



High-Performance, Water-Based Field-Applied Organic Finishes for Architectural Façade Restoration: Sustainability Never Looked So Good

Based on coating technology that has been an architectural industry standard for over five decades, water-based field-applied coatings made with Kynar Aquatec[®] resin are helping extend the lifetime of commercial buildings in an environmentally friendly way.

Replacing building façade materials can be a costly, time-consuming and disruptive endeavor. Fortunately, building owners and project specifiers now have a more efficient, cost-effective and sustainable way to extend the life of building exteriors with less disruption to tenants and activities than completely replacing façade materials. To realize how, it is important to understand the history behind the coating technology that has been trusted by the architectural community for decades.

In 1965, Arkema, Inc. introduced Kynar 500[®] based architectural finishes to the market, and over the next 30 years they became the coating of choice for architectural firms worldwide. However, they are solvent based, with high VOC content. In addition, because Kynar 500[®] emulsion-based finishes must be baked at over 400oF, they can only be applied in a factory to metal coil and extrusion substrates. This limited their ability to be used on other OEM building products that could not withstand the temperature, like wood, vinyl and fiberglass. It also did not allow for field-applied use.

Kynar Aquatec[®] - The next generation of PVDF coatings

In 2001, Arkema addressed these initial limitations and began to develop a novel emulsion coatings technology that became Kynar Aquatec®.

The original goals of the program were to develop a resin that could be incorporated into a coating that could air-dry with long-term weathering performance similar to a Kynar 500® finish system but in a water-based formulation that required no baking and would film-form at ambient temperatures.

These objectives and ensuing technical development work led to the 2005 commercialization of the first Kynar Aquatec® grade called Kynar Aquatec® ARC. This tough, engineered thermoplastic resin that is inherently UV-resistant found its earliest uses in coatings used in metal restoration projects and OEM building products. In 2009, Arkema launched Kynar Aquatec® FMA12 for coatings used on cementitious and other substrates where breathability and/or greater elastic properties were needed. Arkema's most recent offering in the Kynar Aquatec® line is called Kynar Aquatec® CRX. This resin was developed for applications requiring greater hardness, abrasion resistance and chemical resistance since it can be cross-linked with a second component.

Today, Kynar Aquatec® has become an innovative platform of emulsions used by paint formulators, like APV Engineered Coatings (Arkema's first licensee), to make premium, low-VOC, weather-resistant, water-based coatings. Coatings formulated with these emulsions can provide the durability and performance of traditional factory-applied Kynar 500® based coatings. Coatings formulated with Kynar Aquatec® can be applied in the field to a variety of substrates, including metals, plastics, wood, concrete, stucco, EIFS and previously painted surfaces. Moreover, Kynar Aquatec® resin is manufactured through an innovative and patented process that uses no PFAS surfactants or any other fluorosurfactants in its ingredients or manufacturing process.

