



CERAMISEAL

Product Data Sheet

Description: Ceramiseal is a uniform, fine textured one-component coating containing pigments, texturizers, acrylic resins, ceramics, fungicides and water. A liquid applied, fully adhered, seamless membrane that is formed in situ on the substrate . . . offering a multitude of benefits surpassed by other conventional roof coating systems.

Ceramiseal was developed as an economical means to protect the rigid demands on concrete walls and provide a radiant barrier system for roofs while maintaining a superior protective and an aesthetically dynamic coating.

Ceramiseal uses the same space age technology to shed heat away from concrete and roof surfaces as is used on the tiles and front re-entry shields on NASA's space shuttles. This product has utilized the best of acrylic technology to gain excellent adhesion along with resistance to abrasion and moisture.

History: Designing coatings for the protection of highway and roof construction products that will be exposed to both maximum ultraviolet light and harsh environmental conditions has long represented one of the most difficult design challenges for paint chemists throughout the world.

The most important performance properties for quality construction coatings are, flexibility over a broad range of temperatures, resistance to dirt pick-up and hydrolysis, and ultraviolet stability. Although these performance requirements are well established as officially recognized benchmarks to formulate paramount resilience in these coatings, to date, technological limitations have resulted in the need to compromise one or more of their performance requirements to achieve absolute success in another.

These design limitations have long been experienced by applicators and have led to a great deal of confusion when questioning why their projects have suffered from serious long-term performance drawbacks such as premature dirt retention, chalking and in many cases peeling from the substrate.

Clearly, there has only been one answer in response to this disappointment, confusion and questioning on the influencing factors that have caused these effects. This answer is, unavoidable, initial design and technological limitations inherent to the available coatings technology at the time.

1. Coatings designed to maintain good resistance to dirt pick-up have had to be harder films, requiring a compromise in their flexibility and when they are applied to unstable substrates such as concrete, fibro cement or metal sheeting the material will eventually crack through its inability to tolerate dimensional fluctuations in the underlying substrate. Yes, the coating would maintain a clean film but often delaminated from the substrate through its compromise in elasticity.

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2. Coatings that claimed the required flexibility to accommodate substrate movement did so but at the expense of its dirt resistance properties. Acrylics until now, have required the addition of external plasticisers to enhance a reasonably effective level of elasticity. However, these plasticisers limit the coatings performance by migrating from the interior of the coating film to the surface, causing dirt from the air to stick to the film detracting from the coating's appearance and durability. Moreover, they will eventually migrate out of the film entirely, thus the coating will return to its rigid, inelastic state leaving it unable to tolerate substrate movement. Yes a degree of elasticity would be achieved but would require a compromise in dirt resistance qualities to do so.

Design limitations have clearly caused many of the long-term performance drawbacks in coatings used for the protection of construction surfaces during new construction or retrofit.

Through persistent dedication over a ten year period to technologically advancing waterproofing and roofing systems by analytical research, a design in 100% acrylics used in the resin portion of the formulation was conceived by Pro Set, Inc. This achievement involved the collective American studies of highly durable ceramics and 100% acrylic elastomeric compounds. These studies have enabled the production from the ground up of a truly durable exterior grade membrane coating.

In summary, this formula incorporates two unique chemistries, surface curing and low glass transition temperature by internal plasticisation, in combination with our unique ceramic sphere extenders to allow coating formulations that impart the necessary qualities.

Uses: Ceramiseal is a rich, attractive coating on concrete barriers, roofs, walls and has excellent adhesion properties. It can be applied over concrete, metal, brick, stucco, urethane foam, built up roofs and cement tiles.

Advantages: Ceramiseal has insulative properties that when properly applied to a roof could save up to 40% of energy costs. Ceramiseal is resistant to chalking, mildew and other severe elements that destroy conventional coating systems.

