POR-15® - Industrial Applications

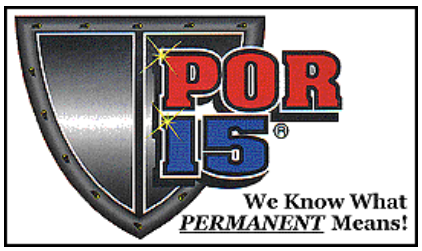
Rust Preventive Coating as a Superior Concrete Protection Coating

Industrial Business Group

POR 15® Product Bulletin

Abstract: Concrete is an alkali material making it highly sensitive to chemical threats. The porosity of the coatings used on the majority of concrete structures facilitates the penetration of chemicals and moisture and dramatically shortens the lifespan and costs millions of dollars annually.

This product bulletin will demonstrate that the non-porous properties that make POR-15® the only total rust inhibitor, also make it a superior concrete protective coating.



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Section 1 – Product Overview and Advantages

PRODUCT DESCRIPTION

POR-15® is a high performance, versatile coating designed for application directly on rusted or seasoned metal surfaces and concrete. It dries to a rock-hard, non-porous finish that won't chip, crack, or peel. Because POR-15 is non-porous, it is an excellent sealer for concrete and other porous substrates because it completely protects from water, chemicals, salt, and mineral oils.

ADVANTAGES OF POR-15

- Completely waterproof
- Abrasion chemical, stain and impact resistant
- Acts as a bridge on cracked areas due to high-level of elasticity - effectively adapts to the expansion and shrinkage of concrete caused by temperature changes.
- Does not split, peel off or come loose from the surface because of superior adhesion
- Inherent static-dissipating properties due to hardness of coating as well as non-porous composition.
- Lifetime – semi-permanent

Section 2 – Protection and Life Extension of Concrete

POR-15 PROTECTS AND EXTENDS LIFE OF CONCRETE

Most concrete structures are exposed to chemically harmful elements that threaten the lifespan and cost business and government millions of dollars annually. The highly porous characteristics of concrete permit harmful elements to penetrate which initiates deterioration. Many coating methods have been used on concrete unsuccessfully. POR-15 is the only coating that is able to protect concrete and extend its life expectancy due to its unique non-porous makeup.

POR-15 as a Concrete Protective Coating

POR-15 has successfully been used as a protective coating for floors of factories, warehouses, parking lots, concrete collection tanks, neutralization tanks, reaction tanks, wastewater treatment plants; deck plates of piers and bridges; internal/external walls and ceilings buildings; concrete sewer pipes; inner walls of subways, underground passages and tunnels.

As a single-solution moisture-blocking agent, POR-15 is most suitable for porous materials. Extensive industrial applications and rigorous laboratory testing have demonstrated that POR-15

Overview of POR-15 Characteristics

- ***Appearance***: Glossy or semi-gloss (black only) finish.
- ***Application***: Brush, roller, spray
- ***Spreadability***: 96 sq. ft. per quart, 384 so. Ft. per gallon.
- ***E****longation rate*: 79%
- ***Abrasion Resistance***: Using Taber Abrasion Test, POR-15® passes 200 cycles with a 100 gram weight on a CF17 Wheel.
- *Temperature data*: high temperature resistance: 750ºF, low temperature resistance: -75ºF. Boiling point: 230ºF.
- ***Drying Time***: Depends on ambient humidity. High humidity = faster dry time, which varies from 3 to 6 hours.
- ***Porosity***: None
- *Viscosity*: 250 - 500cps at approximately 77ºF
- *Durability*: Semi-permanent

has:

- Excellent chemical resistance to: sulfuric acid: 50%, hydrochloric acid: 10%, chromate: 55%, phosphoric acid: 85%, sodium hydroxide: 10%, methanol: 98%, hydrofluoric acid: 50%. No problems shown in results from gasoline and oil testing.[1]
- Strong resistance to salt water – it easily withstood a 1000-1500 hour salt spray test (ASTM B-117) with no breakdown.
- Inherent static-dissipating properties due to hardness of coating as well as non-porous composition.
- Extremely weather resistant - no breakdown in the 2000-hour weatherometer[2] test which is the equivalent of approximately 10 years.
- Superior resistance to wear and high adhesiveness: ASTM C-501 (Modified)

Section 3 – Clear Advantages of POR-15

Comparison of Advantages and Disadvantages of POR-15 vs. Other Available Concrete Coatings

	POR-15	Other
Moisture Protection	Completely non-porous coating free of air holes that forms a strong adhesive bond to concrete and completely blocks water and moisture.	Moisture penetrates through air holes and pours in the painted surface, which causes breakdown of the concrete and paint.
Product Lifespan	Semi-permanent due to completely sealing moisture out.	Some coatings have lifespan of 3-5 years due to cracking and proliferation of moisture. This means *'band aid'* maintenance must be done repeatedly making it non-economical.

