APPLICATION GUIDELINES

Dura-Walk® Systems

WHY DO WE COAT CONCRETE?

- To protect the concrete as well as the structural components of the concrete structure.
- To protect occupied spaces below.
- To prevent accidents (slips, trips, and falls).
- To prevent damage to equipment.
- To prevent damage to products.
- To protect it from chemical attack. It is an alkaline product and will be attacked by acids.
- To protect it from soils, oils, and greases. Concrete can be porous and collect soil.
- To make it easier to maintain. It will cut maintenance costs.
- To add to the attractiveness of the workplace. This is especially important when potential customers are viewing the area.

UNDERSTANDING CONCRETE

CURING CONCRETE

After concrete is poured, a satisfactory moisture content and temperature between 50°F (10˚C) and 75°F (24˚C) must be maintained, for the concrete to cure (unless measures are taken to control the curing process in cooler/warmer temps). Adequate curing is vital to quality concrete. Curing has a strong influence on the properties of hardened concrete such as durability, strength, watertightness, abrasion resistance, volume stability, resistance to freezing and thawing, and deicer salts. Exposed slab surfaces are especially sensitive to curing. Surface strength development can be reduced significantly when curing is defective. Curing the concrete aids the chemical reaction called hydration. Most freshly mixed concrete contains considerably more water than is required for complete hydration of the cement; however, any appreciable loss of water by evaporation or otherwise will delay or prevent hydration. If temperatures are favorable, hydration is relatively rapid the first few days after concrete is placed; retaining water during this period is important. Good curing means evaporation should be prevented or reduced.

WHAT IS LAITANCE?

Laitance is a fine powder on the surface of new concrete that has been created by alkaline salt deposits. It must be removed by shot blasting prior to any coating being applied.

WHEN DO WE COAT CONCRETE?

Concrete cannot be coated until it is fully cured and laitance has been removed from the surface. Usually the curing process (water hydration) takes 28 days from time of pour when the concrete contains less than 5% moisture if conditions are ideal. However, it is possible for excess moisture to remain in the concrete for an extended period, prohibiting the immediate coating of the area.

HOW DO WE TEST CONCRETE PRIOR TO APPLICATION?

TEST FOR ADHESION ON EXISTING COATINGS

A pull test can help determine whether the new coating product will adhere to an existing coating and/or substrate. The area should be free of loose coating, debris, etc. The area should be solvent wiped, primed (if applicable), base coated with a rag or t-shirt like fabric embedded in a three-course application like process. Once allowed sufficient cure time (see product data sheets or Application Guidelines), attempt to pull the rag vertically from the substrate. The rag should tear prior to adhesion failure of the base coat to the substrate.

TEST FOR VAPOR EMISSION THROUGH CONCRETE SUBSTRATE

Using a calcium chloride test can help determine whether a concrete substrate has vapor emission levels that may prevent functional performance of new coating applications. The test determines how much vapor is traveling through the substrate by installing several test kits around the area to be coated and comparing the weight of the calcium chloride before and after the duration of the test. All testing should be documented and filed as a pre-job checklist item. A detailed outline for the test can be found online at https://www.humboldtmfg.com/vapor-emission-test-kit.html

TEST FOR MOISTURE

Hydrostatic pressure created by excessive moisture in the concrete will create a peeling problem with all products. If moisture is suspected in new concrete, wet or dark spots are evident, and/or the area feels damp, several tests can be performed to determine if excessive moisture is present in the concrete (Relative humidity readings of 75% or greater OR moisture content results above 4% are not coatable and may require additional steps prior to application of specified coating system). A reading exceeding 20 on a Delmhorst concrete and masonry moisture meter means that the concrete contains too much water. You can also test by placing a plastic sheet 4 ft. sq. square, taped securely on each side to the concrete for 36 hours; when removed, if it reveals a dark wet concrete floor, the concrete is too wet to coat. The concrete should be tested until the excessive moisture dissipates. Concrete slab-on-grade floors often have excessive moisture and vapor drive issues. These can be addressed through careful measuring of the vapor drive to help determine which and how many applications of moisture tolerant primers should be installed to combat the moisture drive. For slab-on-grade (SOG) applications, please contact your Garland technical representative.

