FOOD TECHNOLOGY CORPORATION

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TMS-Pro

Texture Analyser

Computer-Controlled Test Systems
For The Laboratory

TMS-Pro Texture Analyser

What Is Food Texture?

Food texture is a multi-dimensional attribute. We *feel* it, *see* it, *taste* it and *measure* it as we consume or use a food product. As human beings we grade and assess a food based upon its perceived or anticipated texture. Food Technology Corporation has 40 years' worth of experience in providing the food industry with objective, precise and repeatable methods of texture measurement.

"although food texture is a complex and multi-dimensional attribute, its measurement doesn't have to be"

"When we say an apple is ripe, butter is hard or that a piece of steak is tough, we are assessing its mechanical or physical characteristics as a response to the conditions we are imposing"

What Is Food Texture Analysis?

Texture analysis is the science used by food technologists to *objectively* measure the *subjective* mechanical characteristics of finished foods, their intermediate components and functional ingredients.

In simple terms, we use instruments to measure how a food feels when we eat it or performs during processing or handling.

"measure the immeasurable and get it right first time"

The texture analyser moves in either an up or down direction to squash or stretch a food sample. The travelling beam is fitted with a load cell measuring the foods response as force.

In a compression test, the load cell acts just like an upside down laboratory balance. It is "triggered" when the sample surface is detected, giving a constant start point to the texture test.

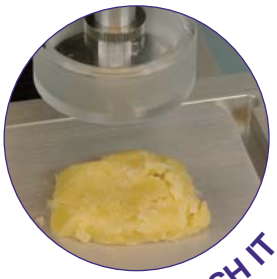
What Is A Texture Analyser?

The Food Technology Corporation TMS-Pro range of texture analysers sets the standard in cost-effective computer controlled texture analysis. Food technologists are able to manipulate forces created within their food samples by using one of our 200 probes and fixtures - You can even use our competitors fixtures its that flexible. A broad range of test configurations are available. When combined with unlimited multi-stage programming through the dedicated Texture Lab Pro software, almost any industrial processing condition or sensory technique can be replicated.

- Crushing
- Snapping
- Cutting
- Penetrating
- Puncturing
- Extruding
- Grinding
- Squeezing
- Sticking

"a real-life measure directly correlated to a food's performance or behaviour"

SNAP IT

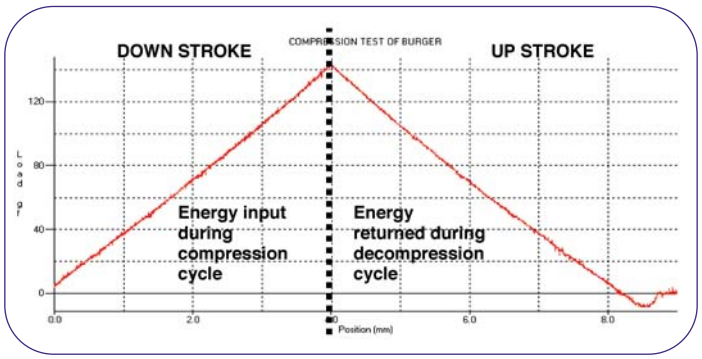


SQUASH IT

STRETCH IT

The texture analyser then travels to either a "target" distance or load, recording the force response of the sample to the deformation imposed. Time is the common variable to all texture tests, e.g. the faster we travel the less time a sample has to respond.

The travelling beam then returns and the sample adjusts to the conditions created. Forces are manipulated through the use of probes and fixtures, recreating conditions that the food is exposed to during handling or consumption.



The energy put into the sample has to be absorbed, stored or returned. We measure this response in graphical form and are able to put numbers to sensory characteristics. Instrumental results are correlated to sensory panels and sensory characteristics such as hardness, cohesiveness, stickiness, etc, can be calculated.

Texture Lab Pro

Texture Lab Pro Software

Food Technology Corporation's Texture Lab Pro software for the TMS-Pro texture analyser combines maximum flexibility for test design and data generation with user-friendly operation. Designed by food technologists for food technologists, our software provides:

- A full range of reference library files for automated testing
- Industry standard protocols for TPA, gel testing and ISO referenced procedures
- Intuitive and logical feel with Windows style format

Accompanying support material allows operators to develop test programs with minimal training so that you can start testing almost immediately. Whether you want our systems for the factory floor or the academic laboratory you will be surprised at just how simple and how much information you can generate at the click of a button!

