MARSHALLTOWN
The Premier Line

perma-cast® shake-on color hardener

Perma-Cast® is a premium dry shake color hardener for use on interior floors and exterior hardscapes. The time-tested formulation of Perma-Cast® Color Hardener creates an extremely dense surface that is resistant to abrasion and the effects off reeze/thaw. It is available in a wide range of streak free, uniform colors ranging from subtle pastels to deep, rich hues. Perma-Cast® Color Hardener conforms to ASTM Standard C979 for color stability.

Blue Stone EDI 18220	Nantucket White EDI 18219	Ginkgo EDI 18205	Travertine EDI 18206
Gray Plum EDI 18196	Coral Gables Pink EDI 18207	Gray Linen EDI 18216	Bone EDI 18217
Wheat EDI 18215	French Cream EDI 18210	Arena Buff EDI 18208	Smoke EDI 18209
Slate Gray EDI 18214	Cape Cod Gray EDI 18212	Storm Gray EDI 18197	Deep Charcoal EDI 18198
Colina Tan EDI 18211	Walnut EDI 18199	Brick Red EDI 18200	Dark Red EDI 18201
Juniper EDI 18218	Terra Cotta EDI 18202	Chestnut EDI 18203	Russet EDI 18204

color selection guide

Color chart may vary from actual color due to printing, lighting, application and/or usage.

Perma-Cast® Shake-on Color Hardener

Technical Data Sheet P-0002

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FOR PROFESSIONAL USE ONLY. Read all applicable and current product information for your project: Technical Data Sheet (TDS), Color Chart, Installation Guide, Material Safety Data Sheet (MSDS).

1. Description: Perma-Cast® Shake-on Color Hardener is a dry shake, color hardener that is applied to the surface of freshly placed concrete. It is a cementitious-based coloring material that may be used to create abrasion resistant interior floors and freeze-thaw stable exterior hardscapes. The time-tested formulation of Perma-Cast® Shake-on Color Hardener creates an extremely dense surface that is resistant to foot and vehicular traffic, and extreme weather. It is available in a wide range of streak free, uniform colors ranging from subtle pastels to deep, rich hues. It is used to uniformly color gray concrete, or provide random accents of color on concrete integrally colored with Uni-Mix® Integral Colorant or Uni-Mix® Liquid. Perma-Cast® Shake-on Color Hardener is also used when imprinting, texturing, or stenciling new concrete with MARSHALLTOWN Stamping Tools, Texture Rollers or Stencils and Perma-Cast® Clear Liquid Release or Perma-Cast® Antiquing Release. Color hardened surfaces may also receive additional coloration by applying one or more colors of Perma-Cast® Sierra Stain™.

Perma-Cast® Shake-on Color Hardener is a precise blend of cement, silica quartz aggregates, synthetic iron oxides, and plasticizer. Perma-Cast® Shake-on Color Hardener conforms to ASTM Standard C979 for color stability. The water-reducing wetting agent in Perma-Cast® Shake-on Color Hardener allows it to be readily incorporated into the concrete surface, forming a rich paste that makes finishing easier. In addition to strength and durability, the color hardened surface is resistant to fading.

Perma-Cast® Shake-on Color Hardener adds a wide array of color options to your architectural designs and hardscape projects while providing an extremely durable surface for pedestrian and vehicular traffic. Perma-Cast® Shake-on Color Hardener, used in conjunction with varying finishing techniques such as jointing schemes, saw cutting and/or pattern stamping, can create a striking effect. Combinations of colors can be used to create a desired mood and theme. Perma-Cast® Shake-on Color Hardener is an excellent choice for high traffic industrial flooring, since it greatly increases the strength and durability of the concrete surface. Using lighter colors will optimize lighting in an industrial environment.

2. Limitations: Perma-Cast® Shake-on Color Hardener must be applied at the recommended broadcast rate. Review section 5. Coverage. Applying insufficient material will reduce the abrasion resistance and may alter the color of the cured surface. Perma-Cast® Shake-on Color Hardener should not be mixed into ready mixed concrete nor applied onto cementitious overlays.

Perma-Cast® Shake-on Color Hardener is intended for application during new concrete flatwork installations. It may, however, be mixed with water and then plastered onto fresh vertical concrete such as step risers or curbs. Review section 8.4 Vertical Surfaces before Installation. Utilize concrete mix designs, tools, and techniques that ensure the thorough hydration of the material for proper finishing and curing.

