

Maintenance of Stainless Steel Railings & Equipment:

Introduction & Background information:

All stainless steel will rust if exposed to adverse conditions such as chlorides (in swimming pools and marine environment) and other corrosive materials. However, proper maintenance procedures can prevent occurrence of damaging rust and correct rusting problems if it does occur.

Maintenance to prevent rusting and corrosion:

When a corrosive environment is present, stainless steel can be maintained to prevent rusting of the surface. The first and most important procedure is to make sure that the surface is passivated prior to installation of the equipment. This removes any free iron that may have been on the surface from machining, welding etc. Remember, stainless steel is around 70-80% Iron. After passivation a rust resistant chromium oxide layer forms on the surface over time, once protected by chromium stainless is considered to be 'passive' and requires little care.

After installation of stainless steel in a chloride or other corrosive environment (all swimming pools), procedures must be put in place to maintain stainless. Without care, all stainless in the pool air envelope will show surface rust. This tarnish & rust is due to chlorides reacting with oxygen & iron on surface of & in the inter-granular structure of stainless. Daily rinsing with clean water is the best way to maintain the surface. This removes any chlorides that may have been splashed onto the surface in normal use. In addition if ANY rust is visible it needs to be removed immediately, using a passivation product (Spectra-Clean System 1). This will remove the rust and re-passivate the surface. All areas passivated also require treatment with SPECTRA SHIELD to ensure salts do find a way into the structure of the steel. A procedure is detailed on page 2.

Maintenance of stainless steel that has rusted severely:

Once the stainless steel has rusted to the degree where corrosion is crusty that may indicate pitting. Pitting is permanent and pitted stainless requires more maintenance ongoing.

But pitted or not most crusty rails can be cleaned up with an aggressive cleaning approach.

1. The first step is to remove the rust with a Spectra-Clean System 1.
Use of Non-scratching Scotchbrite® can help to remove crusty rust (maroon grade).
2. Seal the inter-granular structure with SPECTRASHIELD.
3. DO regular inspections & follow-up care to remove tarnish & literust as it appears.

Long term protection of the surface for new stainless & old stainless can be attained by applying Spectra Shield to the surface after removing the rust and drying the surface. This forms a protective layer in the pits and inter-granular boundaries that prevents air and water from creating corrosion below the surface. Without the oxygen and salts from pool water the rust will not grow.

There are sometimes other considerations that require effort not discussed above. For clarification and assistance you can call us to discuss your particular situation.

Procedures & Techniques Stainless Steel Care & Sealing:

Initial Treatment of Stainless:

This is a three-step process that must be completed very thoroughly to get best results. Result is a railing that is passivated to remove iron from the surface & sealed to prevent corrosion under the surface layer.

1) Clean rails with passivation materials

- a) Start with a dry railing
- b) Apply passivation chemicals Spectra-Clean System 1 to rail (spray or wipe on)
- c) This chemical must be re-sprayed or re-applied as required to maintain a wet surface for 30 minutes.
- d) After 10 minutes agitate the surface with a non-abrasive pad (3M Scotchbrite white). (If visible rust does not seem to disappear, use a mildly abrasive pad (3M Scotchbrite grade maroon).
 - On existing rails where there is visible crusty rust you will usually require a maroon pad
 - Do not use a more course 3M pad than maroon, as green and higher will scratch surface, thus creating more corrosion points.
- e) Re-apply chemical & agitate as required.
- f) After 30 minutes of wet contact, very thoroughly hose off stainless. (Un-rinsed chemical will dry white; you want to get it all off with no residue after drying).
- g) Hand dry so that watermarks do not develop.

2) Thoroughly Dry Stainless:

- a) Steel needs to be more than dry to the touch. Seams & crevices (as well as pit pockets) must be bone dry in order to accept the sealer.
- b) Best practice: Allow steel to dry 48 hours (or more)
If treating steel during pool operation allow 4+ hours air dry & heat gun treatment to ensure water in pockets & seams etc. fully evaporates.

