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Mayonnaise Viscosity Analysis

Understanding the viscosity of mayonnaise is essential for quality control and consumer satisfaction. Viscosity influences texture, spreadability, and mouthfeel, which directly affect the product's performance as a dressing or ingredient in salads and sandwiches. Ensuring consistent viscosity is critical for meeting consumer expectations and maintaining product quality.

Method 1: Traditional Helipath Stand Method

Test Equipment:

- Spring Torque Range: RV
- Spindle: T-D
- Accessory: HPQA
- Speed: 10 RPM

Test Method:

- Conducted at room temperature.
- Originally established by the Mayonnaise and Salad Dressing Institute (1960s) using the Brookfield RVT Dial Reading Viscometer.
- Automated data acquisition can be performed with the Brookfield RVDV2T Viscometer and RheocalcT software.

Observations:

- Regular “A” mayonnaise is more viscous (thicker) than Low-fat “L” (Figure I).

Method 2: Vane Rheometry Method

Test Equipment:

- Spring Torque Range: HB
- Spindle: V-73, immersed to the primary mark
- Accessory: None
- Speed: 1 RPM

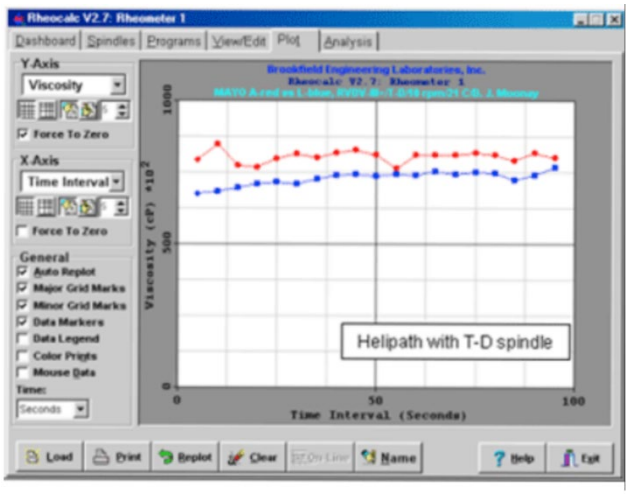

Figure 1

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Test Method:

- Conducted at room temperature.
- Vane rheometry is newer in quality control applications and considered more sophisticated than the Helipath method.
- Automated data acquisition can be performed with a Brookfield Rheometer or Viscometer using RheocalcT software.

Observations:

- Regular “A” has a much higher peak viscosity and yield stress than Low-fat “L” (Figure II).
- The initial slope of the viscosity vs. time curve is steeper for Regular “A,” indicating a firmer texture.

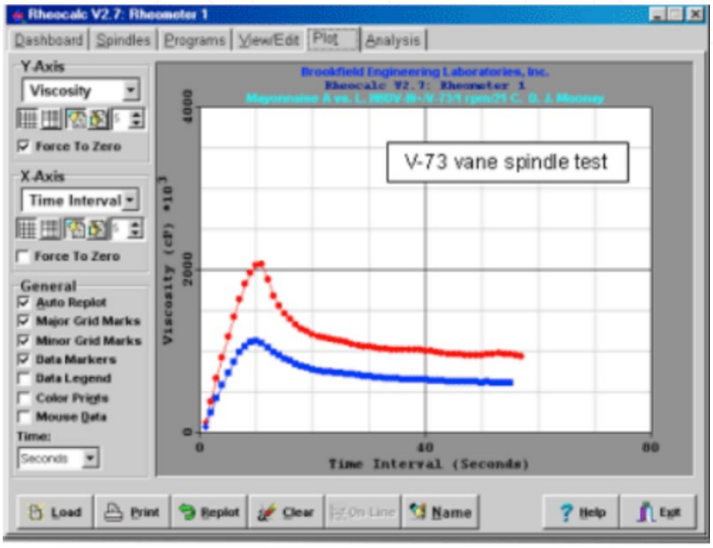

Figure 2

Method 3: Quick Yield Test with RSX

Issue:

- Traditional viscometer testing may produce variations in viscosity (cP) due to spindle movement through the fluid.

Test Method:

- Controlled by shear rate (CSR) at room temperature.

Program:

- One step, start and end at 0.5 RPM for 30 seconds.
- Plot shear stress against time to calculate modulus.

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Observations:

- Figure III: Traditional mayonnaise shows a yield value of 360 Pa, while a soft, low-fat formulation has a yield value of 30 Pa.
- Vane spindle geometry provides consistent results, enabling a quick pass/fail test.

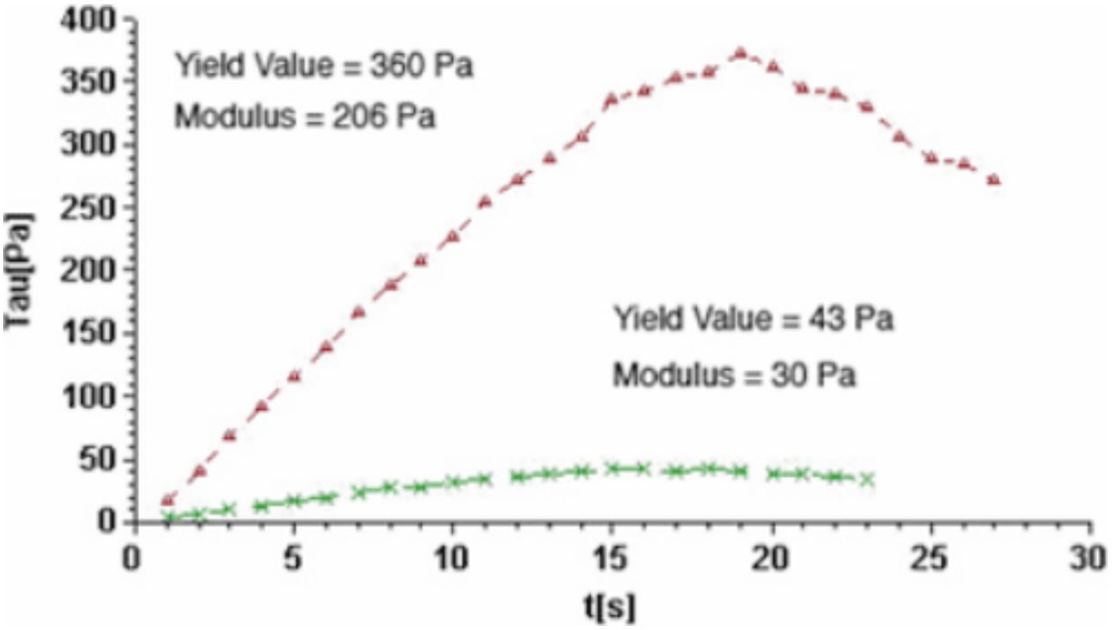

Figure 3

Conclusion:

Each method offers insights into mayonnaise viscosity and texture, helping manufacturers ensure product quality and meet consumer expectations. The appropriate testing method depends on the specific requirements of viscosity measurement and product consistency.