



Ultra-High Shear Capillary Viscometer ACA AX-100

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The ACA AX-100 is a capillary viscometer for paper and board coating operations. Its main function is to measure coating color viscosity at high shear rates, giving you the data you need to know how a coating color will run on the coater before it gets there.

On its own, the AX-100 measures viscosity across a very wide shear rate area to TAPPI T-582 and estimates coating color runnability in process conditions. Fit the orifice option and measurement expands to include extensional viscosity to TAPPI T-583, which simulates curtain coating stresses.

Suitable Samples:

- Coating colors, binders and pigment slurries
- MFC and NFC pulp and other bioproducts
- Battery slurries, paints and adhesives
- Non-explosive, water based liquids only, measured at room temperature

Technical Specification:

Applications:	Appearance Testing, Coating Testing, Corrugated Testing, Materials Testing, Paper Testing, Paperboard Testing, Tissue Testing
Materials:	Cardboard, Corrugated Paper, Non-wovens, Paints and Coatings, Paper, Paperboard
Measurement principle:	Capillary viscometry, flow rate through a narrow capillary of known dimensions <i>Optional orifice for extensional viscosity via the Euler number</i>
Shear rate range:	Up to 1,000,000 1/s
Measurement time:	Less than 1 minute per measurement
Sample volume:	150 ml
Standards:	TAPPI T-582 (wide shear rate area) TAPPI T-583 (extensional viscosity, orifice option)
Accuracy of position potentiometer:	+/- 0.05 mm
Accuracy of pressure transducer:	+/- 0.3 percent
Maximum peak pressure:	100 bar at 0.7 MPa
Air consumption:	7 bar minimum and 150 ml/min
Pneumatic inlet fitting:	Standard type CEJN 320-5152
Power:	100-230 VAC, 50/60 Hz
Dimensions (mm):	(D) 458 x (W) 304 x (H) 1176
Weight:	Main unit 60 kg
Table load capacity:	Greater than 200 kg
Recommended table size:	600 x 800 x 750 to 800 mm
Room temperature:	Nominal 20 degrees C, range 17 to 25 degrees C
Humidity:	Nominal 40 percent RH
Software:	RheoLog

Standard Features:

- Capillary measurement, flow rate measured through a narrow capillary of known dimensions
- Shear rates up to 1,000,000 1/s, above the shear rates generated by modern high speed coaters
- Conforms to TAPPI T-582 for wide shear rate area measurement
- Pneumatically actuated capillary mechanism, pressure and flow data captured automatically
- RheoLog software calculates and displays viscosity and shear rate on a touch screen
- One measurement in less than one minute
- Small sample volume of 150 ml
- Results exported over Ethernet or to a USB memory stick
- Measures non-explosive, water based liquids at room temperature

Optional Features:

- Orifice option, measuring extensional viscosity to TAPPI T-583 and simulating curtain coating stresses [FLAG: part number needed from SME]

Orifice Option and Extensional Viscosity:

The orifice creates accelerating flow, from which the software calculates the Euler number as an indication of how the coating color behaves under stretching rather than shearing. This matters for curtain coating, where the coating is stretched as it falls.

Disclaimer

The information contained in this document is liable to modification from time to time in the light of experience and our policy of continuous product development. Check the Industrial Physics website for the latest version.

Benefits:

- A low shear rheogram can look completely normal for a coating color that will run badly at production speed. Modern high speed coaters generate shear rates above 500,000 1/s, so measuring up to 1,000,000 1/s gives you a direct indicator of runnability rather than a proxy for it.
- When a coating defect appears, the AX-100 gives you data to confirm or rule out coating color rheology as the root cause, so your team investigates in the right direction from the start. It is used against poor coater runnability, surface streaks and web breaks at the coater, and it detects rheological fluctuation that a low shear check misses.
- New recipes such as water based barrier coatings (WBBC) are frequently harder to run than conventional formulations. Viscosity data across the full shear rate range lets you assess runnability before committing to a full scale trial. One reported outcome is a saving of 350 thousand euro, achieved by increasing solids content using AX-100 data.

Site and Installation Requirements:

- Power: 100-230 VAC, 50/60 Hz
- Air consumption: 150 ml/min
- Air supply pressure: 7 bar minimum
- Pneumatic inlet fitting: standard type CEJN 320-5152
- Site surface: table with a load capacity greater than 200 kg
- Recommended table size: 600 x 800 x 750 to 800 mm (depth x width x height)
- Ambient temperature: nominal 20 degrees C, range 17 to 25 degrees C
- Humidity: nominal 40 percent RH

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