SURFACE PREPARATION

A. **Concrete** – Special attention should be given to the surface profile of the substrate and freedom from contaminants and debris. Surface profile required for Dura-Walk Coating system is CSP-3. Consult with your Garland Representative for alternate procedures for coating over existing paints or coatings. Such procedures are highly dependent on specific job conditions. Curing compounds shall be approved by Garland for compatibility or removed by shotblasting. In the event specifications are not met, the following corrective procedures are recommended.

1. **Surface Contaminants** – Grinding or shotblasting may remove heavy deposits of contaminants.
2. **Fins and Projections** – Grind smooth.

PRECAUTIONS & PROTECTION OF WORK

A. Surface temperatures must be at least 40ºF and rising (4.44ºC) and ambient temperatures 5ºF and rising above dew point for application. Do not proceed if the temperature exceeds 90ºF. Do not proceed with application if precipitation is imminent.

B. While work is underway, and for 72 hours thereafter, traffic from other trades should be stopped, if possible. Installers and other essential mechanics should wear steel-spiked shoes. Shoes and clothing should be free from bitumen - even a small piece can discolor through many layers of coating. A piece of burlap or floor mat should be kept at the foot of ladders or stairs so that dirt or foreign material will not be tracked onto the work surface.

C. **Mixing Station** – A material mixing station should be established near the work area and protected to prevent material spills and/or splatter. Special care must be exercised to protect newly coated areas and/or areas not intended to be coated.

D. Adjacent surfaces not to be coated, such as walls, thresholds, fascias, etc., should be carefully masked before priming and coating. Mask vertical surfaces at the line detailed in the drawing or, if none is shown, mask 4” (10.16 cm) up from the deck. When primers are applied by spray, caution is necessary (particularly during windy weather) to prevent overspray damage.

PREPARATION EQUIPMENT OPTIONS

Selecting the method that optimizes a project's objective requires a good knowledge of available options. These method summaries compare the capabilities, limitations, and operating requirements for each surface preparation.

GRINDING – SUBSTRATE PREP & COATING REMOVAL

This method may be used on horizontal and vertical surfaces to remove deposits or existing coatings, and to achieve the required surface profile. The grinding stone or disc is applied under pressure and moved across the surface until the desired effect is achieved. Grinding may be used on almost any substrate and is suitable for both interior and exterior applications.

A. **Purpose** – Grinding is used on concrete surfaces in difficult access areas where shotblasting is not possible, in areas to reduce or smooth slight surface irregularities, to remove mineral deposits or thin coatings.

B. **Limitations** – Grinding is not recommended for the following applications:

- Occupied workspace (unless rigorous dust control methods are used)
- Surfaces of unknown composition

C. **Removal** – Practically restricted to surface protrusions and existing coatings. Grinding may be used to remove non-combustible or non-heat degenerative coatings. This method will successfully remove rigid epoxy, polyurethane, and methacrylate coatings. Grinding may also be used to remove efflorescence, rust, and other oxidized deposits.

D. **Environmental Factors**

1. Dry Grinding will produce a fine airborne dust, which may be minimized with dust control attachments. Debris generated by this method will contain fine particles of any material or contaminant being removed.
2. Grinding soft, easily charred materials will generate smoke, which may be considered hazardous. Preparation should include plans to adequately protect occupants and workers. Noise and vibration levels are considered to be low.

E. **Downtime** – Set-up requires very little time unless dust protection includes draping and taping. Changing stones or discs is quick. Frequency of replacement will depend on the composition of the stone or disc, substrate, and material being removed.

Note: Removal of existing coatings may require dumpsters for debris haul-off/removal.

F. **Clean Up** – Grinding will leave a fine powdered residue of the removed material. The residue generated can be swept, vacuumed, or blown off.

SHOT BLASTING – SUBSTRATE PREP

Shot blasting is principally used to roughen horizontal surfaces in preparation for the application of sealers, coatings, or polymer overlays. This method is also used to remove some existing coatings, adhesives, and surface contaminants. Shot blasting is suitable for use in both interior and exterior applications.

A. **Purpose** – Cleaning and profiling concrete surfaces by removing dirt, laitance, curing compounds, sealers, or other superficial contaminants in preparation for the application of protective materials. Shotblasting is suitable for the preparation (but not removal) of polyurethane coatings. Removal of thicker materials may require removal through a grinding process.

B. **Limitations** – This method is generally not suitable for removing uncured resin systems, resilient coatings, adhesives, and tar-based materials. The pattern and profile of shot blasted surfaces may be visible through concrete sealers and thin or clear coatings.

