

Inorganic Mineral Silicate Coatings

This brochure is designed to supplement the **SILACOTE** product literature and provide economic, technical and design data. The **SILACOTE** CSI Specifications listed herein will supersede all other literature and information. The contents of this brochure will be updated as and when required. Some technical and/or design data may be withdrawn, changed or updated without notice. Please contact **SILACOTE USA LLC** to make sure the information is current for your project.

AN INTRODUCTION TO INORGANIC MINERAL SILICATE COATINGS

In order to properly use this 'support data' for project specifications it is essential that one compare the significant differences between inorganic paints and organic paints. It is vitally important to understand the dissimilarity in their chemical make up which determines their limited or considerable performance characteristics.

For projects that require a paint specification for concrete, stucco, plaster, concrete block, concrete brick, aerated autoclaved concrete, brick, stone, marble and other masonry, including gypsum board applications, one should not specify organic paint as an 'or equal' to inorganic paint. To do so will deprive the end client of receiving the highest quality durable coating expected.

Organic paints are often created from carbon compounds that are bi-products of the oil industry. The chemical nature of these organic paints are such that when exposed to the environment, in particular UV and airborne pollutants, the carbon compounds which holds the organic paint together break down - causing the paint to fail.

Organic paints are mechanically attached to the substrate as a thin film. This thin film is easily pushed off the surface by efflorescence as it does not allow the substrate to breathe. In short, they are not compatible. By comparison, Inorganic paints are compatible, forming a chemical bond of paint and substrate that is highly permeable [>90%] allowing a high breathability function with excellent water shedding capabilities.

Inorganic paints are made from earth's natural compounds such as quartz and different minerals along with natural inorganic mineral oxide colorants. Basically inorganic paints are 'inert colored rock' in liquid form, which bind chemically to another compatible inorganic surface to form a petrification with that substrate. This results in a solid mineral and insoluble compound of paint and substrate that will outlast the best organic paints by many decades.

Organic paints are hazardous to the environment. Certain organic coatings claim zero VOC's but their colorants may not be VOC free and some can contain heavy metals. Inorganic paints are environmentally safe and provide many health and safety benefits. As a one-time application, Inorganic coatings provide significant long term economies.

"SILACOTE 'Liquid Rock' is approved and listed by 'GreenSpec', providing designers the opportunity to specify an environmental, health and fire safe alternative to replace hazardous organic paints."

SHORT FORM SPECIFICATION

To assist the SILACOTE mineral silicate paint to be specified we offer the following 'short form' specification to use for existing and new projects:

MINERAL SILICATE PAINTS

Inorganic Substrates - Interior and Exterior

"The water based coating shall be applied in a two coat application, in accordance with the manufacturers instruction, over inorganic masonry substrates, such as concrete, stucco/plaster, concrete block, concrete brick, aerated autoclaved concrete, unglazed clay bricks, etc..

It shall be an inert mineral silicate paint with not less than 95% inorganic content [DIN 18-363]. It should not flake, peel or crack. Colorants used are to be inorganic mineral oxides not subject to ultra violet deterioration. The binder shall be a potassium silicate solution. Paint and colorants shall not contain heavy metals.

The coating shall be available in a large selection of colors and wet and/or dry samples may be required for final selection. Coatings shall be readily available and tintable within North America.

The coating shall be highly vapor permeable. It should be resistant to pollutants and acid rain and shed water effectively. If a waterproofing or sealer/primer is required, for very porous substrates, it shall be a **SILACOTE** potassium silicate solution mixed and applied as recommended by the paint manufacturer.

The coating must meet the ASTM G53 [new ASTM G-154] UVB accelerated weathering test with no deterioration or discoloration after 4,000 hours. The coating should also reduce the heat gain on the substrate to reduce substrate cracking.

The coating shall be non-toxic, non-allergenic, non-static, environmentally safe and approved and listed by 'GreenSpec'. The coating shall be mold, fungi and algae resistant having a pH of 11.5 or better.

The coating shall be non-combustible. It must meet the ignitability test under **ASTM E1354** and provide a **NFPA: 101 Class A [Class I for National Building codes such as BOCA, UBC etc.] flame spread rating under ASTM E84 with zero smoke development.**

Gypsum Wallboard - Interior wall / ceiling applications:

The above same specification would apply on new gypsum wallboard installations for health and safety benefits.

Products:

SILACOTE™ [known in Europe as *Hansa Silicat*], **KEIM** and **SILIN™**

We trust this is useful in your review and consideration for product specification.

TECHNICAL DATA

CSI SPECIFICATIONS

Silacote primer, paint, textured paint

MANUFACTURER

VIVACOLOR Ltd.
Riga, LATVIA

MARKETING DISTRIBUTOR

SILACOTE USA LLC
11265 Lime Kiln Rd.
Grass Valley, California 95949 USA
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E mail: sales@silacote.com
Web site: www.silacote.com

Product Guide Specification (CSI) Specification Format Section: 09980

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) *MasterFormat*, Three-Part *SectionFormat* and *PageFormat*, contained in the *CSI Manual of Practice*. Five-digit section numbers are from *MasterFormat*, 1995 Edition.

The section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate with other specification sections and the drawings. Delete all "Specifier Notes" when editing this section.

