BEGA Unidure®

Contents

Introducing BEGA Unidure®

Whether baking in the sun or freezing in the cold, architectural outdoor luminaires endure some of the most rigorous, day-to-day durability challenges associated with the built environment. Selecting an exterior architectural finish that preserves the longest lifespan possible can be a daunting task. With BEGA Unidure®, a fluoropolymer technology, you now have peace of mind for decades.

Luminaires achieve even more brilliant, long-lasting colors that look fresh and vivid year after year. The unique chemical structure improves corrosion resistance, ensuring a longer life than any other finish available today.

Quality Above All - Finishes

Aluminum has long been the construction material of choice for a wide variety of products, including architectural outdoor luminaires. These products must be protected against the elements in order to survive. Atmospheric corrosion from acid rain, marine environments, high alkaline soils, high heat, and humidity can all cause these items to fail. That is why all aluminum products require a protective coating.

Topcoats formulated with fluoroethylene vinyl ether (FEVE) resins – also known as fluoropolymer technology – maintain their bright colors for 20 years or more.

As a result, luminaires can look as good as new for decades. Additionally, FEVE resins provide outstanding protection against UV radiation, oxidation, humidity, and corrosion.

Exterior Finish Specifications

Standard Finishes

BEGA exterior luminaires are available in four standard colors: Black, Bronze, Silver, and White. These powder coat finishes are applied electrostatically to a minimum of 3.0 mil thickness with a deep matte, fine textured coating. This distinct look, most noticeable with BEGA Black, provides the highest quality, most graceful aging, and elegantly masks the buildup of particulates over time. BEGA Unidure® finish, a fluoropolymer technology, provides superior fade protection in Black, Bronze, and Silver. Given its minimal usage for exterior applications, and a customer experience that does not necessitate superior fade protection, BEGA standard White remains a Super Durable Polyester Powder. BEGA also offers custom color and finish options which must be specified at an added cost. These are:

RAL Colors (RAL)

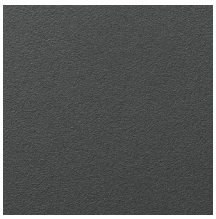
Unless specified otherwise, RAL finishes are applied to the manufacturer's recommended thickness with a deep matte, fine textured Super Durable Polyester coating selected from hundreds of colors contained in the standard non-metallic RAL color system guide (excludes exotic finishes). To specify, suffix the product catalog number with "RAL" followed by the special finish number.

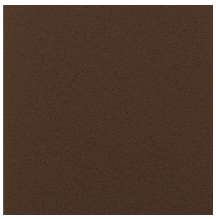
Custom Color Matching (CUS)

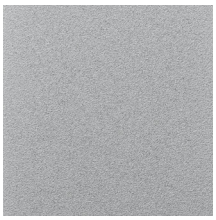
Custom colors, gloss requirements and metallic matches are easily achieved, managed and quoted on a case-by-case basis. Metallic colors with a multi-stage process will match finish, however, colors may vary slightly. Samples will be provided as necessary for approval. To specify, suffix the product catalog number with CUS (Custom Color).

Marine Grade Undercoat (MGU)

BEGA exterior luminaires, when handled and installed properly, are inherently resistant to highly corrosive applications such as coastal environments and natatoriums due to the use of premium alloys, highest quality powder coats, and superior ingress protection. For the harshest of environments, we recommend an epoxy based marine grade undercoat. To specify, suffix the product catalog number with MGU (Marine Grade Undercoat).


Black


Bronze


Silver

White

Material Selection

Polyester Powder

Polyesters are the most commonly used powders in luminaire design, offering good mechanical and chemical resistance while allowing for great flexibility and impact resistance. Standard Polyesters offer 1-3 years of acceptable UV resistance, so they work well for all interior and some exterior applications. Polyesters have solid all-around properties and are a common first choice for many lighting applications. If you're coating pieces that will be permanently outside, and therefore need a higher level of wear-ability and durability, then consider the Super Durable Polyester instead. Limited exterior durability is a Standard Polyester's main disadvantage.

