>
<td>10.0</td>
</tr>
<tr>
<td>Trigger force [g]</td>
<td>5</td>
</tr>
<tr>
<td>Data rate [pps]</td>
<td>250</td>
</tr>
</tbody>
</table>

Sample preparation

Take the sample from the package just before the measurement. Center it under the probe (Figure 3) and start the measurement. Work quickly, since contact with air can dry out the sample and thereby change the properties. Storage and temperature might also influence the samples and should be kept constant for comparison. **NOTE** The diameter of the probe should be larger than the diameter of the sample.

Figure 3: Sample set-up
**Curve Description**

In Figure 4 a Force-Time curve is illustrated. The maximum peak force (Force A) is here defined as the firmness of the sample. The force required after 58 s holding time, called Force B, is used for calculating the springiness.

\[
\frac{\text{Force B}}{\text{Force A}} \times 100 = \% \text{ Springiness}
\]

![Figure 4: Hold until time compression test on Gehallon](image)

**Data Analysis**

The force required compressing the sample to a certain strain or distance is here defined as firmness and can be measured in the units [g] or [N]. Springiness is given as a percentage [%] value. Except raw data (force, time and distance) the program also directly provides calculated results such as *mean value* and *standard deviation*. 