3) Apply Spectra-Shield Sealer

Sealing is the fastest part of the procedure. Use a cotton rag & wipe sealer onto steel so that steel is wet with sealer (very wet not just damp) Allow sealer to stay on rail for 10 minutes then use a dry cotton rag to wipe excess away. Spectra shield is not water soluble and is difficult to remove. Be Careful to minimize amount of sealer that hits deck, glass or other surfaces.

Spot Treatment Follow-up Care:

Any area of rail that was not passivated or where sealer did not 'take' will begin to show rust after treatment (usually due to either: Not dry enough prior to sealer application or not sealed).

Just Re-treat that small specific area using procedure above adapted for smaller scale:

- a) Thorough cleaning of specific spot using Spectra-Clean System 1 spray; keep area wet with Spectra-Clean System 1 for 30 minutes.
- b) Area must be very dry before final step; for small areas at an aquatic center a heat gun is an ideal solution. Areas needs to be heated to the point that the metal is warm to hot resulting in evaporation of water in crevices, seams and pits (heat to hot-to the touch).
- c) Once spot has cooled - final step is an application of SPECTRA SHIELD.
Apply SPECTRA SHIELD generously to surface (surface to be very wet but doesn't need to be dripping)
After 10 minutes wipe area with dry cotton cloth.

Care of Common Misc Deck Items:

These procedure ideas are just variations of SPOT cleaning as outlined above adapted to specific deck problems we have found over time.

Floor Drain Covers Etc:

These small removable items (floor drain grates, some escutcheons, & some compression anchor parts) can be treated by removing them. We recommend acquiring spares to allow removal and treatment. Remove small item and follow a variation of application procedure from above.

- a) Soak in Spectra-Clean System 1 in a bucket or other plastic container. The plastic container must be free of any contaminants or residue of any sort.
- b) Heavy Corrosion may require a stainless steel brush & or green Scotchbrite. Scrub with Scotchbrite as required to remove all corrosion.
- c) Rinse very thoroughly.
- d) Allow to air dry 24 hours or more. Ideally off pool deck, ideally in a warm environment; and/or apply heat with heat gun as required to ensure all pits and crevices are **DRY**.
- e) Soak in SPECTRA SHIELD in a bucket for 10 minutes. Remove from bucket & dry off excess sealer with dry cotton cloth.

Anchors imbedded in cement:

Anchors in cement where rust is appearing need to be treated in place. (Stanchion post anchors & some compression anchors).

- a) Remove post or grab bar if the is one, so anchor is empty.
- b) Remove lids to anchor if present.
- c) Clean with Spectra-Clean System 1 using a Scotchbrite pad to agitate. Coarseness of Scotchbrite pad should match amount of corrosion. Some heavy corrosion may require a stainless steel brush & or green Scotchbrite. Scrub with Scotchbrite as required removing all corrosion.
- d) Rinse very thoroughly.
- e) Dry inside and out the entire anchor with a clean cotton towel to remove excess water. Treat anchor with heat gun both at the flange at deck surface and the interior of anchor. The goal is to get enough heat onto metal that it's fairly hot to touch and all water in pores and seams evaporates both on top and inside.
- f) Final step is an application of SPECTRA SHIELD. Apply SPECTRA SHIELD generously to surface (surface to be very wet but not dripping) After 10 minutes wipe area with dry cotton cloth.

Wall plates, door hardware, fountains and other miscellaneous stainless:

These pieces use the same procedure as SPOT cleaning as outlined above. However where you cannot hose a piece of equipment, use multiple wet rags to wipe off passivation materials prior to drying and treating with SPECTRA SHIELD.

- a) Thorough cleaning using Spectra-Clean System 1 Spray; keep area wet with Spectra-Clean System 1 for 30 minutes.
- b) Remove Spectra-Clean System 1 with wet clothes/sponges
- c) Area must be VERY DRY before final step; for small areas heat gun is ideal solution or long period of air dry (24 hours +)
- d) Final step is an application of SPECTRA SHIELD to seal surface, seams & crevices. Apply SPECTRA SHIELD generously to surface. (surface to be very wet but not dripping) After 10 minutes wipe area dry with a clean dry cotton cloth.