SECTION 09980

LONG-LIFE MINERAL SILICATE PAINT

Specifier Notes: **This section covers Silacote™ 'Liquid Rock®' Mineral Silicate Paint for non-trafficable inorganic concrete, plaster/stucco, cement board, concrete block, aerated autoclaved concrete, natural stone, marble, unglazed clay and concrete brick, gypsum wall-board [walls and ceilings], unsealed wood and existing properly adhered clean cementitious and organic coatings. [No guarantees would apply to pre-painted organic surfaces or glazed substrates as the Silacote would be depending upon the existing coating for adhesion but greater improvements for health (Asthma and Allergy sufferers) and fire safety can be achieved (Class B Flame Spread, Class II BOCA, UBC).]**

SILACOTE Mineral Silicate Paint is made from natural inorganic compounds from the earth strata, such as quartz, different minerals and inorganic mineral colorants, all bound together with a potassium silicate binder. When coated on to inorganic substrates such as concrete, plaster, stucco, concrete block, concrete bricks, marble, natural stone and other inorganic masonry substrates, the SILACOTE bond locks chemically to these substrates through a petrification or silification process to form an insoluble compound of paint and substrate. Very long life can be expected when applied correctly to compatible inorganic substrates. Buildings in Europe have had successful silicate paint applications that have lasted over 100 years.

The Sheraton Hotel in St. Louis, MO was coated with this same technology twenty years ago and it is still in great shape with many more years of life still left in the coating.

SILACOTE, approved and listed by 'GreenSpec', is environmentally safe - representing a technology that has no detrimental effects on the environment from manufacture through application to disposal in landfill. The coating is non-static, non-toxic and non-allergenic making it health safe for interior use. Being inorganic in content it is inert so **it will not support algae, fungi or toxic mold growth**. The coating has a high breathability rate allowing moisture to escape from walls, ceilings, cavity walls and partitions, keeping these areas dry and reducing the possibility of toxic mold or fungi growth. Traditional organic paints do not breathe and so walls, ceilings, cavity walls and spaces between partitions can trap moisture creating the perfect environment for algae, fungi and toxic mold spores to form, which can lead to Sick Building Syndrome (SBS).

The petrification process, to evolve the insoluble compound of paint and inorganic substrate, results in a micro-crystalline structure that has the ability to reflect and reduce heat gain. This is important to reduce the stress cracking of the masonry substrate. It also has economic value in helping to reduce air conditioning loads, particularly in high temperature climates.

Organic paints increase heat gain to the substrate: the darker the color the more the heat gain. This heat gain brings the moisture, along with alkali and other mineral salts [efflorescence] from the substrate, to the undersurface of the paint film, pushing the paint film off the substrate. This leads to water bubbles, discoloration and early failure of the organic paint. The SILACOTE is not affected. It will not crack, craze or peel due to its chemical attachment that uses these alkali salts to create the insoluble compound of paint and substrate.

This micro-crystalline structure of the SILACOTE also diffuses light bringing about a beautiful 'true color' matte finish. This matte finish provides architectural interest in differing light levels and with the 'textured' finish there is the ability to create patterns or designs with the thicker coating. Traditional organic coatings reflect the light, providing a glare in bright sunlight, and generally offers little life to the structure. SILACOTE helps to bring the structure alive. The coating is also not affected by ultra violet light providing a light fast, exceptional long life that runs into many decades of trouble free use. Independent tests under ASTM G53 [new test ASTM G154] 'UVB and Humidity Cycles' for accelerated weathering confirmed that after 4,000 hours the SILACOTE was not affected in any way. Organic paints begin to chalk, fade and deteriorate in generally half of this timeframe.

One of the most important performance characteristics of SILACOTE is its incombustibility. It meets ASTM E1354. ASTM tests by independent laboratories confirm that the product provides a NFPA:101 CLASS A Flame Spread rating with zero smoke development under ASTM E84 for use on concrete and masonry substrates and also on Gypsum Board applications. This Class A rating equates to Class I in national building codes such as BOCA, UBC, etc. Traditional organic paints will burn, giving off heavy toxic smoke, and will spread the flame quickly. The SILACOTE offers a more fire safe environment that should help to provide more time to escape in a fire situation. This should save many lives.

Consult SILACOTE USA LLC for assistance in editing this section for specific applications.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Long life mineral silicate paint for exterior and interior concrete, masonry, gypsum board and unfinished interior wood surfaces. Can also be diluted with SILACOTE PRIMER to offer a STAIN effect.

1.2 RELATED SECTIONS

 Specifier Notes: SILACOTE can also be used on interior wood and timber. Edit the following list as required for the project. List other sections with work directly related to the application of the mineral silicate paint.

- A. Section 03300 - Cast-in-Place Concrete.
- B. Section 03330 - Architectural Concrete.
- C. Section 03400 - Precast Concrete.
- D. Section 04200 - Masonry Units.
- E. Section 04400 - Stone.
- F. Section 09220 - Portland Cement Plaster.
- G. Section 09910 - Paints.
- H. Other: - Gypsum Board, Unglazed Clay Bricks, Autoclaved Concrete, Cement Board, Tilt-up Concrete, Unsealed wood and Timber (under certain conditions).