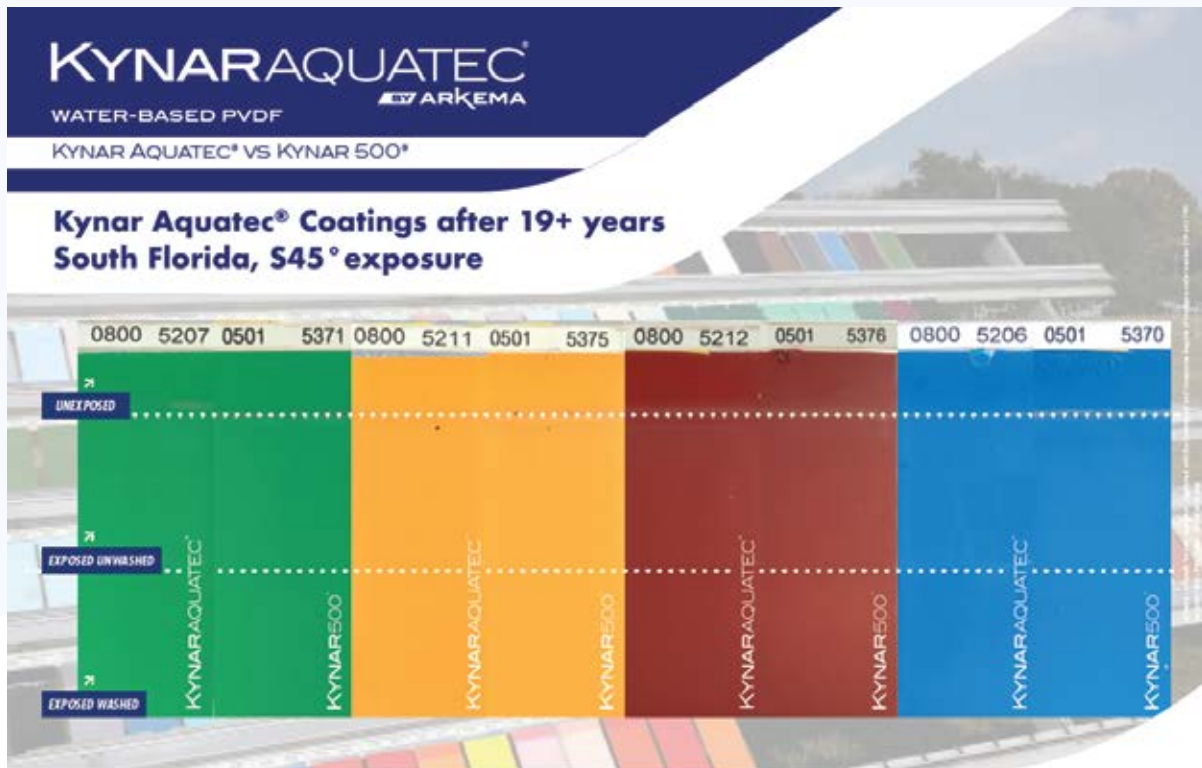
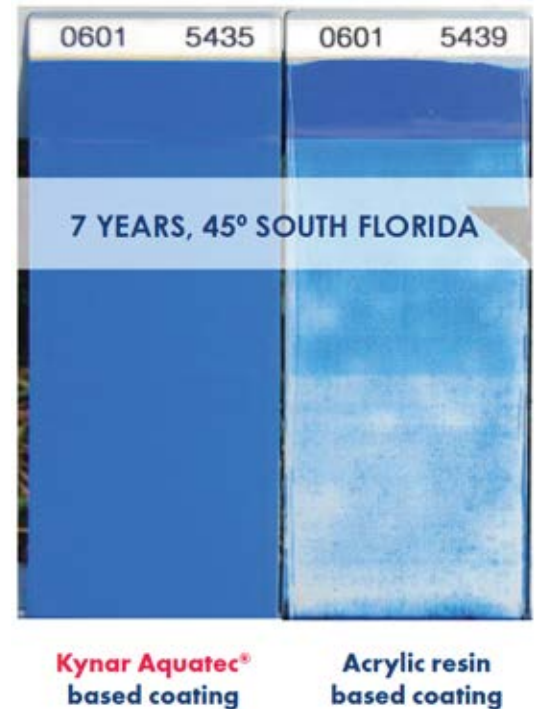


Figure 1: Nineteen years ago, a side-by-side comparison of Kynar Aquatec® to Kynar 500® finishes (using the same inorganic pigments) was conducted. No differences were found in color change, gloss or chalking for either system, demonstrating that that Kynar Aquatec® based systems can perform similarly to a Kynar 500® finish system.

Highly Resistant to Film Erosion

One of the primary purposes of an exterior architectural coating is to protect a building's substrate from weathering. A key indicator of this protection is maintenance of the original film thickness. Figure 2 demonstrates a Kynar Aquatec®-based coating's ability to resist film erosion after outdoor exposure compared with an acrylic-based coating. Both formulations shown utilize cobalt blue pigment, which is not affected by ultraviolet light and does not block UV from penetrating the coating surface. Therefore, any degradation of the coating from weathering is related to the resin binder system only. After seven years of exposure in South Florida at 45° angle facing south, the metal panel is completely showing through the 100% acrylic-based coating, which demonstrates erosion and nearly complete degradation of the coating. The Kynar Aquatec®-based coating is still intact with minimal color fade and no film erosion.

Figure 2



Quality Control through Licensing

To ensure that final coatings made with Kynar® resins meet Arkema's quality and performance requirements, the company established a license program for its Kynar Aquatec® family of water-based PVDF resins. Manufacturer and specialty coatings formulator APV Engineered Coatings became an Arkema licensee in 2009 for its line of NeverFade® Façade Restoration Coatings, which has since been used on hundreds of architectural projects and structures worldwide.

NeverFade® Façade Restoration Coatings Save Time and Money

NeverFade® is a line of water based, low-VOC façade restoration coating systems that provide the durability of factory finish in a field-applied product. Its quality ingredients and unique ingenuity provide a 30-year life cycle, unlike any other coating on the market. In addition to Kynar Aquatec® PVDF resin, NeverFade® coatings contain complex inorganic pigments, as well as additional UV blocking and mold-inhibiting additives for long-lasting durability and color retention. The unique chemistry will not chalk and erode, and it resists dirt and mold growth.