Super Durable Polyester Powder

Super Durable Polyesters have fast become the gold standard of polyester powders. As the name suggests, these exceptional powders offer superior durability when compared with a standard polyester. They are designed to hold their color and gloss for 5 to 10 years more when compared to a Standard Polyester. Not only is their color and gloss protection better, but they also provide better humidity and corrosion resistance. These Super Durables have become hugely popular over the last few years as their superior capabilities and great value for the money have made them popular for interior applications where improved fade resistance is required, as well as all manner of outdoor applications.

Fluoropolymer Powder

Fluoropolymers are typically used in architectural markets due to their phenomenal weathering properties and world-class color and gloss retention. Their corrosion resistance and excellent weatherability make them extremely popular for exterior architectural applications like curtain walls, windows, doors and more. The two most common types of Fluoropolymers found in powder coatings are FEVE, and PVDF. PVDF Fluoropolymers always need a primer beneath them, whether liquid or powder, and are much more difficult to bond when creating metallic powders. FEVE resins are the most popular within the powder community for their superior single coat capability and incredible exterior performance. FEVE based Fluoropolymer metallics can also be bonded so that when applied, the metallic flake is more evenly distributed throughout the powder for a more consistent appearance. As an example, BEGA's standard Silver (SLV) finish is a bonded metallic. Fluoropolymer powders are usually only available to members of a Certified Applicator program, as the service life of this top coating can last over 20-years when applied by a Certified Applicator.

Finishing Methods

All BEGA luminaires go through a multi-stage preparation, finishing and curing process, which provides the most durable and corrosion resistant finish available in the lighting industry today. What should you take away from this? Regardless of which powder is used, alloy preparation is critical to the longevity of a finish in application!

The BEGA finish process is a closed-loop system with nine steps. Initially, all components undergo a thorough inspection. Here we inspect the metal components to ensure they are free of damages, metal burrs, or defects. The material is then loaded onto the assembly line via vertical hooks. This set-up, the second step, allows for multiple components per vertical assembly, and the turn radius allows for very large components to be finished. This is critical for large fittings like our Light Building Elements.

The next five steps are all preparatory and ensure the alloy is in as pristine condition as possible before the application of the actual powder coat occurs. First, there is a cleaning cycle to remove surface contaminants. This is followed by a three-stage ambient rinse, then an ultra-pure rinse for neutralization. Once neutralized, the components receive a non-chrome, phosphate-free, nano-technology coating. The final step of preparation is a high heat dry-off oven. Now the alloy is ready for powder to be applied.

It is important to note that applying a 3-mil minimum thickness doesn't yield a quality, long-term finish unless these steps are taken. A unique facet of the BEGA process is that it ensures if damage were to occur in the field to one of our products, the damage is 100% isolated to the area of the damage and will not spread through the rest of the finish. Inferior manufacturers' powder-coat components will begin to peel if the finish is damaged through to the casting, but our process ensures that to never be the case. A quick application of touch-up paint is all that is required.

As mentioned earlier, all powder coat finishes are applied electrostatically to a minimum of 3.0 mil thickness with a deep matte, fine textured polyester coating. Electrostatic application, what is that you might ask? The powder and alloy are supplied with opposing charges. Basic physics – opposites are attracted to each other. As the powder is sprayed onto the surface the two charges will begin to neutralize. Two highly skilled painters are required for this step to ensure uniformity on all sides of the casting.

From here the coating is cured per the prescribed profile (step eight). Lastly, we carefully inspect each painted component to make sure it meets all quality and aesthetic standards (step nine).

Certified Applicator

BEGA North America has successfully met the stringent AAMA 2605-17a requirements and is a certified fluoropolymer applicator, giving us access to the industry's highest quality materials.

Certification Procedure

AAMA 2605-17a testing includes dry film thickness (Elcometer #NB14163), specular gloss 60° (micro tri-gloss #1012100), pencil hardness, impact resistance (serial# G1120, w/2 lb.), and ≥ 40 liters/mil abrasion resistance. Dry adhesion, 20-minute boiling water adhesion, and 24-hour wet adhesion testing are to be performed sequentially on the same part using the same set of cuts for each test.

Also included are chemical resistance, consisting of 10% muriatic acid, mortar, nitric acid, 72-hour detergent and 24 hours window cleaner resistance. Corrosion resistance includes 2000 hours G85 annex 5 Acetic acid salt fog resistance (#16-0671-46) and 4,000 hours of humidity resistance (#16-0601-46), along with weathering testing requiring 10-years exposure facing south. All testing for BEGA North America has met the AAMA-2605-17a requirements, and the Florida exposure panels have been sent.