3. Cautions: Harmful if inhaled. This product contains silica (crystalline quartz) and Portland cement. Do not breathe dust. Prolonged exposure can result in Silicosis. Use with adequate ventilation. Portland cement may cause alkali burns. Irritating to eyes and skin. Wear a respirator, safety goggles, gloves, and other protective clothing during installation. Immediately after use, wash any area of exposed skin. If contact is made with the eyes, flush thoroughly with water, do not rub. Do not take internally. Keep out of reach of children and animals. Dispose of all residual materials according to local, state, and federal regulations. Slip resistant finishes, slip resistant additives must be utilized in order to minimize dry or wet slip. Read the Perma-Cast® Shake-on Color Hardener Material Safety Data Sheet (MSDS) before installing the product.

4. Packaging: Perma-Cast® Shake-on Color Hardener is packaged in 60-pound (27 kg) plastic pails. Shelf life is 2 to 3 years when stored in original containers in a cool dry environment . Stock should be rotated.

5. Coverage: For most applications and colors, coverage is 60-pounds per 100 square feet (2.9 kg/m²). Lighter colors require 90-120 pounds per 100 square feet (4.40-5.80 kg/m²). Slump, ambient temperature, humidity, use of admixtures or finishing aids, and finishing methods will affect the coverage rate of Perma-Cast® Shake-on Color Hardener.

6. Mix Design: Concrete should have a minimum of 5-sacks of cement per cubic yard of concrete. Exterior concrete requiring freeze/thaw resistance should have a minimum of 6-sacks of cement per cubic yard of concrete. Concrete must be free of reactive ingredients, and should be poured at a 4-inch (100 mm) slump or less. The water/cement ratio needs to be consistent throughout entire project. In hot weather the use of a set retarder should be considered. In cold weather, when an accelerator is needed, choose a non-chloride accelerator. Never use calcium chloride. All concrete subject to freeze/thaw cycles should be properly air entrained (typically 5%-7%), as dictated by the mix design. Perma-Cast® Shake-on Color Hardener is always consistent. There are other variables that can affect the appearance of concrete. The same slump and mix design must be maintained throughout the installation. Any alterations will affect the final color. Mixes containing fly ash may be difficult to finish when a color hardener is applied.

7. Subgrade: The subgrade should be carefully prepared and compacted using an approved gravel fill, such as CA-6. A minimum of 4 inches (100 mm) is recommended. The subgrade should be leveled to ensure a uniform thickness of concrete during placing and finishing. The subgrade must be free of frost with no standing water. Prior to placing concrete, dampen the sub-base with water.

If the color hardened surface will be stamped or stenciled, layout of the forms is especially critical. Set the forms to the correct elevation. The forms must be square at the corners. Install adequate bracing to keep the forms from moving or bulging once concrete placement has started.

8. Placing and Finishing: Once placing of the concrete has begun; do not randomly add water to the mixer drum or to the surface of the concrete. This potentially will create color variations and a strength loss in the color hardened surface. Water may be added to the drum before initial discharge to attain, but not to exceed, the specified slump. Once discharged, the specified slump must be maintained throughout the installation, particularly for adjacent pours of concrete. Never retemper concrete that has started to set. Water reducing and plasticizing admixtures may be used with Perma-Cast® Shake-on Color Hardener. However, use of such admixtures may effect the finishing and setting characteristics of the color hardened surface.

After placing, and initial bull floating or hand floating, no further finishing or application of the color hardener should be performed until the bleed water has dissipated from the surface. Do not use the color hardener product to absorb excess moisture from the concrete surface. Perma-Cast® Shake-on Color Hardener is typically hand broadcast. The first application should be approximately 2/3 of the required amount of color hardener. Once broadcast, allow the color hardener to absorb moisture, slightly darkening, before working the surface with a magnesium or wood float. After bull floating or hand floating, apply the remaining 1/3 balance of the color hardener, concentrating on those areas where the underlying gray concrete color is still visible. Float as before, after it has absorbed moisture.

If the slab is too wide to broadcast by hand, bridging the slab or the use of a mechanical

spreader may be more efficient. If a mechanical spreader is used, 85% of the color hardener should be broadcast in the first application with 15% being retained for broadcast on any light areas during the finishing operation. Water should never be applied to the color hardener, as it will weaken and discolor the surface. Perma-Cast® Shake-on Color Hardener must be correctly applied and finished before the underlying concrete starts to dry and harden. During hot or windy conditions, the use of an evaporation retarder or a finishing aid should be considered.

