metal finishing

technical information

February 2012

METAL FINISHING

Landscape Forms metal outdoor furniture is finished using Landscape Forms' exclusive Pangard II® Polyester Powdercoat System. The Pangard II® multi-step system of cleaning, priming and powdercoating produces the finest metal finish available for site furniture. It provides an attractive, durable metal finish that

- prevents corrosion
- is extremely hard
- retains sufficient flexibility to resist cracking and chipping
- is UV stable
- is impact resistant
- has outstanding gloss retention
- has excellent abrasion resistance
- has good chemical resistance

Pangard II® polyester powdercoat is lead-free, hazardous air pollutant (HAPS) free, does not generate hazardous waste, and contains less than 1% Volatile Organic Compounds (VOC's).

METAL PREPARATION AND CLEANING

Rigorous preparation is key to a successful finish. At Landscape Forms this begins with brushing, grinding, filing or sandblasting welded parts to remove carbon and prepare the metal for cleaning and pre-treatment.

- Products are cleaned using a heated wash to degrease and remove surface oils.

- A zinc phosphate pre-treatment is applied. The zinc finish builds a structure with good bite and hold for coating and is highly resistant to corrosion creep.
- Some aluminum extrusions get a paintable anodic coating for paint adhesion and corrosion resistance.

Unlike many site furniture manufacturers that use an iron phosphate or sandblasting pre-treatment on metal products, Landscape Forms uses zinc phosphate because it produces a more durable finish than either of these two methods. The sacrificial zinc gives the treated metal self-healing properties. Under abuse in the field, even if the finish is cut or scraped right down to the metal, the layer of zinc helps prevent corrosion creep.

EPOXY UNDERCOAT

- An epoxy undercoat (e-coat) is applied to steel and aluminum products. The e-coat provides strong cohesion to the zinc substrate pre-treatment with additional protection for the metal and acts as a moisture barrier between the substrate and the final finish. It penetrates all crevices, including those not readily reached by powdercoating, to protect against corrosion. When reheated during the powdercoating process, it provides a good foundation for adhesion to the powdercoat.

- The e-coat is oven cured in preparation for powdercoat applications.

POWDERCOAT FINISH

- E-coated steel and aluminum products are thoroughly cleaned, rinsed and dried to remove oils, dust and debris in preparation for powdercoat.
- Two coats of powdercoat are applied, with oven curing after each application. All brackets and connectors are finished along with product parts to ensure uniformity of color.
- The topcoat is applied over the primer and parts are again cured in an oven. This heating process cross-links the coating and fuses it to the prime coat. The topcoat adds depth to the finish and provides color and gloss protection. The average film thickness for most colors is six mils.

Landscape Forms uses the most technologically advanced application equipment available. The application equipment on our paint lines provide complete coverage even in hard-to-reach areas; uniformity of thickness; and improved charging of powder particles to achieve optimal transfer efficiency and limit waste.

The result of this multi-step process is beautiful, impact-, light-, weather– and corrosion-resistant furniture that is exceptionally durable and prepared for many years of active use with minimal maintenance.

Maintenance

The Pangard II® polyester powdercoat finish requires minimal routine maintenance. Surface dirt may be removed with a brush or sponge and water mixed with a mild detergent. High pressure washing (not to exceed 500psi) with a mild detergent removes stubborn dirt. Steam cleaning is not recommended.

MECHANICAL & ENVIRONMENTAL PROPERTIES OF PANGARD II® POLYESTER POWDERCOAT

Property	Test Method	Performance
Color (non-metallic)	CIE L*A*B*	Delta E 1.0 Max
Gloss Consistency (Gardner 60)	ASTM D-523	+/-5
UV Resistance (Color)	ASTM G155, cycle 7	Delta E <2 @ 2.0 mils
UV Resistance (Gloss)	ASTM G155, cycle 7	<20% loss
Solvent Rub	PT-310.070	10 double
Corrosion Resistance 1500 hr. test	ASTM B 117	Max undercutting 1mm
Cross Hatch Adhesion	ASTM D-3359 method B	100% Pass
Flexibility (conical mandrel)	ASTM D-522	3mm @ 2mils
Erichsen Cupping	ISO 1520	8mm
Impression hardness (Buchholtz)	ISO 2815	95
Direct Impact Test	ASTM D 2794	60 in/lbs @2.5 mils
Reverse Impact Test	ASTM D 2794	60 in/lbs @2.5 mils
Pencil Hardness	ASTM D 3363	2H (min)
Chip Resistance	ASTM D 3170-03	100% pass
Chemical Resistance	ASTM 1308	
Humidity Resistance 1500 hr test	ASTM D 2247-87	Max blisters 1mm
Total Durability	LF- Total Durability	Pass @ 1.5, 5, 9.5 mils

landscapeforms™

431 Lawndale Avenue, Kalamazoo, MI 49048 P 800.521.2546 F 269.381.3455
www.landscapeforms.com specify@landscapeforms.com