1.3 SUBMITTALS

- A. Comply with Section 01330 - Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including physical properties, coating properties, surface preparation, application instructions and texture finishes and colors available.
- C. Samples: Submit one 75mm x 75mm sample for each finish and color selected by the Architect.
- D. Warranty: Submit manufacturer's 10 year durability warranty for painted areas.

1.4 QUALITY ASSURANCE

 Specifier Notes: Describe requirements for a meeting to coordinate the application of the mineral silicate paint and to sequence related work.

- A. Pre-Application Meeting: Convene a pre-application meeting [] [] weeks before the start of application of paint. Require attendance of parties directly affecting work of this section, including the Contractor, Architect, approved applicator and representative of manufacturer or supplier. Review protection of surrounding areas, surface preparation, application and final cleaning. Review coordination with other work.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage:
 - 1. Store materials in accordance with manufacturer's instructions.
 - 2. Keep containers sealed until ready for use.

- 3. Avoid prolonged exposure of containers to direct sunlight.
- 4. Storage Temperature: 50 to 95 degrees F (10 to 35 degrees C).
- C. Handling: Protect materials during handling and application for prevent damage.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply at ambient temperatures below 50 degrees F (10 degrees C) or above 86 degrees F (30 degrees C). Ensure that substrate temperature is not lower than 50 degrees F (10 degrees C) even though ambient air temperature is above 50 degrees F (10 degrees C).
- B. Do not apply to damp or wet substrate or when rain is expected within 2 hours.
- C. Do not apply under windy conditions such that the paint contacts surfaces not intended.
- D. In very humid climates and in very dry, low humidity climates, where the substrates and very porous, apply SILACOTE Primer/Sealer, in accordance with manufacturer's instructions, at least 12 hours before a SILACOTE application to ensure a dry and/or a less porous substrate. Alternatively, apply a thin layer [brush or trowel coat] of the inorganic SILACOTE 'Remont' surfacing material.

 Specifier Notes: Provided the substrate is sound and dry and paint is applied in accordance with manufacturer's instructions, a warranty is available. Consult SILACOTE USA LLC for confirmation of suitability.

1.7 WARRANTY

- A. Provide a minimum ten [10] year durability warranty for painted areas.

PART 2 PRODUCTS

2.1 MANUFACTURER

VIVACOLOR Ltd.
 Riga, LATVIA

2.2 MARKETING, DISTRIBUTION, TECHNICAL ASSISTANCE

- A. **NORTH AMERICA [USA]:**
 SILACOTE USA LLC
 11265 Lime Kiln Rd.
 Grass Valley, CA 95949, USA
 Tel: [530] 268-3084 Fax: [530] 268-3142
 Email: sales@silacote.com
 Web: www.silacote.com
- B. **OTHER COUNTRIES:**
 PARKER International Limited
 P.O. Box WK 610
 Warwick, WKBX, BERMUDA
 Tel: [441] 238-6454 or [441] 238-0784
 Fax: [441] 238-2771
 Email: gcparker@ibl.bm
 Web: www.parker-intl-ltd.com

2.3 NON-COMBUSTIBLE, NON-TOXIC, LONG-LIFE MINERAL SILICATE PAINT

A. Mineral Silicate Paint for Concrete and Masonry Surfaces: SILACOTE Mineral Silicate Paint. This coating is known in Europe as 'Hansa Silicat' mineral silicate paint.

1. **Generic Components:** Water-borne potassium silicate solution using durable, light fast inorganic colorants and inorganic mineral fillers all free of heavy metals.
2. **Solvent Type:** Water-based, solvent free [0% VOC].
3. **Number of components:** 1.
4. **Solids Content:** 50 percent + or -
5. **Density:** 1.4 kg/l
6. **pH:** 11.5
7. **Coverage Rate:**
Smooth Matte Finish: 180/200 square feet per gallon per coat.
Textured Matte Finish: Varies with design 50/120 square feet per gallon.
8. **Number of coats required:** 2
9. **Film Thickness:** The silicate inorganic coating is chemically bonded to substrate and does not provide a 'film' as such, as do traditional organic coatings.
Wet Coating Thickness: 250 microns + or -
Dry Thickness: 150 microns + or -
10. **Algae and Mold Growth:** Inorganic, high alkali, sterile surface resists algae and mold attack.
11. **Fire Resistance:** Non-combustible. NFPA:101 Class A Flame Spread with zero smoke development as confirmed under ASTM 1354 and ASTM E84. Achieves maximum flame spread rating. Class I under BOCA, UBC, etc.
12. **Adhesion to Substrate:** Forms chemical bond within inorganic mineral type substrates. Case hardens surface, will not peel, flake or crack.
13. **Seals Substrate:** Inhibits freeze/thaw damage. Not affected by acid rain or pollutants.
14. **Ultra Violet Resistance:** High inorganic content provides excellent UV resistance. ASTM G53 [new ASTM G154] accelerated weathering test. [Exposure to UVB and humidity cycles for 4,000 hours – coating was unaffected]
15. **Water Vapor Transmission:** High water vapor transmission factor. Over 90%. Reduces carbonation.
16. **Insulation Qualities:** Light and heat reflected due to micro-crystalline structure. Reduces heat gain significantly reducing cracking of substrate.
17. **Water Resistance:** Sheds water but not to be considered a waterproof coating. The use of the SILACOTE Primer/Sealer and/or 'Remont', will provide a higher degree of waterproofing capability, depending upon the substrate density and climate condition.
18. **Environmental:** Environmentally safe. Approved and listed by 'GreenSpec' in 4th Edition 2003/4.

