

VAPPRO-CRI™ 4000 SERIES

CONCRETE REBAR INHIBITOR

Advanced Molecular Chemisorption Diffusion Technology for the long-term corrosion protection of reinforced concrete.

Vapro-CRI™ 4000 CONCRETE REBAR INHIBITOR

Advanced Migratory Corrosion Protection for Reinforced Concrete

Vapro-CRI™ 4000 uses innovative molecular corrosion inhibition technology to penetrate the concrete matrix and migrate to embedded reinforcing steel, forming a durable protective molecular film that suppresses corrosion reactions and preserves the integrity of the reinforcing steel—even in chloride-contaminated or previously corroded concrete.

1 PENETRATION

Vapro-CRI™ 4000 molecules penetrate deep into the concrete pores with capillary moisture.

2 MIGRATION

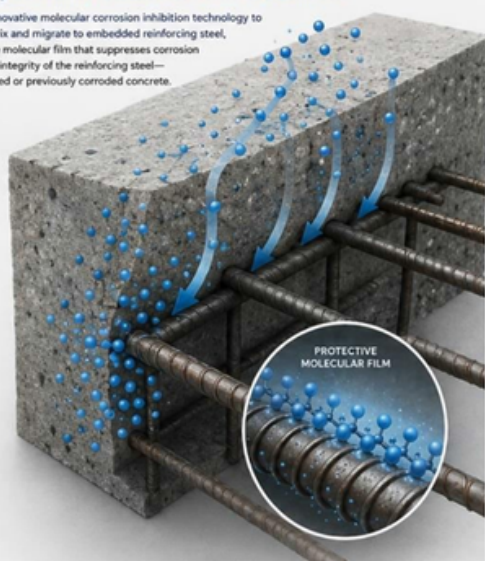
Molecules migrate through the concrete matrix toward the reinforcing steel.

3 ADSORPTION

Molecules adsorb onto the steel surface.

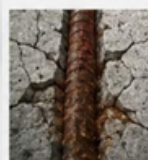
4 PROTECTION

A durable molecular film forms, inhibiting electrochemical corrosion and preserving steel integrity.



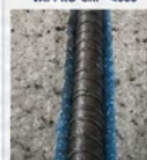
THE CORROSION PROBLEM

UNPROTECTED REBAR



- Chloride penetration
- Breakdown of passive layer
- Corrosion initiation
- Rust expansion
- Cracking, spalling, delamination
- Reduced structural capacity
- High repair costs

REBAR PROTECTED WITH VAPPRO-CRI™ 4000



- Chloride penetration repelled
- Passive layer preserved
- Corrosion inhibited
- No rust expansion
- Concrete remains sound
- Structural capacity maintained
- Extended service life

SCIENCE BEHIND THE PROTECTION



Vapro-CRI™ 4000 molecules adsorb onto the steel surface via polar heads and form a compact, durable protective molecular film that inhibits anodic and cathodic corrosion reactions.

KEY BENEFITS

- Advanced migratory molecular corrosion protection for embedded reinforcing steel.
- Penetrates concrete to reach and protect inaccessible reinforcement.
- Effective in chloride-contaminated and actively corroding concrete.
- Extends the service life of reinforced concrete structures.
- Reduces rehabilitation frequency and lowers life-cycle costs.
- Very low toxicity and environmentally responsible formulation.
- Does not adversely affect air entrainment or concrete workability.
- Suitable for rehabilitation of bridges, marine infrastructure, industrial facilities, and critical civil engineering assets.