BEGA's Quality Policy

BEGA has an unwavering commitment to Quality above all… in our people, products, partners and processes. To deliver on this core value and fundamental brand promise, it is our policy that all products will be exactly as the customer specifies while adhering to or exceeding all necessary requirements critical to quality. Product design, material selection, and manufacturing processes are all focused equally in this regard. For 75 years, BEGA has been developing and producing high-quality luminaires for virtually all areas of interior and exterior architecture.

Our attention to quality is not the result of some industry set of rules, but rather, based on our years of expertise and our commitment to excellence. Our expertise and innovation have influenced many of the quality standards used today. In fact, at BEGA, we believe that we set the standard for quality, and we must always hold ourselves accountable to it.

Quality Assurance

Incoming Powder Lot Inspection

BEGA works with suppliers from initial specification and color match through to quality assurance for each new powder shipment we receive. Along with our suppliers, BEGA has developed specific measurement criteria for standard color offerings. While we ultimately rely on visual standards for final acceptance, we also use precise instrumentation to give quantitative meaning to visual color observations. Incoming lots of powder are analyzed against this measurable standard and accepted only once the criteria has been validated. In addition to this quality assurance protocol, we maintain a working relationship with our suppliers to continually improve quality standards, as well as refine application suitability for our process.

Finished Good Physical Inspection

100% of all finished components are physically inspected post paint, and specific parts are subjected to an additional 4,000 hour salt spray test for quality assurance.

Boiling Water Cross Hatch Adhesion Test

Conducted once with every standard color change, this test is performed on a test panel that is processed at the beginning of the line with actual parts. Pass/Fail criteria are based on the percentage of material loss compared to a quality control classification chart. To pass, the panel must demonstrate less than 5% peel on the scribed area. All panels are then labeled and stored for future reference.

MEK Powder Cure Test for Solvent Resistance

Conducted once with every standard color change, this test is performed on a 3”x5” test panel. This is a pass/fail criterion as well, with passing results only if none of the substrate surface is visible. All panels are then labeled and stored for future reference.

Dry-Film Thickness Test

Completed every color change to establish the average mil thickness per color. One part is marked at the beginning, middle, and end of each run, and is intended to ensure consistent application thickness throughout the day. Feedback from inspectors is provided to painters as necessary to allow for necessary adjustments. This is performed on actual parts.

Material Testing Standards

American Society for Testing and Materials (ASTM)

ASTM International, founded as the American Society for Testing and Materials, is a nonprofit organization that develops and publishes approximately 12,000 technical standards, covering the procedures for testing and classification of materials of every sort. ASTM standards are used worldwide, with its membership consisting of over 30,000 individuals representing 135 countries.

ASTM also serves as the administrator for the U.S. TAGs (United States Technical Advisory Group) to an enormous amount of ISO/TCs (International Organization for Standardization/ Technical Committee) and to their subcommittees. BEGA Unidure® coating properties are as follows:

Standard	Test	Metric
ASTM D523	Gloss at 60°	Visual
ASTM D2454	Overbake Resistance, Time	100%
ASTM D3363	Pencil Hardness	2H
ASTM D2794	Direct Impact, Gardner	30 in/lbs.
ASTM D3359	Adhesion, Cross Hatch	5B Pass
ASTM D522	Flexibility, Mandrel	1/8 in. dia, no fracture
ASTM B117	Salt Spray	4,000 hrs.

Material Testing Standards

American Architectural Manufacturer's Association (AAMA)

The AAMA offers voluntary specifications, performance requirements, and test procedures for superior performing organic coatings on aluminum extrusions and panels. AAMA 2605 is indicative of superior performance organic coatings on aluminum extrusions. This level of specification is recommended for use in architectural applications such as window frames, cladding, shopfronts and other products where superior weatherability is required.

BEGA's Unidure® powder meets the requirements for AAMA 2605 certification and is based on proven fluoropolymer technology.

