

# HoldTight® 102

## SALT REMOVER / FLASH RUST PREVENTER

### Why specify HoldTight®102

- It eliminates Chlorides and STOPS Flash Rust in One Pass.
- It Leaves No Residue. That's good for Coatings.
- A cost-effective alternative to single purpose, multi-step salt removal products
- A coating-friendly and effective alternative to old fashioned nitrate, phosphate, film-forming, and solvent-based flash rust inhibitors
- There are reams (or megabytes) of data and more than 25 years of field experience to back it up

#### Texas Oiltech Labs

REMOVAL METHOD	CHLORIDE CONTENT µg/cm <sup>2</sup> (measured by total extraction method)	
	BEFORE	AFTER
Dry Blast (sample 1)	170.9	43.5
Wet Grit Blast (sample 2)	488.2	35.9
Wet Grit Blast with HoldTight®102 (sample 3)	534.4	Not Detected (<1.0)
Wet Grit Blast with HoldTight®102 (sample 4)	1,134.3	Not Detected (<1.0)

Samples supplied by Occidental Chemical Corp., Luling, LA. Report and independent lab test data available on request.

#### New York City Department of Transport

REMOVAL METHOD	CHLORIDE CONTENT ppm (measured as shown)	
	Quantab Strips	Kitigawa Tubes
None: original sample	236	250
Power Tool only	122	130
Power Tool + pressure wash, water only	210	84
Power Tool + pressure wash, water with HoldTight®102	32	14
Dry Blast only	58	65
Dry Blast + pressure wash, water only	41	20
Dry Blast + pressure wash, water with HoldTight®102	Not Detected	0

Samples supplied by and tested under supervision of NYC DoT Bridge Maintenance & Repair, Brooklyn, NY.

When Chlorides (or other contaminants) are a problem, HoldTight®102 is a cost effective and reliable solution. If Flash Rust is an issue, HoldTight®102 is THE answer. Cost Conscious? Check out our dilution ratios and consult us for estimating assistance. Using UHP? HoldTight®102 will end the "good rust" vs "bad rust" dilemma and, used properly, will work with any equipment. If Coating Compatibility is a concern: ask Ameron, Carboline, Dampney, Hempel, Keeler & Long, PPG, Sherwin-Williams, Sigma, Tnemec, Wasser or most any other coating supplier and compare to other products: no nitrates, no phosphates, no solvents, no film, no residue, non-acidic, neutral pH when applied. HoldTight®102 has been tested for compatibility with many different types of atmospheric and immersion service coatings. Pull test values [p.s.i.] for typical coatings in a number of major categories are shown below. Contact us for more.

**INORGANIC ZINC, e.g.,** •Carboline Carbo Zinc 11 (1084) •Sherwin-Williams ZincClad II HS (>2034) •Ameron Dimetcote 21-9 (>1050)

**ORGANIC ZINC, e.g.,** •Carboline 858 (3030) & 859 (1798) •Sherwin-Williams ZincClad IV (>2034)

**EPOXY, e.g.,** •Hempel Hempadur 557,4514, 4515, & 4563 (>1050) •Tnemec Hibuild Epoxyline series 66 (2527)  
 •Devoe Marine Phenolic Epoxy (>1050) •Ameron Amerlock 400 (>1050)  
 •Tnemec HS Epoxy series 104 (>2295) •Tristar

**COAL TAR, e.g.,** •Sherwin-Williams Corothane I MC Tar (>2034) •Carboline Bitumastic 300M (2266)

**ALKYD, e.g.,** •Tnemec Chemprime HS series 37H (945) •Sherwin Williams KemBond HS Universal Primer (1306)

**POLYURETHANE & URETHANE, e. g.:** •Sherwin-Williams Corothane I MC Tar (>>2034) •Wasser

•Valspar generic polyurethane (1079) •Tristar

**NOTE:** Some of the tests were performed with an Elcometer 106 manual pull-off adhesion testers with a range of 0 to 1,000 psi. Automatic pneumatic or hydraulic testers give higher adhesion test results.

# THE ULTIMATE CHLORIDE REMOVER

Independent tests confirm that **HoldTight®102** removes chlorides (and other contaminants). It then prevents flash rusting, a simple and obvious indication that the surface is clean and ready for coating.

## NYC DoT Tests for Removing Soluble Salts with **HoldTight®102**

Using three different SSPC-approved tests for the presence of soluble salts, New York City Department of Transportation (NYCDoT) researchers concluded that **HoldTight®102** will effectively achieve zero or undetectable salt levels.

SSPC-TU 4 Field Methods for Retrieval and Analysis of Soluble Salts on Substrates sets out guidelines for testing for soluble salts in the field. NYC DoT conducted its tests at a Brooklyn site in accordance with these SSPC guidelines.