B. **Finish and Color:** Paint texture and color as selected by the Architect from manufacturer's standard finishes. Custom colors are available. Supply color sample for matching.

Finishes:

1. **Matte** - in either 'smooth' or 'textured' finish.
Stain effect - SILACOTE paint diluted 60% to 80% with SILACOTE primer.
2. **Colors:** Available in 252 standard colors plus hundreds of derivatives of these colors or can be mixed to special custom colors. Provide samples for color matching.
3. **Decorative:** The heavy texture paint coating could be applied with a trowel or other decorative tools to provide a thin sculptured finish. The addition of fine sand or chalk can enhance this decorative aspect. For a thicker trowel finish use the SILACOTE 'Remont' surfacing material. The 'Remont' is also used for making repairs to all inorganic substrates.

C. Mineral Silicate Primer for Concrete and Masonry Surfaces: SILACOTE Potassium Silicate Primer. Known in Europe as 'Hansa Silicat Primer'.

1. **Generic Components:** Water-borne potassium silicate solution.
2. **Solvent Type:** Water based, solvent free [0% VOC's]
3. **pH:** 11.5
4. **Solids Content:** 15 percent + or -
5. **Density:** 1kg/l
6. **Thinner:** Water
7. **Coverage Rate:** 200/240 square feet per gallon
8. **Coats Required:** As per paint system 'A', 'B' or 'C'

D. Mineral Silicate Textured Paint for Concrete and Masonry Surfaces: SILACOTE Mineral Silicate Texture Coat. Known in Europe as 'Hansa Silicat Struktura'.

1. **Generic Components:** Water-borne one component silicate paint that contains structure fillings (chalk).
2. **Solvent Type:** Water based, solvent free [0% VOC's]
3. **pH:** 11.5
4. **Solids Content:** 70 percent + or -
5. **Density:** 1.60 - 1.68 g/cm³
6. **Thinner:** SILACOTE Primer
7. **Coverage Rate:** 60/120 square feet per gallon. Varies with substrate texture and aesthetic design desired.
8. **Coats Required:** One

E. SILACOTE Cementitious 'Remont' Surfacing Material and Crack Repair for Concrete, Masonry, Gypsum Board and Previously Painted Surfaces.

1. **Density:** 0.85 g/cm³
2. **pH:** 12-13 (when water added)
3. **Color:** Very Pale Grey
4. **Size of corns:** Max 500my 90%<350my
5. **Mixing:** Add 30-40% fresh water
6. **Coverage:** Varies with surface quality and thickness desired.
7. **Water Permeability:** 0.1 mg/m hPa
8. **Working Temperature:** min 40°F

3.1 EXAMINATION

- A. Inspect surfaces to receive paint. Notify the Architect in writing if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions are corrected.

3.2 PROTECTION

Specifier Notes: Describe requirements for protecting surrounding areas during painting.

- A. Protect glass, aluminium, woodstains, painted surfaces including galvanized steel, glass glazed tiles, terra cotta tiles, marble and travertine from overspray and residue.
- B. If the application is to be by spraying, apply paint before installation of windows, if practical.

3.3 SURFACE PREPARATION

Specifier Notes: SILACOTE must have the opportunity to bond directly to the substrate chemically. Therefore it is essential that the substrate be completely clean, dry and free of contaminants to affect this bond.

- A. Remove all dirt, dust, oil, pollutants, curing compounds, previous coatings and other materials that interfere with the penetration required to bond the paint to substrate. Form release agents should be 'Non-Transferable'.
- B. Repair, patch and fill all cracks, voids, blemishes, defects and damaged areas in surfaces as approved by the Architect. Allow repair materials, such as the SILACOTE inorganic 'Remont' surfacing material, to cure completely before application of paint. Ensure any defects match surrounding surface texture before applying the SILACOTE paint.

3.4 APPLICATION

- A. The SILACOTE may require a primer for very dry, low humidity climates where the substrate is very, very porous. The SILACOTE primer/sealer should be mixed with clean, potable water on a 1:1 ratio and then applied evenly to all substrate surfaces to be painted to ensure an even drying time for the finish paint on that area. Do the same for very damp climates to seal the substrate. For normal average applications a separate primer coat is not required. The primer is added to the first coat of paint in a 1:2 ratio: one primer to two-paint. Confirm with the authorized product supplier, or Silacote USA, the SILACOTE paint system ['A', 'B' or 'C'] that is best suited for the specific application.
- B. Apply paint to substrates in accordance with manufacturer's instructions. Apply each of the coatings in right angle directions to each other to ensure proper coverage. Always keep a wet edge and work to corners, edges and openings before stopping. This will eliminate any potential for blotchy areas and roller-tracking or tram-lining. The preferred application is by HVLP or air-assisted spray. Wet-on-wet applications can also be done to reduce job time. Natural fiber rollers and brushes are preferred. These accessories can be obtained from SILACOTE USA.