Features:

- Resistant to heat (provides a cool surface in hot weather)
- Bright white color or "Louisiana Gray" ~ Other colors available.
- Fire retardant (Class A fire rating per ASTM, E - 108 - flame spread)
- Easy application
- Quick Drying
- Non Polluting and safe
- Excellent adhesion
- Low odor
- Great hiding properties
- Washable
- Bridge cracks easily

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- Eliminates chalking
- Resist dirt pick-up
- Maintain flexibility under wide temperature variations
- Resist hydrolysis

Benefits:

- Outstanding exterior durability
- Excellent elongation properties
- Reduces interior building temperatures and energy consumption as a roof coating
- With the low temperature flexibility it enables the coating to maintain and eliminating low temperature cracks
- Maintains an attractive appearance while offering the functional properties necessary for waterproofing
- Excellent ease in crack bridging and good resistance to sound transmission
- Easily cleaned by power washing

Surface Preparation and Application: Ceramiseal may be applied using a .039 to .043 reversible tip size with conventional airless spray equipment. Brush or roller may be used for touch-up and edging work or for small areas which are not practical for spray application. Substrate and adjacent surfaces to be coated shall be free of any grease, oil, dirt or other contaminants which shall interfere with proper adhesion. This will be accomplished by pressure washing with a 3500 psi power washing with a rotar tip.

Spray with multi-directional spray passes (Cross Hatch method) to ensure complete coverage. Ceramiseal must be applied in two or more separate coats to ensure proper film build and cure rate, and a pinhole free continuous film. Each coat shall be applied in a direction perpendicular to the previous coat. Each coat of Ceramiseal must be dry and cured before an additional coat is applied. All surfaces must be uniformly coated and free from voids, pinholes or blisters.

Coverage: The mill thickness given for coverage per gallon is based on smooth non porous surfaces. The actual gallons required to complete a job will depend upon the texture and method of application. It is the responsibility of the applicator to apply sufficient material to achieve the proper dry film thickness. Ceramiseal should be applied at a minimum of 10 dry mills on walls and 15 dry mills on porous surfaces. Porous concrete and roofing is recommended at 60 square feet per gallon, or 30 dry mills.

Roofing: The Ceramiseal Borosilicate Coating System can be applied to any roof to cool and protect the roof. To completely seal and waterproof seams, vents and fastening devices we use our high density roofing foam and/or our Poly Pro Polyurea prior to applying Ceramiseal. This seal seaming technique prevents water from entering seams and joints.

The Ceramiseal Borosilicate Coating Insulating Re-Roofing System keeps buildings cooler in summer and warmer in winter. Tests conducted by an independent government accredited laboratory prove its ability to save up to 30% on energy costs. Letters of recommendation from users affirm the results. Heating and cooling costs are lowered; and the work place is more comfortable and productive.

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Energy Efficient: Ceramiseal incorporates heat reflecting, refracting and dissipating ceramic spheres to create a state of the art thermal barrier. Their almost infinite durability protects the coating and your roof from harmful UV degradation. Buildings are kept cooler in summer and warmer in winter, with clients receiving proven energy savings of up to 40%.

Packaging: Ceramiseal is packaged for industrial use in 5 gallon pails or 55 gallon drums.

Shelf Life: An unopened Ceramiseal container will remain stable at ambient temperature for two years. Ceramiseal must be agitated with a mechanical mixer for 30 minutes if product stands for 30 or more days

Ceramiseal will freeze and become unstable at temperatures below 32° (0°C). Do not ship or store at this temperature unless protection from freezing is available.

Do not apply Ceramiseal below 40° F.

Equipment: A Graco Bulldog or King Air is the required equipment for applying Ceramiseal. A .039 to .043 Graco reversible tip is required.

Material safety data sheets are included after product data sheet.

In Summary: The collective advantages provided by Pro Set Ceramic Design Technologies, with low glass transition temperature and surface curing chemistries, translates into superior durability in both protective and decorative terms. Since Ceramiseal retains elasticity, does not yellow or pick up dirt readily, Ceramiseal will maintain an aesthetically pleasing appearance far longer than other conventional systems.

Ceramiseal is the key to absolute long-term confidence for specifiers, applicators and most importantly the building owner.

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Sun Burn Destroys Roofs: On a bright sunny day, most building owners and facility managers are not hassling with roof leaks. Lots of other building projects take priority. But today's building owners understand that their roofs are key assets, and their front line protection for all building contents and occupants. Roof asset management pays off, because, just because it's sunny, doesn't mean it's all is rosy.

