

metal finishing

technical information

November 2004

METAL FINISHING QUALITY

To achieve an attractive, durable metal finish for exterior use, key elements are essential:

Corrosion resistance achieved by cleaning the raw steel and applying a rust-inhibitive coating.

Strong adhesion of the topcoat to the rust-inhibitive coating.

High-quality topcoat that offers color choice, color stability in ultraviolet light, gloss retention, flexibility, and resistance to impact, abrasion, and chemicals.

PANGARD II® POLYESTER POWDERCOAT SYSTEM

Pangard II®, offered exclusively by Landscape Forms, is a program of cleaning, priming, and powdercoating that produces the finest metal finish available for site furniture.

Corrosion Resistance: The Pangard II® system includes multiple stages of washing and zinc phosphate pre-treatment. The next step is submersion in an epoxy primer that penetrates every crevice and provides strong adhesion to the pretreated zinc substrate and the topcoat.

High Quality Topcoat: Landscape Forms applies polyester powdercoat and cures it in an oven. This heating process cross-links the coating and fuses it to the prime coat. Average film thickness is greater than 3 mils (75 microns).

The Final Result is a finish that prevents rust, is extremely hard and tightly bonded, yet retains enough flexibility to resist cracking and chipping. Pangard II® is light stable, has outstanding gloss retention, excellent abrasion resistance, and superior chemical resistance. It is also environmentally acceptable.

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 500 psi) with a mild detergent removes stubborn dirt. Steam cleaning is not recommended.

COMPARISON TO OTHER FINISHING PROCESS

Other types of corrosion resistant coatings and topcoats are available on the market.

During the Pangard II® development process we investigated several procedures with the following results:

Phosphate and zinc plating by themselves offer a clean surface, but little rust protection.

Liquid coatings fail to give rust protection in undercut areas, are not "fused" to the metal, and scratch or nick easily, allowing rust a foothold.

Galvanizing inhibits rust, but provides poor adhesion. The topcoat easily chips away.

Plastic-dipped topcoats, such as vinyl or PVC, do not bond to the metal, but wrap around it like shrink wrap. This finish is pliable, but it is vulnerable to cuts and scrapes and once started, it peels like an orange. These materials also have a glossy finish, limited color choice and poor gloss retention. They perform poorly in abrasion and adhesion tests.

Epoxy topcoats, wet sprayed or powdercoated, are good for interior applications, but are not UV stable in exterior situations.

MECHANICAL & ENVIRONMENTAL PROPERTIES OF LANDSCAPE FORMS PANGARD II® POLYESTER POWDERCOAT

Property	Test Method	Typical Value
Gloss according to Garner 60 deg.	ASTM D 523	80 - 90
Cross hatch adhesion	ASTM D 3359 method B	pass 100%
Mandrel bending test	ASTM D 522	1/8"/3mm
Erichsen cupping	ISO 1520	5/16"/8mm
Impression hardness according to Buchholz	ISO 2815	95
Impact test	ASTM D 2794-90	60in/lb @ 2.5 mils
Pencil hardness	ASTM D 3363	2H (min)
Drill mill tests:	na	ok
Saltspray resistance 1500 hr test	ASTM B 117	max undercutting 1/16"/1mm
Humidity resistance 1500 hr test	ASTM D 2247-68	max. blisters 1/16"/1mm
Solvent rub	PT-310-070	10 Double
UV resistance	ASTM G155, cycle 7	pass @ 2.0 mils
Color	CIEL *A*B*	Delta E 1.0 max
Edge coverage	LF Edge	50% minimum