Texture all surfaces adequately and uniformly for slip resistance. Closing with a steel trowel can diminish the effectiveness of air entrainment at the surface and should be avoided where freeze/thaw is a concern. For exterior installations apply a broom, or swirl finish using a float. When brooming concrete, care should be taken to shake off any residual rinse water before brushing the surface. Apply adequate pressure while brooming, but avoid exposing the underlying concrete. Finishing techniques should be consistent and timely to avoid color and texture variations. Interior floors should not be burnished by aggressive hard troweling of the surface. Darkening of the surface may occur. All newly color hardened surfaces should be protected from damage from other trades, liquid spills and foot traffic until the surface is fully cured and sealed

8.1. STENCILING: If MARSHALLTOWN Stencils will be used to pattern the color hardened surface, place the stencils before the initial broadcast of Perma-Cast® Shake-on Color Hardener. Stencils should be placed after the bleed water has dissipated and set flat on the concrete surface. Utilize a stencil roller to lay the stencils on the surface of the concrete. Do not push the stencils below the concrete paste. Once the stencils are placed and trimmed, color hardener is applied as previously described. After finishing is complete, the stenciled and color hardened surface can be lightly broomed, floated or textured with MARSHALLTOWN Texture Rollers. Utilize Perma-Cast® Clear Liquid Release or Perma-Cast® Antiquing Release when texture rolling the color hardened surface. MARSHALLTOWN Stencils should be removed the same day after installation. Do not leave the stencils on the concrete surface overnight, which may their removal time consuming and cause damage to the stencil patterned surface.

8.2. ST AMPING: If the color hardened, surface will be imprinted with MARSHALLTOWN Stamping Tools, Perma-Cast® Clear Liquid Release, or Perma-Cast® Antiquing Release must be used to act as a bond breaker between the stamp mats and Perma-Cast® Shake-on Color Hardener. Imprinting should commence as soon as the surface is firm enough to bear the weight of the installer without excessively deflecting the mat tool, thereby causing depressions in the concrete surface. Stamping must be completed before the surface dries and hardens appreciably, rejecting or minimizing the accurate transfer of the pattern and texture. Read all applicable product Technical Data Sheets before installing.

8.3. CONTROL JOINTS: Random cracking of a concrete slab is minimized by the timely and correct placement of control joints. Control joints may be introduced during concrete placement with a groover, or after the concrete has reached initial, set by power sawing. Each method should be evaluated prior to installation and should be incorporated into the pre-job mock up. Refer to following The American Concrete Institute publications for additional information: Guide for Concrete Floor and Slab Construction (ACI 302.1R), Joints in Concrete Construction (ACI 224.3R)

8.4. VERTICAL SURFACES: On vertical surfaces such as risers or curbs, Perma-Cast® Shake-on Color Hardener may be plastered onto the freshly placed concrete at the rate of 70-90 pounds per 100 square feet (3.30 - 4.40 kg/m²). Perma-Cast® Shake-on Color hardener must be mixed with water and plastered onto surface with the aid of a bonding agent prior to the concrete curing completely, typically the same day of the pour and as soon as the verticals surfaces can be stripped of forming without slumping. Once the plaster mix is applied, employ the same finishing techniques that were utilized on the adjacent horizontal surfaces.

9. Curing and Sealing: Never use plastic sheeting or water spray to cure Perma-Cast® Shake-on Color Hardener, as it will mottle and streak the surface. Use curing blankets with caution. Use liquid, membrane-forming compounds such as Clear-Guard™ Cure & Seal or Color-Guard® Cure & Seal. Read Technical Data Sheets before using these products. Do not over apply. To avoid discoloration do not store objects on colored concrete for at least seven days after the pour. Cured and sealed surfaces may become slippery when wet if the concrete surface is not adequately finished for slip resistance. Incorporate a slip resistant additive into the sealer for additional slip resistance. Interior floors may be maintained with a slip resistant wax.

10. Maintenance: Periodically inspect surfaces sealed with Clear Guard® Cure & Seal or Color-Guard® Cure & Seal for wear or damage, and reseal as needed. Avoid exposing sealed surfaces to strong solvents and corrosives. Clean motor oil and gasoline spills as soon as possible. Avoid dragging, dropping or placing sharp objects on sealed surfaces. Prior to resealing, surfaces must be thoroughly cleaned, dry, and free from residual cleaning products or any condition that will affect adhesion. Do not over apply sealer. A slip resistant additive should be utilized when resealing colored concrete.

11. Quality Control: Cast a job site sample at least 21 days prior to the installation for approval of color and finish. Utilize all materials, tools, and techniques from the actual job in the mock-up. Consistent batching, pouring, finishing, curing, sealing, and preparation techniques, will ensure the uniformity of architectural concrete. Verify adequate wet and dry slip resistance. Discuss maintenance requirements.

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