Specification	BEGA	AAMA 2605	AAMA 2604	AAMA 2603
Color Retention	10 yrs.: Fade = 5 Delta E	10 yrs.: Fade = 5 Delta E	5 yrs.: Fade = 5 Delta E	1 year: "slight" fade
Chalk Resistance	10 yrs.: Chalk = 8	10 yrs.: Chalk = 8	5 yrs.: Chalk = 8	1 year: "slight" chalk
1 year: "slight chalk"	10 yrs.: 50% retention	10 yrs.: 50% retention	5 yrs.: 30% retention	No specification
Erosion Resistance	10 yrs.: 10% loss	10 yrs.: 10% loss	5 yrs.: 10% loss	No specification
Dry Film Thickness	3.0 mils minimum	1.2 mils minimum	1.2 mils minimum	0.8 mils minimum
Accelerated Testing				
Salt Spray	4,000 hours*	4,000 hours	3,000 hours	1,500 hours
Humidity	4,000 hours*	4,000 hours	3,000 hours	1,500 hours
Warranty	10 Year Option w/ Adder	10 Years	5 Years	1 Year

*BEGA Accelerated Testing

BEGA's most recent round of 4,000 hour accelerated testing, initiated in February of 2020 and in concert with the launch of BEGA Unidure® technology, is being conducted in our Menden testing laboratories this very moment. Testing will be evaluated every 500 hours to ensure no premature failures are identified. All parts are processed using BEGA North America suppliers, materials, and production processes, with a targeted coverage thickness of 3 mils.

In support of our commitment to quality, all test results will be shared upon request. Preliminary results will guide us in our pursuit of quality above all and will be foundational in the eventual certification of BEGA Unidure® through an independent testing laboratory.

Quantifying Color Retention (Delta-E)

You don’t have to spend too long in the color management world before you come across the term Delta-E. As with many things color, it seems simple to understand at first, yet the closer you look, the more elusive it gets. In its most simple form, Delta-E (dE) is a single number that represents the ‘distance’ between two colors. The idea is that a dE of 1.0 is the smallest color difference the human eye can see.

So, any dE less than 1.0 is imperceptible, and it stands to reason that any dE greater than 1.0 is noticeable. It can be stated, therefore, that BEGA Unidure® retains its color to a dE of ≤ 5 over ten years, providing a 100% improvement in color retention compared to Super Durable Polyesters of like color.

Defining Chalk Resistance

Chalking is a powdery, friable layer on the surface of a coating. It is normally caused by exposure to UV light or other forms of radiation, like nuclear. Chalking is especially prevalent with flat, white, or very light-colored paints that contain high levels of titanium dioxide and extenders. A low degree of chalking is often beneficial to whites and off-whites, since it tends to rid the surface of a certain amount of dirt and mold. Excessive chalking is detrimental because it can lighten the color of the paint, erode the paint film (resulting in a loss of protection), or run down onto the underlying structure and deface the appearance of the surface.

Chalk must be removed before repainting and can be considered similar to dust and dirt. BEGA Unidure® technology, combined with a deep matte, fine textured coating, offers superior chalk resistance for architectural outdoor applications.

The two black color swatches above represent a Delta-E of 5.0004. This example is for reference only, as different computer screens, operating systems, and web browsers have different color characteristics.

Environmentally Conscious

All BEGA finishes are RoHS compliant. BEGA's finishing process is a closed-loop system, meaning extra precautions are taken to manage the waste-water stream, and absolutely no water or chemicals are discharged into the local sewer system. Our process is chrome-free and phosphate-free, making it the logical choice for environmentally conscious clients.

BERG

5-Year Warranty

BEGA Limited Warranty

All materials and component parts are guaranteed to be free from defects of material and/or workmanship for a period of five years from the date of shipment.

Limit of Liability

BEGA's liability under the BEGA Limited Warranty is expressly limited to the repair or replacement of such parts where, in BEGA's sole judgment, damage is caused by a defect and not misuse, and is limited to such repair and replacement being made at the factory.

LED failure is defined as having 15% or more LED's not illuminated in a luminaire. Non-LED sources, ballasts and transformers are covered to the extent of that particular manufacturer's warranty. Freight charges to and from the factory will be borne by the purchaser. BEGA's Limited Warranty excludes claims for lost profits, indirect, special or consequential damages, labor, performance, materials, or deductions from invoices. Unauthorized repairs or alterations will void the BEGA Limited Warranty.

BEGA