

T

Total

A

Appearance

C

Capture



Taking Design Visualization to the Next Level

# Why Total Appearance Capture

In a highly competitive environment, the ability to visualize a vehicle in a physically accurate manner before going to market is vital in the automotive design, production and marketing workflows. Significant costs are incurred in the automotive design and marketing workflows when designers and marketers attempt to virtualize the physical appearance properties of automotive materials. One obstacle to achieving true realism for effect coatings, textured materials and other complex surfaces has been the inability to accurately measure and visualize a physically accurate appearance characteristic of these materials. In automotive design, digital materials are created by CGI artists. Such materials depend on the

artistic skill of the CGI artist, and are typical optimized for a specific scene or lightning condition. There is a lack of consistency as more than one CGI artist is typically involved in the creation of materials, and multiple CGI artists are often using multiple tools for material creation. Every tool require its own proprietary data format, and materials are recreated multiple times. Moreover, other stakeholders would typically have differing opinions of what a material should look like.

## METHODS TO GENERATE VIRTUAL MATERIALS

### TOTAL APPEARANCE CAPTURE

IS THE **DIGITIZATION OF MATERIALS** WITH TRUE, FULL **APPEARANCE MEASUREMENT**.

#### ARTISTIC PROCESSES

ARBITRARY RESULTS DEPENDING ON ARTISTIC SKILL OF OPERATOR  
TYPICALLY OPTIMISED FOR A SPECIFIC SCENE

#### TEXTURE SCANNER

PLAUSIBLE COLOR  
DECLINING ACCURACY WITH  
INCREASING MATERIAL COMPLEXITY

#### FULL APPEARANCE MEASUREMENT

PHYSICALLY CORRECT AS  
BASED ON  
MEASUREMENTS

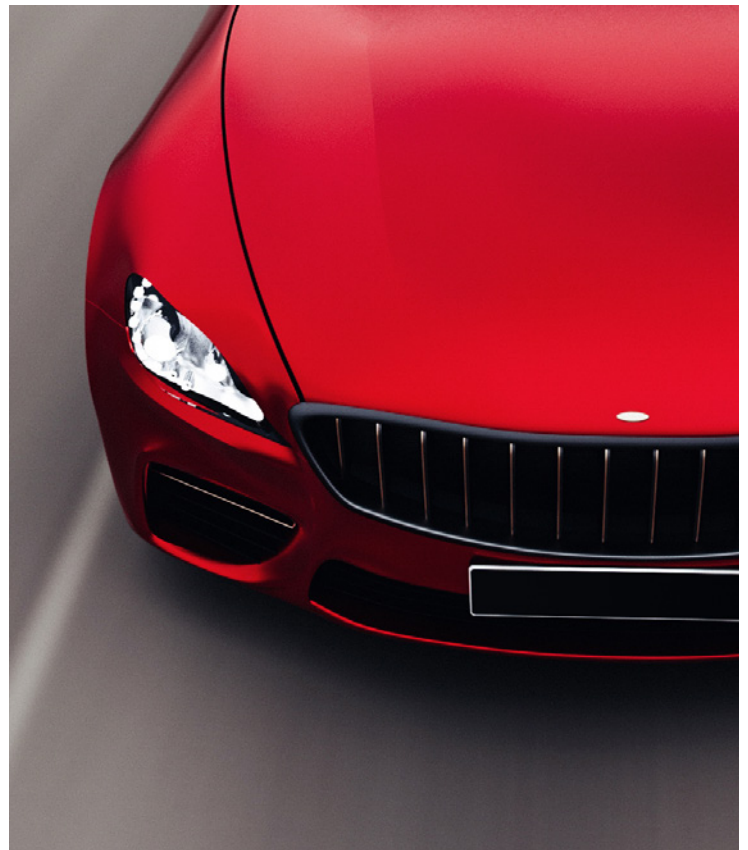
HIGH ACCURACY  
EVEN FOR  
COMPLEX  
MATERIALS

SCENE  
INDEPENDENT

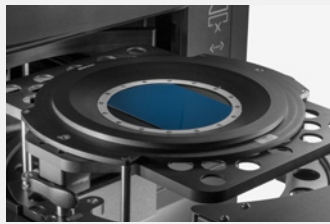
↑  
ACCURACY

The Total Appearance Capture (TAC) Ecosystem from X-Rite Pantone is a revolutionary innovation that is reinventing the way materials are measured and utilized in product design and marketing. With the TAC Ecosystem, you can acquire exact measurements of visual properties and use them for physically precise visualization. **TAC7 creates digital materials based on measurements rooted in physics.** There is no ambiguity of the results as the virtualization is not based on the interpretation of a single or multiple CGI artists. You can apply the same scientific approach to visual material properties -- no more wasted time spent estimating, guessing and adjusting color and appearance. With TAC7, there is no need to recreate the same material as its data format is extensible and is widely used by rendering engines.

TAC7 automates and streamlines the creation of material libraries, and captures true-to-the-eye product renderings – even for products with complex materials, independent of lighting conditions. It is consistent, fast and easy to use. With little user interaction required for measurements, there is no sophisticated skill set required. **The TAC Ecosystem takes virtualization a giant leap forward.** Its physically precise measurements mean that the virtual material will agree with its physical counterpart when applied to any surface, under any lighting condition and in any scenario.







# How TAC Works

Physical material samples are scanned using the TAC7 scanner under a multitude of lighting conditions. The result is a digital representation in an AxF file with the exact same optical characteristics as the real material. The AxF file can then be ingested by popular CAD and PLM software, and rendering engines. Material scans can also be stored in the Pantora Material Hub for distribution and reuse. Or material scans can be viewed in the Virtual Light Booth (VLB) for comparison with physical samples and/or virtually applied to a CAD model in the VLB's various lighting conditions. TAC7 scans delivers significant time and cost savings due to the reduced requirement for manual adjustments made to files within most design tools—ensuring realistic, accurate and consistent appearance throughout the design, production and marketing processes.