C. **Removal** – Removal is accomplished by the pulverizing effect of steel shot impacting the surface at high velocity. Depth of removal is controlled by shot size, machine set-up, and rate of travel.

D. **Environmental Factors** – Shotblast systems produce very little airborne dust or contamination. Most models can be fitted with a filter to further lower the level of airborne dust produced. Debris produced by shot blasting will contain particles of material or contaminants being removed. Any special requirements for containment and disposal will depend on the specific materials or contaminant being removed. Special ventilation provisions may be required when operating gasoline, diesel, or propane-powered units indoors. With the exception of some large machines, noise levels will usually be below 85 dB. Vibration is not considered to be a factor.

E. **Downtime** – Surfaces must be dry and broom cleaned prior to shot blasting. A test area is required to ensure that media size and machine adjustment will achieve desired performance.

F. **Clean Up** – Steel media may remain on the surface, in edges or corners, or trapped in cracks. It must be removed and can be recovered by using magnets, magnetic broom, or vacuum.

ACID ETCHING – SUBSTRATE PREP

If acid etching is necessary due to access and/or other limitations, Treadshield WB Primer would be recommended in lieu of the FC Primer. Contact Garland technical services before recommending or performing acid etching as a means of surface prep.

CAULKING AND REPAIR REQUIREMENTS

See Details (www.garlandco.com) for visual explanation.

SEALING OF CRACKS AND CONSTRUCTION JOINTS, SUBSTRATE CHANGES AND TRANSITIONS

This step is one of the most critical stages in the application of Dura-Walk systems. Success or failure in application of this system depends largely on the care with which the movement joints are removed, prepped, and installed.

The following treatments should be used:

A. **Concrete Control/Expansion Joints** – These are joints designed to allow for movement within the slab and/or structure due to thermal changes, vibration, or structural movement. See selected Dura-Walk System Crack Detail drawing for further explanation. Treat these joints as follows:

1. Remove existing sealant, grind, and prep the edges of the joint to receive new sealant. Install closed cell backer rod and Green-Lock Sealant XL per manufacturer's specifications.

B. **Non-moving Cracks, Concrete**

1. Cracks < 1/16" – Apply a 4" wide 23 mil detail coat of Dura-Walk Base Coat along the crack.
2. Cracks >1/16" - Rout the crack with a grinder approx.. ¼" x ¼ and install Green-Lock Sealant XL (see joint sealant detail for reference). Once sealant has cured, apply a 4" wide application of Dura-Walk FC Primer followed by a 23 mil detail coat of Dura-Walk Base Coat (see joint sealant detail for reference).

C. **Substrate Changes, Changes of Plane / Transitions**

1. Parapets, Curbs, Ventilators, Skylights, Pipe Penetrations, etc. – Any existing cove / transition joint sealant should be removed and the edges of the joint ground to remove any residual sealant. Install 1" x 1" cove joint utilizing Green-Lock Sealant XL (see Garland's cove joint detail for more information). Once sealant has cured, apply a 4" wide application of Dura-Walk FC Primer followed by a 23 mil detail coat of Dura-Walk Base Coat (see joint sealant detail for reference).

BASIC REPAIR

A. **Small/Shallow Depth Concrete Repairs**

1. **Perma-Top Patch Kit** – Sound the concrete to outline the size and shape of the spalled and/or debonded concrete area. Saw cut the perimeter of the repair area to prevent feathering out of the patch material. Chipped out the deteriorated concrete and around the reinforcing steel. Sandblast or grind the reinforcing steel and patch area to remove rust and surface contaminants that would prevent good adhesion of the repair material. Patch with Perma-Top Repair Kit per the product data sheets. Contact your Garland representative for typical shallow depth concrete repair detail for more information.
2. Once patch material has cured, rout the perimeter of the patch ¼" x ¼" and seal with GreenLock Sealant XL.

B. **Heavily Pitted Areas of Concrete**

1. **Leveling Course** – Shotblast or grind the pitted areas. Use a notched squeegee to float Treadshield Flex Primer over the pitted areas and broadcast to refusal sand aggregate into the epoxy while it is still wet. Allow to cure, remove and collect excess sand aggregate before installing Dura-Walk Traffic Coating system.