Roofs leak because water penetrates the membrane. But roofs lose their water tightness mainly due to sunlight attack. Everyone knows that what you see is not always as revealing as what is not seen. The same holds for the sun's harmful rays. Invisible infrared radiation provides the sun's heat. This same invisible light that keeps french fries warm in fast food restaurants and warms you under a bathroom spotlight causes dark roofs to routinely rise above 175°F on summer afternoons. Such intense heat accelerates roof deterioration just as we use heat to speed up so many things like laundering cloths, molding plastics and metal, and cooking. In fact laboratories evaluate long-term performance of roofing products by running accelerated heat aging tests and measuring loss of properties like impact strength, elongation, and tear strength. The ideal is that the more intense heat the roof experiences, the faster it might fall. Just think about it, a dark roof sees temperatures near 200 °F many times during the year - talk about stress! Besides, much of this heat penetrates your building to increase cooling costs.

But invisible solar heat is just the first wave attack. The big gun is invisible ultraviolet radiation. Just as our own skin cells can mutate into cancerous growths from UV exposure, UV rays penetrate roofing membranes and cause accelerated chemical degradation. UV literally changes chemicals in the roof material which then causes loss of flexibility, chalking, cracking, shrinking and surface erosion of what should be durable waterproofing membrane. The net result which we have seen: blisters, splits and other failures in built-up roofs, leaving an alligatored black mastic around roof penetrations, stiffening of asphalt emulsion membranes, cracks and fissures in modified bitumen membranes, shrinking and splitting of single-ply membranes, and the list goes on. Clearly, the proactive building owner or facility manager will sunscreen his or her roof early on - thereby preparing for a rainy day.

Ceramiseal, a high performance 100% borasilicated acrylic elastomeric white reflective coating containing special borosilicate spheres and substantial levels of UV-blocking pigments, is the perfect sunscreen solution. It keeps heat away and blocks the UV nemesis. Ceramiseal is not a white paint or another cheap imitation. After all, when it comes to your valuable roof asset, be sure you have the right long-term match for our solar villain. Reduce the temp in your building 10-20°F and/or reduce entergy consumption by 20-40%.

For more information on how high-performance 100% acrylic elastomeric coating Ceramiseal can battle the sun, lower your energy cost, and save your roof from leaks and early death, contact Pro Set, Inc.

Physical and Chemical Properties:

Appearance	White, Louisiana Gray Other colors available
Color	White or color of choice
State	Liquid
Odor Characteristic	Slight Ammonia Odor
pH	6.5 to 7.5
Viscosity	400 CPS Maximum
Specific Gravity (Water = 1)	1.33

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Vapor Density (Air = 1)	< 1 Water
Vapor Pressure	17 mm Hg @ 20°C/68°F Water
Melting Point	0°C/32°F Water
Boiling Point	100°C/212°F Water
Solubility in Water	Dilutable
Percent Volatility	40%
Evaporation Rate (BAc=1)	<1 Water
Elongation	600%
Tensile Strength	410-720 psi
Fire Resistance	Class A

Durability: Since the advent of Plexiglass®, (acrylic plastic sheet in World War II), acrylics have been known for their exceptional durability, offering unequalled resistance to yellowing and chalking from degradation by sunlight and ambient moisture in alkaline environments. Ceramiseal is the result of these 100% acrylics being further developed by Pro Set, Inc. technology and almost infinitely durable ceramic extenders.

Ceramics are used in a variety of applicators throughout the world for their durability, for example, insulating coatings for space craft protection and high performance engines. Ceramic Technology is a key to strong weatherability that affords, our coatings to last two to three times the life of conventional membranes and paints. Their ability to reflect and dissipate heat protects them from chalking and the substrate from damaging ultra violet light. Pro Sets sophisticated Ceramic Technologies produce membranes with superior resistance to UV degradation and many atmospheric and industrial chemical environments.

Low Temperature Flexibility to -20°C: Membranes for dimensionally unstable substrates must have long-term low temperature flexibility. This flexibility is necessary to accommodate thermal expansion and contraction of the substrate caused by rapid freeze/thaw weather cycling. Many products claim elastomeric performance, but do not have this main property of low temperature flexibility that is essential to a truly durable elastomeric coating.

