Termarust Technologies' 22 year field-proven HRCSA Corrosion Mitigation System.

"Tired of seeing rust bleeding on newly painted steel structures?"

Rust leaking, delaminating coatings, thinning steel, **–*especially within connections***, trigger preventable structural stresses like corrosion-frozen bearings, rust-jacked joints stress your structures beyond their limits.

The following steel structures had been blasted and painted one year before these photos were taken. ***The applied paints were non-HRCSA corrosion mitigation coating formulations.***

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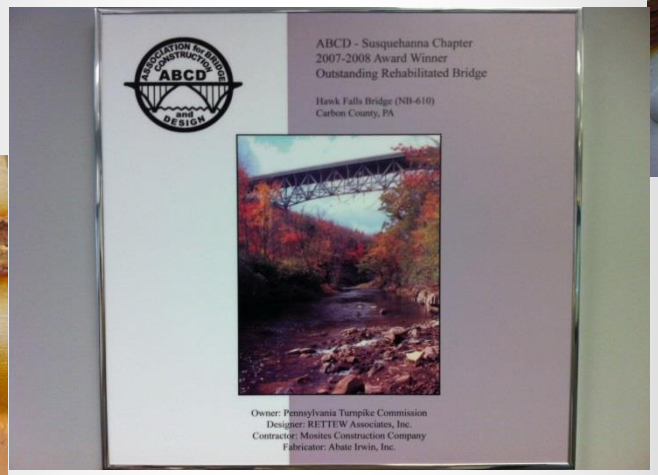
TERMARUST TECHNOLOGIES

Termarust Technologies TR2200HS HRCSA Stops Pack Rust and Crevice Corrosion Cell activity.

(End rust bleeding.)

When pack-rust (within impossible to clean areas) thickens to the point where rivets pop, plates bend, and bearings seize, the structure's integrity is at risk.
HRCSA Penetrant/Sealers and HRCSA Primer/Topcoats provide field proven ways to stop these distructive progressions from worsening.



HRCSA actively penetrates corroded crevices and protects steel in ways non-HRCSA coatings do not.

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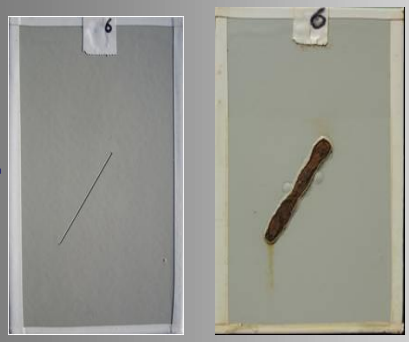
TERMARUST TECHNOLOGIES

How does Termarust Technologies' TR2100 HRCSA Primer/Topcoat Compare against non-HRCSA coatings?

The Prevention of Rust creepage is one of HRCSA's notable points of difference contributing to longterm, corrosion mitigation effectiveness.

3-COAT (zinc / epoxy / urethane) SYSTEM



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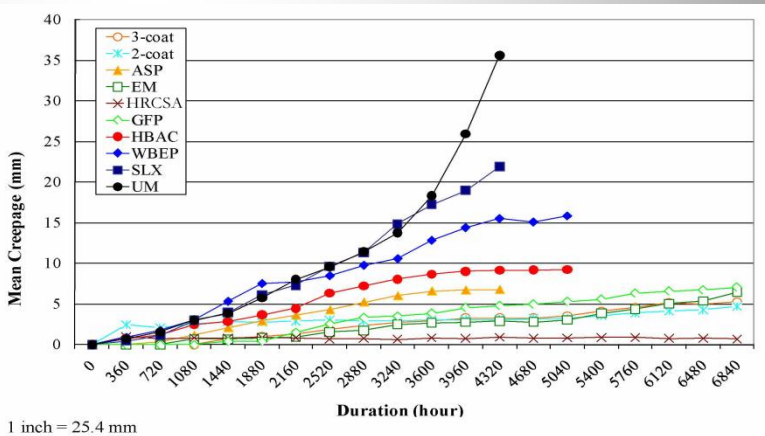
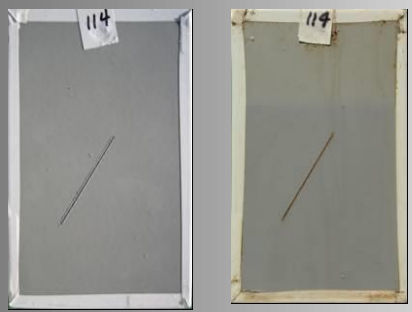


Figure 63. Graph. Development of rust creepage during ALT.