IDEAL FOR A WIDE RANGE OF INFRASTRUCTURE APPLICATIONS



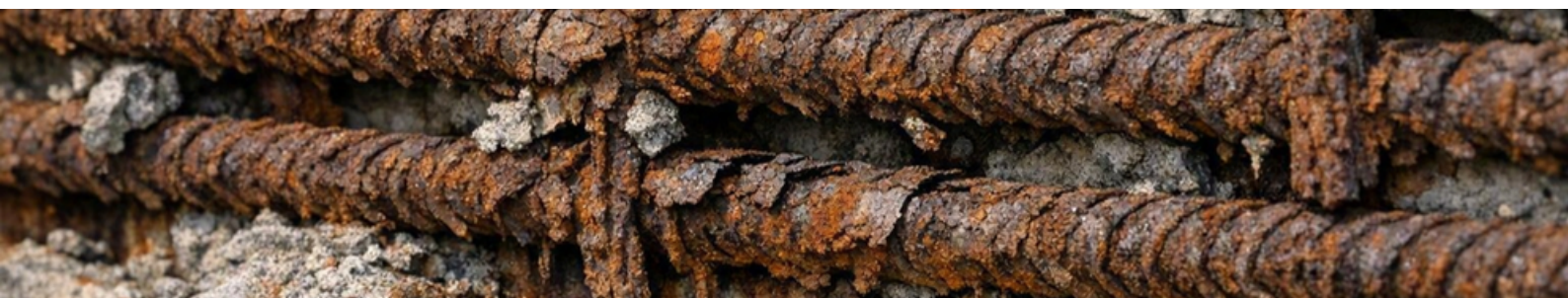
Preserve Today. Protect Tomorrow. Extend Service Life.



Preserve Today. Protect Tomorrow. Extend Service Life.

OVERVIEW

The Challenge & The Solution



THE CHALLENGE

Corrosion of embedded reinforcing steel is the leading cause of premature deterioration in reinforced concrete worldwide. Chloride ions, carbon dioxide, moisture, and oxygen destroy the steel's protective passive film and trigger electrochemical corrosion. As corrosion products form and expand, they crack and spall the concrete, reduce structural capacity, and drive costly rehabilitation.

THE SOLUTION

The Vapro-CRI™ 4000 Series interrupts this process using Advanced Molecular Chemisorption Diffusion Technology. Unlike surface treatments that stay near the concrete surface, it penetrates the pore network and migrates to the reinforcing steel by molecular diffusion and capillary action. There, active inhibitor molecules chemisorb onto the steel, forming a durable protective film that suppresses both anodic metal dissolution and cathodic oxygen reduction.

This molecular barrier isolates the steel from aggressive chlorides and moisture while stabilizing its passive state. Even in chloride-contaminated or actively corroding concrete, it significantly reduces corrosion activity — helping preserve structural integrity and extend the service life of reinforced concrete infrastructure.

HOW IT WORKS

Scientific Protection Mechanism



1

Concrete Penetration

Active inhibitor molecules enter the concrete through its interconnected capillary pores.

2

Molecular Migration

Driven by concentration gradients, the inhibitor diffuses toward the embedded reinforcing steel.

3

Chemisorption

Molecules bond chemically to the steel surface, producing a stable, compact protective layer.

4

Corrosion Suppression

The film inhibits anodic iron dissolution and cathodic oxygen reduction, sharply reducing corrosion current.

5

Long-Term Preservation

Steel stays passivated — delaying cracking, spalling, and structural deterioration while extending service life.

WHY IT MATTERS

Key Advantages & Applications

KEY SCIENTIFIC ADVANTAGES

- ✓Advanced Molecular Chemisorption Diffusion Technology
- ✓Deep penetration reaches otherwise inaccessible reinforcement
- ✓Effective in chloride-contaminated and carbonated concrete
- ✓Forms a durable molecular film directly on the steel
- ✓Suppresses both anodic and cathodic corrosion reactions
- ✓Extends the service life of reinforced concrete infrastructure
- ✓Reduces repair frequency and life-cycle maintenance costs
- ✓Very low toxicity and environmentally responsible formulation
- ✓Compatible with rehabilitation and preservation programs
- ✓Engineered for marine, industrial, transport, and civil environments

Engineered for both new construction and rehabilitation, the 4000 Series protects without affecting concrete workability, air entrainment, setting, or mechanical strength.

