

DYNESIC, EPOXY APPLICATION GUIDE

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DYNESIC, EPOXY APPLICATION GUIDE

1.

GENERAL

Dynesic Epoxy coating systems are comprised of two parts that are mixed prior to application. The two parts consist of an epoxy resin (Part A) which is cross-linked with a co-reactant or hardener (Part B). Dynesic epoxy coatings are formulated based upon the performance requirements for the cured product. When properly catalyzed and applied, Dynesic systems produce a high strength, chemical and solvent resistant finish. They are typically used on metal, steel and concrete surfaces to repair and protect against corrosion, harsh environments and chemical attack.

It is the specific selection and combination of the epoxy component and the hardener component that determines the final characteristics and suitability of the epoxy coating for a given environment.

WHICH COATING TO USE

PANSEAL – 2000PG - *All Purpose Adhesive and Coating with Abrasion Properties*

PANSEAL is an all- purpose adhesive, coating and sealant for solid surfaces. PANSEAL has the viscosity of honey, but it's finish is very hard, and it's designed for abrasion resistance. PANSEAL has a strong 2,750 PSI adhesion strength and an extensive list of chemical resistance properties. Although PANSEAL has some flexibility (8% elongation), PANSEAL is not recommended for areas of heavy vibration or extreme expansion and contraction. If the surface is not well supported underneath and there is the possibility of flex while walking on the surface (trampoline effect) ELASTASEAL would be more ideally suited for this type of surface due to it's high flexibility. However, if the surface is well supported, PANSEAL offers excellent, long term protection with the least amount of odor and toxic chemicals in the industry.

Coverage rate: 160 square feet at 10 mils (recommended minimal thickness)
80 square feet at 20 mils.

Ideal uses: Cooling Tower Basins, Condenser Pans, Leak Repair, Tank Linings, Flooring, Pipe Line Coating, Secondary Containment Lining, Clarifiers, Collection Systems, Digesters, Lift Stations, Manholes, General corrosion Protection, Acid Resistant Linings, Abrasion Resistant Linings and Exterior Finishes.

ELASTASEAL – 2100EG - *All Purpose Flexible Coating*

ELASTASEAL is also used as an all -purpose coating and sealant, but due to it's greater than 300% elongation it is ideal for areas of heavy vibration or expansion and contraction. ELASTASEAL's adhesive strength (1600 psi) and chemical resistance are well suited for many applications. ELASTASEAL's strength and durability rank above the best flexible, industrial coatings.

Coverage rate: 160 square feet at 10 mils (recommended minimal thickness)
80 square feet at 20 mils.

Ideal uses: Cooling Tower Repair, Condenser Pans, Leak Repair, Tank Linings, Concrete Base Coats, Large Stress Cracks, Concrete and Metal Topcoat, Secondary Containment Structures, Expansion Joints and Waterproofing.

PANSEAL Paste Grade – 2500PG - *All Purpose Trowelable Repair Compound*

PANSEAL Paste Grade is a thick, trowelable version of PANSEAL which works great for vertical repairs, ceiling repairs or for rebuilding majorly damaged surfaces. Paste Grade is ideal for filling voids with high strength and can be sanded or machined.

Coverage rate: 2 square feet at 800 mils

Ideal uses: Wastewater and Storage Tanks, Cooling Tower Repair and Structural Metal/Concrete Repair, Structural Adhesive for Metal Bonding, Resurfacing Damaged Areas

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DX-1100 – *Dynesic Primer for Concrete Surfaces*

Although Dynesic coatings and sealant products are self-priming on most surfaces, DX-1100 is a primer that is recommended for concrete due to its ability to strengthen adhesion strength to concrete and to prevent hydrostatic pressure. DX-1100's slow cure rate and hybrid, novolac chemistry allow DX-1100 to deeply penetrate surfaces, which greatly enhances the long-term performance of coatings and sealants.

Coverage rate: 300 to 350 square feet at 5 mils (recommended minimal thickness)

Ideal uses: Primer for Dynesic coatings and sealants for concrete surfaces.

DX-3300 - *Flagship Chemical Resistance Coating*

Coverage rate: 160 square feet at 10 mils (recommended minimal thickness),
80 square feet at 20 mils.

Ideal uses: High-Temperature Immersion Tank Lining, Crude Oil Storage to 350°F (177°C), Floor and Chemical Trenches in Process Areas, Secondary Containment Areas, Bulk Petroleum Storage Tank Lining, Process Equipment Supports and Pads Exposed to Acids, Truck Loading and Unloading Pads, Internal Pipeline and Vessel Linings

* See product data for more product details.

