



AN INTRODUCTION TO THE NAWKAW STAINING PROCESS:

A COMPARISON OF PHYSICOCHEMICAL
PROPERTIES OF STATE-OF-THE-ART MINERAL
STAINS AND CLASSICAL COATINGS

BY NAWKAW
07/2019



CEO's Statement

– *Russell Gray*

Preface

As the founder and CEO of Nawkaw, I am proud to see the company which started in Toronto, Canada, flourish around the globe. It is with much devotion, effort, and skills that our talented employees enhance the look of concrete and masonry buildings and impact surroundings and communities positively. I want to thank every Nawkaw employee around the world for their daily contribution and outstanding accomplishments over the past thirty years – Nawkaw's attainment is due to your superior performance.

We are all part of the same world. Despite the daily noise of our environment and economic fluctuations, Nawkaw's clients have stood by us. Your trust and loyalty in Nawkaw have allowed us to grow as a company, giving individuals the chance to build a career for themselves and to add to the beauty of our ambiance. When it comes down to premium quality, we do our utmost to satisfy you as a client.

Nawkaw heavily relies on science when manufacturing our proprietary stains. With all our products you can be assured, they are environmentally-friendly, long-lasting, and will not cause any harm to your building material. All technical specifications are backed up by years of research and are continually being updated as we conduct more scientific research. If you have questions about our products, our Chief Science Officer is available to answer your requests.

Creating a healthier, more beautiful environment will not just benefit the people that currently live on this planet; indeed, it is the generation that comes after us that we should think of. Their lives, health, the way and the area they grow up in, is our immediate responsibility. With every decision we make, we as companies should take our corporate social responsibility seriously and implement improvements that cater to the needs of whoever will follow our footsteps in the near future.

Thank you for giving Nawkaw the chance to be part of your company's future.

Sincerely,



In 1988, Nawkaw was founded in Toronto, Canada by CEO, Russell Gray. Since that time, Nawkaw has pioneered the concrete and masonry staining industry by manufacturing innovative, high-quality, and environmentally-friendly products that contain little to zero VOC. Now headquartered in Athens, Georgia, we offer our services around the globe to both the commercial and residential sector. We continually strive to invent new techniques and products that result in outstanding finishes on concrete and masonry. By applying color and adding

texture to your preferred building material, we can create any look you desire – there are few limitations when it comes to color. Our experienced Certified Stain Applicators will help you bring your ideas to life.

As the North American company that launched the concrete and masonry staining industry, we manufacture innovative products and strive to invent techniques that deliver outstanding results to those who are looking to express elegance and accentuate the architectural details of their buildings. Nawkaw is an ambassador for the environment, and as such, we make every effort to produce sustainable products that cause zero harm to nature.



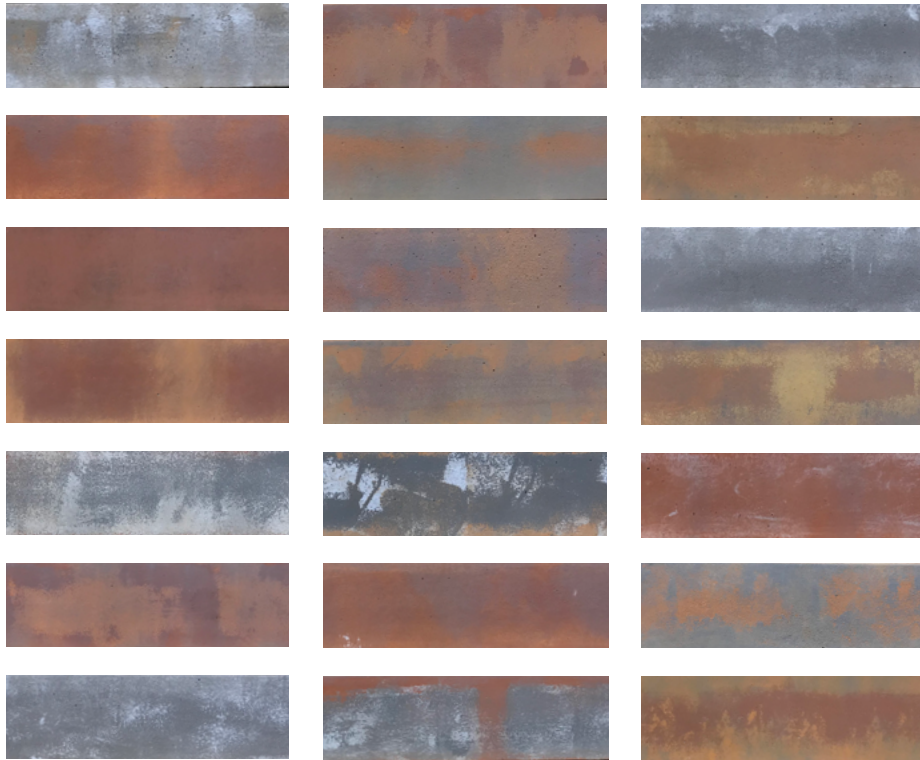
“ Nawkaw’s Vision:

Nawkaw is determined to bring more happiness into your life by adding color and unique features to the buildings you work, live and breathe in every day.”

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Stained Concrete Bricks

Nawkaw has created 21 brick samples that differ in color and when unified, will form a beautiful brick pattern. To create the samples presented on the left, we used the primary colors black, white, red, and yellow. Our Color Technicians were able to achieve 21 unique looks mixing those colors together while using a variety of utensils. When it comes to creating a pattern a client requests, we will try and match it as close as possible to their visions and ideas. Color perception is a very subjective matter. By using ΔE of 0.5 for color measurements, Nawkaw proudly exceeds the industry's precision standards.

The Perception of Color

Humans interact with color on a daily basis. In fact, it is an inevitable part of our lives that we take for granted unless we suddenly lose the ability to perceive colors. The human perception of color is determined by the difference in the absorption and stimulation of the retina cones by the light of a given wavelength. Not only does color add beauty to our lives, but it also serves as a guide by providing different signals our mind associates certain colors and objects with.

The Art of Concrete and Masonry Staining

Concrete and masonry staining requires not only attention to detail and a passion for color, but it also involves years of training. While an ordinary paint brush goes a long way for staining, as well; a roller, sprayer and other unique objects are used to achieve specific patterns, finishes, and desired looks.

While paint will cover the surface with a thick latex layer, stain will create a much more natural finish because it penetrates the substrate material and differs a lot when it comes down to applying the product. In fact, many people coming from the painting industry will need some time to adjust to the approach of staining concrete or masonry, since staining skills differ from painting skills. Therefore, Nawkaw trains employees regularly to ensure their skills are up to par with our standards.

Nawkaw is always striving for innovation that will transform concrete or masonry into more than a stunning looking building. We like to go as far as calling it art. We care about the quality of our service and the products we use and believe that it is that same passion for the trade that makes Nawkaw stand out from its competitors.

Acrylic Concrete Paints vs. Nawkaw Concrete Stains

The most common cause of paint failure is the moisture accumulation beneath the film formed by the paint on the surface of the substrate. Those films show low water vapor transmission, usually in the range of 0 to 20 Perms. Moisture evaporating from the substrate and trapped behind the paint film causes loss of adhesion and lifting of the paint from the underlying surface. Blisters are formed, and this process causes cracking and peeling. Moreover, these films upon UV exposure are subjected to aging and cracking due to the deterioration of polymeric chains of the paint binders.

Nawkaw's mineral stains do not form films. Nawkaw's mineral stains penetrate the substrate. Upon silicification, which is a chemical reaction between Nawkaw's mineral stains binders and the components of the concrete, NawTone-K and NawTone-K Opaque permanently bond with the substrate. This color infusion process ensures an impressive finish that withstands the elements. Nawkaw's mineral silicate stains provide more than color to concrete surfaces. Those stains help deter the effects of weathering caused by sunlight or driving rain and are environmentally friendly. Water vapor permeance of 75-85 Perms assures high breathability. Those characteristics prevent blistering, cracking, and peeling.

Nawkaw's mineral stains contain inorganic, lightfast pigments - resistant to fading. Unlike acrylic binders, NawTone-K and NawTone-K Opaque binders, due to their mineral nature are not subjected to UV damage. Accelerated weathering studies of NawTone-K were commissioned at independent commercial laboratories. The tests were carried out in conditions considered as severe test conditions using ASTM Designation 154 - 2000, which is Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials. In addition, ASTM Designation D 2244, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates, was followed. After over 2000 hours of UV exposure, no thermal degradation, cracking, chalking or visible discoloration was observed indicating excellent performance of Nawkaw's stains.

