POLYMER SCIENCE CORPORATION

Product Information Sheet

April 16, 2024

PSC 2301 ClearGuard

PSC 2301 ClearGuard is a two component, self-leveling, 100 % solids tintable epoxy coating. Both components are precisely measured and packaged for accurate on-site mixing and use. PSC 2301 ClearGuard is a high build epoxy coating system designed for applications up to 20 mils and can be applied in humid conditions without creating a foggy surface. It has very good dry heat and chemical resistance.

PSC 2301 has good flexibility, 7% @ +20˚ C (68˚ F). It has a long pot life, 35 minutes, allowing the applicator to mix large batches thus providing fast turn around time with minimal labor.

PSC 2301 ClearGuard is approved by CFIA (Canadian Food Inspection Agency) for incidental contact in federally or provincially inspected meat and poultry plants.

Uses

- Interior, new or old horizontal concrete surfaces.
- For broadcast with multi-colored quartz aggregate.
- Industrial, commercial, municipal and warehousing facilities.
- Can be mixed with aggregate (sand) to fill and repair surface imperfections and cracks in concrete.
- Designed for applications up to 20 mils. Thickness of the coating can be built up with several applications within the re-coat window.
- Vehicle repair bays, paper mills, service stations, water treatment facilities, waste treatment facilities, meat packing and food processing facilities, dairies, canneries etc.
- Commercial applications, warehouses, supermarkets etc.
- Can be used as a prime coat for PSC 2304 Exterior Epoxy or PSC 3839 Polyaspartic

Advantages

- Long pot life, 35 minutes @ +20˚ C (+68˚ F).
- Fast curing,
- Produces a smooth, seamless finish.
- Excellent compressive, flexural and tensile strengths.
- Excellent wear resistance in harsh industrial environments.
- Excellent chemical resistance.
- Fills and hides minor surface imperfections, bridges hairline cracks.
- Excellent workability, low odor, can be tinted.
- Decorative, add color or quartz.
- Can be mixed with aggregate (sand) to be used as filler.
- Withstands temperature extremes without cracking or peeling.
- Can be applied in highly humid conditions.

PSC 2301 is designed to

- Waterproof new or existing indoor structures.
- Reduce maintenance costs associated with unprotected concrete.
- Protect from deterioration of reinforcing steel caused by ingress of chloride, acids, etc.
- Protect concrete from various chemicals, like gasoline, aviation fuel, brake fluids, alkalis and solvents.
- Prolong the life of your concrete floor or any horizontal concrete structure.
- Protect concrete from leakage and moisture intrusion.
- Prevent scaling and spalling.

How does PSC 2301 perform?

- It bonds to concrete and becomes an integral part of the concrete surface.
- It is liquid applied to form a seamless protective barrier.
- Aggregate (approved) can be embedded in the coating to create a durable, skid resistant surface.
- PSC 2301 ClearGuard System is sustainable for the life of the floor.

Suggested System Components

Primer : PSC 2099 Bonding Primer (for use, refer to Product Information Sheets re. PSC 2099) or PSC 2301 diluted with max. 10 % PSC Epoxy Reducer.
Topcoat or intercoat : PSC 2301 ClearGuard.
Alternative topcoat : PSC 3839 Polyaspartic or PSC 2304 Exterior Epoxy for applications subjected to UV radiation.

Limitations

- Avoid applying PSC 2301 ClearGuard (or any polymer coating) in direct sunlight during times of extreme heat. This can cause air bubbles being caught under the surface of the coating, wrinkling, blistering and pinholes. Schedule the application for early morning or late afternoon when ambient and substrate temperatures are low.
- PSC 2301 ClearGuard is not intended for exterior use, immersion or application where moisture can reach the underside of the coating.
- Protect both components A and B from freezing.
- Do not apply if ambient or substrate temperature is below +10˚ C (+60˚ F) or over +30˚ C (+86˚ F).
- Do not thin (except for priming purposes). Addition of thinners will slow down the cure and reduce the qualities of this product. Critical re-coat times will also be affected.
- Do not spray this product.
- Be careful with heating and/or Air-conditioning air flow outlets, as they can introduce dust, debris, particles, etc. resulting in defects and imperfections. Even more this can compromise completely the quality of the whole job, requiring additional coats and / or surface preparation.