US Federal Highway Administration Lab Report

Termarust Technologies HR CSA



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Non-HRCSA coating systems typically hard leaving steel vulnerable to (micro-cracking, delaminating, rust leaking, perforations).

ASTM D5894 lab results (link below) provide results comparing non-HRCSA coating system performances with field proven HRCSA corrosion mitigation technologies.

RUST CREEPAGE test results in FHWA McLean Research Lab D5894 Accelerated Cyclic Corrosion Rust Creepage – Laboratory Testing (ALT). Click link below to see report

http://www.fhwa.dot.gov/publications/research/infrastructure/bridge/11046/11046.pdf

TERMARUST TECHNOLOGIES

Termarust Technologies HR CSA: Clean

1. **WJ4** high-pressure water cleaning surface preparation. Cleaner air, no dust affecting air. plants, equipment, **Paint chips and rust remnants** easier to gather and collect.
2. Emissions reduced to a fraction of traditional sandblasting equipment emissions.
3. Hazardous waste streams minimalized. **No catalyzed paint, micronized lead dust, abrasive dust , no flushing or toxic solvents to manage**
4. Materials are **100% recyclable** during equipment cleaning.
5. Stored with care, extended shelf-lives and multiple re-uses minimize waste.

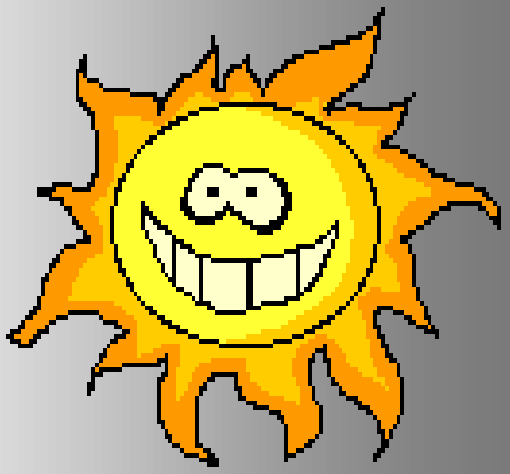
- **LC 50 96HR trout of 41007 PPM**

("Safe paint" ratings are considered OK with 1,000 PPM ratings. Termarust HRCSA is 41 times 'safer' than 'safe paint'. Exclusively used for corrosion mitigation of structures which span over salmon spawning rivers and streams in Western Canada.)

TERMARUST TECHNOLOGIES

Termarust Technologies HR CSA: Optimized UV Protection!

HRCSA is rich in inorganic pigments making HRCSA films more UV stable in intense exposure. In contrast, high gloss non-HRCSA coatings are usually rich in organic pigments and are often more susceptible to UV degradation.

