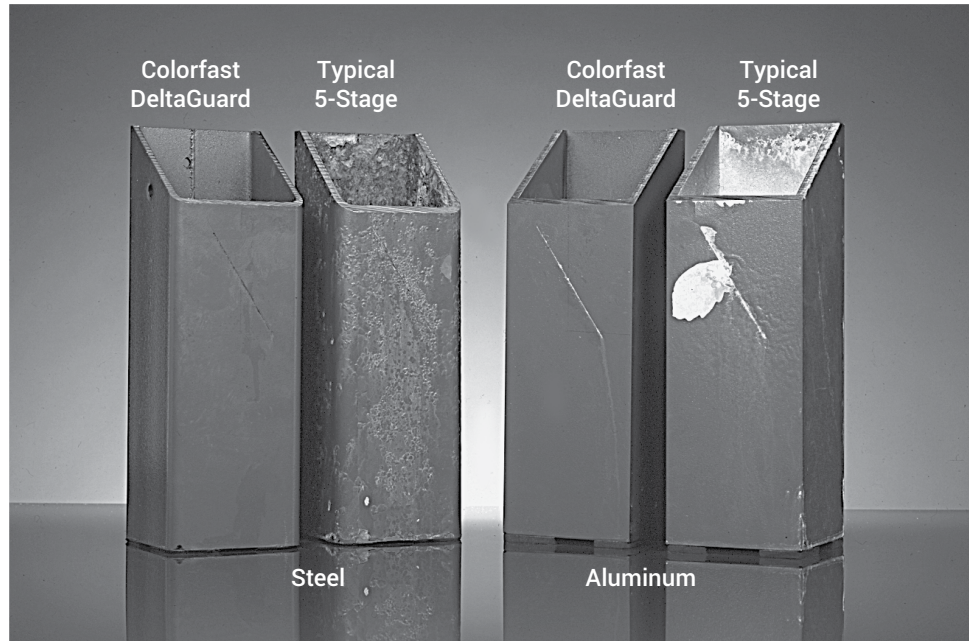


TECHNICAL DATA TD-1

COLORFAST DELTAGUARD® FINISH

Salt Fog Test Results

The same 3-mil thickness of powder was applied to each of these four pole section samples, which were then scored and exposed to a salt fog test for 2,500 hours



Cleaning

All surfaces, inside and out, shall undergo a high-temperature, total immersion cleaning process. For steel products, this process shall include two buffered alkaline cleaning stages, two clear water rinses, one hot pickle and two more clear water rinses. For aluminum products, this process shall include two buffered alkaline cleaning stages followed by two clear water rinses

Pretreatment

All cleaned surfaces, inside and out, shall be chemically pretreated by total immersion. For steel products this process shall include one zinc phosphate coating, one clear water rinse, one non-chrome seal bath and two reverse osmosis water rinses. For aluminum products, this process shall include one non-chrome conversion and two reverse osmosis water rinses

E-Coat Primer

All cleaned and pretreated surfaces, inside and out, shall receive a 0.7 to 1.5 mil epoxy primer applied by cathodic electrodeposition process through total immersion. Coating throw shall be a minimum two feet from top and bottom on inside surface of poles. For both steel and aluminum products the process shall include one E-coat stage, one permeate spray rinse, two permeate immersion rinses, followed by a dehydration bake-out and high temperature curing

Powder Topcoat

All exposed surfaces shall receive an ultra-durable powder topcoat, electrostatically applied between 2.5 and 6.0 mil. Topcoat shall be cured with a uniform temperature controlled baking process

Environmental Considerations

The finishing facility shall be environmentally clean and produce minimal air pollution. The process shall use no heavy metals. All materials used or applied shall be extremely low in volatile organic compounds (VOCs). The facility and the process shall exceed all EPA and DNR requirements

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COLORFAST DELTAGUARD® FINISH

The Colorfast DeltaGuard Process

The Colorfast DeltaGuard system employs an exclusive 18 stage full immersion system that provides cleaning, pretreatment, epoxy electrodeposition (E-coating), and an ultra-durable powder topcoat. Each stage is listed below:

Cleaning

Seven full immersion cleaning stages are performed to remove all organic materials and contaminants from the metal surfaces

Stage	Steel	Aluminum	Description
1	X	X	All parts are fully immersed in a buffered alkaline cleaner
2	X	X	Second immersion in a buffered alkaline cleaner. Fresh cleaner is continuously metered in
3	X	X	Clear water immersion rinse
4	X	X	Second clear water immersion rinse. Fresh water is continuously metered in
5	X		Hot immersion acid pickle to remove rust, welding slag and mill scale from steel
6	X		Clear water immersion rinse
7	X		Titanium conditioner immersion rinse

Pretreatment

Seven pretreatment stages, using heavy-metal-free conditioners, prepare the metal surfaces for optimal adhesion for E-coating

Stage	Steel	Aluminum	Description
8	X		Immersion zinc phosphate coating
9	X		Clear water immersion rinse
10		X	Non-chrome conversion coating for aluminum
11		X	Clear water reverse osmosis immersion rinse
12	X		Non-chrome seal for steel
13	X	X	Clear water reverse osmosis immersion rinse
14	X	X	Clear water reverse osmosis immersion rinse

E-coat Primer

Lead-free epoxy primer is applied via cathodic electrocoating. Parts are fully immersed, and electrified particles are drawn to the metal, forming uniform coverage over every surface and contour of the part

Stage	Steel	Aluminum	Description
15	X	X	Electrocoat (E-coat) primer. This black lead-free paint is deposited evenly (1 mil thickness)
16	X	X	Recirculating permeate spray rinse (removes excess paint)
17	X	X	Second fresh permeate immersion rinse (removes excess paint)
18	X	X	Third fresh permeate immersion rinse (removes excess paint)

After E-coat application and rinsing stages, the parts are moved through dehydration and curing ovens (365°F for 30 minutes). Once the epoxy coating is thermoset into place, parts are cooled to room temperature in the cooling chamber. Epoxy is an excellent primer in that it has outstanding corrosion resistance and provides a superior substrate for topcoats

Ultra-durable Powder Topcoat

Parts are moved to a temperature/humidity controlled area for the application of ultra-durable powder paint topcoat. Cree has worked in close alliance with its suppliers to develop an ultra-durable powder paint that provides excellent ultraviolet resistance, hardness, adhesion, corrosion and chemical resistance. The powder paint is applied with electrostatic guns to provide uniform coverage. Two automatic spray gun booths allow quick color changeovers for flexibility of color selection without prohibitive setup time. Powder covered parts are moved through a bake-out oven where parts are heated between 385° – 425°F for approximately 25 minutes. The ultra-durable topcoat paint is thermoset into place, and then passes through a cool down tunnel where parts are cooled to room temperature.

Note: Refer to <http://lighting.cree.com/warranty> for warranty terms