PROVEN ACROSS INFRASTRUCTURE

Bridges

Highways

Marine Structures

Ports

Tunnels

Parking Structures

Industrial Facilities

Water Treatment

Airports

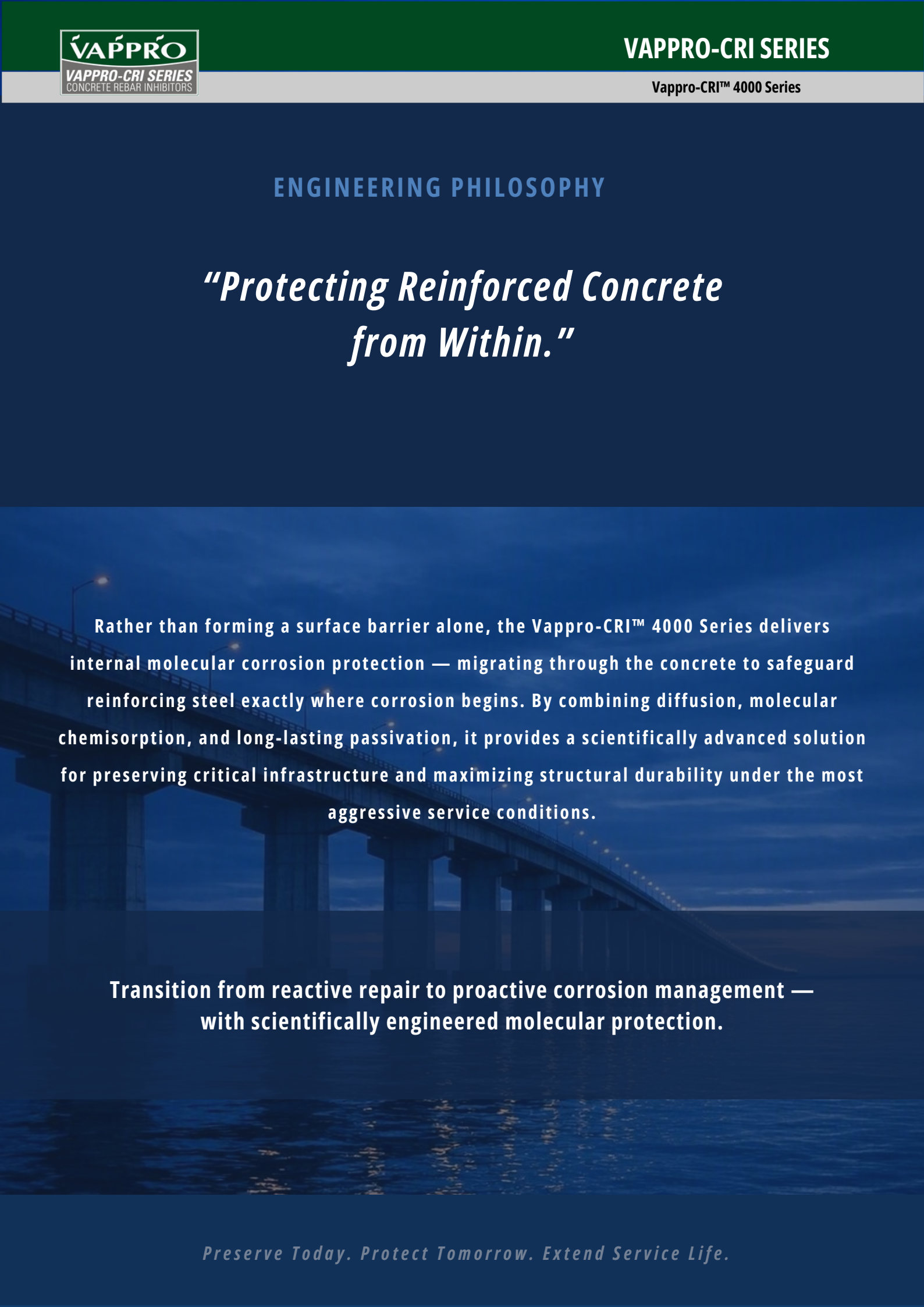
Power Stations

Commercial
Buildings

Civil Works



ENGINEERING PHILOSOPHY

***"Protecting Reinforced Concrete
from Within."***

Rather than forming a surface barrier alone, the Vapro-CRI™ 4000 Series delivers internal molecular corrosion protection — migrating through the concrete to safeguard reinforcing steel exactly where corrosion begins. By combining diffusion, molecular chemisorption, and long-lasting passivation, it provides a scientifically advanced solution for preserving critical infrastructure and maximizing structural durability under the most aggressive service conditions.

**Transition from reactive repair to proactive corrosion management —
with scientifically engineered molecular protection.**

Preserve Today. Protect Tomorrow. Extend Service Life.