

CT3 Texture Analyzer

...compression and tension testing for rapid QC analysis

An extensive history and customer input have contributed to the development of the most powerful, low cost, stand-alone Texture Analyzer ever produced.

With six test modes (plus calibration check) and a wide choice of accessories, no other texture analyzer has ever done so much without a computer and software.

Standard Test Modes

Normal Test:

a single compression cycle

Hold Time Test:

compress and hold

Cycle Count Test:

compress multiple times

Bloom Test:

gelatin bloom strength test

TPA Test:

texture profile analysis

Tension Test:

tensile testing

Static Load Test:

calibration check

Texture Loader Software

allows up to ten custom tests and ability to lock parameters

Compression distance

up to 10cm, can accommodate sample up to 22.5cm, almost 9 inches tall. Probe shaft is 8cm from back wall.

Choice of Load Cells

7 measurement ranges up to 50kg

Choice of Base Tables

allows for larger samples and more accessory choices



CT3 with Fixture Base Table and Cylindrical Probe in compression mode



TA-RT-KIT

Rotary Base Table



TA-BT-KIT

Fixture Base Table

What's Included?

Instrument with choice of load cell

Texture Loader Software

USB Cable

What else do I need?

Rotary Base or Fixture Base Table (see below)

At least one probe or test fixture

Optional Accessories

The CT3 has a wide variety of probes, fixtures and jigs, which enable it to be very versatile. Brookfield can also custom design fixtures and probes for most applications.

TexturePro CT Software
TA-CT-PRO-AY

Temperature Probe
DVP-94Y

Bubble Level
TA-LVL

Calibration Weight Set

Gelatin Bath System for Gel Conditioning

Bloom Jar-industry approved



TexturePro CT Software Optional

COLLECT DATA AND PERFORM DETAILED DATA ANALYSIS WITH REAL-TIME GRAPHIC PLOTTING.

While the CT3 can perform many tests in stand alone mode, use of the TexturePro CT Software permits creation of multiple tests and automatic execution without operator involvement.

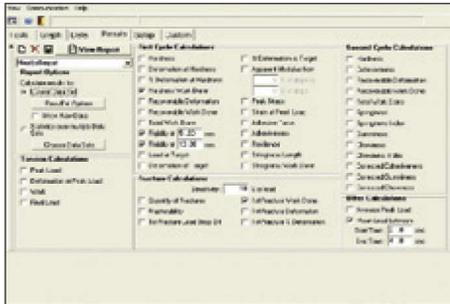
Easily create custom reports and graphs right from the menu screen.

- Sample identification set-up screen helps new operators quickly get started; test fields outline a variety of parameters
- Intuitive set up or test methods and database file structures in a single window
- Data is captured as a graph and stored in tabular database format
- Advanced data analysis with built-in parameter calculations such as springiness, chewiness, hardness and much more!

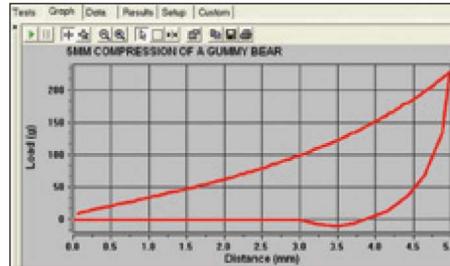


Tension Mode

Provides tensile testing capability



Sample Test Set-up



On Screen Live Force Deformation Curve



TA-CW-1500C

Calibration Weight Set contains a combination of certified weights which may be used to confirm the calibration and linearity of each specific load cell.

MODEL	Load Range/Resolution*
CT3-100	0-100g/0.01g
CT3-1000	0-1000g/0.10g
CT3-1500	0-1500g/0.20g
CT3-4500	0-4500g/0.50g
CT3-10kg	1-10000g/1.0g
CT3-25kg	1-25000g/2.0g
CT3-50kg	2-50000g/5.0g

g=grams kg=kilograms *Accuracy=±0.5% Full Scale Range (FSR)

ALL CT3 MODEL SPECIFICATIONS	
Speed:	
Range	0.01-0.1mm/s*
	0.1-10mm/s**
Accuracy	±0.1% of set speed
Position:	
Range	0-101.6mm
Resolution	0.1mm***
Accuracy	0.1mm

m=millimeter s=seconds

*Increments of 0.01mm/s

**Increments of 0.1mm/s

***Resolution 0.01mm when used with TexturePro CT Software



Fixtures, Probes and Jigs for the CT3

FIXTURES USED WITH ROTARY BASE TABLE TA-RT-KIT



TA-BEC

Back Extrusion Cell for displacing applesauce, pudding, yogurt and similar products.



TA-ATT

Adhesive Tack Tester for measuring stickiness of pressure sensitive adhesive materials such as tape.



TA-JPA

Junior Punch Fixture is small scale holder for punching through flat samples with maximum 12.7mm diameter probe. Hole in fixture is 14mm.



