

BoatCraft Pacific

RUST PREVENTIVE TREATMENT OF RECOVERED MARINE ARTEFACTS

When any iron or steel based artefact is recovered after extended submersion in fresh or salt water there are two critical requirements for its immediate treatment to ensure its preservation:

- (i) scale, heavy rust, and marine growths must be completely removed
- (ii) suitable rust treatment must be applied to prevent re-rusting.

Weed and calcareous growths must be removed to permit access to the underlying surface to carry out necessary rust treatment. Similarly heavy rust scale and paint residues must be removed to expose a sound underlying metal surface. The normal process is to water blast at high pressure of 70 Mpa (10,000 psi), which removes both kinds of contaminant and leaves a clean metal surface.

Immediate rust prevention is important, as old submerged ferrous materials (especially cast and wrought iron) have a degree of porosity which will have retained chloride and sulphate salts. Such salts will accelerate further corrosion as soon as the iron is exposed to atmospheric oxygen.

Thorough saturation of the iron surface with a tannin based rust converter has been found to be particularly effective. If applied immediately while the iron is still wet, the tannin chemicals can diffuse into the surface structure of the iron and convert residual oxides to a stable (black) complex iron tannate. This confers temporary protection from further rusting up to several months, during which time conventional paints can be applied over the tannated iron for permanent protection, in the same way as for a fresh metal surface.

It is important to appreciate the difference between the tannin treatment and dry sandblasting for surface preparation. Dry blasting will remove surface growths and scale, but permits immediate absorption of oxygen into the iron surface, with possible disastrous consequences. Tannin, on the other hand, diffuses into the wet surface where it provides protection from attack by the atmosphere.

Rust removers based on acids such as phosphoric acid must be avoided. These partially dissolve the iron oxides, but must then be washed away as any acid residues in the iron will accelerate future corrosion, especially under a paint film. After washing away, no ongoing inhibiting effect is retained.

The tannin treatment has been found to be non-toxic to marine organisms as well as for human exposure. Therefore it is safe to apply, including in any area where runoff to waterways might occur.