

RPV-1 Gen. 3 Polymer Viscometer

PA, PET, PVC, PAN, PLA, PB, PC, PE, PP, pulp, cellulose, MCC,
electrical papers

Automated Polymer Viscometer

The Rheotek Polymer Viscometer – generation 3 – provides a reliable and precise method for measuring the dilute solution of polymers.

In this very operator sensitive test, automation using the RPV-1 Gen. 3 minimizes the variability of results.

Reported results include:

Relative Viscosity
Specific Viscosity
Reduced Viscosity
Viscometer Number
Inherent Viscosity
Intrinsic Viscosity
K-Value



The RPV-1 Gen. 3 Automates dilute solution viscosity

Typically, the RPV-1 system is combined with the **integrated sample preparation (ISP-1)** system and a **heating, stirring and cooling reaction block (SD-1BM)**.

A precise concentration of the polymer and diluting solvent is prepared using the ISP-1 typically in a glass vial. A stir bar is added, and the capped vial is placed in the reaction station to solubilise at an elevated temperature. The sample is then cooled and transferred to the RPV-1. Sample filling stations are situated above each viscometer, allowing the sample to be easily poured in (alternatively, samples can be delivered via an auto sampler). After a temperature stabilization period, the sample is automatically pushed up (under pressure), held in the capillary and timing bulb before being released. Repeat flow times are measured, under gravity at a closely controlled temperature. The sample is automatically removed from the viscometer, followed by solvent cleaning and drying. Viscosity results are reported, together with the precision of flow times.

The RPV-1 Gen. 3 consists of two main modules – a constant temperature bath and Viscometer Measurement and Control Module

The **EVS-TCB Viscometer Bath** provides a very stable temperature which is critical for viscosity testing.

The AC-DC switching power supply provides continuous temperature control.

A built-in solid-state re-circulating chiller provides ambient cooling at set-points 20, 25 and 30 deg. C.

The bath is designed with a flat top lid, to accommodate a Viscometer Control Module.



The **RPV Viscometer Measurement and Cleaning Module** includes the pneumatic valves as well as embedded electronics and firmware.

A control module can be configured with one or two measuring positions, with each position with two or three cleaning solvents.



RPV-1 Polymer Viscometer Specification

Test methods	ASTM D789, D871, D1243, D1795, D2857, D4603 ISO307, ISO 1628. ISO 5351 Tappi T230, IEC 60450, USP 911
Applications	Diluting polymers in acids, organic solvents and water. Diluting pulp, cellulose and MCC in Cuene
Range of results	Flow times, kinematic viscosity, relative viscosity, specific viscosity, reduced viscosity, Viscometer Number, inherent viscosity, intrinsic viscosity, K-value, degree of polymerization & custom results
Bath filling volume	10L or 20L (depending upon model)
Coolant filling volume	150mL
Temperature set-points	20, 25, 30, 40°C and custom
Number of Viscometer Positions	1 to 4 (depending upon system configuration)
Heating power	450W
Cooling power	150W
Power requirements	100 to 240V AC
Dimensions (combined bath and control module)	400mm (wide) x 536mm (deep) x 700mm (high) 16" (wide) x 22" (deep) x 30" (high)
Optional	iSP-1 sample preparation, reaction blocks, quenching bath and heat by-pass chillers

RPV-1 System Configurations



The RPV-1 Gen. 3 system is highly modular and customisable with different levels of automation:

Standard systems – include automated flow time measurements, in-situ viscometer cleaning, multiple viscometer positions and reporting of results

RSS systems – include the above as well as automated sample delivery

Auto systems – include integrated sample preparation, sample dissolution and auto loading, as well as flow time measurement, cleaning and reporting of results

RPV-1 Gen 3 Polymer Viscometer Systems:

All systems are supplied with a PC control system and RPV-1 software

RPV-1 (2) GEN.3.0 with two positions/two cleaning solvents

RPV-1 (2) GEN.3.1 with two positions/three cleaning solvents

RPV-1 (2) GEN.3.2 with two positions/two cleaning solvents and auto sampler

RPV-1 (2) GEN.3.3 with two positions/three cleaning solvents and auto sampler

RPV-1 (2) GEN.3.5 with two positions/two cleaning solvents/nitrogen purge for pulp

RPV-1 (2) GEN.3.7 with two positions/two cleaning solvents, auto configuration – integrated sample preparation, single reaction block, and auto sampler

RPV-1 (2) GEN.3.8 with two positions/two cleaning solvents, auto configuration – integrated sample preparation, dual reaction blocks, and auto sampler

RPV-1 (2) GEN.3.9 AutoPulpIVA with two positions/two cleaning solvents, auto configuration – integrated sample preparation, CED delivery, stirring block, and auto sampler

RPV-1 (4) GEN.3.10 with four positions/two cleaning solvents

RPV-1 (4) GEN.3.11 with four positions/two cleaning solvents/nitrogen purge for pulp

Options include:

ISP-1 integrated sample preparation with one syringe pump and precision balance

ISP-2 integrated sample preparation with two syringe pumps and precision balance

ACC – anti-corrosive coating for sulphuric acid and DCA applications

SD-1BM – heating and stirring reaction block

SD-STIR – stirring reaction block