All test samples were taken using the ISO 8502-6 Bresle Sampling Method, as described in SSPC-TU 4, Section 3.3 - Adhesively Bonded Cell. Then, three different SSPC-approved test procedures were used to determine the soluble salt levels on the test samples before and after the application of **HoldTight®102**, as recommended by the manufacturer. In principle any one of the three procedures would have been sufficient. NYCDoT staff used all three, however, as a multiple cross-check of the results and to confirm with a high degree of certainty that **HoldTight®102** would effectively remove chlorides.

The substrates tested were severely corroded steel coupons, approximately 2" thick, cut from bridge structures removed during repair operations. In each test the sample was first dry blasted. **HoldTight®102** was then used in a potable water wash down at 500 psi, 1-2 gpm, one part **HoldTight®102** was used with 50 parts water. (Note, the manufacturer recommends this 50:1 dilution of **HoldTight®102** as a starting point, especially with dry blasting. In practice, users report similar results with 100:1 to 200:1 dilutions depending on the condition of the surface and the method of surface preparation used. Typically, the more pressure and water used in surface preparation, the less **HoldTight®102** per unit of water needs to be used to achieve zero or undetectable levels of chlorides.) The three tests were as follows:

Kitigawa Tube method. Prior to using **HoldTight®102**, soluble salt levels on the test samples ranged between 200 and 280 ppm, as measured by an ISO 8502-5 Chloride Ion Detection Tube. These soluble salt levels were reduced to zero after the **HoldTight®102** wash down. This ISO procedure for testing of soluble salts is described in SSPC-TU 4, Section 4.3 - Field Detection of Chloride Ion by Kitigawa Tube.

- **Quantab Strip method.** Prior to using **HoldTight®102**, soluble salt levels on the test samples ranged between 200 and 260 ppm, as measured by Quantab Strips in the test procedure described in SSPC-TU 4, Section 4.4 - Field Detection of Chlorine Ion by Quantab Method. Soluble salts were **undetectable** after the **HoldTight®102** wash down.
- **Silver Dichromate (qualitative) method.** Soluble salts were also **undetectable** after the **HoldTight®102** wash down as determined by the ISO 8502-1 Field Test for Iron II Salts in Abrasive Blast Cleaned Surfaces (Field Test for Soluble Iron Corrosion Products) as described in SSPC-TU 4, Section 4.8 Qualitative Field Detection of Ferrous Ion. Similar results have been reported by users of **HoldTight®102** in various other surface preparation methods and in our own lab tests:
- In water or wet abrasive blasting when **HoldTight®102** is used either in the blast water or in the wash down water or in both
- In ultra-high pressure (UHP) blasting when **HoldTight®102** is used, as in dry blasting, after the initial blast or stripping step in a wash down at a minimum pressure of 500 psi, 1-2 gpm)

## **HoldTight®102** prevents flash rusting: the easy way to determine surface cleanliness.

Simply put, if flash rust occurs after surface preparation -- even by a method intended to reduce or remove salts -- you cannot be sure the surface is clean enough to coat. After working with the water\* to remove contaminants, **HoldTight®102** then rapidly evaporates. **HoldTight®102** does not evaporate until after the water evaporates. **HoldTight®102** interferes with the reaction of oxygen with the iron, then evaporates, leaving a clean, contaminant free surface that is ideal for coating. But if hygroscopic (water-attracting) contaminants of any kind remain on the surface, even this quick drying action would not prevent flash rusting. That's because those suckers pull moisture out of the air, then they react with the oxygen in the air and new moisture to cause rust.

So, if the surface rusts, you may or may not have contaminants. Even if you test for chlorides and find none, the results may only apply to the specific area of the test. Contaminants may not be spread uniformly across the surface. The fact is that rust, no matter what its cause, is typically inconsistent. On the other hand, if the surface does not rust, you can be very confident that it is both contaminant- and moisture-free. Over time, of course, contaminants carried in the air re-contaminate the surface and then pull moisture out of the air to cause rust. Then you lose your window for coating. With **HoldTight®102** that window is usually 2 to 5 days.

\* **HoldTight®102** reduces the surface tension of the water -- causing the water to spread more evenly over the surface, to literally wet the surface more efficiently. This wetting action combined with the force of the water under pressure results in more efficient cleaning than water alone, even water under very high pressure. Heating the water also reduces surface tension somewhat, for example, raising water temperature of 20°C (68°F) to 100°C (212° F) reduces surface tension from 72.8 dynes/cm to 58.9. But at a 1:50 ratio, **HoldTight®102** reduces surface tension of 20°C water to 23.4 dynes/cm.

