

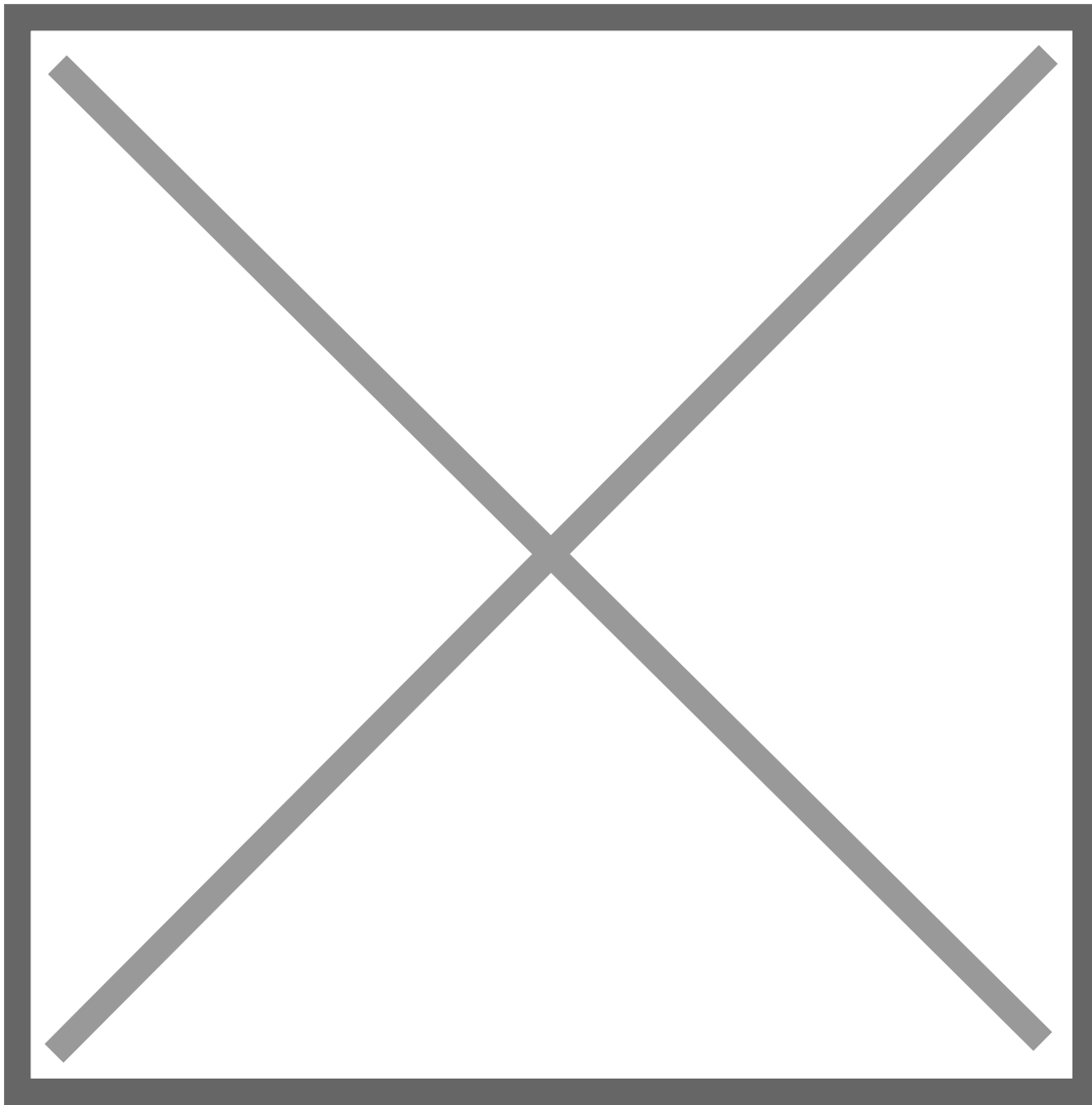


# ROTATIONAL VISCOMETER FOR ASPHALT VISCOSITY

## **Rotational Viscometer for Asphalt Viscosity TT-4402**

Rotational Viscometer for Asphalt Viscosity TT-4402 complies with the ASTM D4402 Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer.

Rotational Viscometer for Asphalt Viscosity TT-4402 utilizes a rotational viscometer to gauge the apparent viscosity of asphalt at elevated temperatures. By measuring the torque on the apparatus-measuring geometry as it rotates within a thermostatically controlled sample holder containing asphalt, the relative resistance to rotation is determined. This torque and speed combination allows for the determination of asphalt viscosity in pascal seconds, millipascal seconds, or centipoise.



