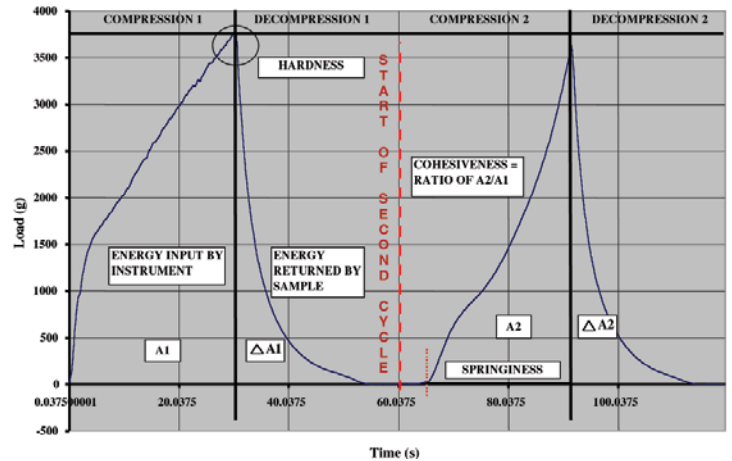


What is texture analysis?

Texture analysis is primarily concerned with the evaluation of mechanical characteristics where a material is subjected to a controlled force from which a deformation curve of its response is generated. These mechanical characteristics in food can be further sub-divided into primary and secondary sensory characteristics which have proven to be correlated to sensory perception.



Primary Characteristics

PARAMETER	SENSORIAL DEFINITION	INSTRUMENTAL DEFINITION
HARDNESS	Force required to compress a food between molars. Defined as force necessary to attain given deformation.	Peak force of the first compression cycle.
SPRINGINESS	Rate at which a deformed material goes back to its undeformed condition after deforming force is removed.	Height that the food recovers during the time that elapses between the end of the first bite and the start of the second bite.
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 compressing probe away from sample.
COHESIVENESS	The strength of internal bonds making up the body of the product (greater the value the greater the cohesiveness)	The ratio of positive force during the second to that of the first compression cycle (downward strokes only)

Secondary Characteristics

PARAMETER	SENSORIAL DEFINITION	INSTRUMENTAL DEFINITION
BRITTLENESS (Fracture force)	Force at which a material fractures. Related to the primary parameters of hardness and cohesiveness, where brittle materials have low cohesiveness. Not all foods fracture and thus value may relate to hardness if only single peak is present. Brittle foods are never adhesive.	The first significant break in the first compression cycle.
GUMMINESS	Energy required to disintegrate a SEMI-SOLID food product to a state ready for swallowing. Related to foods with low hardness levels.	Calculated parameter: Product of Hardness x Cohesiveness
CHEWINESS	Energy required to chew a SOLID food product to a state where it is ready for swallowing. attribute is difficult to quantify precisely due to complexities of mastication (shear, compression, tearing and penetration).	Calculated Parameter: Product of Gumminess x Springiness (essentially primary parameters of Hardness x Cohesiveness x Springiness)

*Parameters utilized in determining the manner in which a food handles and behaves in the mouth. PARAMETERS AS DENOTED WITHIN ORIGINAL SZCZESNIAK et al (1963) AND BOURNE (1978) TPA WORK

BROOKFIELD TEXTURE ANALYZERS

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
Yogurt
Butter
Cheese

Bakery

Dough
Bread
Pastry

Snack Foods

Chips
Granola
Bars
Confections

Meat

Beef
Poultry
Seafood

Fruit and
vegetables

Cosmetics

Lipstick
Mascara
Powder
compacts
Eye liner pencils
Creams
Soap bars

Pharmaceuticals

Gelatins
Tablet hardness
Ointment
Adhesive dressing
Eye liner pencils

Materials

Packaging
Adhesives
Caulking
Rubber
Grease
Wax

Properties Measured

Ripeness
Yield Point
Spreadability
Tackiness
Consistency
Relaxation
Pliability
Adhesiveness
Chewiness

Fracture Force
Elasticity
Hardness
Cohesiveness
Burst Strength
Breaking Point
Gel Strength
Apparent Modulus
Gumminess

Why Choose Brookfield?

Brookfield has over 70 years experience in providing reliable, low cost viscosity measuring instruments while offering high quality product support. We are now using this recipe for success to expand our line of physical testing products to include texture analyzers.

Brookfield’s redesign of the LFRA enhances the load capacity and test speeds of the old model, which evolved from the Stevens range of Texture Analyzers and further back to the Boucher Jelly Tester.

The Brookfield Texture Division provides customers with a 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.

Utilizing simple compression or tension forces, we are able to imitate almost all conditions imposed during the manufacture or handling of a wide range of foods, industrial materials and personal care products. Such measures provide a “real life” insight into the physical properties of a product, often invaluable in maintaining consistent quality manufacture while minimizing rejects in production.

Price

Choices for Instrumentation

The chart shows the Brookfield family of Texture Analyzers at a glance. These two instruments are explained in detail on pages 48 – 51.



Simple compression for QC Applications



R&D materials tester for compression and tension methods

Performance