*“At the core of our material process is a flexible solution for easily creating, processing and providing virtual materials easily in a multitude of different systems with the ultimate level of realistic depiction. Solutions from our partner X-Rite help us to accomplish this task.”*

*~Jan Pflüger, Digital Retail / After Sales IT Solutions, AUDI AG*

## Material Workflow

CAPTURE



COMMUNICATE



VISUALIZE &  
COMPARE



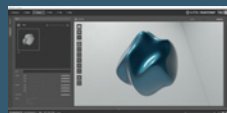
ASSEMBLE



USE



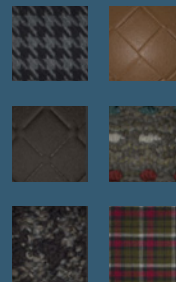
TAC7 Scanner



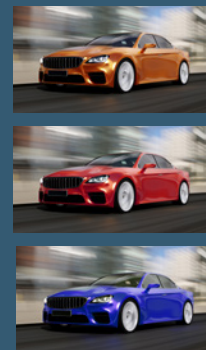
PANTORA™  
Material Hub



Virtual Light Booth



PLM or  
Internal Database



Render Engines





## Enabling Realism

Engineers and designers do not have to guess; they measure. Anyone can apply the same scientific approach to visual material properties with the X-Rite TAC Ecosystem. Eliminate wasted time spent estimating, interpreting and adjusting color and appearance. Acquire exact measurements of appearance properties for even the most complex materials and use them to achieve physically precise visualization.

The TAC Ecosystem makes it easy to ensure material appearance accuracy and consistency from design and manufacturing through marketing, ecommerce and more. Typical benefits include:

### Design

- Unleash designer creativity by making available a robust material library to explore and consider new product scenarios, reducing the early-stage need for time-consuming physical comps and enabling designers to capture reality in a physically precise way.
- Reduce costs with less need for physical samples.
- Simplify maintenance of easily accessible digital material libraries and make it easy to re-use existing materials in design derivatives and variants.

### Marketing

- Create accurate sales and marketing materials, including ecommerce catalogs, from physically precise virtualizations as soon as designs have been finalized. Move seamlessly from design to immersive 3D marketing for your showrooms and online sales.
- No need to simulate material texture or light effects—virtual material will agree with its physical counterpart when applied to any surface, under any lighting condition.
- Improve customer satisfaction and shorten buying cycles with accurate renderings that clearly set expectations for product appearance.



*“To turn the vision of a fully automated Car-Configurator process into reality, TAC is essential. X-Rite’s solution enables us to reach true-to-life quality images to replicate highlights in a car’s paint job.”*

*~Dr. Markus Denny, Head of Digital Image Factory Multimedia Centre Volkswagen AG*

## **A Single Solution to Achieve Consistency Across All Tools**

With TAC, there is no need to change your current infrastructure or software investments. TAC’s AxF file format is vendor neutral. TAC easily integrates with popular PLM and CAD software, and rendering engines. With access to a single library of physically-accurate digital materials, design and marketing teams can now achieve a universally consistent look and feel from digital prototyping to the showroom and point-of-sale environment.

## **Unmatched Realism**

TAC enables designers to capture reality in a physically precise way. Measure and capture every appearance characteristic of a physical material and experience unmatched realism in the virtual world. From automotive paints with special effects, to leather grains and vinyl floors, it is now possible to capture appearance properties such as color, gloss, texture, translucency, and transparency.

Built on decades of color science, TAC brings a new level of accuracy and efficiency to virtual design, empowering designers, 3D artists, engineers and marketers to bring product designs to life with digital materials that have the same visual characteristics as their physical counterparts.

## **Accelerate Time to Market**

In automotive, TAC has been proven to help to cut design time, accelerating speed to market and reducing waste throughout the design-to-production-to-marketing process.

By leveraging one library of physically-accurate digital materials across all product design and marketing tools, TAC enables an efficient virtualization workflow with its ability to accurately capture material appearance, reduce manual file manipulation, and provide consistency in virtual designs with a single-source library of physically accurate digital materials. It allows designers, 3D artists and marketers to speed up and improve the design, production and marketing processes, reducing approval steps and related rework.

# Total Appearance Capture Ecosystem

CAPTURE



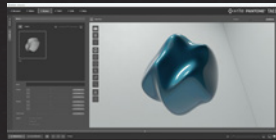
COMMUNICATE



VISUALIZE &  
COMPARE



TAC7 Scanner



PANTORA™  
Material Hub



Virtual Light Booth



## *Where Can I Get a Demo?*

X-Rite has multiple demonstration centers in North America, Europe, China and Japan for the TAC Ecosystem.

To request a demo please visit: [www.xrite.com/tac-request-a-demo](http://www.xrite.com/tac-request-a-demo)



The Total Appearance Capture (TAC) Ecosystem is the latest technology advancement from X-Rite Pantone, continuing a long legacy of innovation in the art and science of color. For more than 60 years, X-Rite Pantone created tools and technologies to help companies master color management. The TAC technology solution builds on this legacy by extending our expertise in color communication and measurement to appearance, taking virtualization and 3D technology to the next level by offering a new level of realism and efficiency in digital material capture.

X-Rite Pantone has extensive expertise and resources distributed around the globe providing customers with unmatched technology and service.

## *Next Level Realism in Virtualization*

[xrite.com/tac](http://xrite.com/tac)