"no hidden costs, Texture Lab Pro software and upgrades supplied free of charge as standard"

Programming

A logical programming language means that more experienced operators can set up their own tests easily detecting; peaks, fractures, slopes and much more in a matter of seconds.

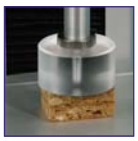
For those of us who don't want to "reinvent the wheel" the Texture Lab Pro software is supplied with a wide range of detailed library files that automatically detect the most commonly used sensory-based food parameters.

A second range of library procedures is included for simple routine measurements, ideal for the majority of food testing applications.

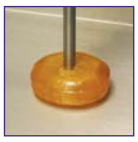
"write your own tests or use one of our many library files which automatically calculate established food science textural parameters"

Library File Examples

GELATIN BLOOM



COMPRESSION



PENETRATION

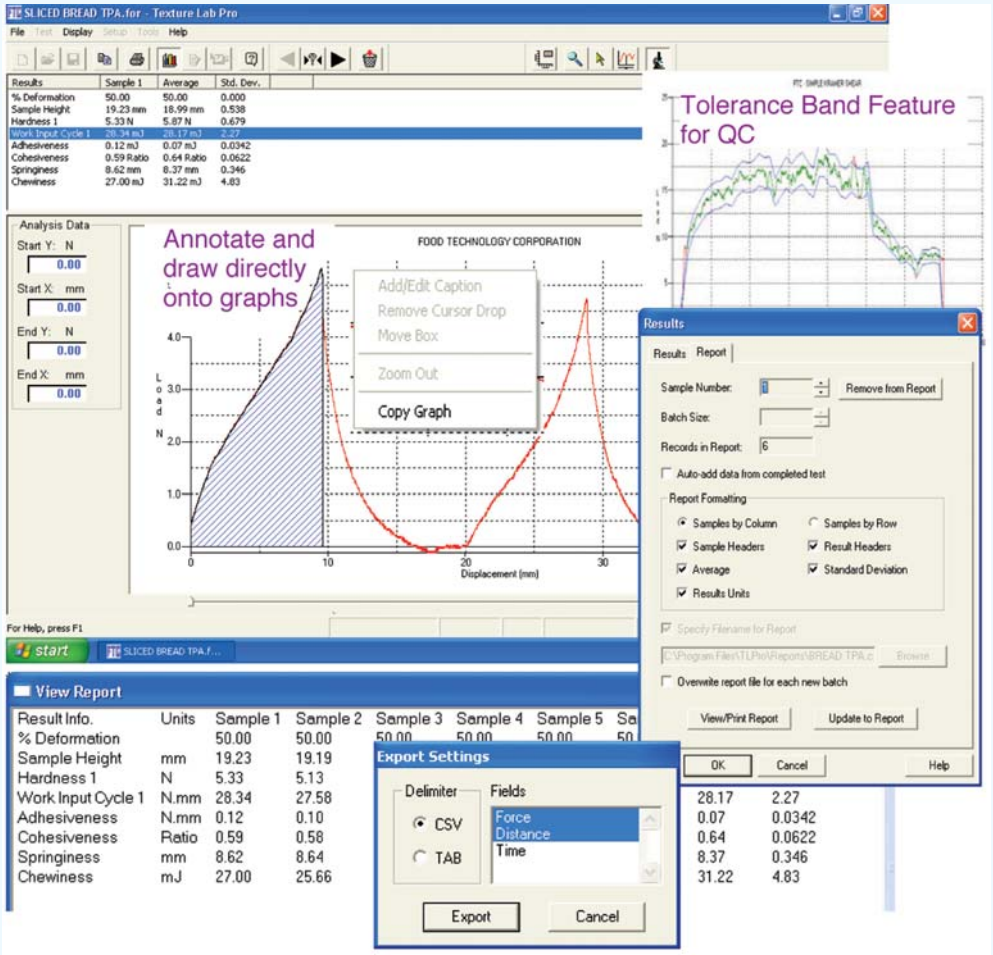
SHEARING

EXTRUSION

SNAPPING

Texture Lab Pro Features

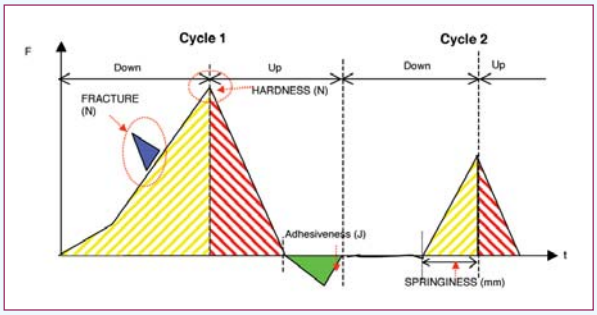
- Master and operator modes for factory and laboratory analysis
- Simple-to-use controls and logical programming sequence
- Multi-stage programming for unlimited test development
- Full set of reference library files for routine testing
- Extensive electronic support notes for operation and test design
- Wide range of application studies for all food industrial sectors
- Automatic graphing facility to display multiple overlays
- Graphical interrogation feature and parameter calculation
- Automatic calculation of expanded Texture Profile Analysis parameters
- Copy and paste option for easy report generation
- Automated batch report with statistics
- QC features: tolerance traces, operator prompts and pass/fail analyses
- Direct report export to Microsoft Excel



Texture Profile Analysis

The food industry's favourite, Texture Profile Analysis (TPA) is fully automated with the Texture Lab Pro software. TPA has been used for almost 50 years to bridge the gap between sensory and instrumental texture measures.

All original TPA calculations and parameters are included, along with many expanded characteristics highlighted by subsequent research.



Primary

- Hardness
- Cohesiveness
- Springiness
- Adhesiveness

Secondary

- Fracturability
- Gumminess
- Chewiness

Texture Analysis Applications

Where And Why To Measure Food Texture

