

Gel, Gel Strength & Elasticity by Penetration Test

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:

- Hardness
- Rupture force
- Elasticity
- Stickiness
- Adhesiveness

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



Figure 1: TVT Texture Analyzer

Scope

- Determination of gel strength & elasticity of gels by single cycle penetration test.

Method Description

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

Calibration

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

Load cell (recommended) 5 - 10 kg

Probe

Cylinder probe 25 mm diameter, perspex material
Part number: 67.32.25 (Figure 2)



Figure 2a: Perspex probe

Profile Settings

Setting Parameter

Single Cycle Compression

Sample height [mm]	60.0
Starting distance from sample [mm]	5.0
Compression [mm]	20.00
Initial speed [mm/s]	2.0
Test speed [mm/s]	1.8
Retract speed [mm/s]	10.0
Trigger force [g]	10
Data rate [pps]	200
Adhesiveness	Marked <input checked="" type="checkbox"/>

Sample preparation

Prepare the gels according to a predefined standard. Make sure to use the same type of containers filled with the same amount of sample each time. Let the samples relax under same conditions before the measurements. Place the container centrally under the probe and attach it to the support if needed.

Curve Description

The gel strength of the gels is taken at a pre-set distance (custom force) in the beginning of the penetration where only a small deformation has occurred (3mm), while the maximum peak⁺ force is here defined as the rupture force/hardness of the gel. The distance between the trigger point and the rupture indicates the elasticity of the gel, a longer distance indicates a more elastic gel. The area of peak⁺ is representing the total work of penetration while the area of the negative peak (peak⁻) gives the adhesiveness of the sample.

Data Analysis

The force required for penetrating the sample can be measured in the units [g] or [N]. The elasticity 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*.