General data

- Standard colors : Clear, 01, 03, 04, 06, 10, 11, 13, 20, 21, 30, 35, 36, 41, 60, 63.
- Solids content : 100 %
- VOC : 0
- Viscosity @25.5 C° : 940 CP
- Appearance : Clear
- Finish : Glossy
- Mix ratio : Mix two volumes of resin (A) with one volume of hardener B.
- Mixing method : Low speed jiffy mixer.
- Working Time* : 35 minutes at +20 C˚ (+68 F˚).
- Thinning : Not recommended.
- Drying time

Tack free time	8 to 10 hours (refer to temperature chart below)
Re-coat time	8 to 36 hours (refer to temperature chart below)
Light foot traffic	10 hours
Full cure	2 days

- Flash point : Greater than +280˚ C (+536˚ F)
- Specific weights : Resin; 9.6 lbs/gal
  Hardener; 8.1 lbs/gal.
- Recommended WFT : 6 to 20 mils
- Coverage @ 6 mils WFT : 270 sq. ft/gal
- DFT @ 6 mils WFT : 6 mils
- Application method : Squeegee, roller and trowel.
- Shelf life : 1 Year in unopened container.

Low surface temperatures and/or high ambient humidity may require longer drying time.
*Do not leave mixed epoxy in a container. Pour it as soon as you finished mixing it

System estimating guide

- As primer, diluted with 10 % PSC Epoxy Reducer, film thickness @ 5 to 6 mils, coverage 270 to 320 sq. ft. per gallon.
- As topcoat, using a squeegee, roller or trowel, film thickness @ 12 to 20 mils, coverage from 80 to 130 sq. ft. per gallon.
- As topcoat, using a squeegee, film thickness @ 6 to 12 mils, coverage from 160 to 300 sq. ft. per gallon
- Coverage will vary according to surface texture and porosity.

Chemical resistance data

Performance

	Concentration	Immersion	Spills	Fumes

Acids				
- Acetic	5 %	Yes	Yes	Yes
- Fatty acids	-	Yes	Yes	Yes
- Chromic	-	-	Yes	Yes
- Citric	-	Yes	Yes	Yes
- Hydrochloric	30 %	-	Yes	Yes
- Lactic	10%	Yes	Yes	Yes
- Phosphoric	10 %	Yes	Yes	Yes
- Sulfuric	50 %	Yes	Yes	Yes
- Sulfuric	90 %	-	Yes	Yes
Alkalis				
- Ammonia	10 %	Yes	Yes	Yes
- Caustic Salts	-	Yes	Yes	Yes
- Detergents	Various	Yes	Yes	Yes
- Sodium Hydroxide	50 %	Yes	Yes	Yes
- Sodium Hypo Chloride	10 %	Yes	Yes	Yes
Brake fluids				
- Skydrol, A and B	-	Yes	Yes	Yes
- Hyjet	-	Yes	Yes	Yes
Solvents				
- Acetone, requires 7 days cure	-	-	Yes	Yes
- Gasoline	-	Yes	Yes	Yes
- Aliphatic Hydrocarbons	-	Yes	Yes	Yes
- Ketones, requires 7 days cure	-	-	Yes	Yes
- Carbon Tetrachloride	-	-	Yes	Yes
- Xylene	-	Yes	Yes	Yes
Salts				
- Metal Salts, various	-	Yes	Yes	Yes

Chemical exposure at temperature range +16˚ C (+60˚ F) to +27˚ C (+80˚ F)

Intermediate	2 days
Maximum	7 days

Consult Polymer Science Corporation for compounds not listed above or for exposures in excess of those listed.

