TEXTURE APPLICATION NOTE

GELATIN GELS

APPLICATION

Determination of Gelatin Bloom Strength.

TEST OBJECTIVE

Determination of Bloom Strength as a means of monitoring the effects of quality, concentration and processing methods on gelatin.

TEST PRINCIPLE

When conducting a gelatin bloom test, the bloom jar is centered with the probe just above the sample surface. The test begins when the designated trigger force is reached. The probe then penetrates the gelatin to a target depth of 4mm at a speed of 0.5mm/s, then retracts. The peak force is accepted as the gel strength in Grams Bloom, uncorrected for moisture.

BACKGROUND

From the 2nd July 1998, the GME (Gelatin Manufacturers Europe) have adopted the GMIA (Gelatin Manufacturers Institute America) and AOAC standard as a universal means of assessing gelatin quality.

Differences between the methods relate to the geometry of the probe used. All current methods specify a 12.7mm diameter flat face, cylindrical probe with a sharp edge. The former European method referenced the same probe with a small radius rather than a sharp edge.

METHOD

Gelatin is weighed into water to typically create a 6.67% solution in standard Bloom bottles with stoppers. The mix is then stirred and left to hydrate for approximately 3 hours at room temperature. Once soaked, bottles are placed in a 65°C bath for 20 minutes, stirring occasionally to assure that the gelatin is completely dissolved. After allowing the Bloom jars to cool for 15 minutes at room temperature, they are then conditioned for 16 hours in 10°C water bath.

DEFINITIONS

Hardness—force necessary to attain the given deformation; peak force of the compression cycle.
Gel Strength in grams Bloom—peak force recorded during probe travel. In most gelatin, this is the same as hardness.

TABLE 1
LFRA Texture Analyzer Test Settings

MODE:	Bloom
PLOT:	Peak and Final
SPEED:	0.5mm/s
DISTANCE:	4mm
TRIGGER:	4g - 5g

TABLE 2
LFRA Probe References

12.7mm Clear Acrylic AOAC and GME cylinder with sharp edge (Ref: TA 10)
12.7mm Delrin (Black Acetyl) cylinder with radius (Ref: TA 5)

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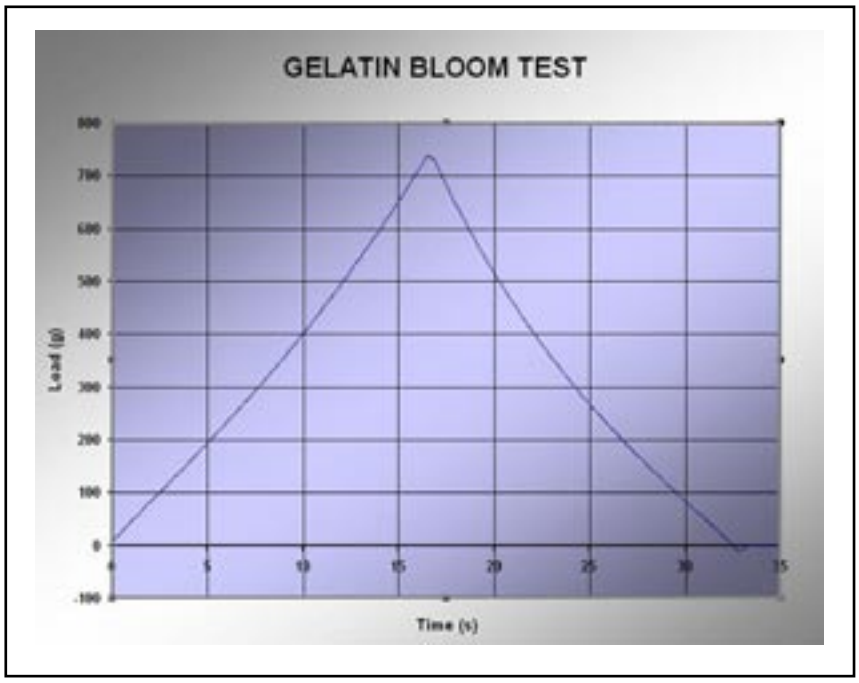
READING



DISCUSSION

The original Bloom methodology dictates the measurement of FINAL load obtained from a 4mm penetration. Subsequent methods developed more recently utilize the peak or maximum value obtained during the single compression cycle as the true measure for Bloom strength.

Please also note the trigger value is permanently set to 4.5g in the Bloom test method of the Brookfield LFRA Texture Analyser. This may have an effect on the probe travel depth and test result when compared with different brands of apparatus or methods with different trigger values. When the same test is run on the LFRA in NORMAL mode, the trigger valve may be set by the operator.

RESULTS

Results generated are dependant upon the gelatin concentration of the gel investigated. The critical measure to be recorded is sample hardness for cross comparison with other gels within QC and manufacturing standards.

CONCLUSIONS

The method as described here corresponds to recommendations in the GME Gelatin Monograph for Bloom Strength testing. The LFRA load accuracy is better than 0.5g for a 1kg load cell operated at the recommended test speed of 0.5mm/s, and its distance accuracy is better than 0.1mm.

EMPIRICAL FACTORS

The Bloom test is a standard empirical method which should be strictly followed if cross-comparisons between batches are to be made.

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