[1] *North America and Asia test sites*: US ABIC Testing Laboratory and Korea Chemical Testing Laboratory

[2] *Weatherometer* - a tool for testing the weather resistance of coatings. It recreates the harsh climactic conditions of the Rocky Mountains (USA) where the desert starts by repeating a cycle of 160 minutes of sunlight, 18 minutes of rain and 18 minutes of wind. 200 hours is regarded as about one year.

Chemical Resistance	Superior chemical resistance and completely prevents chemical penetration. By blocking concrete from chemicals, it increases life span dramatically.	Concrete is an alkali material making it sensitive to chemical threats. The porosity of other coatings facilitates the penetration of chemicals.
Flexibility	Due to high elasticity, POR-15 can successfully act as a bridge should cracks appear.	Other coatings do not expand and contract as well as POR-15. Therefore if cracks appear in the concrete, moisture can penetrate and the breakdown of the coating and concrete is initiated.
Electric Static Dissipating Properties	Outstanding static dissipating capabilities due to non-porous and hardness (abrasion resistance) of coating.	Less than satisfactory performance since coatings are porous and softer (lack of abrasion resistance) than POR-15.

Section 4 – Preparation and Application

GENERAL PREPARATION

POR-15 can be applied to a variety of substrates. As a single-solution moisture hardening urethane, it does not have air holes and forms a strong adhesive film on concrete so that it produces a durable coating that completely blocks water and moisture. However, It is necessary for concrete surfaces to be adequately cured for at least 30 days at a temperature of 68ºF or more. The surface should be smooth and free of laitance, oil as well as fine dust and particles. Bubble marks, joints and indented parts must be smoothed out or removed.

WORK-BASED SPECIFICATIONS

Description	Use	Coat Thickness
Surface treatment (Uneven areas)	Grinding and mortar	If needed
Surface treatment (Pinholes, etc.)	POR-Patch, Putty	If needed
1st coat	POR-15 Anti-Corrosive Paint	25~50μm
2nd coat (internal)	POR-15 Anti-Corrosive Paint	25~50μm
2nd coat (external)	POR-15 Stirling Silver or POR-15 Hardnose Paint	25~50μm

APPLICATION

1. Using an airless sprayer, brush or roller, apply a first coat to the surface. Appropriate layer thickness: 25-50μm.

2. In order to form a complete anchor, apply the second coat immediately after verifying the dryness condition of the first coat by touch after 1-2 hours have passed. Appropriate layer thickness: 25~50μm.

3. Perform surface treatment with sandpaper after complete hardening and paint a second time.

4. Second coat (50μm) when using external topcoat paint (POR-15 Stirling Silver, Hardnose Paint) takes two hours to dry to the touch but complete hardening takes about four days at 65ºF.

5. For externally exposed areas, paint topcoat with POR-15 Stirling Silver or POR-15 Hardnose (various colors) in order to block from ultraviolet light.

Section 5 – Additional Information

Cleanup

Clean up mixing and application equipment immediately after use. Tools should be cleaned after work but before the paint hardens using a urethane thinner. Cleaning is not possible after hardening. Observe all fire and health precautions when handling or storing solvents.

Safety

Material Safety Data Sheets must be read and understood by personnel responsible for supervision and installation of POR-15. All applicable federal, state, local, and particular plant safety guidelines must be followed during the handling and installation and cure of these materials. Safe and proper disposal of excess materials shall be done in accordance with applicable federal, state, and local codes.

All work personnel should wear gloves, protective clothing, facial protection shield, mask and protective goggles.

Material Storage

Store materials in a temperature-controlled environment (45ºF to 95ºF) and out of direct sunlight. Two-year shelf life is expected for products stored between 45ºF to 95ºF.

Maintenance

Occasional inspection of the installed material and spot repair can prolong system life. For specific information, contact the Technical Service Department.