- C.
 - 1. Before applying the first coat when using Paint System 'A', mix SILACOTE primer/sealer [ratio 1:2] with the SILACOTE paint. This will ensure the first coat will achieve proper penetration.
 - 2. Apply second coat at right angles to first coat to obtain best coverage and protection. The 'smooth' finish final coat may be thinned up to 10% with the SILACOTE primer/sealer. The 'textured' finish may be thinned up to 15% with the SILACOTE primer/sealer. Water is *NOT* to be added to the primer for mixing with paint. Water is *NOT* to be added to the paint.
 - 3. SILACOTE dries very quickly, making it difficult to maintain the 'wet edge' when using a roller. Always paint in the cool of the day, preferably in shadow, to prevent the roller 'tram-lining'. Spraying eliminates this problem but the roller applicator should follow the spray applicator to ensure that drips and runs are taken care of.
- D. Allow 12 hours between all primer and finish coats.
- E. Keep containers sealed until ready for use.
- F. Do not dilute or alter primer or paint except for *required* thinning.

Specifier Notes: The SILACOTE paint and primer system is a potassium silicate base. **All surfaces or substrates must not be coated with sodium silicate based coatings as the SILACOTE will not be able to chemically cure and bind to the substrate chemistry.** It is also important for silicate paints, as well as organic paints, to ensure that sodium based additives to the concrete mix **are not used.**

Sodium additives will bleed out of the concrete undermining virtually all paint coatings. In coastal areas where high winds and salt spray are normal, the substrates must be power washed and rinsed to eliminate as much of the salt content on the surface of the substrate as possible before the SILACOTE application.

Edit the following as required for the project.

- G. Avoid sodium silicate concentrations:
 - 1. Do not apply the SILACOTE Paint System over existing coatings with a sodium silicate base.
 - 2. Do not allow any sodium silicate based additives to the concrete or plaster mix designs.
 - 3. In coastal areas of wind driven rain, salt spray and high humidity, substrates to be coated must be power washed and rinsed to ensure that the content on the substrate surface is either removed or significantly diluted to allow proper penetrations and bonding.
- H. Avoid over spray, wind drift and splash of paint.

3.5 FINAL CLEANING

- A. Remove and dispose of temporary materials used to protect surfaces not intended to receive paint.
- B. Repair, restore or replace to the satisfaction of the Architect, materials or surfaces not intended to receive paint, damaged by exposure.

END OF SECTION

COMPARATIVE PROPERTIES OF PAINT COATINGS

FOR COATING NEW EXTERIOR/INTERIOR CONCRETE, PLASTER /STUCCO, GYPSUM, ETC.

Type	'SILACOTE'	ACRYLICS	URETHANES	EPOXIES	ELASTOMERICS
Base	>95% Inorganic	organic	organic	organic	organic
Primer Required	Yes – within 1st coat	Yes	Yes	Yes	Yes
Strip Coating for Maintenance	No	Yes	Yes	Yes	Yes
Total Coats Required	2	3	3	3	3
Environment:					
Is coating toxic	No	Yes	Yes	Yes	Yes
Any toxic fumes	No	Yes	Yes	Yes	Yes
Any deleterious effect on the Environment:					
During Manufacture	No	Yes	Yes	Yes	Yes
During application	No	Yes	Yes	Yes	Yes
After stripping off	No - Not required	Yes	Yes	Yes	Yes
Listed by 'GreenSpec'	Yes	?	?	?	?
Climates:					
Very Hot/Dry/Humid	Yes	Yes	Yes	Yes	Yes
Very Cold/Freezing	Yes	Yes	Yes	Yes	Yes
Reduces Thermal Stress on Building Fascias	Yes	No	No	No	No
Durability:					
Light fast for 20+ years	Yes	No	No	No	No
Subject to UV Deterioration	No	Yes	Yes	Yes	Yes
ASTM G53 UVB/Humidity 4,000 hours					
No discoloration, cracking, spotting etc		?	?	?	?
Any effect from Acid rain	No	Yes	Yes	Yes	Yes
Expected coating life	25+ years	5/10 years	10 years	10 years	10 years
Water Vapor Permeability	excellent >90%	poor/none	poor/none	none	poor/none
Water Shedding	excellent	excellent	excellent	excellent	excellent
Increases Carbonation	No	Yes	Yes	Yes	Yes
Health:					
Non-Allergenic/Non-Toxic	Yes	No	No	No	No
Non-static: will not attract dirt	Yes	No	No	No	No
Sustains algae, fungi and mould growth	No	Yes	Yes	Yes	Yes
Allows condensation to form on surface	No	Yes	Yes	Yes	Yes
Fire Protection:					
Combustible	No	Some	Yes	Yes	Yes
Meets ASTM E1354 Ignitability	Yes/No Ignition	Some	No	No	No
Meets ASTM E84 Flame Spread	Yes/Class A	?	No	No	No
Smoke Development	None	?	Toxic Smoke	Toxic Smoke	Toxic Smoke

Note:

GYPSUM WALLBOARD: The Silacote paint also meets the *ASTM E84 NFPA:101 Class A/Class I* rating for new unpainted gypsum wallboard applications and a rating of *Class B/Class II* for applications of Silacote paint over existing paint coatings under *ASTM E84* also. **Although we do not recommend SILACOTE paint applications over existing paints this latter test shows that it will increase the level of fire protection over the organic paints that ignite readily.** The use of the Silacote 'Remont' surface material over existing paint coatings can form a new skin to receive the Silacote Paint coatings. This would enhance, slightly, the health and safety benefits over just applying the Silacote paint to existing paint.

