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## Results

Results obtained from a coating company of an electronic components supplier for the automotive industry. The PCBs that were dipped in a resin base coating and solidified at room temperature gave the following results:

- Optimization of base resin and solvent consumption
- Production time increase due to the decrease of downtime linked to laboratory viscosity checks
- Production continuity due to 100% quality in coating uniformity
- Customer satisfaction regarding the PCB coating protection quality and life duration of the PCB

## Benefits

The inline MIVI viscosity sensor provides:

- Constant varnish viscosity
- Increased process repeatability
- Coating homogeneity and uniformity
- Guarantees 0 defect in the coating process
- Increases customer satisfaction
- Time savings
- Material savings
- Reduction in labor costs
- Streamlined production

## Return on Investment

The installation of one Sofraser inline MIVI viscometer on the PCB manufacturer coating machine provided the following savings:

	<b>Manual control</b>	<b>Inline MIVI viscosity control</b>
<b>Number of PCBs / coating bath</b>	50	50
<b>Coating bath dipping + drying time</b>	1 minute	1 minute
<b>Manual viscosity controls</b>	Every 30 minutes	0
<b>Production waste if viscosity control indicates bad coating homogeneity</b>	1500 PCBs	0

Given the elevated technology and high value of the PCB, a rejected a batch of 1500 units, operators' time, and consequent production downtime would equal enormous losses. Inline viscosity control is the only way to avoid such expensive consequences.

## Electronic component coating users:

BMB, Valéo, Johnson Controls, Gers Electronique, Siemens Automotive Systems, Kasco, Sté Telma, Goldstar Cable Co. , Nitto Electric Industrial Co., Ltd, Yamagata 3M CO Ltd, Hyundai Heavy Industries, Robert Bosh Productie

## Guide for identifying viscosity measurement needs

### Topics and Key Points

#### How is coating uniformity achieved in the process?

Viscosity is the only flow parameter that allows detection of varnish coating uniformity.

#### How is assured the coating's uniformity and quality?

Only inline viscosity control can, in real time, detect viscosity variations and implement a correction like solvent addition, base product addition, or temperature regulation that would assure 100% coating uniformity and quality.

#### How many manual / laboratory controls are performed per hour? Day? Week? Month? And how long does it take to perform?

Manual, hand-held, or laboratory controls are timely and costly to perform because they are so frequent. In addition, they do not prevent bad batches between controls.

#### What is the laboratory response time?

Even when regularly and rapidly performed, laboratory viscosity measurements do not prevent bad coating uniformity production between two laboratory controls.

#### How many parts are coated between two manual controls?

Potentially one or several production batches can be rejected if they were produced without inline viscosity measurement. The MIVI ensures correct coating homogeneity and quality.

#### What is the cost of non-conformant production?

The direct costs are the material, overhead, and labor required to make the rejected parts. In addition, add the costs of downtime, wasted material, and delaying pending orders.

#### Are there environmental regulations in place regarding the control of solvent emissions?

If the solvent emissions are subject to environmental regulation, inline viscosity control helps regarding compliance.

#### Is there excessive scrap material and uneven quality? What is the cost of rejected production?

Only inline viscosity control can bring 100% quality and avoid batch rejects. Material, labor, and utility costs add up, and overhead becomes unaffordable if production is poor.

### Sofraser recommended solution

<b>MIVI 9510</b>	Solution including control
<b>MIVI 9100</b>	Cheaper solution to be combined with external automation for control operations
<b>OEM solution</b>	For large quantity markets

Contact Sofraser for detailed sensor configuration

### Main competitors in this application

Worldwide:

- Brookfield
- Cambridge

### This system is also efficient in:

- Paint or lacquers spraying / dipping in the automotive industry
- Mechanical parts coating
- Film coating
- Paper and paperboard coating
- Thermal transfer ribbon coating

