Bridge Deck Waterproofing on Steel

Dirk UEBELHOER
Chemical Engineer
Sika Services AG
Stuttgart, Germany
uebelhoer.dirk@de.sika.com

Dirk Uebelhoer, born in 1963, received his degree of chemicalengineering from the University ofapplied science Stuttgart, Germany. He worked for Hoechst AG, HerbertsGmbH, Permatex GmbH and DuPontProtectiveCoatings before joiningSika Services AG.

Summary

Bridges are critical structures for infrastructure. ISO 12944, 1-8,is the worldwide recognized standard for corrosion protection of structural steel and is also valid for bridge structures. The 8 parts of this standard cover different items, however parts 2 & 5 are most important for preservation, but it's difficult to find standards for the protection and refurbishment of bridge decks. Bitumen based state of the art systems cannot fulfil the increasing requirements for modern bridges, when it comes to extended service life and resistance to severe stresses, so developing new resin based systems which can provide a longer service life, shorter down times in case of maintenance works and reduced repair costs are the main target for system manufacturers. The introduction of 2new systems, with excellent physical properties, is shown in this paper.

Keywords: Steel Bridges, Deck Waterproofing, Corrosion protection, Bond to Overlay, Shear Resistance, ISO 12944

1. Introduction

Bridges and overpasses are an essential part of modern infrastructure and commonly use brick, concrete, wood and steel as construction materials. Steel provides a lightweight, fast, low cost solution with the highest strength-to-weight ratio of any construction materials, hence these advantages have been in use for more than 100 years, particularly for longer spans.

Due to their location and scope, bridge decks are often subject to the most severe climatic conditions, having to withstand attack from water, sulphates, chlorides, frost and heat together with high loads and movement from traffic and earthquakes, which can lead to deterioration and potential issues with structural integrity, so installation of an effective bridge deck waterproofing system should be an essential part of any new build project or refurbishment programme.

Currently, modern bridges have a design life of approximately 120 years however the performance of the protective systems for the structure and bridge deck have an expected life of 10-20 years, therefore whilst regular repainting adds to the life time cost of the structure, failure of the protective system if not regularly maintained, is one of the major causes of premature deterioration of the steel.

2. Corrosion of Steel

https://doi.org/10.2749/222137816819259103