Resinous Flooring: Understanding Systems & Performance

TECHNICAL GUIDE 03 | Guide to Resinous Floors

Understanding Resinous Flooring

Resinous flooring is formed by applying liquid materials to a properly prepared substrate. As the materials cure, they create a continuous wearing surface that can be designed for durability, cleanability, chemical resistance, traction and appearance. Unlike polished concrete, the finished wearing surface is a coating system over the concrete.

A resinous floor is often made from several compatible layers. For example, a decorative flake floor may use an epoxy base and a urethane or polyaspartic topcoat. The visible finish and the resin chemistry are not the same thing.

The right system starts with the environment

The most successful resinous floor is selected for its actual service conditions—not simply its color or resin name. Substrate preparation, moisture evaluation, system design, topcoat and maintenance all contribute to long-term performance.

01 | Appearance and make up

Solid color, decorative flake and decorative quartz describe how a floor looks and how aggregate may be incorporated. Epoxy, urethane cement and polyaspartic describe different material technologies. These categories overlap: the same decorative appearance may be achieved using different resin combinations in each layer of the floor.

Solid-color epoxy

A continuous, relatively uniform-colored surface used in warehouses, manufacturing and commercial areas. The primer, epoxy body coat, thickness and topcoat are selected for expected traffic, spills and cleaning. A thin coating is not equivalent to a heavy-duty industrial system

Decorative flake

Colored polymer flakes are broadcast into a resinous base and sealed with protective topcoats. Flake coverage and size give a lot of options for aesthetics; the topcoat and surface texture influence cleaning, wear and traction. Common applications include garages, corridors and commercial interiors.

Decorative quartz

Colored quartz aggregate is broadcast into resinous material to create a decorative, textured floor. Quartz can be useful in restrooms, locker rooms and institutional or commercial areas where traction and appearance matter. More texture can improve traction under some conditions but can also make cleaning more demanding.

Sand Broadcast

Sand is broadcast into resinous material to create a non-slip, textured floor. This can be useful in restrooms, locker rooms and institutional or commercial areas where traction and budget are the most important features. More texture improves traction under some conditions but can also make cleaning more demanding

Urethane cement

Urethane cement (also called cementitious urethane) is a heavy-duty system often used in food processing, kitchens and demanding industrial environments. It can also be the foundation for any solid or aggregate floor in new construction because of its ability to eliminate the need for a vapor barrier. Properly selected systems can withstand certain thermal shocks, wet service and chemicals better than conventional thin-film coatings. Performance depends on the formulation, thickness and service conditions. Systems can be purely functional or highly aesthetic.

Polyaspartic

Polyaspartic materials can be used in complete flooring systems or as protective topcoats over compatible epoxy and decorative systems. Their faster cure can reduce downtime, and selected products offer good color stability and wear performance. Faster curing also makes temperature, moisture and installation conditions especially important.

CONCRAFTED

03 | Why the topcoat matters

The topcoat is exposed to daily foot traffic, wheels, cleaning equipment, spills and abrasion. For many epoxy floors, Concrafted commonly uses a protective urethane topcoat, often with aluminum oxide for additional abrasion resistance and surface texture.

Urethane topcoats

A compatible urethane topcoat can improve wear resistance, cleanability and resistance to selected chemicals. The result depends on the particular product, not simply the word “urethane.”

Aluminum oxide and slip resistance

Aluminum oxide is a hard mineral additive used in some topcoats to improve wear performance and contribute to texture. Slip resistance depends on the complete surface profile, contaminants, footwear and maintenance. No floor is slip-proof in every condition.

The texture trade-off

A smoother finish is often easier to mop and maintain, while a more aggressive texture can provide additional traction in wet or oily areas. The right balance depends on the actual use of the space.

04 | Integral cove base

An integral cove base extends the resinous floor up the wall, creating a continuous, curved transition rather than a sharp floor-to-wall corner. It can help make perimeter cleaning easier and reduce locations where dirt or moisture collects.

Cove base is especially useful in kitchens, food production, laboratories, restrooms and washdown spaces. Height, wall substrate, termination details and chemical or sanitation requirements should be coordinated with the overall system design.

05 | Concrete moisture and RH limitations

Moisture within concrete is a critical consideration for resinous flooring. Elevated internal moisture can contribute to blistering, loss of adhesion or other failures when the selected system is not designed for the measured conditions.

Relative humidity testing

Relative humidity (RH) testing evaluates moisture conditions within the slab. Each manufacturer and flooring system sets its own acceptable conditions; there is no single RH threshold that applies to every epoxy, urethane cement or polyaspartic system but a typical base line is 80%.

Some Concrafted system configurations include a purpose-designed moisture vapor mitigation layer when the slab conditions exceed the standard coating system's limits. This is different from simply adding another conventional epoxy coat.

Concrete moisture content and ambient air humidity are separate considerations, and both must be evaluated to ensure a successful installation.

06 | Why preparation is essential

Why the Concrete Matters

Successful coating depends on sound concrete and the right surface profile. Grinding or shot blasting removes unsuitable surface materials and creates texture for adhesion. The required profile depends on the product and system thickness. This is usually identified as the CSP or Concrete Surface Profile. Profiles are numbered by the aggressiveness of the texture. CSP-3 is commonly, but not exclusively, used for resinous coatings. This profile allows a mechanical bond between the concrete and the resin.

Existing coatings, adhesives, oil, cracks, repairs and weak concrete can require additional evaluation. Oils or contaminants in the concrete can repel the resin. A high-performance product cannot compensate for an unsound or contaminated substrate.

How Air Temperature and Humidity Affect Curing

Air temperature and relative humidity play an important role in the installation and curing of resinous flooring systems. Temperatures that are too low can slow chemical reactions, extending cure times and delaying when the floor can be used. Excessively high temperatures can accelerate curing, reducing the time available to properly apply and finish the material. High humidity can also interfere with certain coatings, potentially causing surface defects, cloudiness, or improper curing. Additionally, the concrete surface temperature must remain sufficiently above the dew point to prevent condensation, which can compromise adhesion and the finished appearance. Each resinous flooring product has specific environmental requirements, making proper temperature and humidity control essential throughout installation and curing.

Concrete moisture content and ambient air humidity are separate considerations, and both must be evaluated to ensure a successful installation.

07 | Comparing resinous flooring options

SYSTEM / FINISH	TYPICAL USE	KEY CONSIDERATIONS
Solid-color epoxy	Warehouse, manufacturing, commercial	Thickness, chemical exposure, topcoat, traffic
Decorative flake	Garages, corridors, commercial, institutional	Flake size, broadcast, texture, topcoat
Decorative quartz	Restrooms, locker rooms, institutional, commercial	Texture, wet service, cleaning
Urethane cement	Food production, kitchens, industrial	Thermal shock, chemicals, moisture, thickness
Polyaspartic	Decorative and time-sensitive projects	Cure time, temperature,

References & further reading

For project-specific performance and application limits, consult the current technical data sheets and installation instructions for the selected manufacturer's system, including moisture testing and mitigation requirements.

This guide is general educational information. Actual performance depends on the selected system, substrate, environment and maintenance.