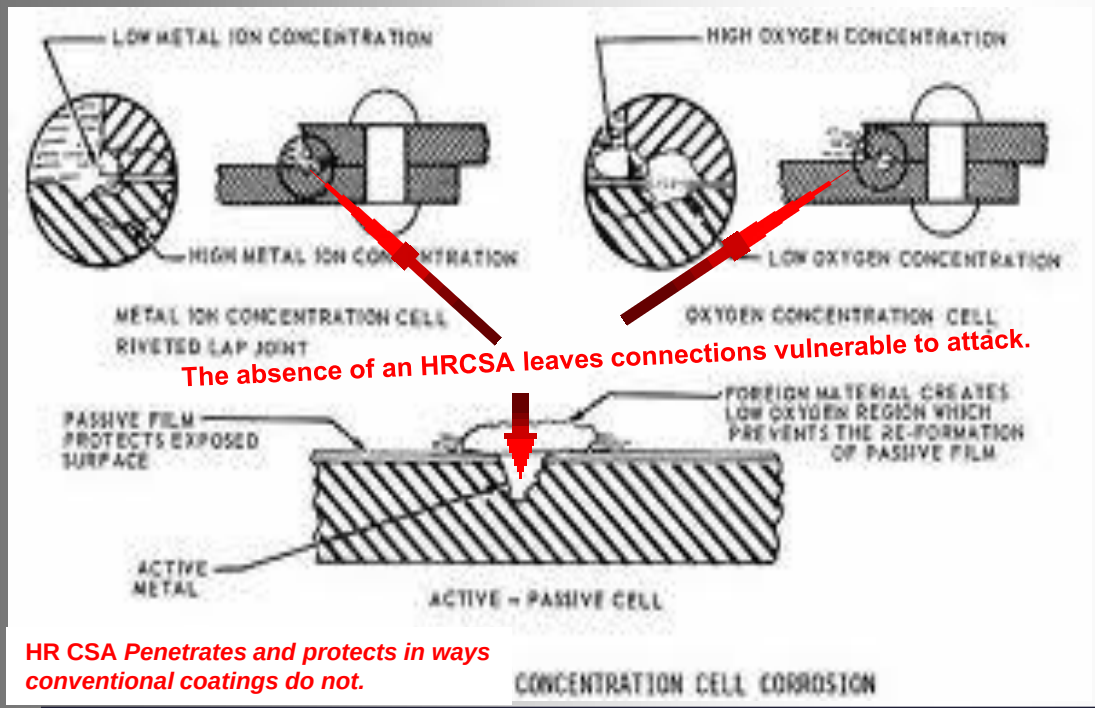


In the above photo, HRCSA (left) and ZEU (right) **were applied the same 12 month period**. (5 yr old picture). Today, the ZEU side displays rust bleeding which the HRCSA side does not.

TERMARUST TECHNOLOGIES

Termarust Technologies HRCSA has 22 year Field-Proven History of Stopping Concentration Cell Corrosion.

HRCSA *penetrates* by (polar attraction) deep inside crevices (pack-rusted or not), to **protect steel surfaces in ways non-HRCSA coatings do not.**



HR CSA *Penetrates and protects in ways conventional coatings do not.*

Concentration Cell Problems?

1. Remove Surface Black Oxides
2. SSPC **SP WJ4, NVC-3, NVS-10**
3. Inject **HRCSA TR2200HS Penetrant into crevices**
4. Apply **TR2100 HRCSA** Caulk **coat**.
5. TR2100 Stripe coat edges and spot prime prepared bare or rusted steel.
6. TR2100 Overcoat all wet-on-wet.

Concentration Cell Corrosion and surface rust can be stopped and corrosion mitigated for decades! *

- Sandblasting not required.☺

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* When applied per Termarust Technologies Condensed Specifications and in environments of PH4.5+.

TERMARUST TECHNOLOGIES

Termarust Technologies HR CSA: WJ4, NVC3, NVS10 is far more cost-effective and easy to manage than abrasive blasting. (Typical project savings >30%)

Mechanically remove surface black oxides.
(To expose contaminates beneath before final cleaning.)

WJ4 High Pressure Water Cleaning… field trials have shown the optimum surface preparation performance (effectiveness /effort / environmental) for removing loose paints, loose rust and non-visible contaminates to NVC3, NVS10 levels are achieved when using **7,000 psi / 6gpm / +170F Hot water** with **0 degree rotating tip** – with Termaclean or Chlor-rid salt remover additive.

5,000PSI cold water with 0 ^{0} rotating tip will do, but optimum surface preparation production rates (30 to 40% reduction in time) with 80% reduction in waste water can be achieved with 7000 PSI 6 gallon per minute 0 ^{0} rotating tip, hot water (steam) leaves little water to recycle.

Diesel HPWC machine courtesy
Unimanix High Pressure Washers

0 ^{0} Rotating tip is another HRCSA min. requirement.
Rotating pattern cleans surfaces **200% more effiently** than fan tips while ensuring a clean and tightly-adhered surface.

For application video showing HRCSA, click on:
Termarust Application Video (~8 minutes)

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TERMARUST TECHNOLOGIES

Termarust Technologies HRCSA:

Inspect what you Expect: Checks and Balances.
Detailed application specifications available upon request.

A) CLEAN: WJ4 High Pressure Water Clean Surfaces

Using zero-degree rotating tip at 4 inch standoff.

7,000 psi / 6gpm, +170F @ 4” standoff
High pressure water cleaning.

Field proven to Produce:

&

(Actual HRCSA field photos.)

