World's First Industrial Digital Printer for Hydrophobic Coated Automotive Displays

Exceptional Clarity, Optimal Hydrophobic Performance

Lowest materials consumption with the highest efficiency

Automotive HUD Application Case Study

COTEC®
Materials I Vacuum I Coating

Executive Summary

Automotive Challenges:

Today's automotive pressures include a vast array of continuously changing government mandated standards, regulations, safety, and efficiency mandates; as well as supply chain disruptions, and upskilling workers to adapt to new technologies. This is further compounded by increased competition, including new entrances by high tech companies which accelerate the need for continuous investment in R&D to accommodate innovation. Additionally, consumers and regulators alike desire advancements in the design and development of cheaper, easy to maintain, lighter weight yet durable clean energy efficient vehicles with fewer emissions.

Industry Outlook: Technology, Value, Sustainability

Technological Innovation: AI is a game-changer, if used strategically, the integration of autonomous driving, navigation systems, and voice-active controls offer convivence and boost the driving experience to gain a competitive edge and accelerate growth. This attracts tech-savvy consumers and positions automotive companies as leaders in innovation.

Artificial Intelligence (AI)

Customer Value: *Embracing New Technologies*—The adoption of Electric Vehicles (EVs) and autonomous driving can also enhance customer value. Quality products, convenience, and cost savings through technological advancements contribute to customer retention and brand loyalty. *Changing Consumer Behavior*—adapting is crucial. Offerings such as on-demand travel subscriptions and ridesharing programs address the changing perception of car ownership, positioning the industry to provide cost-effective and flexible alternatives.

Customer Value

Sustainability: Climate change, carbon footprint, and sustainability have a considerable impact on the future of transportation. Consumer and governmental demands for fuel efficiency, lowered emissions, and alternative clean energy resources are factors that universally resonate with environmental consciousness.

Sustainability

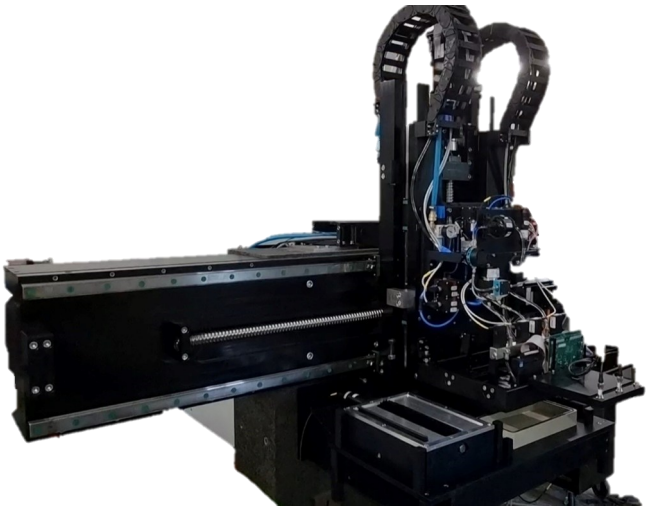
A Digital World, Unlimited Applications

Technology is evolving, new applications and case uses are constantly emerging from nearly every industry, urging companies to develop their own innovative technology strategy. Technology advancements are particularly vital to the automotive engineering and manufacturing environment. Future industry success lies in effectively navigating the intersection of technology, profitability and sustainability, with a deep understanding of evolving consumer expectations and global environmental challenges.

COTEC and CADIS Develop The World's First Digital Printer for Hydrophobic Coating System

Revolutionizing The Visibility and Durability of Automotive Display Panels

The collaboration between COTEC GmbH (COTEC) and CADIS Engineering GmbH (CADIS) to develop the world's first digital printer for hydrophobic-coated automotive displays is a significant technological advancement in the automotive industry. COTEC's expertise in hydrophobic, oleophobic, and AR coatings have been instrumental in enhancing the durability and surface quality of automotive displays. The partnership with CADIS, a specialist in digital printing machines, has led to the creation of an industrial printer specifically designed for applying hydrophobic coatings on automotive displays.



Hydrophobic Printer picture to the left.

Above a logo printed using hydrophobic ink and wetting with water droplets.

One of the key challenges in coating touch displays is their size, making it difficult to use traditional physical vapor deposition (PVD) equipment for curing. The new digital printing technology offers precise coating application for complex geometries to ensure uniform coating and to also enable coating on larger touch displays that were previously challenging to handle.

The technology's ability to provide controlled placement of coatings is a noteworthy feature. This control allows for strategic spacing of coatings to accommodate mounting displays with adhesives, offering flexibility in the manufacturing process. Moreover, the digital printing technology contributes to efficiency by minimizing materials consumption, making it a sustainable and cost-effective solution by eliminating expensive cleaning and polishing steps.