Cured resin performance for PSC 2301 ClearGuard

Description	Test Method	Results
Solids content	ASTM D2697	100 %
Hardness (Shore D)	ASTM D2240	82
Compressive strength	ASTM D695	13,100 psi
Compressive modulus	ASTM D695	331,000 psi
Tensile strength	ASTM D638	8,200 psi
Tensile modulus	ASTM D638	433,000 psi
Elongation at break	ASTM D638	7 %
Flexural strength	ASTM D790	12,400 psi
Flexural modulus	ASTM D790	389,000 psi
Adhesion	ASTM D4541	350 psi
Izod impact strength	ASTM D256	0.52 ft. lbs. /in. notch)
Taber abrasion (CS-10)	ASTM D4060	33 mg loss (1000 cycles)
Water resistance	ASTM D570	0.16 %
Fungus/Bacteria resistance	Mil-F-52505	No support of growth (TT-P-34)

Maximum temperature limits for PSC 2301 ClearGuard

Dry heat	+110˚ C (+230˚ F)
Spills	+66˚ C (+150˚ F)
Immersion	+66˚ C (+150˚ F)
Cold	-40˚ C (-40˚ F)

Above temperature limits are laboratory test results.

Test section

Apply PSC 2301 ClearGuard in an inconspicuous are measuring approx. 5 ft. by 5 ft. and evaluate for compatibility with an existing coating, if any, and for proper adhesion. Follow the surface preparation and application instructions.

Preliminary floor inspection and surface preparation

The area to be coated must be clean, sound, dry and above +10˚ C (+50˚ F) and less than +30˚ C (+86˚ F) to assure successful application. Concrete must be at least 28 days old. Test for vapor drive according to ASTM D4263.

If there is uncertainty as to whether or not a curing compound or any coating is present on the floor, the following tests can be performed.

- Pour a cup of water on three or four areas on the floor. If the water puddles out, then there probably is not any curing compounds or coatings on the floor and the preparation process may begin. If the water beads up like rain on a waxed car, then curing compounds or any other coatings may be present. These must be removed either by chemical or mechanical means.
- Place a drop of muriatic acid on the floor. If the acid bubbles, a curing compound or any other coating is not present.

The concrete substrate must be examined for the presence of moisture. Test vapor drive according to ASTM D4263. The vapor drive should not exceed 3 lbs./1000 sq.ft./24 hours. Follow instructions as outlined by the supplier of the test kits. Make sure the concrete surface to be tested is completely clean of any residue or other debris. All sealants, curing compounds or coatings must be removed before testing.

Remove all oil, grease, wax, dirt, laitance and other surface contaminants. Mechanical methods are recommended to clean concrete, such as shot-blasting, scarification, sandblasting, and high-pressure water blasting. Next sweep and vacuum any remaining dirt and dust with wet/dry vacuum**.**

Contaminants may also be removed by scrubbing with PSC 0100 Cleaner Degreaser, followed by thoroughly rinsing and scrubbing with clean water. Do not use unbuffered acid, or any solvents to remove contaminants. Do not use sweeping compounds to remove dust**.**

Use of PSC 2099 Bonding Primer

Dense new surfaces, such as tile, stone (should contain silicate), smooth concrete, densifyed concrete etc, **that are not contaminated** with oil, dirt, grease, curing compounds or other bond breakers, can be primed with PSC 2099 Bonding Primer thus eliminating expensive surface preparation like shot blasting, scarification, or grinding.

Consult Product Information Sheets re. PSC 2099 Bonding Primer for more information.

Mixing and tinting

PSC 2301 ClearGuard may be applied clear or tinted. Clear PSC 2301 is prepared by accurately measuring the required amounts, 2 Parts by volume of resin (A) and 1 Part by volume of hardener (B), into a clean mixing container. Pour the components slowly to avoid introducing air bubbles. Mix for 2 to 3 minutes. Scrape the sides and bottom of the mixing container to ensure complete mixing.

Tinted PSC 2301 is prepared by first mixing resin (A) and the colorant together, then mixing hardener (B) into the tinted Part A. Do not count colorants into the volume ratio of Part A, resin, or Part B, hardener. When using more than one can of colorant, it is recommended to mix all the colorant cans in a container prior to use in order to get a consistent color. This is due to the unavoidable variations between cans/batches or small amounts of colorant left in the cans.