7000 PSI Produced
Near equivalent
SSPC SP6 blast

B) PENETRATE: HRCSA

TR2200HS Penetrant stops corrosion and rust bleeding from within crevices when injected into WJ4 HPWC cleaned joints and crevices that are properly dried with 100 psi clean, dry, oil-free air before TR2200HS is injected into all joints and crevices

<u>Inject before over-coating.</u>

C1: INSPECT Pull-Test

HRCSA coatings provide proven durable <u>(decades)</u> over-coating protection when applied overtop tightly adhered contaminant free **existing coatings or rust.**
Pull-tested 300 PSI minimum adherence

C2: INSPECT Surface Contaminates.

Test surface contaminates Chlorides, Sulfates Nitrates to meet NVC3, NVS10 standards. Ex: ChlorTest or Bresle test.

Spray, Brush or Mitt caulk-coated crevices, stripe-coated edges, bare steel and tight, cleaned rust. Overcoat to finish.

1 coat, 3 step wet-on-wet.

C3: INSPECT

Wet film and Dry film thicknesses.

15 year old HRCSA application, no rust leakage.

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TERMARUST TECHNOLOGIES

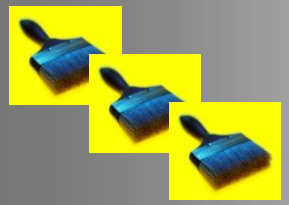
Termarust Technologies HR CSA: Reason #8: EASY Field Repairs.

Multi-coat hard film Paint Repair (Labor intensive)

1: **Sand** damaged surface coating down to bare steel.

2.1 **Feather back** top-coat.
2.2: **Feather back** epoxy coat.
2.3 **Feather back** primer coat.

3.1 **Apply** primer coat.
3.1.1: **Clean** equipment, allow time to cure.

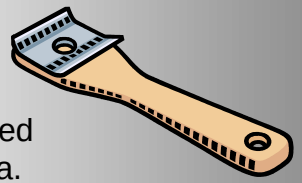


3.2.1 **Mix 2k** epoxy coat.
3.2.2 **Apply** epoxy coat.
3.2.3 **Clean** equipment,.
3.2.4 Allow **time to cure**.

3.3.1 **Mix 2k** Top coat.
3.3.2 **Apply** Top coat.
3.3.3 **Clean** equipment.
3.3.4 **Protect** until cured.

4. **Clean** equipment / **Dismantle** protection / **Manage 2K Waste Disposal**.

HRCSA Coating **Simple** Spot Repairs



1: Scrape off damaged TR2100 topcoat area.

2.1 Clean surfaces & **remove** non-visible contaminates.
2.2 **Force air dry** crevices.

100 PSI dry, oil-free air.

Apply **Chlor*Rid DTS** to remove non-visible contaminates from surfaces and crevices.

3.1 Apply TR2200HS HRCSA penetrant to **crevices ONLY**.
3.2 **Liberally apply TR2100** primer/topcoat onto prepared surface (and penetrated crevices – when required.)

4 Bag brushes. Seal container(s) and re-use for your next application.

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Termarust Technologies HRCSA:
Reason #10: Structure Owner's **Bill of Rights.**

1. "How does your current coating material deal with the following areas of failure as seen on your structures?

    - **Pack or Rust Jacked Joints** which cannot be cleaned or sandblasted per coating specifications?
    - Rust bleeding from Rivets with gaps, bolt-heads, threads, and **sharp edges**?
    - **Areas on flanges** with standing water, salt, sand, dirt, bird droppings which cause **poultice corrosion** ?
    - **Deep rust pits** with uneven profiles?
    - Structures with **unknown metallurgical** histories?
    - **Others**

2. "**How does your coating process *work*** to solve the above-mentioned corrosion issues?"

3. "Are there any special methods (exceptions) required for the coating to be effective in any of the above-noted areas?"

4. "Will your current supplier enter into **a joint long-term (5 year) warranty** with a coating contractor / applicator to **guarantee the performance of there material** against the following modes of failure?

    - **Rust leaking** from crevice corroded joints and connections?
    - **Delaminating coatings** from the surface or between coats.
    - **Perforation** from sand, stones, gravel and (others).
    - **Poultice** rusting on flange bottoms."

5. "Can the coating supplier provide **examples** of 5 years **field experience** where the coating has proven **reliable at solving the above corrosion issues without failures** in these areas?"
6. "Are you willing to require certification or samples before delivery and take samples on the job site to verify material is as specified for the project ?"