## **APPLICATIONS**

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The primary application of the Rotational Viscometer for Asphalt Viscosity TT-4402 is to determine the **apparent viscosity of asphalt at elevated temperatures**, in compliance with the **ASTM D4402** standard. This test is critical for characterizing the flow behavior of asphalt binders during production, storage, pumping, and mixing. The instrument measures the torque required to rotate a spindle in the hot asphalt, providing a precise viscosity value. Due to its wide measurement range, it is also highly suitable for testing other high-temperature melts, such as hot melt adhesives and plastics.

## Key Industries

- **Asphalt Production & Road Construction:** This is a cornerstone instrument for quality control. It is essential for determining the pumpability and workability of asphalt binders at the high temperatures used in hot-mix asphalt (HMA) plants, and its results are a key part of the Performance Grading (PG) system for asphalt.
- **Adhesives Manufacturing:** Producers of hot melt adhesives use this viscometer to measure the viscosity of their products in the molten state. This is a critical quality control parameter that ensures the adhesive can be applied correctly and will have the right flow characteristics for its end-use application.
- **Plastics & Polymer Manufacturing:** This viscometer is used to measure the melt viscosity of plastics and polymers, such as polyethylene wax. This data is vital for quality control and for predicting how the material will behave during high-temperature processing steps like extrusion or molding.

## FEATURES

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- Utilizes ARM technology and a built-in Linux system for efficient operation. The interface is user-friendly, allowing for quick and convenient viscosity testing through the creation of testing procedures and data analysis.
- Ensures accurate viscosity measurement with each measuring range automatically calibrated by the computer, resulting in high precision and minimal error.
- Offers a rich display including dynamic viscosity, kinematic viscosity, temperature, shear rate, shear stress, measured value as a percentage of the full range value (graphical display), range overflow alarm, automatic scanning, maximum

measurement range under the current rotor speed combination, date, time, and more. Kinematic viscosity can be displayed under known density to accommodate various measurement requirements.

- Provides comprehensive functionality such as timed measurement, the ability to create 30 groups of testing procedures, access to 30 groups of measurement data, real-time display of viscosity curves, and the option to print data and curves.
- Features stepless speed regulation for precise control.
- Displays the curve of shear rate to viscosity, allowing users to set the range of shear rate and view real-time display on the computer. Additionally, it can show the curve of time to viscosity.

This viscometer is capable of measuring in a wide range from 50 to 80 million MPA.S, making it suitable for various high viscosity and high-temperature melts such as hot melt adhesive, asphalt, plastics, and more. An optional ultra-low viscosity adapter (rotor 0) enables measurement of viscosity for molten samples like paraffin wax and polyethylene wax.

## TECHNICAL SPECIFICATIONS

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|                         |                                                                                                                                    |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Model                   | TT-4402                                                                                                                            |
| Control/Display         | 5 inch color touch screen                                                                                                          |
| Speed (r/min)           | 0.1 – 200, Stepless speed2000 speeds available                                                                                     |
| Measuring range (mPa.s) | 6.4 – 3.3M<br>Rotor No.0: 6.4-1K<br>Rotor No.21: 50-167K<br>Rotor No.27: 250-834K<br>Rotor No.28: 500-1.7M<br>Rotor No.29: 1K-3.3M |
| Rotor                   | 21,27,28,29(Standard), No.0 (optional)                                                                                             |

|                                   |                                                                                                                                                                |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample dosage                     | Rotor No.0: 21ml<br>Rotor No.21: 7.8ml<br>Rotor No.27: 11.3ml<br>Rotor No.28: 12.6ml<br>Rotor No.29: 11.5ml                                                    |
| Measurement error                 | ±1% (Newtonian Liquid)                                                                                                                                         |
| Repetitive error                  | ±0.5% (Newtonian Liquid)                                                                                                                                       |
| Show shear response / shear rate  | have                                                                                                                                                           |
| Timing function                   | have                                                                                                                                                           |
| Real-time display Viscosity curve | Time-viscosity curve<br>Temperature-viscosity curve (optional temperature sensor)<br>(Optional data processing software shows shear rate and viscosity curves) |
| Kinematic viscosity               | Density of samples to be entered                                                                                                                               |
| Measuring range                   | Automatic display of selected combinations of rotor and rotation speed. Measurable viscosity range                                                             |
| Self-built Measuring Procedures   | Save 30 groups (including rotor, speed, temperature, time, etc)                                                                                                |
| Preservation of measurements      | Save 30 sets of data (including viscosity, temperature, rotor, speed, shear rate, shear stress, time, density, kinematic viscosity, etc.)                      |
| Printer interface                 | Print data, curves (need to buy printer)                                                                                                                       |
| Computer output interface         | RS232                                                                                                                                                          |
| Working power supply              | Viscometer mainframe: wide voltage operation (110 V/60 Hz or 220 V/50 Hz) Heating furnace and temperature control unit:220V50Hz                                |
| Dimension                         | 300 × 300 × 450(mm)                                                                                                                                            |



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