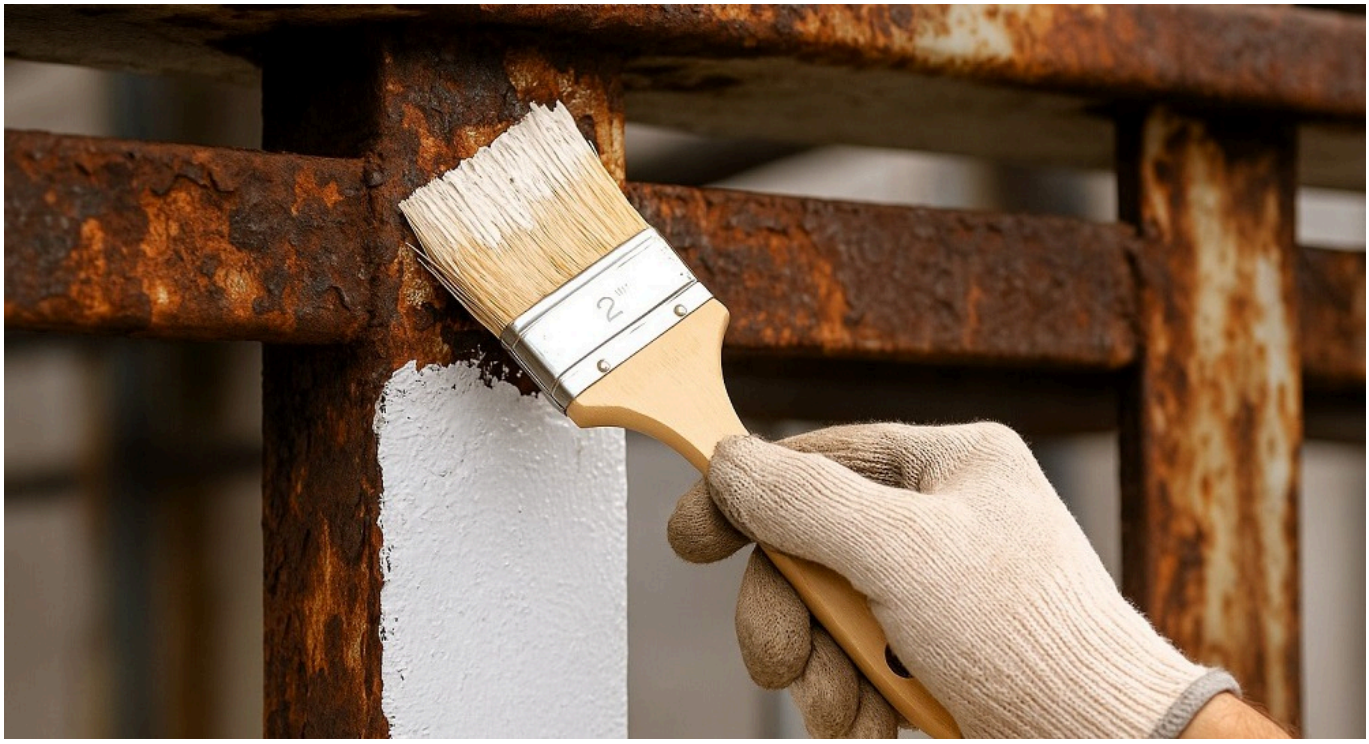
TECH OFFER

Revolutionary Nano-Coating for Durable Corrosion Protection and Structural Reinforcement



KEY INFORMATION

TECHNOLOGY CATEGORY:
Materials - Nano Materials
Chemicals - Coatings & Paints
Sustainability - Sustainable Living

TECHNOLOGY READINESS LEVEL (TRL): TRL9
COUNTRY: JAPAN
ID NUMBER: TO175364

OVERVIEW

As infrastructure all around the world continues to age, asset owners face increasing challenges related to corrosion, rust, and material degradation. Simultaneously, rising environmental regulations and the global shift toward sustainable practices have created strong demand for long-lasting, eco-friendly asset protection solutions. The market of corrosion protection coating is expected to grow significantly, particularly in the Asia-Pacific region, driven by the demand for energy-efficient, low-maintenance alternatives.