TA-JTPB

Small scale version of Three Point Bend fixture and is used with TA7 blade from general probe kit.



TA-AVJ

Adjustable Vice Fixture for holding small samples for puncture test. Good for jelly beans, gummy bears, etc.



TA-5

GMA & GME probe and spec Bloom bottle TA-GBB-2 sold in package of twelve bottles.

FIXTURES USED WITH FIXTURE BASE TABLE TA-BT-KIT



TA-CTP

Compression Top Plate for applying uniform compression forces on samples up to 4x6 inches (10x15cm).



TA-AACC36

AACC spec probe for bread firmness and texture profile analysis.



TA-DSJ

Dough Stickiness Fixture is standard test for measuring dough stickiness which is an important parameter for processing raw dough.



TA-FMBRA

Standard dough pot set for preparing dough samples and measuring dough firmness.



TA-DE

Dough Extensibility fixture for holding sheet of raw dough or flat bread. Biaxial test force is applied by spherical probe. Test measures force and distance as sample is stretched to breaking point.



TA-STJ

Syringe Test Fixture for measuring the force required to push or pull syringe plunger. Important to pre-filled syringe market or manufacturers of custom syringe products.

FIXTURES USED WITH FIXTURE BASE TABLE TA-BT-KIT



TA-DEC

Dual Extrusion Cell for either forward or back extrusion of fruit puree, pudding, yogurt or similar products.



TA-OC

Ottawa Cell for extruding assorted soft samples through one of two interchangeable bases. Good for cooked pasta or diced vegetables and fruit.



TA-KSC

Kramer Shear Cell for combination cutting-shear and extrusion tests. Small fruits and vegetables such as tomatoes, grapes, figs, corn and beans.



TA-CJ

Confectionary Fixture for holding candies and the like for penetration testing. Prevents sample from lifting during probe retraction.



TA-DGA

Pair of grips for tensile testing of thin films or integrity of seals for packaging.



TA-VBJ

Volodkevich Bite Jaws for testing bite force of meat products using cutting-shear test.



TA-SBA

Shear Blade for products where a cutting-shear test is meaningful: meat, fish, sausage, etc.



TA-MTP

Magness-Taylor Probes for testing hardness of fresh fruit and vegetables.



TA-JMPA

Small scale Multiple Probe Assembly consisting of nine 3mm probes and corresponding base plate specifically designed to hold nine small samples of irregular geometry such as peas, corn, nuts or dried fruit.



TA-WSP

Wire Shear Plate allows cutting wire to pass completely through the sample. Good for products with significant stickiness which would cause cutting-shear blade to show significant drag. Good for cheese and butter.



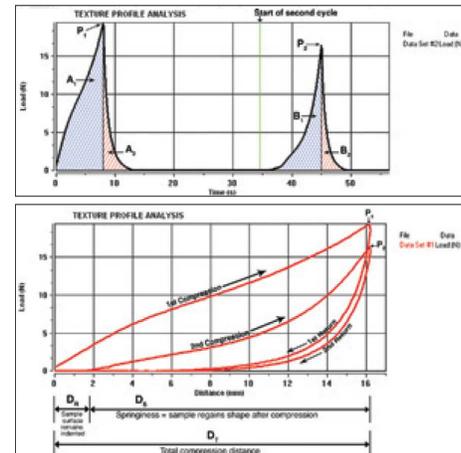
TA-P-KIT2

Standard Probe Kit
A variety of cylindrical (8), cone (3), ball (2), needle (1), knife-edge (1), and wire cutting (1) probes. Complies with BS and AACC standards.

What is Texture Analysis?

Texture analysis is primarily concerned with measurement of the mechanical properties of a product, often a food product, as they relate to its sensory properties detected by humans. Fifty years of texture research has developed a set of definitions relating the sensory properties of a product to the instrumental properties which can be calculated from the results of a two cycle texture profile analysis test. Texture analyzers perform this test by applying controlled forces to the product and recording its response in the form of force, deformation and time.

These graphs show two ways of looking at the data from one 2 cycle Texture Profile Analysis test. The force vs time graph clearly shows the force peak resulting from each compression cycle, while the force vs distance graph displays the response of the sample to the application and removal of strain.



