

Technical Bulletin

Measuring Conformal Coating Viscosity

Introduction

Controlling viscosity is critical to achieving repeatable conformal coating performance. Incorrect viscosity can lead to defects such as bubbles, pinholes, orange peel, and inconsistent film thickness. This bulletin outlines the methods and benefits of viscosity measurement using Zahn cups and stopwatch timing.

Why Viscosity Control Matters

- Ensures correct coating flow for spray, dip, and brush processes.
- Maintains consistent film thickness across batches.
- Prevents defects such as runs, bubbles, and dewetting.
- Supports compliance with IPC and OEM process standards.

How Viscosity is Measured

- Zahn Cup Method – A Zahn cup with a calibrated orifice is dipped into the coating and allowed to drain. The time (in seconds) taken for the coating stream to break is measured with a stopwatch.
- Standardisation – Regular measurement ensures coatings are within control limits, regardless of ambient temperature or solvent loss.
- Best Practice – Always measure viscosity before and during production runs to maintain control.



Recommended Control Ranges

- Each coating chemistry has a recommended viscosity range provided by the manufacturer.
- Operators should maintain viscosity within $\pm 5\%$ of the target range.
- Adjustments can be made with controlled solvent addition if permitted by the material data sheet (MDS).

Practical Tips for Operators

- Calibrate Zahn cups regularly to ensure accuracy.
- Use the same operator technique each time for consistency.
- Record viscosity readings in process logs for traceability.
- Train all staff on viscosity measurement procedures.

Applications in Industry

Aerospace, automotive, defence, and medical electronics require tight viscosity control to meet reliability standards. SCH's conformal coating services integrate viscosity monitoring as part of every production run.

Conclusion

Accurate viscosity measurement ensures reliable, defect-free conformal coating. By adopting a structured control approach, manufacturers reduce scrap, improve yields, and maintain compliance with IPC standards.

About SCH Services

SCH Services Ltd offers:

- Conformal coating process setup and training
- In-house coating services with full process control
- Equipment and consumables for coating application and inspection

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