The NeverFade® Façade Restoration Coating System includes topcoats and compatible primers. NeverFade® Original Topcoat is ideal for concrete, stucco, masonry, EIFS, fiber cement, composite materials and vinyl building exteriors. NeverFade® Metal Restoration Topcoat is formulated for use on ferrous and non-ferrous metal surfaces. NeverFade® 2K Performance Topcoat is used in more demanding applications requiring greater chemical resistance, hardness and abrasion resistance.

Proven Performance is Guaranteed

NeverFade® coatings provide longer-lasting color performance than premium latex/acrylic, urethanes and even FEVE exterior paint systems thanks to unique chemistry of Kynar Aquatec® PVDF

polymer and special UV inhibiting additives and specialty grade inorganic pigments.

The harsh Sonoran Desert Climate in Cave Creek, Arizona was no match for NeverFade®, which looked like it was freshly applied nine years after its original application to the Plaza at Black Mountain. The Plaza's brown stucco exterior had faded to light grey then washed out completely after years of weathering, leaving the stucco exposed to high temperatures and harsh UV rays. In 2010, it was coated with a custom-blended NeverFade® Original Topcoat in Sahara Yellow. In October 2012, one of the tenants moved out and took down their sign, leaving the bare stucco exposed. Thanks to the long-lasting performance of NeverFade®, the contractor was able to fill in the small area where the sign had been, and it was a perfect match to the rest of the elevation and building.

Another tenant had hung a banner on the east side of the exterior of his shop after the building was freshly coated in 2010. When the tenant retired in mid-2019, the banner was removed and behind it, the area protected from the sun was identical in color and appearance to the rest of the wall. You could not identify that the banner had ever been on the building -- after nine years.

APV Engineered Coatings is so confident in the long-term, fade-resistant performance of NeverFade® Façade Restoration Coatings, it offers a 15-year product-and-labor guarantee. If the coating fades by a ΔE of 5 or higher, APV will replace the product and cover the labor cost of re-coating. This warranty is unique to the architectural coatings industry.

The following project photos demonstrate the versatility of NeverFade® coatings to protect multiple substrates.

NeverFade® Projects Examples:



Project: Sanibel Island (first NeverFade® application: 2007)

Products used on stucco:

W-1500 Universal Primer and a custom Sanibel Yellow NeverFade® Original Topcoat

Credit: APV Engineered Coatings



Project: Condo Property, New Providence, Bahamas

Products used on decorative metal:

W-1650 Bonding Primer and a custom Silver Birch Mica color of NeverFade® Metal Topcoat

Credit: Stuart Dean Company



Project: 610 Newport Beach (winner of the 2020 Metal Architecture Design Award in the Renovations and Retrofit category)

Products used on anodized aluminum surface: W-1650 Bonding Primer and a custom metallic NeverFade® Metal Topcoat

Credit: APV Engineered Coatings



Project: Jewish Adoption and Family Care Options (JAFCO) Sunrise, FL

Products used on concrete: W-1500 Universal Primer and custom Red and Yellow colors of NeverFade® Original Topcoat

Credit: APV Engineered Coatings



Project: Westin Tampa Waterside, Tampa, FL

Products used on stucco: W-1500 Universal Primer and a custom Sanibel Yellow NeverFade® Original Topcoat

Credit: APV Engineered Coatings



Project: Plaza at Black Mountain, Cave Creek, Arizona

Products used on stucco: W-1500 Universal Primer and a custom Sahara Yellow color of NeverFade® Original Topcoat

Credit: APV Engineered Coatings



Project: Solano Community College Vallejo Center, San Pablo Bay, Calif.

Products used on stucco: W-1500 Universal Primer and a custom Solano Blue color of NeverFade® Original Topcoat

Credit: APV Engineered Coatings



Project: Goodyear Blimp, Akron, Ohio

Products used on Tedlar®: Custom Primer and Goodyear Yellow and Blue colors of NeverFade® Custom Topcoat

Credit: APV Engineered Coatings



Project: Great Stupa of Dharmakaya, Rocky Mountains Region, Colorado

Products used on concrete: W-1500 Universal Primer and 15 custom NeverFade® Original Topcoat

Credit: APV Engineered Coatings



Project: Residential Mural, Cavecreek, Arizona

Products used on stucco: W-1500 Universal Primer and Primary Red, Yellow, Blue, White, and Black colors of NeverFade® Original Topcoat

Credit: APV Engineered Coatings

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About the Authors



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Erin Neff is Director of Marketing & Business Development for APV Engineered Coatings. She is responsible for generating new business accounts and managing key product development projects in strategic markets including flexible films and textiles, architecture and building products. She oversees external communications, public relations, advertising, as well as website and digital marketing efforts. She has been with the company since 2008.

Erin has a Bachelor of Science degree in Business and Marketing Management from the University of Akron. She is a NACE®-Certified Coating Inspector and is certified in sales and negotiations in professional selling via Sandler Training®.

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