- The Part A, resin, must be thoroughly mixed with colorant prior to the addition of Part B, hardener.
- Carefully empty the contents of Part B, hardener, entirely into the mixing container of Part A, resin.
- Mix with very low speed jiffy mixer, until completely blended. Be careful not to introduce air bubbles while mixing.
- Due to the difference in viscosity between Part A, resin, and Part B, hardener, care must be taken to thoroughly mix both components in order to avoid partially cured and weak spots in the coating.
- When using a 165 gallon bulk drum unit use mixing ratio of 2 Parts A, resin, and 1 Part B, hardener by volume. Do not count colorants in the volume ratio.
- Accuracy in measuring and mixing the components is essential to the performance of the product, and if tinted, to the color consistency between batches.

Colorant data

Kit size	Colors # 01, 03, 04, 06, 20, 21, 36, 41, 63	Colors # 10, 11, 30, 35, 60

3 gallon kit	1 quart (0.9 L)	2 quarts(1.9 L
15 gallon kit	5 quarts (4.7 L)	10 quarts (9.5 L)
165 gallon bulk kit	Consult Polymer Science Corporation.	

Application

- Apply by first pouring a bead of material in the form of a ribbon on the surface to be coated. Do not leave the material in the container for too long because it will set faster thus reducing the pot life.
- Using a serrated squeegee, spread the poured material at desired thickness. Do not exceed 20 mils with one coat. Apply as evenly as possible with slow steady motion in one direction.
- Back roll using a high quality nap roller. Avoid excessive agitation of the liquid with the roller, particularly if applying a thin coat between 6 to 12 mils as it may leave bubbles or pinholes in the applied film.
- Roll thicker built surfaces, 12 to 20 mils, with a porcupine roller after 10 minutes to remove excess bubbles, if any.

PSC 2301 ClearGuard is designed to be used as it is and therefore thinning or reducing with solvents is not recommended.

The pot life of PSC 2301 is approximately 35 minutes at +20˚ C (+68˚ F). High temperature and high humidity will accelerate curing and reduce pot life. PSC 2301 is not a solvent based system therefore the pot life is relatively short. Do not mix more kits of material that can be used within this period of time.

Curing time

The floor area should be maintained at a temperature range of +10˚ C (+50˚ F) or less than +30˚ C (+86˚ F) during application and curing. For heavy wheeled traffic and/or chemical spillages, allow a minimum of 72 hours cure.

Temperature	+10˚ C (+50˚ F)	+20˚ C (+68˚ F)	+30˚ C (+86˚ F)
Tack free	10 to 14 hours	8 to 10 hours	6 to 8hours
Re-coat	12 to 36 hours	8 to 30 hours	6 to 24 hours
Full cure	72 hours	48 hours	30 hours

If PSC 2301 is allowed to cure longer than 24 hours before subsequent re-coats, screening will be necessary. The surface should be screened to the effect that a uniform dullness is achieved. There should be no gloss present on the floor before applying the next coat**.**

Clean up

Equipment should be cleaned immediately after use with solvents such as PSC Reducer.

Trouble shooting

Problem observed	Possible causes
Fisheyes	Oil contamination; improper substrate cleaning; mold release agents; improper mixing.
Peeling from substrate	Insufficient preparation process; oil impregnation; moisture in concrete; hydrostatic water pressure.
Peeling between coats	Past critical re-coat time; contamination between coats.
Coating soft, dulling	Improper mixing; use of thinner in product; extreme weather conditions.
Whitening	Excessive exposure to moisture from substrate; water on the surface during drying; exposure to pooling water after full cure.
Slow cure	Low substrate and ambient temperatures; use of thinner in product; improper mixing; product applied too thin. Wrong ratio re. Part A and B.
Pigment flooding, floating or color streaking	Part A was not premixed with colorant adequately.
Fast cure	High substrate and ambient temperatures.
Bubbling	High temperatures; hydrostatic pressure no primer used; working product past pot life; improper mixing;

overworked the product.

