



Forth Rail Bridge

United Kingdom



Project

An incredible 119 years old, the Forth Rail Bridge was constructed from 53,000 tonnes of steel. Standing 110m high and 2,467m in length, the structure requires enough protective coating to cover 230,000m² of steel.

Subject to coastal conditions with moderate to high salinity the steel of the Forth Rail Bridge needs to be protected against a very aggressive environment; including high winds and sea mists. Network Rail required a system that would provide a minimum of 25 years protection against corrosion.

After careful consideration and detailed discussions, Railtrack (now Network Rail) opted for a glass flake epoxy based system, which could be applied to a higher film build, resulting in a system comprising of three coats compared with the four coats of an epoxy MIO system.

Substrate: Steelwork.

Requirements: To provide 25 years protection in a highly corrosive environment.

Specifications: Transgard™ TG223, Transgard™ TG123 and Transgard™ TG168*.

Area coated: 230,000m².

Client: Network Rail.

Main contractor: Balfour Beatty.

Consultant engineer: Pell Frischmann.



System

The selected system consists of a higher build blast primer (Transgard™ TG223), an epoxy glass flake build coat (Transgard™ TG123) and an acrylic urethane finish (Transgard™ TG168*), as well as a stripe coat of epoxy glass flake.

The glass flake epoxy system was selected due to its excellent adhesion and anti-corrosion properties, acting as a powerful barrier against the harsh weather conditions. Transgard™ TG223 has an anti-corrosive pigment and can be applied at 60µm dft, providing additional protection to a blastcleaned surface, without adversely affecting the intercoat adhesion on the system.

Transgard™ TG123 is a high solids material with glass flake particles, providing excellent barrier protection. The particles align themselves within the film, parallel to the substrate, to give barrier and physical reinforcement. Transgard™ TG123 can be applied through smaller spray tips, giving a smooth finish, excellent mechanical properties and outstanding corrosion resistance.

It was very important to maintain the striking red oxide colour of the Forth Rail Bridge, and so together the team ensured that the primer, stripe and intermediate coats had a sufficient colour contrast, whilst complimenting the traditional Forth Rail red finish.

The finish coat (Transgard™ TG168*) is based on an acrylic urethane resin system manufactured to the required gloss level and colour shade. It has very good colour and gloss retention properties and is indefinitely re-coatable, which is advantageous for future repaints as surface preparation can be kept to a minimum.

* Now superseded by Acrolon™ C137V2.

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