PARAMETERS ₁	SENSORY DEFINITION	INSTRUMENTAL DEFINITION	
Hardness	Force required to compress a food between the molars. Defined as force necessary to attain a given deformation.	Peak force of the first compression cycle.	P_1
Springiness Index Preferred for comparing samples of different lengths	Ratio of the height the sample springs back after the first compression compared to the maximum deformation.	Springiness divided by total deformation.	$\frac{D_S}{D_T}$
Corrected Cohesiveness (PELEG, 1976)	Net work invested in the non-recoverable deformations of the first and second chews.	The ratio of the net work of the second cycle B_1-B_2 divided by that of the first cycle A_1-A_2 .	$\frac{B_1 - B_2}{A_1 - A_2}$
Corrected Chewiness	The net energy required to chew a SOLID food to the point required for swallowing it.	The product of hardness, corrected cohesiveness and springiness index.	$P_1 \times \left(\frac{B_1 - B_2}{A_1 - A_2} \right) \times \frac{D_S}{D_T}$
Resilience (PELEG, 1976)	Measurement of how a sample recovers from deformation in relation to speed and forces derived.	Resilience is the ratio of work returned by the sample as compressive strain is removed (known as recoverable work done A_2), to the work required for compression (known as hardness work done A_1).	$\frac{A_2}{A_1}$
Adhesiveness	The work necessary to overcome the attractive forces between the surface of the food and the surface of other materials with which the food comes into contact (e.g. tongue, teeth, palate). Work required to pull food away from a surface.	The negative area for the first bite, representing the work necessary to pull the compressing plunger away from the sample. (No adhesiveness is seen in graphs above.)	
Adhesive Force (Fizman and Damaio, 2000)	The maximum force required to separate teeth after biting sample.	Maximum negative force generated during probe return.	
Gumminess Applies to semi-solid products only if they have no springiness and undergo permanent deformation	Energy required to disintegrate a SEMI-SOLID food product to a state ready for swallowing. Related to foods with low hardness levels.	The product of hardness and cohesiveness.	$P_1 \times \frac{B_1}{A_1}$
Cohesiveness A measurement of how well the structure of a product withstands compression	The strength of internal bonds making up the body of the product (greater the value the greater the cohesiveness).	The ratio of the work during compression (downward stroke only) of the second cycle B_1 divided by that of the first cycle A_1 .	$\frac{B_1}{A_1}$
Chewiness Solid foods only	The energy required to chew a SOLID food to the point required for swallowing it.	The product of hardness, cohesiveness and springiness.	$P_1 \times \frac{B_1}{A_1} \times D_S$

Why Choose Brookfield?

Brookfield Engineering is recognized around the world for offering high quality measurement instruments at an affordable price. Unsurpassed customer support is but one more reason to choose a Brookfield product when you are considering a viscometer, rheometer, texture analyzer or powder flow tester. To find out about the in-depth service that we provide, ask any customer who has used one of our instruments.

The CT3 offers the highest performance/cost ratio on the market. Distance accuracy is assured during calibration for each and every CT3 by storing the unique compensation curve for load cell deflection. Each load cell deflects naturally and uniquely as the force builds to the maximum range for the load cell. This unique deflection of each load cell is stored during calibration and applied to the drive system in real time as the test runs. This compensation assures accurate distance travel regardless of the load force recorded.

The CT3 Texture Analyzer utilizes uni-axial compression and tension forces in combination with a selection from our extensive list of probes, grips and fixtures to test a wide variety of food, personal care products and industrial materials. Most tests desire to imitate conditions imposed on these products during manufacture, handling, and consumption or use. Characterizing the physical properties of your products in such an analytical manner provides “real life” insight and can be invaluable toward maintaining consistent, high quality manufacturing while minimizing cost.

The Brookfield Texture Department can also provide customers with complete texture assessment service. We specialize in the development of novel and innovative test applications and accessories for solid and semi-solid materials, enabling our customers to maximize the practical value of their texture studies within all test environments.

Brookfield's compact design of the CT3 has a long heritage of more than 20 years dating from the Stevens gelatin Bloom tester. The CT3 still contains the Bloom test method and we now offer the complete gelatin bath preparation system along with GMIA and GME approved Bloom bottles. The system includes a CT3, a rack allowing easy handling of twelve Bloom bottles, two TC-402D large reservoir baths and a TC-351D chiller.



CT3 Gelatin System

Why Measure Texture?

Consumer products succeed in the marketplace in part because their “textural characteristics” are pleasing to customers. This is certainly true with food products but it also applies to cosmetics, pharmaceuticals, packaging, industrial materials and even adhesive type materials.

Applications

Quality Control, Product Development and R&D

FOOD

Dairy	Bakery	Snack Foods	Meat	Fruits & Vegetables
Butter	Bread	Chips	Beef	
Cheese	Dough	Confections	Poultry	
Tofu	Pastry	Granola Bars	Seafood	
Yogurt			Surimi	

COSMETICS

Creams	Eye liner pencils	Lipstick
Mascara	Powder compacts	Soap bars

PHARMACEUTICALS

Ointment	Adhesive dressing	Syringe testing
Tablet hardness	Gelatins	

MATERIALS

Adhesives	Caulking	Packaging
Rubber	Wax	Grease

Properties Measured

Adhesiveness	Apparent Modulus	Breaking Point
Burst Strength	Chewiness	Coefficient of Friction
Cohesiveness	Consistency	Gumminess
Fracture Force	Gel Strength	Relaxation
Hardness	Pliability	Tackiness
Ripeness	Spreadability	
Yield Point		