DX-5400 - *Flagship Heat/Temperature Resistance Coating*

Coverage rate: 160 square feet at 10 mils (recommended minimal thickness)
80 square feet at 20 mils.

Ideal uses: Process Floors and Trenches, Secondary Containment Areas, Tube Sheets, Equipment Supports and Pads in Acid Service, Heat Exchangers, Internal Pipeline and Vessel Linings

* See product data for more product details.

MIXING

Power mix separately, then combine and power mix. DO NOT MIX PARTIAL KITS.

APPLICATION ACCORDING TO SURFACE TYPE

General Rule of Thumb - Best Case Scenario

The cleaner and more profiled the surface, the greater the adhesive strength. Epoxy products have a difficult time adhering to slick surfaces, so the goal is always to obtain an ideal profile to enhance adhesion.

* *Dynesic Technologies products are designed to perform well even when surface preparation is less than ideal, but to get the best results, here are some recommendations. The following is based on optimum surface preparation:*

Implements for Abrading

Sandblasting, wire brush, emery cloth, and or glass paper.

Metal Surfaces

Use grade 80-150 abrasives for steel and materials resistant to scoring. Use 300-600 grade abrasives for light alloys and less resistant materials. Remove all oil, grease, or scale from the surface, and then blast with sharp sand or grit to finish. Use a non-spherical blast medium to give a 2 - 3 mil (50 - 75 micron) profile and to achieve the following surface preparation standards or their equivalents:

| | |
|-------------------------------|--|
| Non-chemical Service | SSPC-SP 6 Commercial Blast (NACE 3) |
| Intermittent Splash or Wear | SSPC-SP 10 near White Metal Blast (NACE 2) |
| Immersion or Abrasive Service | SSPC-SP 5 White Metal Blast (NACE 1) |

* Many Dynesic products (such as PANSEAL) can perform well on metal surfaces with minimum preparation such as pressure washing and can encapsulate existing rust. Again, the best adhesion strength would include a profiled surface, so it depends on the desired outcome.

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Concrete

New concrete must be cured a minimum of 7 days at 75°F (24°C) and 50% relative humidity or equivalent. Prepare surfaces in accordance with ASTM D4258 Surface Cleaning of Concrete and ASTM D4259

Abrading Concrete. Voids in concrete may require surfacing with PANSEAL Paste Grade. Mortar joints should be cured a minimum of 15 days.

DX-1100 Primer/Sealer is recommended to avoid bubbling caused by out gassing and to increase overall adhesion strength to concrete. Once the primer is applied, the top coating should be applied within the re-coat window (5-24 hours). This is the best scenario for the coating to bond to the primer.

Copper, Brass and other Copper Alloy

Degrease with trichloroethylene if necessary, sand/score surface and clean.

Ferrous Alloys Other than Stainless

Degrease with trichloroethylene if necessary, sandblast, sand (100 grit) or etch in 15% aqueous hydrochloric acid (equal parts concentrated muriatic acid and water) for 10 minutes. Etched surfaces should be rinsed immediately and dried with hot air. Freshly sandblasted or etched steel begins to rust immediately; therefore, adhesive should be applied as soon as the surface has been prepared.

Stainless Steel, Chromium

Degrease with trichloroethylene if necessary. Mechanically abrade surface with a grinder or similar tool and clean. We recommend blasting stainless steel with angular shaped garnet to get a blast profile of 3+ mils to get a decent anchor profile to bond to.

Wood

Sand until clean. Ensure wood is dry (moisture content not higher than 8-12%). Wipe surface with solvent. Wood free of grease requires no pretreatment.

Plastic

Adhesion varies. If a plastic is impervious to solvents such as acetone, epoxy generally will not bond to it. Soft, flexible plastics such as polyethylene, polypropylene, nylon, Plexiglas and polycarbonate fall into this category. Hard, rigid plastics such as PVC, ABS and styrene provide better adhesion with good surface preparation and adequate bonding area. Sand, clean and apply.

** Downloadable Product Data Sheets and MSDS are available on the website. Please feel free to call us for further questions.*

REASONS WHY EPOXY MAY NOT CURE

Mixing

It is recommended to 1st mix Resin (part A) and Hardener (Part B) separately in order to obtain an ideal blend of the liquids and solid contents within. Then mix part A and B together and continue mix to ensure uniform color and viscosity.