## HoldTight® 102 is like soap – but it is not soap

It cleans, but you don't have to rinse it off. **HoldTight® 102** is NOT applied any more that you would "apply soap" to wash dishes. Like a detergent it adds to the natural cleaning power of water. It doesn't convert or chemically alter contaminants that cause flash rust, though it does cut grease. When used at the recommended pressures in a stream of water it removes contaminants, both those that were on the surface before the blast (abrasive or ultra-high pressure) and those that were created or freed-up by the blast.

The best analogy is soap. Suds (foam) are fun but they don't clean -- scrubbing with soap and water cleans -- soap in a dishwasher with proper water flow, agitation, etc., cleans even better. Dip a dirty dish in soapy water and some grease and food residue will be removed; scrub a dirty dish with a sponge or brush with soap and water and you will remove more; use a dishwasher -- with detergent -- and you will generally remove it all. Using **HoldTight® 102** and water in a pressure washer is similar to using a dishwasher to clean.

And here's the bonus: clean surfaces simply don't rust as fast. **HoldTight® 102** prevents flash rust not by forming a film to separate the surface from air and humidity, but by leaving an exceptionally clean surface. Contaminants of any kind – visible or invisible – literally suck moisture out of the air, like sponges. To be a bit crude, but clear, about it, **HoldTight® 102** remove's those suckers. Because **HoldTight® 102** evaporates with the water in which it has been dissolved, it does not leave a residue as do some salt removers and virtually all conventional "inhibitors." It does not solve one problem by creating another.

## HoldTight® 102 is not a coating: It is NOT "applied"

One of the most common misconceptions about **HoldTight® 102** salt remover / flash rust preventer is that it can be "sprayed on" or otherwise applied like a coating. NOT SO! Sure, it is physically possible to do so, but its effect on the surface if used that way will be of little value. And if it is "put on" this way at full strength (i.e., without at least a 25 to 1 dilution of potable water to **HoldTight® 102**) it may be a problem for some coatings.

The key to using 102 effectively is to dilute it properly AND to pressure wash the surface with the water + **HoldTight® 102** fluid -- we say "treated water" -- the more pressure the better but the water volume need not be greater than 1 gallon per minute -- a common flow rate for pressure washers. Higher pressure improves performance, higher volume doesn't help or add much: Most off-the-shelf pressure washers (at Bunnings or Mitre 10, for example) can easily generate 1500 P.S.I. of pressure with a flow rate of 1 gallon per minute. Industrial washers can go much higher, 5,000 P.S.I. or above, and they are more efficient. Heating the water will improve performance, but is not essential.

Why are pressure and flow important? Simply because **HoldTight® 102** is a cleaning agent, a surfactant like high efficiency detergent, but UNLIKE conventional soaps or detergents, it leaves no residue if allowed to evaporate with the water that contains it. Forcing the water with the **HoldTight® 102** into the profile or pores of the surface results in more thorough cleaning. When the surface is dry, the **HoldTight® 102** is gone. There is nothing to remove. You are ready to apply your primer or coating, or you can wait several days without seeing flash rust.

## HoldTight® 102 USERS

- Shell Refining
- Shell Exploration & Production
- Chevron Texaco Refining
- Exxon Mobil Refining
- Dow Chemical / Union Carbide
- Lyondell Chemical
- Lyondell Citgo Refining
- Koch Refining
- Marathon Refining
- Suncor (East coast Offshore)
- Husky Oil (East coast Offshore)
- General Motors
- Delphi Automotive
- Advanced Silicon (chip manufacturing)
- Bredero Shaw (piping and pipeline maintenance & construction)
- National Aeronautics & Space Administration (NASA)
- Colonial Pipeline
- Canadian Coast Guard
- Cenovus Energy
- Victoria Shipyard
- Chantier Davie/ Shipyard
- Lockheed Martin
- Irving Shipbuilding (Halifax)
- American Rail Car (maintenance)
- City of Houston, Texas
- Ministry of Transport Nova Scotia
- Ministry of Transport Ontario
- Ministry of Transport Quebec
- Ministry of Transport Newfoundland & Labrador
- State of Illinois Department of Transportation
- New York Bridge & Tunnel Authority
- New York Port Authority
- U.S. Naval Surface Warfare Center, Crane, Indiana (munitions maintenance facility)
- U.S. Bureau of Reclamation (hydro-electric dams)

15 x magnification of a steel plate dry blasted



Surface profile showing no contaminants at this magnification level

500 x magnification of steel plate dry blasted



Surface profile showing contaminants and shattered Abrasive Particles impregnated into the metal profile at this magnification level

15x magnification of a steel plate wet-abrasive blasted with HoldTight®102



Surface profile showing no contaminants visible at this magnification level

500x magnification of a steel plate wet-abrasive blasted with HoldTight®102



Surface profile showing no contaminants even at this magnification level



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