

Bostwick Consistometer

The consistency of a sample is measured by its resistance to flow under specific conditions, for a specified time.

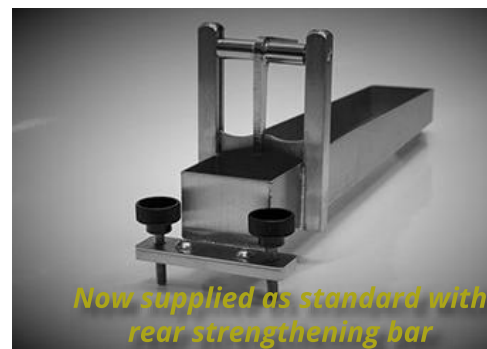
The Bostwick Consistometer is one of many instruments designed to make such measurements.

The Consistometer is manufactured from stainless steel engraved with a series of precise graduations at 0.5cm intervals. The sample is initially retained in a reservoir behind a spring loaded gate prior to testing.



Applications:

- Food Processing
- Tomato Sauces + Others
- Preserves
- Fillings
- Soups
- Baby Foods
- Salad Dressings



Directions for use:

A measured sample, usually 75 ml, is placed in the reservoir behind the gate. The gate is released, by pressing the lock release lever - the spring action ensures it opens instantaneously.

As the liquid flows down the instrument its progress can be accurately measured using the graduated scale. By comparing the flow rate to specified time periods the physical properties of the sample can be calculated.

Bostwick Consistometer

INTRODUCTION

The CONSISTOMETER is an instrument used to determine the consistency of viscous materials by measuring the distance that the material flows under its own weight in a given time interval.

The instrument allows producers of such viscous products as lyes, preserves, sauces, etc, to predetermine formulas for their product and to standardize production lots.

DESCRIPTION

CONSISTOMETER is made of 316 Stainless Steel (Food Grade) stain-resistant material.

The instrument consists of a trough divided into two sections by a gate. The smaller section serves as a reservoir for the material to be tested.

The larger section has laser etched graduated measurement lines along the bottom in one centimeter divisions beginning at the gate.

The gate is spring-operated and is held by a trigger that permits instantaneous release. In operation, the gate slides vertically in the grooves of two posts extending upward from the sides of the trough.

L-shaped trigger release hooks over the top of the gate to hold it in a closed position.

Two levelling screws are located at the reservoir end of the trough and a circular spirit level is located at the other end of the trough.

The gate is fully closed before filling the reservoir. The reservoir should always be filled completely to the top.

The material should always be tested as quickly as possible after being removed from the constant temperature oven or bath to prevent any consistency changes caused by temperature change or exposure to air.

See the following instructions.

Specifications: 24cm and 30cm Models

Engraved Graduations in 0.5 cm Divisions

Wear & Smear Resistant

Assures Accurate Results

Length 355 mm Long Version 418mm

Through length : 240 mm Long Version 300mm

Width : 88 mm

Height : 104 mm

ASTM F1080-93

316 Food Grade Stainless Steel

SETTING UP THE INSTRUMENT

Place the CONSISTOMETER on a LEVEL surface and adjust the leveling screws until the bubble in the circular level is centered. Check the level by placing another spirit level, on the bottom of the trough about midway along the length of the graduated section. The two levels should agree. If they do not, then proceed as follows:

Adjust the leveling screws until the bubble of the level in the trough is centered. Then, bend the pointed, vertical lip of the CONSISTOMETER slightly until the two levels agree. Do not bend the horizontal part of the lip as this may prevent proper leveling of the instrument.

Close the gate and hook the trigger release over the top.

The material to be tested should be prepared by holding it at a constant temperature (usually 20 degrees C or 68 degrees F) for several hours to assure a uniform temperature throughout.

OPERATION

Fill the reservoir with the material to be tested and level off the top with a spatula or other straight-edge.

