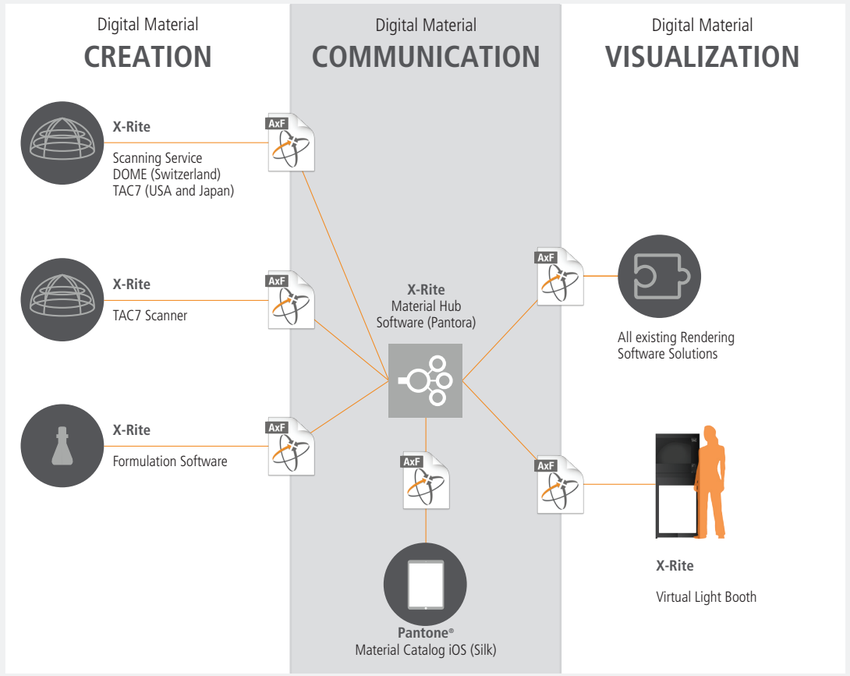
Total Appearance Capture Ecosystem



"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

X-Rite is a world leader in color measurement, management, and communication technology for industries and applications that reach around the globe. We provide the expertise and know-how to make the most of your color and appearance opportunities…right the first time, right every time.

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Total Appearance Capture

Essential tools for appearance-centric supply chain material virtualization

Total Appearance Capture Ecosystem

Why Total Appearance Technology?

Virtualization in digital models is key to designing products (including automobiles), factories, transport and infrastructure. Automate calculations, predict material and product performance, and visualize and optimize design decisions in virtual prototypes before physically manufacturing anything. Being able to see virtual products in a totally realistic manner is vital to many steps in the automotive design, production and marketing workflow.

Taking Virtualization to the Next Level - Material Appearance

Virtualization has continued to improve over time – it's far more efficient and less expensive to make mistakes in a virtual computer model. But there has been one obstacle to achieving true realism for special-effects paints and coatings, textured materials and other complex surfaces. We have not been able to accurately measure and model every appearance characteristic of nearly all materials or surfaces under all lighting conditions. Until now!

X-Rite's Total Appearance Capture (TAC) Ecosystem takes virtualization a giant leap forward. TAC digital materials are physically correct and do not require manual adjustments, vastly improving virtualization.

The TAC Ecosystem consists of four key components:

- Total Appearance Capture Scanner (TAC7)
- Pantora Material Hub
- Virtual Light Booth (VLB)
- Appearance Exchange File Format (AxF)

TAC Ecosystem is Vendor Neutral

Physical material samples are scanned using the TAC7 scanner under all lighting conditions, digitally represented in AxF files, managed as a digital material library in the Pantora Material Hub, presented in the Virtual Light Booth and can be accessed by popular CAD systems such as Autodesk VRED™ and Nvidia Iray®. X-Rite continues to add integrations with additional product lifecycle management solutions on an ongoing basis.