   Note: Larger and/or structural repairs may require different repair methods, products, supplemental/structural shoring, and potentially engineering services for shoring designs and load requirements.

SCOPE OF WORK FOR DURA-WALK TRAFFIC COATING SYSTEM

DURA-WALK PS (LIGHT DUTY PEDESTRIAN SYSTEM)

A. Shotblast all surfaces to receive coating.

B. Rout all cracks > 1/16” and caulk with Garland single-component Green-Lock Sealant XL.

C. Remove & Replace sealant at all expansion, control, cove, and construction joints with Green-Lock Sealant XL.

D. At all projections such as rails, pipes, etc., apply and tool Green-Lock Sealant XL at the perimeter of the base of the penetration.

E. In order to avoid dew point conditions during application, relative humidity must be no more than 75% and substrate temperature must be at least 5°F (3°C) above measured dew point temperatures.

F. Apply a 4” wide application of Dura-Walk FC Primer followed by a 23 mil detail coat of Dura-Walk Base Coat at all cracks, transitions, movement joints, control joints and cove joints.

G. Prime all surfaces to be coated with Dura-Walk FC Primer at the rate of 300 sf/gal, mix only as much as can be used in a 2 hour period and allow to cure.

H. Install one (1) 32 mil application of Dura-Walk Base Coat at the rate of 50 sf/gal. Apply Base Coat with a notched squeegee and back roll with a heavy-duty nap roller to help avoid pin holes and squeegee lines. Repair any pinholes as they occur. Allow Base Coat to cure overnight for at least 16 hours or until tacky and not wet (but not more than 72 hours before installing the intermediate or top coat).

I. Apply one (1) 16 mil application of Dura-Walk Top Coat in the desired color at the rate of 100 sf/ gal.. Apply Top Coat with a notched squeegee. While coating is still wet, broadcast 16/30 rounded sand aggregate uniformly into wet coating with a seed spreader at a rate of 10-20 lbs / 100 sf (a seed spreader tends to work very well in lieu of spreading by hand which typically results in uneven aggregate distribution). Back roll with a heavy-duty nap roller to help avoid pinholes and squeegee lines. Repair any pin holes as they occur. Allow Top Coat to cure overnight for at least 16 hours for foot traffic (72 hours for vehicular traffic).

Note: Larger sized aggregate can be used for additional traction in steep ramps (check with Garland technical rep for more info.

DURA-WALK PS HD (HEAVY DUTY PEDESTRIAN SYSTEM)

A. Shotblast all surfaces to receive coating.

B. Rout all cracks > 1/16” and caulk with Garland single-component Green-Lock Sealant XL.

C. Remove & Replace sealant at all expansion, control, cove, and construction joints with Green-Lock Sealant XL.

D. At all projections such as rails, pipes, etc., apply and tool Green-Lock Sealant XL at the perimeter of the base of the penetration.

E. In order to avoid dew point conditions during application, relative humidity must be no more than 75% and substrate temperature must be at least 5°F (3°C) above measured dew point temperatures.

F. Apply a 4” wide application of Dura-Walk FC Primer followed by a 23 mil detail coat of Dura-Walk Base Coat at all cracks, transitions, movement joints, control joints and cove joints.

G. Prime all surfaces to be coated with Dura-Walk FC Primer at the rate of 300 sf/gal, mix only as much as can be used in a 2 hour period and allow to cure.

H. Install one (1) 32 mil application of Dura-Walk Base Coat at the rate of 50 sf/gal in low humidity conditions. Apply Base Coat with a notched squeegee and back roll with a heavy-duty nap roller to help avoid pin holes and squeegee lines. Repair any pinholes as they occur. Allow Base Coat to cure overnight for at least 16 hours or until tacky and not wet (but not more than 72 hours before installing the intermediate or top coat).

I. Apply one (1) 16 mil application of Dura-Walk Top Coat as an intermediate wear course at the rate of 100 sf/ gal.. Apply intermediate coat with a notched squeegee. While coating is still wet, broadcast 1630 rounded sand aggregate uniformly into wet coating with a seed spreader at a rate of 10-20 lbs / 100 sf (a seed spreader tends to work very well in lieu of spreading by hand which typically results in uneven aggregate distribution). Back roll with a heavy-duty nap roller to help avoid pinholes and squeegee lines. Repair any pin holes as they occur. Allow the Intermediate Coat to cure overnight for at least 16 hours or until tacky and not wet (but not more than 72 hours before installing the intermediate or top coat).