Food texture is manipulated during manufacture to achieve optimum sensory and physical performance. The sensory experience of texture, as perceived by the consumer, and its engineering based performance in the factory go hand-in-hand.

Texture measurements should be applied within the *Total Quality Policy*:

- **Identify key quality markers related to your product's texture at concept**
- **Learn *what* affects them during production**
- **Identify *what* you can do to optimise them**
- **Write them into product specifications and establish min/max tolerance levels**
- **Monitor them routinely on the factory floor and correct the process accordingly**

"don't start measuring food texture when things go wrong, get it right from the start and truly understand your process"

Texture Test Environments

RESEARCH AND DEVELOPMENT

Extensive investigations to understand micro and macro structures of new ingredients etc, following strict rheological principles or strongly correlated with sensory panels.

NEW PRODUCT DEVELOPMENT

Fast moving investigations to benchmark key attributes and enable food technologists to make educated decisions during development cycle e.g. product matching, shelf-life trials, scale-up etc.

PROCESS DEVELOPMENT

Engineering materials science approach to testing, identifying what and where texture is affected within a process. Conditions are manipulated, formulations adjusted and product quality maximised.

QUALITY CONTROL

Critical quality points are identified and monitored within production process. Specifications are established and tolerance maintained to ensure consistent quality manufacture.

Case Studies

TMS-PRO IN THE LAB

Application: Development of fat replacer in meat product

Solution: Correlated instrumental and sensory analysis. Core attributes of *hardness to touch* and *hardness to bite* identified

Benefit: Different blends and variations compared until optimum product match obtained between low and full fat products

TMS-PRO IN THE FACTORY

Application: Hardness of prepared short dough ex mixer

Solution: Standardised preparation and penetration to measure effect of fat type, mix energy and temperature on dough firmness

Benefit: Daily cost savings through reduced down time and waste. Aided development of new pastry bases in future

For further application information see our industrial sector brochures for full testing details and support advice