The range of lightfast colors we offer is much broader than traditional concrete coloring methods. Nawkaw is proud to be the North American company that launched the concrete and masonry staining industry.

COMPARISON: Nawkaw Stains vs. Leading International Brand Exterior Paints

Product	Leading International Brand Exterior Paint*	Nawkaw NawTone-K	Nawkaw NawTone-K Opaque
Binder	Acrylic	Mineral	Mineral
Type of Bond	Adhesion (mechanical), film forming	Silicification (chemical), penetrating	Silicification & adhesion, penetrating
Caulking	Priming required prior to caulking	Priming not required prior to caulking	Priming not required prior to caulking
Water Vapor Permeance (Perms)	29.64	85	75
VOC (g/L)	<50	0	<1
Water Repellency	No	No	No
Mildew Resistance	Yes	Yes	Yes
Chemical Resistance	Alkali	Alkali & acid	Alkali & acid
UV Resistance	Not warrantied	Yes; warrantied	Yes; warrantied

*Comparison with a premium product of leading international brand

COMPARISON: Nawkaw Stains vs. Leading International Brand Exterior Stains

Product	Leading International Brand Vertical Concrete Stain*	Nawkaw NawTone-K	Nawkaw NawTone-K Opaque
Binder	Acrylic	Mineral	Mineral
Type of Bond	Adhesion (mechanical), film forming	Silicification (chemical), penetrating	Silicification & adhesion, penetrating
Caulking	Priming required prior to caulking	Priming not required prior to caulking	Priming not required prior to caulking
Water Vapor Permeance (Perms)	18	85	75
VOC (g/L)	<50	0	<1
Water Repellency	Yes	No	No
Mildew Resistance	Yes	Yes	Yes
Chemical Resistance	Alkali	Alkali & acid	Alkali & acid
UV Resistance	Not warrantied	Yes; warrantied	Yes; warrantied

*Comparison with a premium product of leading international brand

NawKote-PC

Nawkaw has been a manufacturer and service provider for concrete and masonry stains for over 30 years. With strong presences in USA, Canada, Australia, and New Zealand, we strive to develop innovative products that are not only harmless to the environment but in fact, contribute to a better place to live and work in, while significantly improving the longevity of concrete and other building materials.

NawKote-PC is a clear coating which can be applied on many different surfaces, including but not limited to glass, tile, painted surfaces, precast concrete, and masonry. For several years, it has been rigorously tested and has had great success in Australia before the launch for the American and Canadian market in 2019.

NawKote-PC Coating System

Nawkaw is proud to present a solution for the issues the concrete industries are experiencing. NawKote-PC is a clear, water-based, nontoxic, zero-VOC, and solvent-free coating system that gives the treated area properties that help to prevent carbonation, algae-buildup, protect the concrete from harsh UV-light and even from graffiti, while it provides self-cleaning attributes. The coating consists of a high-quality, unique formulation including photocatalytic TiO_2 nanoparticles that will build a long-lasting protective barrier. NawKote-PC makes use of nature's natural powers. By using only rainwater and sunlight, it shields surfaces from harmful environmental pollutants, while decomposing those contaminants. NawKote-PC functions in all weather conditions – sunshine, rain or during overcast days, the UV-rays will suffice to activate the photocatalytic layer of the coating. The technology behind NawKote-PC was first discovered in 1967 by Japanese scientist Prof. Fujishima. In order to standardize photocatalytic products, the Photocatalysis Industry Association of Japan (PIAJ) was established in 2006 with the goal to promote and improve the quality, performance, and safety of those products. Since 2016, Nawkaw has been testing the new technology and has had great success with it in Australia. Specifications for NawKote-PC can be found under this link: <https://www.nawkaw.com/products/nawkote-pc>

The Benefits of NawKote-PC

NawKote-PC's coating provides many beneficial characteristics that will help to maintain the look of buildings and due to its self-cleaning properties will reduce life-cycle costs. The treated surfaces carry no electric charge and reduce the absorption of dust and dirt. The hydrophilic surface wets out evenly which

leads to faster drying and dramatically reduces the dirt sticking to the surface. When sunlight activates NawKote-PC, harmful airborne pollutants, viruses, bacteria, mold, VOCs, CFCs, allergens, and smog will decompose, leading to a more sustainable, better environment. Furthermore, the air stays fresher, due to the deodorizing properties of the coated surfaces.