Quartz broadcast
Consult Technical Bulletin regarding PSC Granite Quartz 122 system.

Seeded Floor System
Requires one coat of tinted PSC 2301 ClearGuard over primed substrate at 15 to 20 mils, seeded with 30-40 mesh round sand at 0.75 lbs./0.34 kg per sq. ft. Allow to dry overnight then remove excess sand. Apply a second coat of tinted PSC 2301 ClearGuard and sand as before. When second coat is dry and excess sand has been removed, topcoat with tinted PSC 2301 ClearGuard. Additional topcoat of PSC 2302 Flexible Epoxy or 2304 Exterior Epoxy is optional**.**

Slip resistance flooring and coating
Approved aggregate can be embedded into PSC 2301 ClearGuard to create a durable slip resistant coating providing excellent compressive and tensile strength properties designed for areas requiring a slip resistant finish. These properties are especially applicable in highly oily manufacturing and assembly plants, fork lift ramps and docks, (indoor), showers, lobbies and maintenance shops.

The engineered slip resistance requirements can be met by a selection of various grades of additives. The degree of density of application can be altered for each facility's requirements. Evaluation should be made to determine the right amount of aggregate for the specific needs of the surface.

Recommendations
- Always apply a test patch in an inconspicuous area. Confirm compatibility with the substrate and that the application meets owner's expectations.
- For interior use only. PSC 2301 will yellow and chalk when exposed to sunlight.
- Seal product containers immediately after use.
- Store product cool and dry at temperatures above +10º C and below +30º C.
- Use a single container to accurately measure the volumes of Part A and Part B. For accuracy in transfer, scrape the
- walls of the measuring container.
- Use only clean and dry equipment.

Exposure risks
PSC 2301 contains isophorone diamine and other proprietary aliphatic polyamines.

Corrosive, may cause severe eye and skin burns. Harmful or fatal if swallowed. Aspiration hazard if swallowed, can enter lungs and cause damage. May cause allergic skin reaction. May cause blindness.

Proposition 65
This product contains chemicals listed by the State of California as known to cause cancer, birth defects, or other reproductive harm**.**

Shipping Information
Dangerous goods, class 8, UN 1760, PG III.

VOC content
Part A and Part B combined contain 0 g/L of VOC.

Precautions
Keep out of reach of children. Avoid all personal contact. Use rubber gloves, eye protection. Use adequate ventilation. If the TLV is exceeded or if primer is used in a poorly ventilated area, use NIOSH / MSHA approved respiratory protection in accordance with applicable federal, provincial, state and local regulations. Avoid breathing vapors

Seal containers after use. Empty containers may contain hazardous residues. All warning labels must be observed until containers are commercially cleaned or reconditioned.

First aid
In case of eye contact, flush thoroughly with water for at least 15 minutes. Seek immediate medical attention. In case of skin contact, wash affected areas with soap and water. If irritation persists, seek immediate medical attention. If inhalation causes physical discomfort, persists or any breathing difficulty occurs, seek immediate medical attention. If swallowed, seek immediate medical attention.
Refer to Material Safety Data Sheets (MSDS) for further information.

Safety
We certify that PSC 2301 ClearGuard is formulated without lead, mercury, asbestos or chromates.

Maintenance
PSC maintenance products are specifically formulated to protect and maintain the surface of PSC coatings.

To clean the surface, use periodically PSC 0150 Cleaner-Rejuvenator. To protect the surface, use regularly PSC 0200 DuraWax-Gloss or PSC 0210 DuraWax-Satin.

Packaging
3 gallon kit (short filled / 2 gallons Part A and 1 Gallon Part B)
15 gallon kit (10 gallons Part A / 5 gallons Part B)
165 gallon bulk kit.

Warranty Disclaimer

We guarantee our Products to conform to the specifications of Polymer Science Corporation. Polymer Science Corporation makes no warranty or guarantee, express or implied, including warranties of fitness for a particular purpose or merchantability, respecting its Products. Liability, if any, is limited to refund of purchase price or replacement of the Product. All consequential damages, labor and cost of labor are hereby excluded.

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