You can get a well-mixed product with a mixing stick, but a mechanical mixer is quicker and more effective. The key is to get to the areas on the side, bottom and corners of the bucket. Once mixed, the best way to prevent un-cured patches within the applied product is to pour the mixed product in another empty bucket or paint trough. The goal is to get all the hardener distributed equally within the resin. Any resin without the infusion of hardener may remain uncured.

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Low Ambient Temperatures

Most Dynesic epoxies are formulated for curing at temperatures above 40°F. Temperatures below 40°F will decreasingly slow the rate of the chemical reaction between the epoxy and the hardener. Once the ambient temperature rises above 40°F, the product will continue to cure, however the cure time is slower in cold temperatures. Heat can be brought in to increase the speed of cure time and is recommended in cold temperature settings. Dynesic products will also thicken in cold temperatures. It is recommended to heat Part A and Part B components in a warm environment such as a room or car to reach an ideal viscosity prior to mixing and applying.

High Humidity, Moisture Condensation, Stagnant Air

High humidity will also slow cure times, but otherwise will not affect the performance of Dynesic products.

Remaining Oils, Greases or Chemicals On the Surface

The surface must be free of oils, greases or chemicals for Dynesic products to perform. These areas can be cleaned with trichloroethylene, or any optimum degreasing agent then washed thoroughly.

Remaining Acids On the Surface

The surface must be free acids for Dynesic products to perform. These areas can be neutralized with baking soda.

HOW TO PREVENT BUBBLING EFFECT FOR EPOXY SYSTEMS

The reason why bubbling effects can occur in epoxy coating systems is that there is a presence of ion or salt contamination on the surface. If it is determined that the surface contains these contaminants, you can neutralize with baking soda and pressure wash the surface.

Test Methods for Determination of Salt Contamination on Steel Surfaces

Prior to surface preparation (abrasive blasting) for application of Dynesic coatings or linings, steel surfaces should be tested for ion or salt contamination. This contamination, if left on the surface can cause dis-bonding of coating or lining systems. Steel surfaces should be checked for ion contamination prior to the application or repair of Dynesic Lining systems.

For previously used tanks, it is advisable to test for acidity using narrow range pH indicating paper and distilled or deionized water. Establish the pH reading of the water being used. Wet the surface to be tested, using a minimum amount of water. Press the pH paper onto the wet surface, remove it, and read the measured pH; If the pH of the surface is more than 2 pH units lower than the water reading or less than 4.0, the surface should be washed and neutralized. This can be done with high-pressure water and dilute tri-sodium phosphate or ammonium hydroxide. If the pH of the surface is greater than 2 pH units higher than the water reading, consult Dynesic technical support.

To determine the presence of chlorides, sulfates, and nitrates, qualitative test paper and quantitative test kits should be used. These kits are available through K.A. Tator or S.G. Pinney.

Chlor-Rid offers a test kit for all three types of ions. If chloride is present on the surface at concentrations above 2 micrograms per sq. cm (20 mg per square meter), the surface should be cleaned with high-pressure water and re-checked. Chlorid® or dilute baking soda (sodium bicarbonate) which has been found to be very effective in removing chloride contamination.

If sulfates are present at concentrations above 5 micrograms per sq. cm or nitrates present at concentrations above 2.5 micrograms, the surface should be treated with a Chlorid high pressure wash.

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Re-test for contamination after cleaning and repeat cleaning if necessary. After cleanliness is verified proceed with appropriate surface preparation.

How to Re-Coat a Bubbled Surface

Cut the bubbled areas out with a sharp utility knife or similar tool and neutralize/pressure wash the surface. If you apply over or overlap on the pre-existing coating material, you would get the best results by lightly sanding the cured material.

Once this preparation is satisfactory, you can test the pH level and reapply the coating.

DYNESIC PRODUCT FAQs

Can PANSEAL be Applied On Wet Surfaces?

PANSEAL does not mix with water, so it can be applied on wet surfaces and even cure under standing water. It's easier to apply on a dry surface but if options are limited PANSEAL will seal leaks and cure underwater. If you are applying vertically, some of the material could separate due to water pressure, however the base would remain intact.

Are Primers Required?