For long-term protection, NawKote-PC will prevent concrete carbonation. The inorganic NawKote-PC coating system will protect the pores of the concrete, to restrict water ingress which will slow down the natural carbonation process, preventing concrete from loss of durability and protecting steel reinforcement.

The sustainable aspect provided by the photocatalytic coating is a significant contribution to improve the overall life quality in our cities. To put the capabilities of the NawKote-PC into perspective: Per day, an area of 250 sq. ft. coated with NawKote-PC purifies just as much air as one tree, which can remove the equivalent of NOx emitted by two automobiles. Our scientists are currently conducting further research.

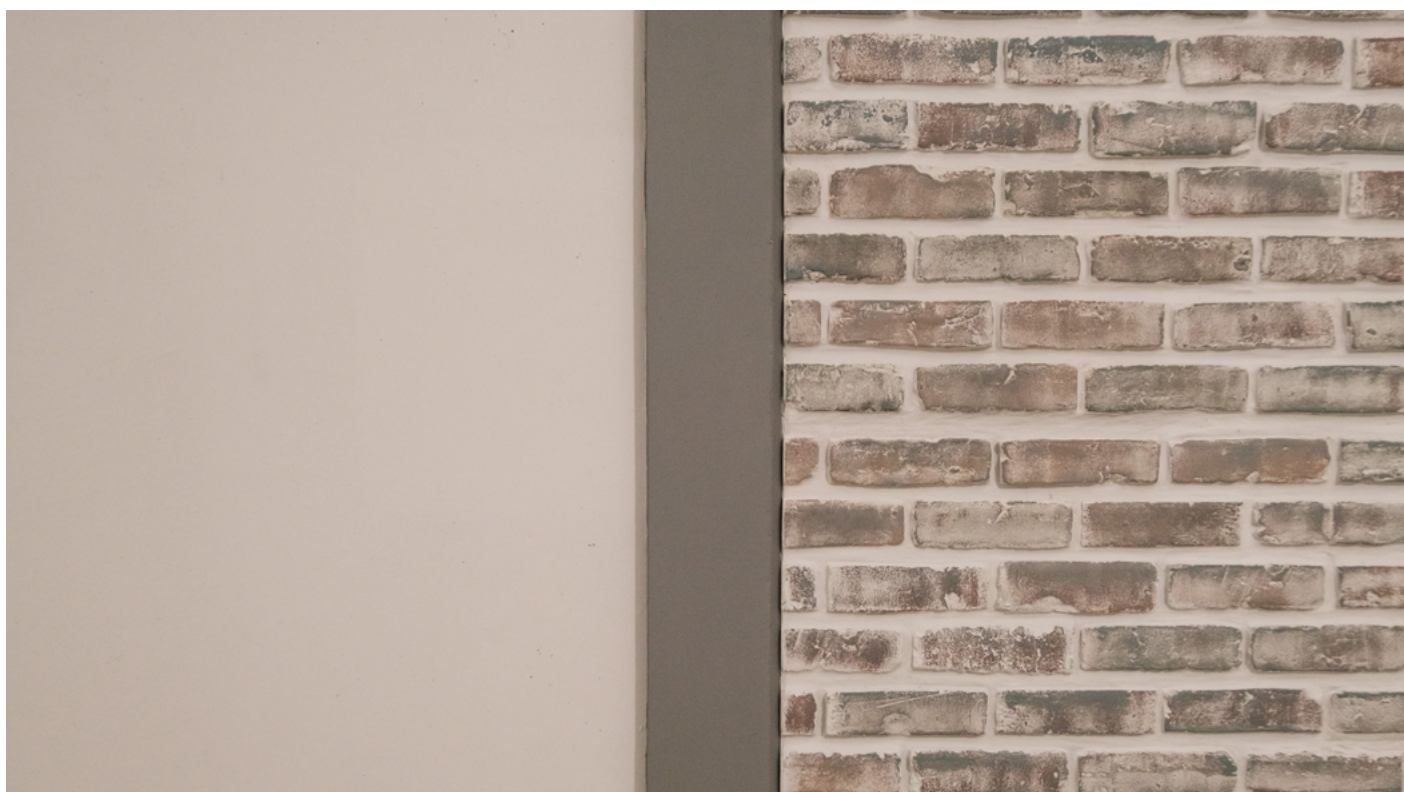












Nawkaw®

ARCHITECTURAL FINISHES INSPIRED BY ART & SCIENCE