To obtain acceptable elasticity, products that have claimed elastomeric performance, have to date required the addition during manufacture of external plasticising materials to improve their flexibility, even though there are serious drawbacks to its use. Typically, plasticisers only enhance elongation over a narrow range of temperatures and one serious disadvantage is that they will continually migrate out of the coating film until they have gone entirely. As this leaching occurs, elongation will be reduced. In addition, if the ambient temperature steps outside of the coatings narrow operating range on the high sides 110°F, the coating risks losing its recovery properties, it becomes gummy and can flow apart from stresses caused by dimensional fluctuations in the substrate. Furthermore, if the coating steps out side it application temperature (40°F) on the low side, at the inelastic glass transition state, the coating will crack with any substrate movement.

Pro Set's design technology does not rely on the need for external plasticisers to acquire the right level of softness. The right level of softness is inbuilt (internal plasticisation) from the ground up. They derive elasticity from a unique combination of special composition, molecular weight, and cross linking. As a result,

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they retain their flexibility over extended periods of time, over a broader range of temperatures expanding and contracting over continually moving substrates without plastic flow, (wrinkling) at higher temperatures or cracking through glass transition at low temperatures.

Ceramiseal's unique low temperature chemistry ensures that the system will not fail over an extended period of time under extreme weather conditions.

For example: It must be remembered that the effects of water after a sudden thunder storm on a hot day in any geographic location can rapidly drop the roof temperature as much as 50°F, causing a severe thermal stress on the roof surface.

Ceramiseal resists the degradive effects of harsh freeze-thaw cycling with its uncommon low temperature flexibility and will resist these effects to temperatures as low as -20°C, hence ensuring crack-free adhesion to the substrate and superior resistance to hail stone damage. Most importantly, Ceramiseal offers complete confidence in the long-term resistance to ponded water transmission.

Superior Dirt Pick-up Resistance: The analysis of Low Temperature Flexibility showed one of the disadvantages when using external plasticisers to achieve a coatings elasticity. Here again is a further disadvantage to their use. As the plasticisers migrate to the surface of the coating film they have a detrimental effect on the coating's dirt resistance properties. Dirt tends to adhere seriously to the coating, detracting from the coating appearance, flexibility and durability.

Pro Set, Inc designed formulations require no external plasticisation to derive flexibility, therefore, do not have the dirt retention problems inherent to other externally plasticised coatings.

Pro Set, Inc. design technology employs the chemistry of Surface Curing to ensure quality dirt resistance properties. Surface Curing Chemistry has enabled the manufacture of soft membranes with excellent elongation and elastic recovery without the disadvantages of dirt retention normally associated with this style of coating.

Surface Curing chemistry hardens only the very thin top layer of the coating film to dramatically improve dirt pick-up resistance. This process is activated by sunlight. In full sun, this takes about two hours, or one to two weeks in very shady conditions. The coating will rapid dry like a normal acrylic, however, until the process of surface cure is complete the surface may seem a bit tacky. The activating wavelength for this phenomenon is not purely in the UV band. The actual chemistry is proprietary information.

Ceramiseal's surface will cross link to give a high level of resistance to dirt pick-up. Unlike many coatings with exceptional elongation. Ceramiseal offers the dirt pick-up resistance of a hard, more inflexible paint while at the same time offering the functional properties necessary for waterproofing.

Ceramiseal not only maintains its attractive appearance from our unique dirt resistance chemistry, but further by the incorporation during manufacture of proven algicides, keep the coating free of unsightly mold and fungal spoilage.



CONTRACTORS GUIDE TO APPLYING CERAMICOAT

Pro Set is a manufacturer and applicator of Cermaiseal. The procedure below is followed by contractors & Pro Set, applying our material, Ceramiseal

PART I GENERAL

1.01 WORK SUMMARY

- A. Provide labor, materials, equipment and supervision necessary to complete the specified Ceramiseal coating membrane.

1.02 QUALITY ASSURANCE

- A. **Qualifications:** Contractor shall have a minimum of 5 years experience and meet the approval of the architect.

1.03 SUBMITTAL

- A. **Certification:** The contractor shall submit to Pro Set a list of five projects which he has completed within the last five years, exhibiting the contractor's coating skills. The list shall include the project name, location, and description of work.
- B. **Product Data:** Shall include manufacturer's product data sheets, product specifications and installation instructions.