[The above general comparative information is provided without prejudice and is based upon publicly available data. Specific brands of paints may disagree with any or all of the above at which time, if proven, we would happily amend the information accordingly.]

SILACOTE PAINT SYSTEMS

For standard concrete, stucco and other inorganic substrate applications.

System A – Silacote Smooth / Two-Coat System

[For 90% of all application situations.]

Clean and repair surface as necessary.

Apply one coat SILACOTE PAINT PRIMER COAT (white or tinted) Mixed at a ratio of 1:2 (1 primer to 2 paint)

Allow 12 hours of drying time.

Apply one coat of SILACOTE PAINT at full strength.

A maximum dilution with SILACOTE PRIMER of up to 10% is allowed in hot and dry climates.

Each coat to be applied at right angles to each other for proper coating coverage.

Allow 12 hours of drying time.

Job is complete.

System B – Silacote Textured Coating System

(For decorative effect or to cover minor surface blemishes.)

Clean and repair surface as necessary.

Apply one coat SILACOTE PRIMER

Allow 12 hours of drying time.

Apply one coat of SILACOTE TEXTURE WHITE

A maximum dilution with SILACOTE PRIMER of up to 15%

Is allowed for hot and dry climates

Allow 12 hours of drying time.

Apply one coat of SILACOTE PAINT at full strength (white or tinted). A maximum dilution with SILACOTE PRIMER of up to 10% is allowed in hot and dry climates.

Each coat to be applied at right angles (opposite direction) to each other to provide quality coverage.

Allow 12 hours of drying time.

Job is complete.

System C – Three-Coat System

(For applications that have extremely porous surfaces or for climates with constant low humidity of 25% or less.)

Clean and repair surface as necessary.

Apply one coat of SILACOTE PRIMER mixed 1:1 with water at a rate of 200 sq/gal. Saturate substrate.

Allow 12 hours of drying time.

Apply one coat of SILACOTE PAINT with a maximum dilution of 15% with SILACOTE PRIMER.

Allow 12 hours of drying time.

Apply one coat of SILACOTE PAINT at full strength with a maximum dilution of 10% with SILACOTE PRIMER only if required.

Apply coatings at right angles (opposite direction) to each other for proper coating coverage.

Allow 12 hours of drying time.

Job is complete.

SILACOTE 'REMONT' SURFACING SYSTEM

The 'Remont' inorganic surfacing system can be used for crack, joint and void repairs, as a trowelled thin set coating base, a rolled on coating base, or applied by typical masonry spraying equipment to take all above systems.

Can also be applied over existing organic surfaces that are to be coated with the Silacote paint. Allow 12 hours to dry before applying primer or color coats.

PRODUCT WARRANTY

Product: SILACOTE™
Smooth and Textured paint

SILACOTE USA LLC warrants that the above Silacote™ smooth and textured mineral silicate paint products distributed by the company are free from material defects. Quality assurance given by the manufacturer, VIVACOLOR LTD. of Riga, Latvia, ensures that the products will meet consistent formulations and manufacturing standards as required under ISO9002 and ISO14001 under EC directive 88/379/EEC.

The liability to SILACOTE USA LLC and VIVACOLOR LTD., in a case where product is proven defective, would be limited to the replacement of the said material proven to be defective only, and under no circumstances shall SILACOTE USA LLC and VIVACOLOR LTD. be liable otherwise for incidental or consequential claims or damages related to the defective product.

Neither SILACOTE USA LLC nor VIVACOLOR LTD. makes any product guarantees nor accepts any liability, expressed or implied, as to the salability for an application or purpose other than those promoted within the latest Silacote™ literature and technical data. Any application or use outside these specific parameters of use would be at the full risk of the purchaser or user, unless approved in writing by SILACOTE USA LLC or VIVACOLOR LTD..

WARRANTY PERIOD

The warranty period would be ten [10] years from date of completed application, or, a period of time agreed to in writing by SILACOTE USA LLC and/or VIVACOLOR LTD. for specific applications.

WARRANTY CONDITONS

The application must be in accordance with the Silacote™ CSI Specifications applicable at the time of application. The most up to date set of Silacote™ CSI Specifications will supersede all other Silacote™ literature and technical data.

Product shall have been applied within twelve months of purchase date in accordance with the Silacote™ CSI Specifications. The product should have been applied by experienced paint and coatings applicators that will have read and understood the CSI Specifications. Said applicators to have applied a small test area within the project to ensure the technique and quality of the final coatings.

The completion date of the final application of a specific project is to be filed with SILACOTE USA LLC, in writing, by the customer or their agent, within 90 days of project completion.