TMS-Pro Technical Overview

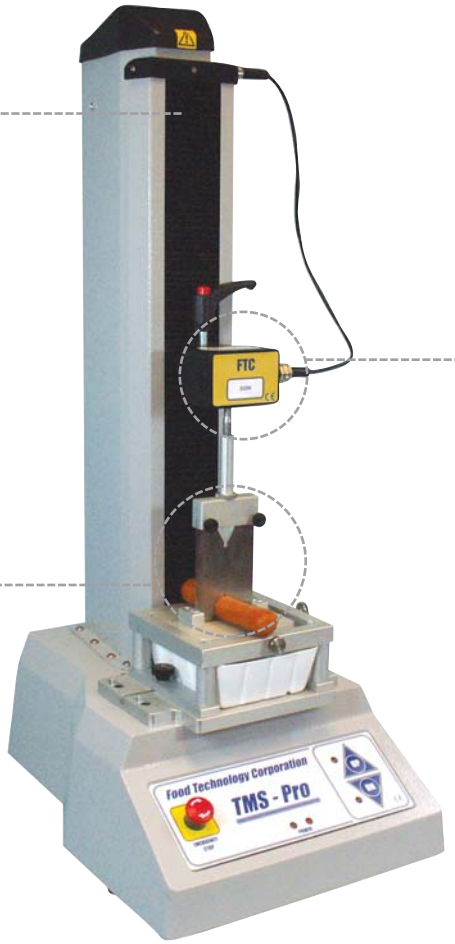
The TMS-Pro is a fully programmable computer-operated test system for the laboratory environment. This rugged and portable test system provides high specification analysis at an affordable price with a user-friendly operator interface.

Programmable testing and data capture options in compression, tension or cyclic mode

Super fast 2000 points per second data collection rate of time, distance and load response during analysis

Run to load, deformation, time or break. Multistage programming via PC allows any combination of commands

10 interchangeable load cells available from just 0.2kgf (0.4lbf) to 254kgf (560lbf) for ultimate precision



Over 200 test probes and fixtures compliable with ISO and ASTM international test standards

Unlimited test speeds between 1mm and 500mm/min, over 300mm travel with an accuracy better than 0.1%

USB and RS232 data output to PC for real-time graphical representation

Universal test table accepts competitors fixtures for correlation between brands

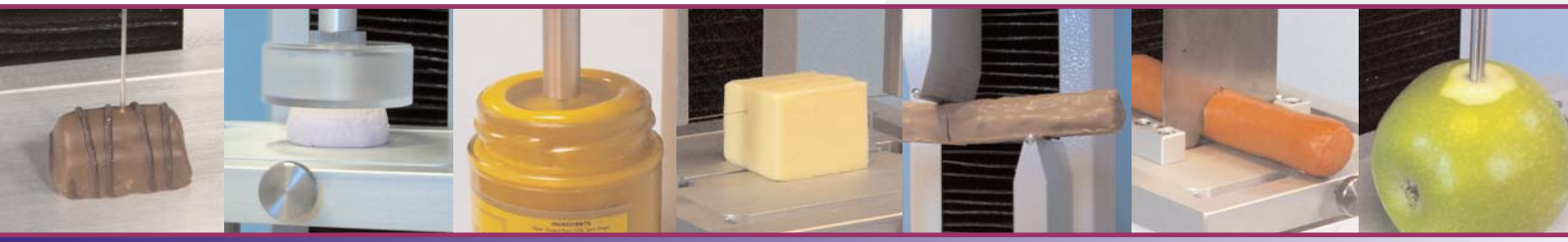
System Specification

Force Range	±2500N (562lbf, 255kgf)
Force Resolution	0.015% of load cell - 15gf (0.5ozf) for a 1000 Newton load cell
Travel Range	300mm (12in)
Position Resolution	0.01mm (0.0004in)
Speed Range	1 - 500mm/min (0.04 - 20in/min) *
Speed Accuracy	Better than 0.1%
Data Acquisition Rate	16000 readings/sec, filtered to 2000 readings/sec
Load Cells	Intelligent load cells, changeable by the user in seconds
Capacities Available	2, 5, 10, 25, 50, 100, 250, 500, 1000, 2500N (0.45 - 225lbf, 0.2 - 102kgf)
Weight	18kg (40lbs)
Power Supply	120/220 VAC 50/60 Hz selectable

* option to 1000mm/min available

WHO IS FOOD TECHNOLOGY CORPORATION?

Founded in 1966, Food Technology Corporation is the industry's longest standing provider of quality texture measurement systems. With over 40 years experience evolving from the groundbreaking Kramer Shear Press, our company is able to provide systems for the field, factory and laboratory test environments. Our extensive experience in practical food texture measurements, combined with our cost-effective solutions, makes us the ideal partner for your texture testing.



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