Press down on the trigger to open the gate and, at the same time, start a stopwatch. At the end of the selected time period, determine how far the material has flowed along the trough. Take the maximum reading at the center of the trough and the minimum reading at the edge of the trough, and average the values. The average value is then compared against a previously determined standard.

When using the CONSISTOMETER, make certain that the gate is fully closed before filling the reservoir. The reservoir should always be filled completely to the top.

A material should always be tested as quickly as possible after being removed from the constant temperature oven or bath to prevent any consistency changes caused by temperature change or exposure to air.

MAINTENANCE

No maintenance should be necessary except occasional checking of the level, as explained. In Setting up the instrument, and cleaning of the troughs after each test. Should any difficulty occur, contact C R Instruments Ltd for further

ASTM Standard Test Method for Determining the Consistency of Viscous Liquids Using a Consistometer

This standard is issued under the fixed designation F1080; the number immediately following the designation indicates the year of original adoption in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

Scope

- 1 This test method describes a procedure for the determination of the flow of a standard volume of a semisolid or thick liquid under its own weight.
- 2 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.
- 3 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations or to use.

Summary of Test Method

A sample of the material to be tested is poured into a reservoir and the distance of flow in a horizontal direction is read from a marked track after a fixed time following the material's release from the reservoir.

Significance and Use

This measurement of flow gives results that cannot be predicted with viscosity measurements, due to surface tension and viscosity effects. The measured flow, is related to flow performance of viscous materials sprayed on aircraft surfaces or other large structures.

Apparatus

- 1 Consistometer constructed as described in Annex A1.
- 2 Timing Device accurate to 61 s.
- 3 Mixer capable of 1600 r/min and fitted with a 25-mm (1-in.) diameter three-bladed propeller.
- 4 Beaker, 500-mL.

Procedure

- 1 Bring the material to be tested and the apparatus to the same ambient temperature in the range from 20 to 25°C (68 to 77°F).
- 2 Agitate 250 mL of the material to be tested using the mixer set at 1600 r/min, for 1 min 6.5 s, or until a vortex forms that indicates the sample has been exposed to shear. Avoid aeration of the sample as this may cause evaporation of solvents.
- 3 Place the consistometer on a level surface and adjust the leveling screws until the bubble is centered.
- 4 Close the consistometer gate and set the trigger.
- 5 Fill the consistometer reservoir with the material to be tested (approximately 100 mL), and level the surface with a spatula or a straight edge.
- 6 Start the test by simultaneously tripping the consistometer gate trigger and starting the timing device. At 5 min 6.1 s (unless otherwise specified), read the distance the material has flowed. Average the result to the nearest 0.5 cm by taking the maximum distance indicated in the center of the trough and adding this to the minimum distance at the edge of the trough and dividing the result by two.

Report

- 1 The report shall include the following:
 - 1.1 Material name or reference, type and lot number.
 - 1.2 Average distance of flow to nearest 0.5 cm.
 - 1.3 Test temperature in °C to 61°C.
 - 1.4 Duration of test in minutes and seconds.

Precision and Bias

- 1 Precision:
 - 1.1 Reproducibility—Viscous materials often vary in consistency dependent upon age, temperature, and shear history. Caution must be exercised between laboratories regarding the history of a sample.
 - 1.2 Duplicate results by the same operator on the same sample shall be within 0.5 cm.
- 2 Bias—No statement can be made regarding bias as there are no absolute nor widely accepted standards for the property measured by the consistometer.

Keywords

consistometer; liquids; viscous

(Mandatory Information) A1. CONSISTOMETER

- 1 Consistometer shown in Fig. A1.1. It consists of the following parts constructed of stainless steel.
 - 1.1 Reservoir, 4-cm high, 5-cm long, fitted with spring stainless steel trap door on one side.

- .1.2 Stainless Steel Track with side walls (24 cm long, 5 cm wide) with ruled markings each $\frac{1}{2}$ cm.
- .1.3 Leveling Device, for proper leveling of track.