In response to these challenges, the technology owner has developed a revolutionary nano-coating solution based on a proprietary nanoparticle formulation. This advanced coating directly addresses three critical industrial concerns: corrosion, surface deterioration and thermal inefficiency across a wide range of operating environments. Unlike conventional coatings that often degrade quickly under harsh conditions, such as UV radiation, high humidity, and marine environments, this single-layer nano-coating delivers exceptional corrosion resistance and enhanced reliability.

By effectively reducing surface temperatures, the coating helps protect the underlying substrate while decreasing energy demands for indoor cooling, resulting in tangible operational savings. Its VOC-compliant formulation also ensures environmental sustainability and enhances workplace safety. It extends the lifespan of critical infrastructure components with fewer maintenance cycles while also reflecting infrared and UV radiation to support energy efficiency goals.

The technology owner is actively seeking test-bedding opportunities with industrial partners in sectors such as oil & gas, marine & shipyard, infrastructure, and heavy manufacturing, particularly valuable for high-value or difficult-to-access assets, where reducing maintenance frequency and minimizing operational downtime are essential.

TECHNOLOGY FEATURES & SPECIFICATIONS

The core innovation lies in the use of nano-particles capable of penetrating micro-craters and crevices in metallic and other substrates. These nanoparticles displace moisture and air, forming a strong, impermeable barrier that resists corrosion and environmental damage. Key features include:

- Long-lasting corrosion resistance
- Water-repellent and anti-condensation properties
- Water-based and VOC-compliant (low-VOC solvent formulation)
- UV-blocking and weather resistant
- Applicable to substrates with temperature between -5°C and 50°C

Key Performance Advantages:

- **Single-Layer Coating System**
  - Combines the functions of primer and topcoat in a single layer
  - Eliminates the need for multiple intermediate coats
  - Reduces application time, labor costs, and asset downtime
- **Minimal Surface Preparation**
  - Requires only basic SSPC SP2/SP3 manual surface preparation (e.g., wire brushing)
  - Eliminates the need for sandblasting
  - Ideal for hazardous zones where hot work is restricted
- **Proven Excellent Durability**
  - Maintains coating integrity and performance up to 150°C
  - Successfully passed a 6,000-hour saltwater spray test
  - Demonstrates long-term corrosion resistance in harsh coastal and offshore environments
- **Superior Structural Reinforcement**
  - Increases the compressive strength of coated concrete by up to 4x
  - Enhances the flexural strength of coated concrete by up to 20x
  - A 5mm coating on 1mm SS400 steel achieves a tensile strength of 80MPa

POTENTIAL APPLICATIONS

This versatile coating technology is well-suited for a wide range of sectors requiring robust protection and thermal regulation:

- **Oil & Gas:** Pipelines, storage tanks, offshore platforms, etc.
- **Manufacturing:** industrial machinery, processing lines, etc.

- **Building & Infrastructure:** Roofs, façades, supporting structures, etc.
- **Marine:** Ships, vessels, dock infrastructure, coastal installations, etc.

It can also be positioned as a green building material or integrated into sustainable facility upgrade project.

UNIQUE VALUE PROPOSITION

This nano-coating solution offers a powerful combination of performance, ease of use, and sustainability, making it an ideal choice for demanding industrial applications. Key unique values include:

- **Application Versatility:** Can be applied directly & immediately on wet condense surfaces after wiping by a cloth
- **Excellent Compatibility:** Adheres well to a wide range of metallic and non-metallic substrates
- **Non-Welding Repairs:** Enables patching of leaks or holes without hot work
- **Reduced Downtime:** Minimizes operational disruption, especially valuable for offshore and coastal assets

In addition, this water-based, VOC-compliant formulation meets environmental and worker safety standards. Proven effective in harsh conditions, it enhances operational reliability and supports broader ESG goals.