



RUST BULLET LLC
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Metal Blast

Soluble Salt Contamination of Steel

Rust Bullet Metal Blast Surface Cleaner and Conditioner Recommended to Rid Surface of Soluble Salts

Coatings industry participants, especially those involved in project inspections and audits, readily agree that one of the largest single contributors to premature coating failures are non-visible surface contaminating soluble salts which go undetected prior to coating application. The presence of soluble salts such as chlorides or sulfates on metallic substrates to be coated can result in premature coating failure when present in sufficient concentrations. These salts are typically not removed by blast cleaning and, in fact, can be driven into the blast profile of the metal by inappropriate blast cleaning. Insufficient or inadequate testing of the surface and surface preparation materials, and the lack of proper surface cleaning steps, are important factors to consider when soluble salt presence is suspected. When coatings are applied over soluble salt contaminated steel, subsequent moisture migration (normal to coatings in humid or immersion environments) in and out of the coating film results in the moisture solubilizing the salts and condensing on the steel surface under the coating film. Over time, this creates small osmotic cells pulling more moisture to the concentrated solution causing osmotic pressure to develop. This pressure pushes the coating off the surface creating blistering of the coating with subsequent delamination.

When surface reacted soluble salts are detected through quantitative testing, the use of a Rust Bullet Metal Blast, an acidic, nonhazardous, noncorrosive soluble salt remover, applied very simply with a pressure washer (3500 to 4000 psi) will cost effectively remove these surface contaminants to prevent premature coating failures caused by the salts.

The removal of the contaminating salts with abrasives has limitations. The blending of different size grit can improve the physical attack on an uneven surface profile, however this method provides no assurance that this will reduce the salts to acceptable levels. Furthermore, the amount of time taken to physically remove layers of the substrate surface to accomplish this task may be impractical and costly. Combined abrasive blasting and water washing steps generally requires multiple cycles with no assurance of achieving the threshold acceptable levels. The cost of time, labor and materials must be considered.

Ultrahigh water pressure (35,000 to 40,000 p.s.i.) has become a more commonly accepted method of surface preparation with more affordable equipment available for contractor use. It is an excellent method for removing old coatings and pack rust, yet documented field cases exist where the hydraulic action of the ultra-high pressure water jetting is insufficient for removal of soluble salts to threshold levels.

The speed and direction at which hydroblasting passes over the surface may be a key reason why the contaminating salts are not removed from the deep and narrow crevices of the surface profile and corrosion pits. The use of an acidic chemical to draw the salt anions from the deep and narrow or microscopic crevices provides the chemical antidote required to effectively decontaminate. Rust Bullet Metal Blast will address not only the soluble salts, but other surface and embedded contaminants and impurities.

It is well known that the insoluble oxide products which form on the surface are a layer above where the contaminating salts can continue the corrosion cycle. Imperfections in the insoluble layer allow oxygen to penetrate the corrosion cell to perpetuate the debilitating reactions. Removing the insoluble layer with physical pressure to achieve the acceptable visual appearance standard becomes only a part of surface preparation. Uncovering the corrosion cells in which the salts can be found will facilitate their removal through chemical action.

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