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FLOORS GALORE! 3

Let Polymers and Application Method Guide Your Selection

By Floyd Dimmick, Sr.

In "Floors Galore!," the first article of this series, I noted that the selection process of decorative polymer floor overlays should be determined by thickness and method of application. "Floors Galore 2" addressed the aesthetics, quality, versatility, durability, maintainability, and polymer selection by exposure. Included was a pull-out checklist to guide you in choosing the right system.

What I've tried to stress in both articles is the importance of looking at the 'big picture," which means understanding your customers' desires and fears concerning their floors. Once you have gathered the data from your inspection checklist, the next step is to select the polymers and application method. Remember, it's important to estimate the entire project cost by using different application methods and selecting which method provides the fastest installation and overall cost-effectiveness. However, applicators should not compromise protection and maintenance as part of this selection process.

A Few Basic Rules

The first rule of polymer selection is to create the strongest possible attachment to the substrate. The foundation of the overlay durability is the polymer that becomes a part of the concrete. In different systems, the first contact polymer is called a primer, membrane, or base coat. This portion of the system is required to take up all the stresses developed during quick thermal changes, impact, or shear, and maintain adhesion without stressing the substrate. The most compatible polymer with concrete is a low- or medium-modulus epoxy.

The second rule is to select polymers with the best compatibility. The polymer should never blush, develop a greasy film on the surface during curing, or be so dense that the surface requires sanding before placement of the next polymer. Follow the polymer manufacturer's guidelines on the limitation of time to place the next polymer. Going past that period may prevent adhesion of the next polymer or reduce the overall life cycle of the system.

The third rule is to determine if UV resistance of the overlay is important to the project. Not all projects require this protection. However, when UV rays from the sun and some interior overhead lighting systems shine on the surface of the polymer overlay, non-resistant polymers will turn an amber color over time. How fast this occurs depends on the polymer formula. Moreover, if the exposure is only on a portion of a non-UV-resistant decorative floor, that portion of the floor will turn color, while the unexposed portion of the floor will keep its high gloss and great appearance. Imagine the decorative floor surface becoming two different colors. The UV-exposed area will become dull and amber and the unexposed area will maintain its high gloss. This is one of the most important selection considerations in designing the overlay system.

No Magic – No Cure-alls

Since most polymer formulations are proprietary, it is important to consult with polymer manufacturers regarding their products. The properties and performance of products vary widely. In addition, when products are combined to create a system, the properties and performance can change. However, an experienced person with concrete and polymers and knowledge should select and combine the polymers into an overlay system. The following table is fundamental from a system design perspective and only the required physical properties of the polymers need to be included in the selection process. Use wisdom in your selection and beautiful floors are a reality. CP

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The Selection Process by Polymer & Application Method

Polymer OverlayTypes	Typical Thickness	Application Methods	Primer		Base Coat (1)		Slurry	Self-Leveling	Troweled	Topcoat	Aggregate and Notes
			Req.	Polymer	Req.	Polymer	Polymer	Polymer	Polymer	Polymer	
Neat Coatings		1									
One coat	10-15 mils		No		Yes	E					Aggregate broadcast into topcoat for anti-skid properties only (AATC)
Two coats	20-40 mils		Yes	E	Yes	E,P,PU,M					
Three coats	30-60 mils		Yes	E	Yes	E,P,PU,M				E,P,PU,M	
Random Flake											
Min. two coats	20 mils	1	Yes	E (2)	No					E	AATC
Min. three coats	30 mils	1	Yes	E	Yes	PU (2)				PU	AATC + UV Resistant
Imaging Overlays System	40 mils-¼ in	1	Yes	E	Yes	E,PU (3)				PU	TC + UV Resistant
Broadcast Coating Systems											
Single broadcast — flake	1/16 in	1	No		Yes	E (4)				E, P, PU	AATC, P & PU UV Resistant
Double broadcast — flake	⅛ - ¼ in	1	No			E (5)				E, P, PU	AATC, P & PU UV Resistant
Single broadcast — colored quartz	1/16 in	1	No			E (6) (8)				E, P, PU	Aggregate broadcast into wet polymer. Pigmented Aggregate, P & PU UV Resistant
Double broadcast — colored quartz	⅛ - ¼ in	1	No		Yes	E (7) (8)				E, P, PU	Aggregate broadcast into wet polymer. Pigmented aggregate, P & PU UV Resistant
Slurry Broadcast System	⅛-⅜ in	2 & 1	No		No		E (9)			E, P, PU	
Self-Leveling	⅛-3/16 in	2 & 1	No		No			E (10)		E, P, PU	AATC, P & PU UV Resistant
Troweled Polymer Concretes											
Closed Dense Systems											
	¼ in	3, 4, 1	Yes	E					E,M,PE(11)	E, P, PU	Aggregate is mixed with the polymer then placed and compacted. AATC, P & PU UV Resistant
	unlimited depth	3, 4, 1	No						E, M, PE	E, P, PU	
Decorative Natural Stone Systems	Typ.¼ in, ⅛ - ⅜ in	3, 4, 5	Yes	E					E, (12)	E, P, PU	Aggregate is mixed with the polymer then placed and compacted. AATC, P & PU UV Resistant
Closed Decorative Terrazzo Systems	¼-⅜ in	3, 4, 1	Yes	E					E (13)	P, PU	Aggregate is mixed with the polymer, troweled and compacted. The surface is ground smooth and a topcoat applied.
Decorative Pigmented Stone System	⅜ in	3, 5	No						E (14)	P, PU	Aggregate is mixed with the polymer then placed and compacted. Pigmented aggregate, P & PU UV Resistant

Application Methods

1 — Squeegee & Roller
2 — Gauge Rake
3 — Hand Troweled
4 — Power Troweled
5 — Roller

Polymer Code	Comments
E=Epoxy	100% solids, nearly no odor, no shrinkage, no blush, clear or pigmented
P=Polyurethane	35 to 60% solids, high odor, many flammable, shrinkage, no blush, clear or pigmented
PU=Polyurea	100% solids, nearly no odor, no shrinkage, no blush, clear or pigmented
M= Methacrylate	100% solids, high odor, no shrinkage, no blush, satin or pigmented
PE=Polyester	Typ.70% solids, highly objectionable odor, toxic fumes, shrinkage, blush, pigmented

Additional Notes

- Typically most base coats are also resurfacers. They may be used as the base coat or primer and as the pigmented topcoat.
- Vinyl chips or flakes are lightly broadcast into the wet coating and sealed under the topcoat.
- The base coat acts as an adhesive to hold the imaging fabric.
- Vinyl chips or flakes are broadcast into the wet coating and sealed under the topcoat.
- Vinyl chips or flakes are broadcast into both wet coatings and sealed under the topcoat.
- Colored quartz sands are broadcast into the wet coating and sealed under the topcoat.
- Colored quartz sands are broadcast into both wet coatings and sealed under the topcoat.
- Option - Silica sands may be broadcast into single or double lift applications by using pigmented polymers for solid color overlays.
- Slurry mix consists of epoxy and a suspended aggregate.
- No aggregates are ever broadcast into a self-leveling system.
- All polymer concretes are not equal. Some require priming — other are self priming. Some have high air content (voids in the overlay) up to 22% and require a seal or grout coat to prevent the top coat from penetrating into the porous polymer concrete — others are dense with less than 2% air. The less air content, the longer the life-cycle of the overlay with less maintenance.
- If water is trapped in the overlay voids and freezes it can cause surface spalling.
- Decorative patterns and designs are common with this overlay. Mainly an interior application.
- Inlays such as logos and art are common with this overlay. Mainly an interior application.

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