

APPLICATION

Butter hardness according to ISO 16305

TEST OBJECTIVE

Determine the hardness of prepared butter samples following ISO Method 16305

TEST PRINCIPLE

A cutting wire probe slices through a specially prepared butter sample at a defined speed. The load is monitored as the wire descends and the average load during a portion of the travel becomes the test result. All sample preparation and test details are specified in ISO 16305

BACKGROUND

ISO and the International Dairy Federation created joint standard ISO16305 / IDF 87 in 2005. This standard strictly defines sample preparation and an instrumental test method to determine the firmness of butter. Temperature conditioning the sample prior to measurement is critical. Refer to the standard for precise details.

METHOD

A block of butter is tempered at 10.0°C. From this block 25mm³ cubes are cut using specially prepared fixture. Load is recorded as the wire probe cuts a total of 18mm into the sample at a speed of 1mm/s. The hardness test result is the mean load between 8mm - 16mm of travel.

DEFINITIONS

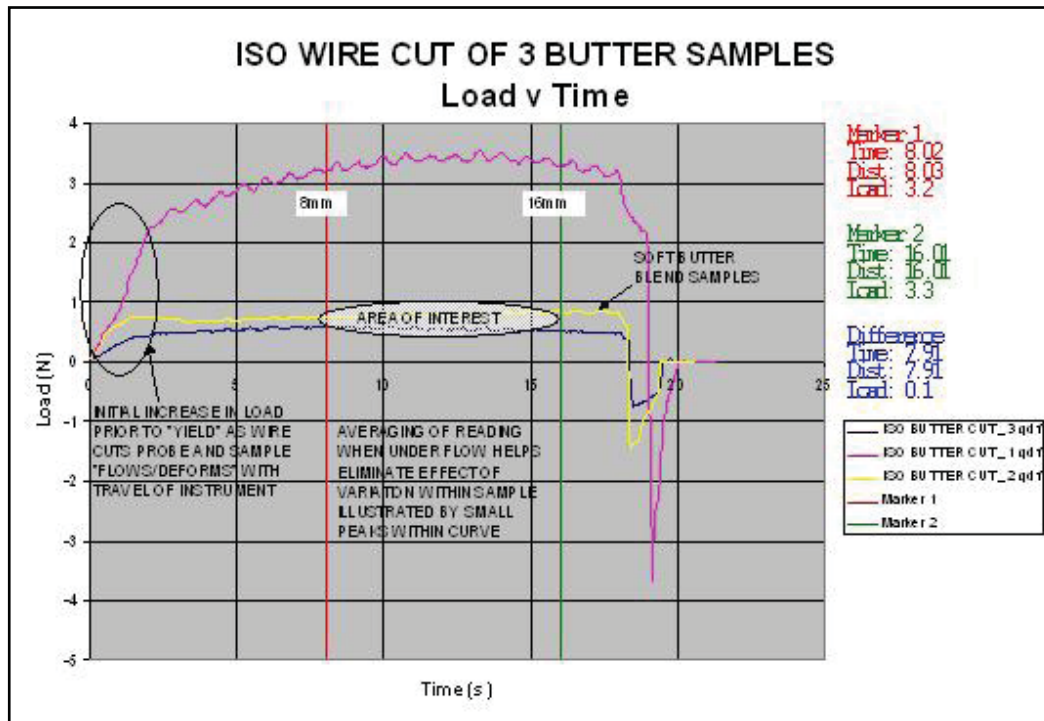
Hardness - the mean load between 8 - 16mm of travel.



TABLE 1
Test Settings

MODE:	Normal
TRIGGER:	1
TEST SPEED:	1mm/s
TARGET UNIT:	Distance
TARGET VALUE:	18mm

RESULTS



DISCUSSION

The response of the sample was recorded within the force-deformation curve above where an initial increase in forces is clearly observed followed by a plateau as the wire begins to “cut” through the sample. Pockets of differences are observed via the small peaks in the curve. If the percentage difference between min and max values is greater than 10% the test result is void.

EMPIRICAL FACTORS

Test conditions:

- Sample size and dimensions
- Sample temperature
- Presentation of sample to instrument

Sample conditions:

- Type of fat present
- Dispersed particle volume (water and stabiliser content particularly in low fat formulations)
- Solid fat content and ratio of unsaturated and saturated components.

CONCLUSION

The method developed within ISO/DIS 16305 is strictly defined and must be adhered to if results are to be cross-compared between laboratories. The TexturePro software has been modified to permit automatic calculation of these characteristics in-line with the definitions imposed by the ISO.

- Sample age
- Residue on probe wire

- Work softening and preparation of sample
- Crystal modification resultant of temperature abuse during product/sample storage