The COTEC/CADIS collaboration has resulted in a groundbreaking digital printing technology that revolutionizes the application of hydrophobic coatings on automotive displays. This innovation addresses challenges related to display size, coating precision, and efficiency, setting a new standard in the industry. This partnership is a power combination bringing together COTEC's advanced ultra-hydrophobic coating technology with CADIS expertise in high-end inkjet digital print solutions. The Result is a synergistic solution that offers a range of benefits for automotive displays.

COTEC's ultra-hydrophobic coating is specifically developed to enhance displays by making them easy to clean and repelling liquids. This is particularly crucial for automotive displays that need to remain clear and functional, even in extreme weather conditions. The technology not only improves visibility but also contributes to safety and the overall aesthetics of car screens.

COTEC's coating technology combined with CADIS' industrial-scale digital printing expertise, has produced the premier industrial printing equipment for premium ultra-hydrophobic materials. It improves application precision, reduces materials costs, and enhances both production quality and speed.

Successful commissioning of the first production equipment was completed in the third quarter of 2023 for a leading automotive supplier, delivering a finished display to a premium German car manufacturer. The CADIS digital printer machine and coating material supplied by COTEC are perfectly matched for best-in-class optimal performance with a superior hydrophobic surface combined with a robust printing process. This is a truly groundbreaking and practical coating application; it marks a new milestone in the era of automotive technology.

Hydrophobic Digital Printer Coating System Benefits:

- Ultra Hydrophobic Smooth Surface: to effectively repel liquids
- Easy-Clean Surface, anti-fingerprint/anti-smudge, oleophobic properties
- Exceptional Optical Clarity: preserving a sharp visual display quality.
- Cost-Effective Hydrophobic Coating Application
- Precise Application with Complex Geometries Speeds Up Production Process: enhancing operational efficiency.
- Lowest Materials Consumption: an environmentally friendly and cost-efficient solution.
- Controlled Application with Highest Application Efficiency: maximizing materials use during the manufacturing process.
- Ability to apply the coating where it is needed to avoid material waste.
- Extensive Technical Support from Prototype to Manufacturing Implementation: assisting in the seamless transition from prototype development to full-scale manufacturing implementation.
- Expert Knowledge combination from Chemistry and the machine Engineering to create customer solutions and satisfaction.

Conclusion

COTEC has a distinguished track record and capabilities in providing premium abrasion resistant ultra-hydrophobic and oleophobic coatings used by the world's most premium and respected brands—and developed to meet unique industry demanding specifications. They consistently and rapidly adapt to a multitude of prototype testing, under tight product development time frames. Delivering high-performance durability, and superior coating adhesion for optimal efficiency using superior coating processes and equipment to automate and streamline the coating application process.

Best-In-Class Coating Solution Features

Coatings trusted by the world's most prestigious brands used in the ophthalmic, automotive and display technology industries, COTEC also offers large area coating and high quality surface finishing, as well as special optics and precision optics.

- Full range PVD coating supplier for different fields of applications
- Development, synthesizing, production and confectioning of Easy-clean anti-smudge, oleophobic and water repellant coatings.
- Coatings for protection against extensive mechanical wear or environmental impact.
- Coating systems and test units for surface modifications and it's quality analysis.
- Supplier of spare parts, accessories for PVD evaporation systems.
- Solar control coating to reduce light and improve thermal insulation.
- Certified to ISO 9001:2015 quality and ISO 14001:2015 environmental management standards .

Additionally, our COTEC product portfolio is enhanced by the collaboration of our parent company SDC Technologies complementary coatings, expanding the range of offerings while providing global access to additional resources and expertise. SDC Technologies is the recognized world leader in the development and manufacture of high quality specialty coatings for plastic, glass and metal. SDC's portfolio of optically clear coatings provide superior performance and durability for variety of applications from aerospace and automotive parts to vision eyewear, electronic devices and other customized applications. SDC's extensive high-performance coating product range includes a variety of features such as tintability, thermoformability, weatherability, and anti-reflective compatibility. These are available in thermal and UV-cure, primer and primerless coatings options. Visit sdctech.com

For More Information

COTEC®

Founded in 1997, COTEC GmbH serves customers worldwide in automotive, ophthalmic, precision optics and display technologies. To find out how to improve the performance of your products and enhance your competitive edge, visit:

cotec-gmbh.com

CADIS

Founded in 2016, CADIS Engineering GmbH (CADIS) develops innovative high-end inkjet systems catering to automotive, packaging, pharmaceuticals, energy, consumer electronics and graphics industries. CADIS solutions are integrated special-purpose machines for inkjet printing, digital printing production solutions and advanced printing applications on an industrial scale, visit:

cadis-engineering.de/en-au

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