J. Apply one (1) 16 mil application of Dura-Walk Top Coat in the desired color at the rate of 100 sf/ gal.. Apply Top Coat with a notched squeegee. While coating is still wet, broadcast 16/30 rounded sand aggregate uniformly into wet coating with a seed spreader at a rate of 10-20 lbs / 100 sf (a seed spreader tends to work very well in lieu of spreading by hand which typically results in uneven aggregate distribution). Back roll with a heavy-duty nap roller to help avoid pinholes and squeegee lines. Repair any pin holes as they occur. Allow Top Coat to cure overnight for at least 16 hours for foot traffic (72 hours for vehicular traffic).

Note: Larger sized aggregate can be used for additional traction in steep ramps (check with Garland technical rep for more info.

DURA-WALK VS (VEHICULAR SYSTEM)

A. Shotblast all surfaces to receive coating.

B. Rout all cracks > 1/16" and caulk with Garland single-component Green-Lock Sealant XL.

C. Remove & Replace sealant at all expansion, control, cove, and construction joints with Green-Lock Sealant XL.

D. At all projections such as rails, pipes, etc., apply and tool Green-Lock Sealant XL at the perimeter of the base of the penetration.

E. In order to avoid dew point conditions during application, relative humidity must be no more than 75% and substrate temperature must be at least 5°F (3°C) above measured dew point temperatures.

F. Apply a 4" wide application of Dura-Walk FC Primer followed by a 23 mil detail coat of Dura-Walk Base Coat at all cracks, transitions, movement joints, control joints and cove joints.

G. Prime all surfaces to be coated with Dura-Walk FC Primer at the rate of 300 sf/gal, mix only as much as can be used in a 2-hour period and allow to cure.

H. Install one (1) 32 mil application of Dura-Walk Base Coat at the rate of 50 sf/gal in low humidity conditions. Apply Base Coat with a notched squeegee and back roll with a heavy-duty nap roller to help avoid pin holes and squeegee lines. Repair any pinholes as they occur. Allow Base Coat to cure overnight for at least 16 hours or until tacky and not wet (but not more than 72 hours before installing the intermediate or top coat).

I. Apply one (1) 16 mil application of Dura-Walk Top Coat as an intermediate wear course at the rate of 100 sf/ gal.. Apply intermediate coat with a notched squeegee. While coating is still wet, broadcast 1630 rounded sand aggregate uniformly into wet coating with a seed spreader at a rate of 10-20 lbs / 100 sf (a seed spreader tends to work very well in lieu of spreading by hand which typically results in uneven aggregate distribution). Back roll with a heavy-duty nap roller to help avoid pinholes and squeegee lines. Repair any pin holes as they occur. Allow the Intermediate Coat to cure overnight for at least 16 hours or until tacky and not wet (but not more than 72 hours before installing the intermediate or top coat).

J. Heavy Traffic Areas: Ramp and turn radius will receive one (1) additional 16 mil wear course of Dura-Walk Top Coat at a rate of 100 sf/ gal.. Apply coating with a notched squeegee. While coating is still wet, broadcast 16/30 rounded sand aggregate uniformly into wet coating with a seed spreader at a rate of 10-20 lbs / 100 sf (a seed spreader tends to work very well in lieu of spreading by hand which typically results in uneven aggregate distribution). Back roll with a heavy-duty nap roller to help avoid pinholes and squeegee lines. Repair any pin holes as they occur. Allow Top Coat to cure overnight for at least 16 hours or until tacky and not wet (but not more than 72 hours before installing intermediate or top coat).

K. Apply one (1) 16 mil application of Dura-Walk Top Coat in the desired color at the rate of 100 sf/ gal.. Apply Top Coat with a notched squeegee. While coating is still wet, broadcast 16/30 rounded sand aggregate uniformly into wet coating with a seed spreader at a rate of 10-20 lbs / 100 sf (a seed spreader tends to work very well in lieu of spreading by hand which typically results in uneven aggregate distribution). Back roll with a heavy-duty nap roller to help avoid pinholes and squeegee lines. Repair any pin holes as they occur. Allow Top Coat to cure overnight for at least 16 hours for foot traffic (72 hours for vehicular traffic).

Note: Larger sized aggregate can be used for additional traction in steep ramps (check with your Garland representative for more info.