

APPLICATION SOLUTION 04

Marine Steel, Piles and Splash Zone

Problem, corrosion mechanism, recommended system, product combination and application procedure.

4 000 h

Salt spray, seawater grade

Grade A

Acid / alkali / salt rating

Underwater

Application possible

0.165

g/m²·24 h WVT



01 The Problem

Marine and Splash Zone Steel Protection

The splash and tidal zone is the most aggressive part of a marine structure and the least accessible. The steel is alternately wetted and dried, oxygen is abundant, chloride concentration is high and mechanical abrasion from waves, debris and vessel contact removes any brittle coating. Below the waterline the surface simply cannot be dried, so conventional coating systems cannot be applied at all.

Corrosion risk

- Accelerated corrosion in the tidal and splash zone, typically several times the rate of fully immersed steel.
- Chloride-driven pitting and section loss on piles and bracing.
- Coating breakdown from wave action, floating debris and berthing impact.
- Microbiological attack in warm, nutrient-rich harbour water.
- Impossible surface drying below the waterline.



Marine steel structure



Port and terminal steelwork



Berth and loading equipment

02

Recommended System

Why this configuration

The seawater-grade petrolatum tape is a three-layer thickened, oil-based material designed to be applied to wet or submerged steel. Inert oily petrolatum, corrosion inhibitors, preservatives and antimicrobial agents form a continuous hydrophobic seal that displaces seawater from the surface and passivates existing oxide. Because it is applied cold and wet, the working window is the tide, not the weather forecast.

System structure



Product combination and application procedure

Stage	Product	Procedure
Prepare	—	Remove marine growth, loose rust, scale and flaking coating. The tape may be applied to wet or submerged steel.
Profile	Petrolatum paste / mastic	Fill pitting, weld seams, flange details and section changes so that the wrap makes continuous contact.
Seal	Petrolatum tape — seawater grade, 200–300 mm	Wrap spirally with a minimum 55 % overlap, working upward where practical. Press and smooth each turn so that the layers consolidate.
Protect	Protective armour or jacket	Install the mechanical outer protection over the completed wrap throughout the tidal and splash zone.

Zhuohuang systems are modular. Overlap, tape width, number of layers and the protective outer wrap are confirmed for each asset, and components are added or omitted according to substrate condition, geometry and exposure. Where a project specification or acceptance standard applies, its requirements take precedence over this general sequence.

Choosing the protective outer layer

The outer wrap is selected for the exposure, not fixed by the primary tape. Three outer wrap materials are manufactured in-house, so the outer layer can be matched to ultraviolet, soil stress and handling risk.

Outer wrap option	When it is selected
Protective armour or jacket	Tidal and splash zone, where wave action, debris and berthing impact govern — project-specified.
Aluminium foil outer wrap	Above the splash zone, where the exposure becomes atmospheric and UV.
PP fibre-reinforced outer wrap	Where an additional mechanically reinforced layer is required below the armour.

03

Key Benefits and Evidence

What the customer gets, and what supports it

- Applicable to wet and submerged steel — no drying required.
- 4 000 h neutral salt spray without rust (GB/T 10125).
- Rust grade A after 10 % HCl, 10 % NaOH and salt-water exposure (SY/T 0315).
- Water vapour transmission 0.165 g/(m²·24 h) (GB/T 1037).
- Insulation resistance 5.0 × 10² MΩ·m² (GB/T 32119 Annex I).
- Non-curing and non-hardening — accommodates structural movement and impact without cracking.

Typical applications

- Jetty, quay and berth steel pipe piles
- Splash-zone and tidal-zone structural steel
- Loading arm supports, fenders and marine fittings
- Offshore wind foundations and harbour steelwork

Supporting documents

- Petrolatum Anti-Corrosion Tape — Seawater Grade TDS
- Petrolatum Anti-Corrosion Tape — Marine Grade TDS
- Microcrystalline Wax Anti-Corrosion Tape TDS
- Test report J25C12220188BR (wax system, 3 000 h salt spray)

TECHNICAL & COMMERCIAL CONTACT

Send us your asset information

Send asset photographs, dimensions, operating temperature and exposure conditions. We will return a system configuration, an estimated material quantity and the supporting documents.

- Product and system selection
- Technical data sheets and safety data sheets
- Third-party test reports and certificates
- Installation sequence and application guidance
- Samples, packaging and private-label discussion

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DISCLAIMER

The information in this document is based on Zhuohuang product records, manufacturer data and third-party test reports available at the date of issue. Values are typical or standard configurations and are not universal acceptance limits. Product performance depends on substrate condition, surface preparation, geometry, operating temperature and exposure. Confirm the applicable grade, current packaging, project acceptance criteria and the relevant safety data sheet before order and application.