The warranty claim would only be considered valid if payment in full, for the Silacote™ product supplied directly, or, indirectly via an approved SILACOTE USA LLC representative, including all freight, forwarding and insurance, has been received by SILACOTE USA LLC..

DESIGN DATA - USES

The inorganic SILACOTE Mineral Silicate paint systems should be considered for use when one or all of the following is to form an integral part of the 'Design Criteria' for your project.

ENVIRONMENTAL SAFETY:

Should you design an environmentally safe structure for your client and your community?

SILACOTE is environmentally safe and has been assessed, approved and included in the 4th Edition of the **GreenSpec.**, and written up in the **Environmental Building News** in October 2003. The product provides no deleterious effect on the environment from manufacture, through application, whilst attached to the substrate, or when disposed off to a landfill still attached to the structural element.

Traditional organic paints and coatings, on the other hand, are toxic; create hazardous fumes during manufacture, during application, whilst they are attached to the substrate and long after they are consigned to the landfill where their breakdown from mold and fungi provides a danger to underground water.

Unlike inorganic paints that last for many decades, organic paints have a short life, requiring constant cycles of painting, stripping with hazardous chemicals, and repainting again. It should be noted that organic paints have been acknowledged to be one of the major contributors to the deterioration of the world environment. Over a 25 year period it would take at least 5 gallons of toxic organic paint plus three gallons of hazardous chemical stripper to cover the same square area as 1 gallon of inorganic environmentally safe SILACOTE mineral silicate paint. Multiply those numbers by the millions of gallons of organic paint and chemical stripper sold each day and you can soon realize why we have a severe environmental problem!

The more projects that you specify and use inorganic paints the faster we can improve the air we breathe and the water we drink. BE SEEN TO BUILD GREEN!

HEALTH BENEFITS:

Is there a need in your design criteria to provide a better living environment with cleaner air and a reduced chance of toxic mold and fungi growth?

SILACOTE is non-toxic, non-allergenic and non-static. When used for interior applications there are no toxic fumes during application or through latent or residual action that will affect allergy sufferers. As the coating is non-static it will not attract dust, a problem along with paint fumes for asthmatics.

As the SILACOTE breathes it does not support condensation keeping walls and ceilings dry and without the water from condensation the risk of mold and fungi growth is greatly reduced. Organic paints, on the other hand are toxic, create condensation as their film coating cannot breathe, creating the water required by mold and fungi spores to begin their colonization of the structure. Once they get a foothold then they will feed upon whatever they are attached to giving off very toxic fumes and odors that can make people very ill.

SILACOTE has no toxic fumes, no allergy components in the coating, provides a reduction in dust attraction, a reduced capacity for the formation of mold and fungi, all of which should make the living environment and the air quality normal and healthy.

DURABILITY:

With costs going up every day for labor, materials and especially maintenance, are you designing your structure for the long or short term?

Inorganic mineral silicate paints applied to inorganic substrates are compatible and create a chemical bond forming an insoluble compound of paint and substrate. Once cured any attempt to remove them will also remove the substrate. There are buildings in Europe that were coated with silicate paint over 100 years ago and they are still in great shape today. Cave dwellers used silicates and ochre 20,000 years ago for their cave art that you can still view today. Silicates are inert and very durable as time proves.

FACT: Mineral silicate paints are uncontested by any other paint coating, when it comes to Durability.

The reasons for this are simply based upon the chemistry of inorganic paints in comparison with organic paints. Inorganic paints have inert inorganic mineral colorants that are not subject to UV deterioration. Therefore colors will not fade and the coating itself is not affected as are the organic paints.

The inorganic coatings are compatible with inorganic substrates and are chemically attached becoming a part of the substrate. They are not affected by acid rain and have a good water shedding capability.

Organic paints come from a bi-product of oil and being a part of the carbon chain are in a state of decay. The thin film coatings that are mechanically attached to the surface of the inorganic substrate are not compatible so they are rejected.

Unlike inorganic paints that have a high vapor permeability rate of over 90%, organic film coatings have negligible if any vapor permeability, **accelerating carbonation**. Without the ability to breathe moisture builds under the film bringing with it alkali salts which push the coating off. What is left is white efflorescence that requires special chemical cleaning before the next organic application. With life expectancy of no more than five to ten years, even for the best of organic coatings, there will be many cycles of painting, stripping and re-painting before the SILACOTE will need a single fresh coat several decades in the future.

If you are designing for the long term then the SILACOTE is the only answer to stop escalating maintenance costs in the future for your client.

FIRE PROTECTION:

Is there any need to consider a non-combustible coating for the living, working and escape areas?

Virtually all of the organic paints are combustible. Several have special additives to improve their flame spread and some have very low VOC's, but because they are all organic they are environmental hazards.

Inorganic paints are incombustible. Test results following show they meet the NFPA 101: Class A flame spread for concrete and masonry plus Gypsum wall and ceiling boards.

By painting the four walls and ceiling of a typical room with inorganic paint the flammable area to spread flame during the early moments of a severe fire would be reduced by over 70%. With no toxic smoke from the paint the chance for asphyxiation is also reduced.

If you were in such a fire situation surely you would like a few extra minutes for escape? SILACOTE should provide additional escape time and save the lives of the inhabitants and those who would attempt rescue. It could be you!

