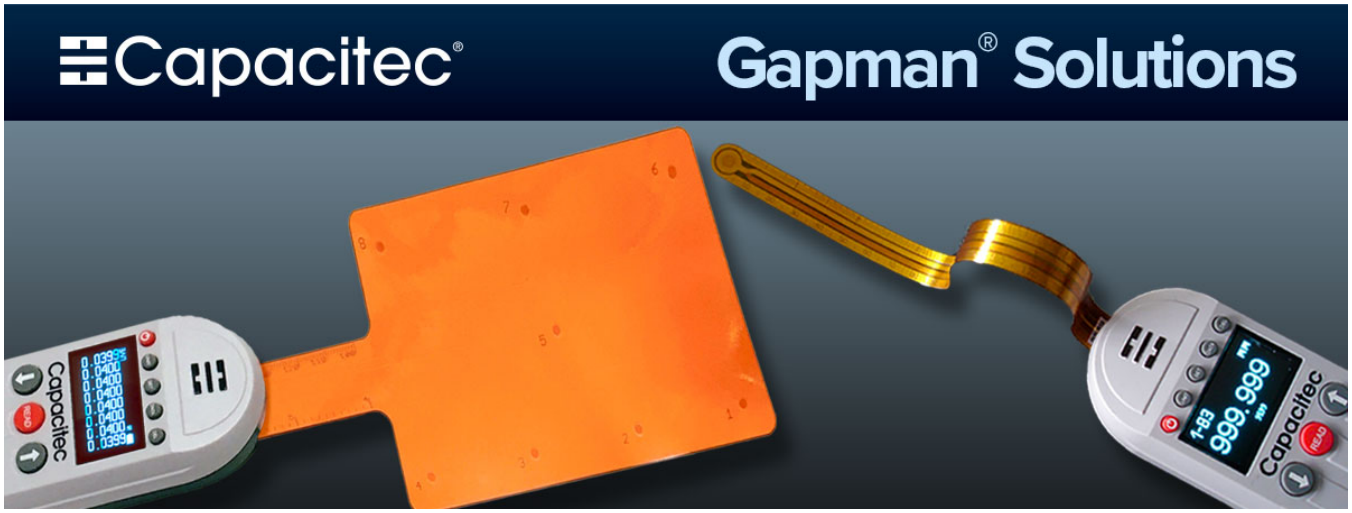



This issue of Gapman Solutions is focused on Automotive Applications in support of the Automotive Testing Expo Being held next week in Novi, MI.

**Please visit us at Booth 7038.**

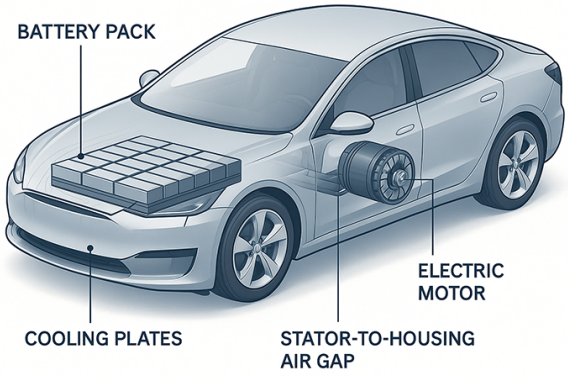

**Gap Measurement: Precision Coating for EV Battery Manufacturing and Electric Motor Production**

Capacitive gap sensors are pivotal in the design and manufacture of precision electric motors for use in electric vehicles (EVs) of all types. Gap measurement solutions using non-contact and contact (spring contact gap wands) measurement techniques to enhance accuracy and reliability are deployed throughout the design and production of EV motors.

Capacitec's non-contact sensors operate on the principle of capacitance, measuring gaps between conductive surfaces to provide gap monitoring which is crucial for both Slot Die and roll-to-roll quality control. Coater gaps achieve resolutions as low as one micro-inch in the width of the slot gap to control the thickness of the coating material, it is critical for manufacturers to set a very uniform gap along the full length of the coater die.

EV Battery performance consistency depends significantly on the uniformity of electrode layers produced using these coating techniques. Battery electrodes require precise uniform thickness to optimize electrochemical reactions which ensures consistent ion diffusion

thickness to optimize electrochemical reactions which ensures consistent ion diffusion rates. Uniformity in coating thickness is essential for meeting regulatory standards for safety, durability, life-cycle performance criteria.




In EVs, even microscopic deviations in battery cell spacing, cooling plate gaps, or motor air gaps can impact safety, efficiency, and durability. Precision gap measurement ensures consistent performance and reliability across critical systems.

**Click Here**

To see the Full article, **"Closing the gaps: Precision measurement for safer, more reliable EVs"** in EV Engineering Online.

### Braking Systems (Disc and Truck Drum)

The rugged modular electronics in Capacitec's new line of disc brake wear analysis sensors can measure high-temperature (1200°F, 648°C) displacement for dynamic brake system motions both in laboratory dynamometers and on the vehicles at test track facilities. By measuring displacement variables on a brake rotor in motion, data can be collected and analyzed to show a myriad of characteristics, such as: Rotor runout (TIR), Rotor thickness variation (DTV), Rotor coning, Thermal expansion, Plate-to-plate orientation (V-ing, barreling), Wobble, and Ovality.

### Rotor Stator Gap Physics

Today's EV applications place increasing demands on electric motor efficiency. The air gap plays a vital role in the magnetic interaction between the rotor and the stator. A smaller air gap typically enhances the magnetic force, as magnetic force is inversely related to the square of the distance between the rotor and stator. Conversely, an increased air gap weakens the magnetic field strength, leading to reduced operational efficiency. For optimal performance, it is generally advantageous to minimize the air gap to enhance torque generation and reduce hysteresis losses within the stator and rotor.

## Assembly of Electric Motors – Concentric Alignment

In the context of electric motor manufacturing for EVs, capacitive gap sensors are used by designers, engineers and production personnel to accurately center the rotor assembly, which is critical for optimizing performance and minimizing performance losses. Capacitec's gap sensors ensure that the spacing between the stator and rotor is uniform, and remains within specified tolerances, thereby enhancing the motor's efficiency and reliability. By incorporating capacitive gap sensors, manufacturers can implement more rigorous quality control measures, leading to higher quality, more efficient electric motors that meet the demanding requirements of modern EV applications.

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### Get in Touch

Ready to move beyond traditional feeler gauges?

**Tell us About your Application**

Capacitec's advanced gap measurement solutions deliver greater accuracy, reliability, and efficiency than those outdated mechanical options. Our application engineers are here to help you optimize your operations.

**Email an Application Engineer**: sales@capacitec.com

**Explore or solutions:** www.capacitec.com

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