With these capabilities, the TAC Ecosystem can replace the existing virtual material systems and definitions that are not powerful enough to fully characterize and render today's complex materials. From automotive paints to hand-made fabrics, from vinyl flooring to shingles, the TAC Ecosystem accurately captures and presents even the most complicated and sophisticated materials.

TAC Ecosystem in Automotive

Total Appearance Capture (TAC) is a complete digital material appearance management ecosystem that ensures appearance accuracy, consistency and repeatability across the entire Automotive workflow.

Advancing the Manufacturing Ecosystem

The TAC ecosystem continues to evolve to support designers and manufacturers as their businesses and the market demands that affect them change over time. Competition, environmental pressures, new materials and technologies, and disruptive innovations are all factors that drive both dramatic and incremental change within the manufacturing supply chain. Incorporating the TAC Ecosystem's advanced virtualization capabilities into product development and manufacturing processes across the entire manufacturing supply chain will bring significant value, including cost reduction, improved product quality and faster time to market.

Enabling Realism

You don't guess at material strength, you'd measure it. Now you can apply the same scientific approach to visual material properties -- no more wasted time spent estimating, guessing and adjusting color and appearance to make your products and designs look right.

Even with multiple iterations, rarely is the result exactly right. With the X-Rite TAC Ecosystem, you can acquire exact measurements of visual properties and use them for physically precise visualization.

The TAC Ecosystem makes it easy to ensure material appearance accuracy and consistency as well as precise properties across the design, manufacturing and point of sale processes. The following business benefits are typical:

Creation

- Cost savings by minimizing the need for physical samples
- Simplified maintenance of material libraries
- Simplified logistics for digital samples
- Instant availability with digital deployment
- Flexibility to cost-effectively explore different materials
- Creation of customized materials
- Re-use of existing materials to design derivatives and variants

Production

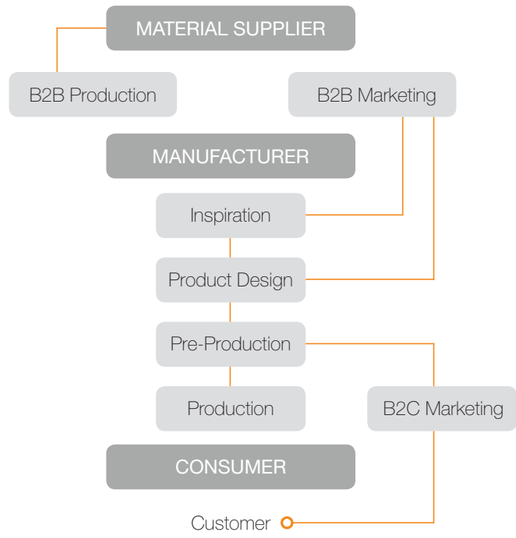
- Cost reduction and accelerated design with fewer physical prototypes
- Improved communication with more accurate renderings
- Design comparison and consistency with measured appearance data
- Simplified logistics and faster time to market
- Systematic appearance-based quality control

Marketing

- More accurately rendered marketing materials
- Easy reuse of digital design materials for improved productivity and cost savings
- Improved customer communication with accurate renderings
- e-commerce & showroom improved by true realism

3D Virtualization with digital data and models has helped the automotive industry design, build and maintain higher performance vehicles. The digital data is used throughout the value chain – in Design (CAD), Proof of Design (CAE), Supply Chain (ERP), Engineering and Manufacturing (PLM/CAM) and Marketing in Automotive and other industries where color and appearance are important.

Now it's time to take 3D Virtualization to the next level, by integrating exact, physically correct material appearance into the design, manufacturing and marketing process. The Total Appearance Capture (TAC) Ecosystem enables creation of virtual materials that have the exact same optical characteristics as the real material. The capturing and use of exact material APPEARANCE within the entire virtualization process speeds up and improves the design and production process.



"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 MultimediaCentre Volkswagen AG