1.04 MATERIAL PACKAGING AND STORAGE

- A. **Packaging:** Materials are to be received in sealed undamaged manufacturer's containers shipped from the factory with legible manufacturer's labels and certification labels thereon where applicable.

Related miscellaneous items shall be delivered to the job site in new condition and where applicable, properly labeled.

- B. **Batch Date:** Where applicable, age of the packaged materials shall be evidenced by the date of the batch clearly stamped or marked on the container or by acceptance evidenced from manufacturer as to the date of batching.
- C. **Material Condition:** Upon delivery to the job site or prior to use, the materials should be inspected for any signs of damage during transport.
- D. **Appearance:** Refer to product data sheets for detailed material description. Follow preparation instructions and mixing when checking color and consistency.

- E. **Materials:** Batched or otherwise exceeding the shelf life herein specified or not stored under proper conditions will be rejected and must be removed from the job site immediately upon notification unless a guarantee to the materials is received and accepted and written prior approval is received and accepted in writing by the owner prior to rejection.
- F. **Damaged Materials:** Contaminated or damaged materials shall not be used in the installation and shall be removed from job site immediately upon discovery.
- G. **Storage:**
 - (1) Store all manufactured products off the ground, under cover, protected from dampness and sunlight.
 - (2) All liquid products shall be stored at 40°F or above, however lower than 100°F and protected from freezing.

1.05 JOB/ENVIRONMENTAL CONDITIONS

- A. Install all material in strict accordance with all safety and weather conditions required by Pro Set's product literature and in accordance with ASTM specifications or as modified by the applicable standards of the authorities having jurisdiction.
- B. **Application temperature requirements:**
 - (1) **Ambient:** Application shall not proceed when ambient temperature is less than 40°F or greater than 110°F.
 - (2) **Surface:** Application shall not proceed when surface temperature is less than 40°F or greater than 130°F.

PART II PRODUCTS

2.01 FLUID APPLIED CERAMISEAL ELASTOMERIC ACRYLIC LATEX MEMBRANE

- A. **Acceptable Manufacturer:** Pro Set, Inc.
- B. **Physical and Performance Requirements:** A seamless membrane system consisting of Ceramiseal fluid applied elastomeric base coat and a fluid applied elastomeric top coat of the same material. Ceramiseal base coat and top coat shall meet the following minimum requirements when tested in accordance with the standards indicated:
 - 1. Elongation (ASTM D-412) - 628%
 - 2. Tensile Strength (ASTM D) - 412 - 716 psi
 - 3. Fire Resistance (ASTM E-108) Class A

Refer to Ceramiseal product data sheets on proceeding pages for specific properties.

Part III Execution

3.01 Installation

A. Supervision and Records

1. Maintain daily project log containing the following information and submit such log to the owner or owner's representative at the end of each day or as directed by owner's representative.
 - a. Temperature at start, mid-day, end of day
 - b. Wind velocity (speed and direction)
 - c. Sky conditions (clear, partly cloudy, cloudy)
 - d. Amount of work performed
 - e. General remarks
2. Coating manufacturer or their representative appointed in writing at submittal shall provide close inspection of application to ascertain adequateness of all applicator procedures to provide the approved system and to allow issuing of the specified warranty upon completion of the system application. Discrepancies or conditions of application contrary to Pro Set's instruction which could affect the system performance or deter or delay issuing of the warranty shall be reported in writing to the architect and the owner's representative immediately upon discovery with written recommendations for corrective action of the discrepancies.
3. Any inspections, tests, or reports required by Pro Set as a "condition of warranty" will be the responsibility of the contractor or owner to obtain.
4. Application: For optimum results, the protective coating must not be applied to wet or damp surfaces. If rain or harsh weather is imminent, the coating application shall be postponed. Ceramiseal to be applied by heavy-duty conventional spray equipment, such as a Speedflo Hydra Pro Airless or Graco Bulldog or King Air sprayer designed for higher viscosity coating at 0 - 150 psi with a .039 to .043 reversible tip size, depending on atmospheric conditions. Spray application should not be attempted when win velocity exceeds 10 mph.

PART IV

4.01 SAFETY

Refer to Section 8 of the MSDS for recommended PSE (Personal Safety Equipment).