INDEPENDENT TEST RESULTS

ASTM E1354

Ignitability and Heat/Smoke Evolution

Result: Did not ignite during required test exposure

ASTM E84

Flame Spread and Smoke Development

Substrate : ¼" Cement Board

Result: Flame Spread Index 5 Smoke Developed Index 0
Meets NFPA 101: Class A 25 or under flame spread rating

ASTM E84

Flame Spread and Smoke Development

Substrate: Gypsum Board

Result: Flame Spread Index 10 Smoke Developed Index 0
Meets NFPA 101: Class A 25 or under flame spread rating

ASTM E84

Flame Spread and Smoke Development

Substrate: Pre-organic coated ¼" Cement Board

Result: Flame Spread Index 65 Smoke Developed Index 55
Meets NFPA 101: Class B 75 or under flame spread rating

ASTM G 53 [New ASTM G154]

UVB and Humidity Cycles

Result: Coating not affected. There was no discoloration, cracking, spotting, etc., after 4,000 hours of testing.

ASTM E96

Vapor permeability [Testing in progress]

ASTM C1555 – 03a

Exterior Surface Treatment of Aerated Autoclaved Concrete
Liquid Permeability [Testing in progress]

**Note: NFPA: National Fire Protection Association
Life Safety Code.**

Class A Flame Spread Rating equates to Class I BOCA, UBC and other National Codes.

Class B Flame Spread Rating equates to Class II BOCA, UBC and other National Codes

EUROPEAN STANDARDS

EN-ISO 7783-2

Vapor Transmission Rate (Permeability)

Standard: Class 1 (High) $S_d M < 0.14$ Silacote < 0.05

SFS-EN 1062-3

Liquid Water Transmission Rate (Permeability)

Standard: Class 1 (High) $\text{kg}/(\text{m}^2\text{-h}^{0.5}) > 0.5$ Silacote > 0.5

DIN 18-363 [Germany]

Inorganic Composition of Coating

Result: Inorganic Composition not less than 95%

APPROVALS

Environmental:

SILACOTE was assessed and approved for inclusion in the 4th Edition of **GreenSpec** by Building Green Inc., October 2003, and written up in an article in the *Environmental Building News*, also in October 2003.

Testing Laboratory:

The Independent Testing Laboratory for all above ASTM required tests performed on the SILACOTE Paint was executed by the VTEC Laboratories Inc., 212 Manida Street, Bronx, New York 10474. Tel: (718) 542-8248

VTEC is an approved Testing Facility by BOCA.

Quality Assurance:

Base materials manufactured in Riga, Latvia by VIVACOLOR Ltd., **meet or exceed ISO 9002 and ISO 14001 standards** in accordance with and under the EC Directive 88/379/EEC.

JERSEY/ HIGHWAY DIVIDERS

Several cities and DOT's have found that significantly fewer accidents take place at night, with less loss of life, when highway divider barriers are more visible through painting in light colors, particularly on long dark stretches of highways. Unfortunately, spiraling costs, related to maintaining these organic coatings on these barriers have been prohibitive.

So accidents and deaths continue!

Traditional Organic Paints are not compatible with concrete, are subject to deterioration by UV, pollutants, acid rain etc. and are films that rely on their mechanical bond for attachment. **Paint films that sit on the surface, build up heat bringing moisture to the surface of the substrate, along with alkali and other salts, which push this organic film off the surface because the paint does not breathe.**

We understand the impracticality of using organic paints over the long term as the maintenance factor would also mean closing down sections of the highways, and creating a safety risk during the regular stripping off and repainting cycles. This is a costly addition to already tight budgets!

However, a one-time application of the SILACOTE paint System 'A' would provide decades of service. It would not peel or flake off, and the 2 coat system costs about the same applied as a 3 coat organic paint system. This should be affordable even by those with tight budgets.

After all, how much is a human life worth that you cannot, for less than a dollar a square foot, provide highway division barriers that are clearly visible at night?

With **SILACOTE** there is now no excuse. The maintenance cost factor is insignificant because of the products' proven long-term durability.

We, here at Silacote USA LLC, also have a moral responsibility to provide the SILACOTE coatings at a price that will allow as many barriers as possible to be coated in order to reduce potential accidents and to save lives! Ask about our "Paint the Barrier Program".

Structures that would benefit by SILACOTE paint

Airports, Animal and Livestock Containment Areas, Aquariums, Bridge and Column Structures, Building Facades, Commercial Buildings, Communication Buildings, Concrete Structures, Condominiums, Escape Routes, Food Preparation Areas, Hospitals, Hotels, Industrial Buildings, Manufacturing Plants, Motels, Museums, Office Buildings, Paint Lockers and Paint or Hazardous Storage Buildings, Parking Garages and Parking Decks, Pre-cast Concrete Elements, Public Buildings, Race Tracks, Residential Homes and Apartments, Restaurants, Schools and all Educational Buildings, Shopping Malls, Silos, Stadiums, Stairwells, Theatres, Tilt-Up Slab Buildings, Transportation Buildings, Warehouses, Zoos, etc.. **Basically any interior masonry and gypsum substrates and exterior masonry.**