CASE STUDY

Enhancing Digital Material Representation in Automotive Design

A renowned luxury automotive manufacturer known for its high-quality craftsmanship and innovative designs, has a dedicated visualization team who works closely with various departments, including exterior design, interior design, and CMF (Color, Material, Finish). The team creates a wide range of digital content, including imagery, animations, and immersive experiences, to help decision-makers visualize and assess different designs and materials.

Challenge

The automotive industry is undergoing a significant digitalization shift, influencing decision-making processes based on digital content. As a luxury brand focused on innovation and craftsmanship, this company recognized the need for reliable digital material twin. However, the Visualization team faced challenges in efficiently creating digital representations of materials, especially for comparing existing products with future designs. Traditional methods with physical samples and prototypes were time-consuming, expensive, and wasteful.

The company's Design Studio needed a comprehensive library of digital materials to quickly access both existing production materials and new developments for flexibility in assessing designs and to improve speed to market.

Industry:
Automotive

"We want to show materials and finishes, digitally, what is already on the road and then compare it to any future designs. We are currently working on building up that library of materials that we can draw from so we can directly put it onto the latest designs and surfaces and not only assess single small sample but see it visually on the rendering."

- Visualization Team Lead Manager

Solution

Autodesk and Integration with PANTORA: The studio primarily used Autodesk software, especially for its compatibility with automotive design. They identified PANTORA, a solution that directly integrates with Autodesk tools, as a key component in their material digitization process.

Digital Twin Technology: The company's Visualization Team recognized the importance of having a reliable digital twin of various materials for effective decision-making. Here's why they chose PANTORA and MAT-12.

- **PANTORA** directly integrates with Autodesk, the design studio's preferred software for automotive design. It is perceived as an industry standard, and its adoption was driven in part by the experience and knowledge within their larger group.
- The **MAT-12** handheld multi-angle spectrophotometer quickly assesses and digitizes development pieces to integrate into the latest designs. It is less expensive and offers a faster digitization process than alternatives like the TAC7.
- **Cost and Speed**: The decision to choose the MAT-12 handheld multi-angle spectrophotometer over alternatives was influenced by a combination of lower entry cost, accuracy, and quicker digitization process.
- **Trial:** The team trialed PANTORA and the MA-T12 handheld multi-angle spectrophotometer to ensure the speed and accuracy of the digital materials created would meet the standards of the team.

The design studio is in the process of training its team on PANTORA and the MAT-12 multi-angle spectrophotometer. A loaner device was provided initially for testing and familiarization. The studio plans to integrate these tools into their workflow for both interior and exterior material types.

Results

Using PANTORA and MA-T12, they can create a virtual prototype that goes beyond color to capture full material appearance in a fast, easy, and economical way to gain stakeholder buy-in. With this solution, they can:

- Reduce design iterations by 2-3 times.
- Visualize multiple components together to ensure part to part harmony.
- Specify and reuse materials through a digital material library.
- Save millions of dollars by reducing the need to create clay prototypes.
- Establish a spectral and texture data audit trail for formulation and production.
- Improve supplier and partner communication to streamline the design to production process. Seamless adoption of X-Rite instruments without significant disruption to existing processes.

Conclusion

By leveraging PANTORA and the MA T-12 multi-angle spectrophotometer, this leading luxury automotive manufacturer's Design Studio has been able to enhance digital material representation, streamline the design workflow, and improve design decision-making. Integrating digital twins and advanced measurement technologies aligns with the industry's move towards digitalization and innovation in automotive design. In the future, the company plans to expand this technology to other functions like quality control as well.