

Introduction

The following pages are meant as a guideline to the successful preparation of steel surfaces and the subsequent application of a Polymeric Engineered Solutions coating system. The steel preparation checklist is meant as an addition to the method statement sent out for specific projects. If you have any questions regarding the information listed on the following pages please contact Plant Equipment & Services at 1-888-778-6510 or by email at pes1@pes-solutions.com.

Areas to be assessed prior to abrasive blast cleaning, hydro blasting, water jetting and mechanical grinding

Prior to any surface preparation methods being carried out on the steel surface the following areas need to be assessed –

1. Oil, grease and other surface contaminants
2. Mill scale and rust
3. Weld spatter
4. Weld irregularities
5. Sharp edges, dents and burrs
6. Water soluble salts

Oil, grease and other surface contaminants

Contrary to perceptions, oil and grease are not removed by mechanical surface preparation alone. In fact if using a mechanical grinder or MBS bristle blaster the abrasive tools may collect the surface oil and grease and deposit them in other areas. Any surface contaminant will act as a barrier to coating adhesion and will result in delamination, poor adhesion and mechanical resistance. To ensure that all surface contaminants have been removed the repair/coating area must be washed down with a suitable degreaser such as MEK (Methyl Ethyl Ketone). The surface, if badly affected, may require more than one wash down prior to any surface prep taking place.



Mill scale and rust

Mill scale if left on the surface of the steel can cause galvanic corrosion between the coating and the substrate and therefore cause peeling or delamination of the coating system. Rust will reduce the adhesion between the steel surface and the coating. In light operating environments this will only slightly degrade the performance of the chosen coating material, however where the coating system is to be applied in more aggressive environments such as chemical contact and high temperature this will cause premature failure of the system. To eradicate mill scale the steel surface must first be washed down with a suitable degreaser such as MEK (Methyl Ethyl Ketone) and then entire repair and coating area must be abraded by abrasive blast cleaning, hydro blasting or by using an MBX Bristle Blaster. For aggressive environments rust must be abrasive blast cleaned from the surface and the coating system applied to the steel surface before moisture contact creates gingering on the surface.



Weld Spatter

Weld spatter may appear to be bonded to the steel surface and therefore not be a threat to coating adhesion, however the spatter may only have minimal adhesion to the steel surface and may contain contaminants from the welding process. Abrasive blast cleaning alone will not remove all of the weld spatter therefore due diligence dictates that the weld spatter must be removed by chipping or grinding first and then entire surface abrasive blast cleaned. This will ensure that the spatter does not leave any shadowing on the final cured finish of the coating system.



Weld Irregularities

Welds are a potential weak area for any coating system if they are not properly assessed and prepared. Protrusions or wire residues that have not been removed will create thin dry film thicknesses for epoxy or polyurethane coatings. Sharp edges or localized porosity on the weld will also create potential weak spots and will ensure premature failure of any coating system. Prior to application all weld seams must be checked and any irregularities must be ground smooth using mechanical grinding equipment.

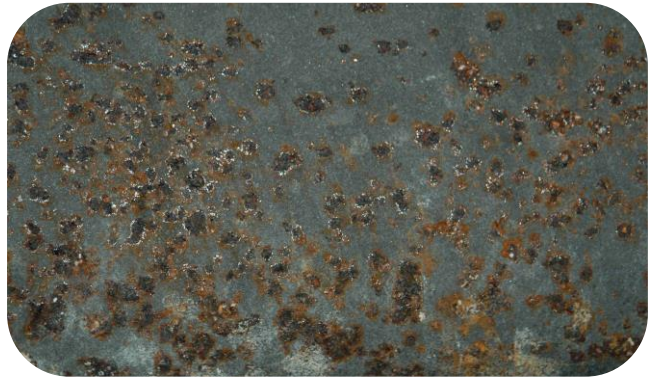
Sharp edges, dents and burrs

These factors are created during manufacture of the steel plate or during fabrication or manufacture of the equipment or structure. Abrasive blast cleaning alone will not eradicate sharp edges and therefore additional mechanical grinding is needed to smooth off any sharp edges. However even this method may not give the required results and therefore stripe coating of particularly bad surfaces is required. Inspection of the stripe coat will confirm if further coats or rectification work is required.



Water soluble salts

Water soluble salts will not be removed by abrasive blast cleaning as they will have become embedded in the steel surface. Testing of water soluble salts is performed using a Bresle sampler kit. The level of steel surface salt contamination will be measured by using this sample kit and corrective action can then be taken. The surface should be high pressure fresh water blasted and scrubbed down with brushes. A further test using the Bresle sampler kit will indicate



if the level of salts has been reduced sufficiently to begin coating work. It is common to have to perform this wash down process several times to achieve the required surface cleanliness.

Testing at the Polymeric Engineered Solutions Laboratories on coated steel panels using PES Ceramic 205 HT Fluid has allowed us to set out the following guidelines for steel surfaces contaminated with water soluble salts. Using the Bresle salt test in accordance with ISO 8502 the following are our recommended maximum levels of surface salt contamination:

68°F 60mgs/m²
122°F 30mgs/m²
194°F 20mgs/m²

The results listed above set out the maximum limits any Polymeric Engineered Solutions coating or repair material should be applied. In all applications every effort must be made to achieve the lowest level of salt contamination where possible.