Dynesic products are self-priming and there is no need to primer the surface prior to installing the coating unless the surface is concrete. DX-1100 primer/sealant is recommended for concrete applications to enhance the products ability to adhere to concrete and to prevent hydrostatic pressure. Once the primer is applied, the re-coat window ranges from once the initial coating is tacky (4-8 hours) and 24 hours after initial application. This is the best scenario for the coating to bond to the primer. Once the primer cures, it will have a slick finish and would otherwise need to be sanded before the recoat could be applied.

Can Dynesic Products be Applied Over Other Coatings?

There are circumstances where a pre-existing coating is remaining on the surface and is difficult to remove. This may be due to the area where the coating exists is hard to reach in order to prepare the surface. Although Dynesic products are well suited to work on most surfaces and may perform well over another coating, the newly applied coating is subject to the pre-existing coating. For this reason, the application over an existing coating cannot be considered under warranty. If the previous coating cannot be removed, a sanded or roughed profile is recommended to allow adhesion.

The preexisting coating will diminish the adhesion strength to the substrate, so the amount of time spent on preparing the surface is dependent on the situation. If the application is for a drain pan, adhesive strength is often less of an issue than surfaces that are impacted by harsh environments, heavy vibration, abrasion issues or chemical attack. In these situations, preparation is more crucial.

Are 2nd Coats Required?

In most applications, one coat is sufficient. In more extreme situations such as harsh environments, heavy vibration, abrasion issues and chemical attack, a 2nd coat may be recommended.

Once the first coating is applied, the re-coat window ranges from once the initial coating is tacky (4-8 hours) and 24 hours after application. This is the best scenario for the coatings to bond together. Once the first coat cures, it will have a slick finish and would otherwise need to be sanded before the recoat could be applied.

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Can Dynesic Products be Sprayed?

Dynesic epoxy can be applied with a brush, roller or sprayer (in most cases). You can thin most Dynesic epoxies with Acetone or Xylene.

* See the product data for further information on spraying details according to product.

Can Dynesic Products be Thinned?

Thinning Dynesic epoxy products can make spraying applications more efficient or allow more self-levelling properties in cooler temperatures. Most Dynesic epoxies can be thinned with Acetone or Xylene. Add as needed, not to exceed 10 ounces per gallon. Start by adding 5 ounces to the resin and then mix the thinner and resin. Add the hardener last and mix again. If you need additional thinning, add in additional thinner up to 10 ounces per gallon.

* See the product data for further information.

Can Dynesic Products be Thickened?

Thickening coating products can allow for better vertical installation. You can use cabosil for this purpose. You can also add sands and silica gels for desired textures such as anti-slip textures.

What is the Shelf Life for Dynesic Products?

Dynesic products don't really have a known shelf life. Dynesic resins and hardeners can be stored for many years. It is recommended to 1st mix Resin (part A) and Hardener (Part B) separately in order to obtain an ideal blend of the liquids and solid contents within. Then mix part A and B together and continue to mix to ensure uniform color and viscosity.

CLEANUP

Use MEK or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

COLD WEATHER TIPS & RECOMMENDATIONS

Coatings Will Thicken In Cold Temperatures

You can obtain a thinner viscosity by:

- 1- Keeping the products in a warm environment indoors or in a car prior to mixing and applying.
- 2- You can use a thinner such as Acetone or Xylene up to 10 ounces per gallon.
- 3- If the coating environment can be covered and heating, then an optimum viscosity and cure time will be achieved.

Coatings Will Take Longer to Cure In Cold Temperatures

You can enhance cure time by:

- 1- Adding Dynesic Accelerator up to 1 to 2 ounces per gallon to speed up the hardener and cure time.
- 2- If the coating environment can be covered and heated, then an optimum viscosity and cure time will be achieved.

Cold Weather Application Points to Consider

- Dynesic coatings and sealants start to cure at 40 degrees plus. They can be applied in colder temperatures, but will begin to cross-link as the ambient temperature climbs to 40 degrees or above. At 40 degrees we generally estimate a 12 hour cure time. The cure time increases to 6 hours in 80 degree temperatures.
- If the weather is expected to climb, the coatings will cure and if the weather drops the leaks will still remain sealed and the curing process will continue as the ambient temperature climbs again.

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Disclaimer

The information provided in this Application Guide is a general guideline designed to answer questions and educate customers and contractors. The specific information according to each individual product (product Data) is downloadable on the Dynesic website **www.dynesic.com**, as is the SDS. It is important to refer to the Product Data and SDS per product prior to application.

- ***See product data and SDS prior to using Dynesic products.***
- ***Call 972-692-0962 for further technical and application questions.***

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