# The Importance of Coating Testing: Learning from a Corrosion Failure

Protective coatings are a critical line of defense for structures exposed to harsh environments. Whether it's a bridge, offshore platform, or industrial plant, coatings shield the underlying materials from corrosion, chemical attack, and mechanical damage. However, when coatings fail, the consequences can be severe—leading to costly repairs, environmental damage, or even catastrophic structural failures. This is why thorough **coating testing** is not just recommended—**it's essential**.

#### Why Coating Testing Matters?

Coating testing ensures that protective systems meet design specifications and can withstand real-world conditions. Tests like adhesion strength, thickness measurement, impact resistance, and accelerated corrosion testing (e.g., salt spray tests) help validate the quality and durability of coatings before and after application. Early identification of weaknesses can prevent larger failures down the road.





### Case Study: Corrosion Failure in a Highway Bridge



A notable example comes from the failure of a **steel highway bridge** in the Midwest, USA. Despite being recently repainted, large patches of corrosion were observed within two years—far earlier than the expected 15-year lifespan of the coating system.

Root Cause Analysis revealed two critical issues:

- The surface preparation was inadequate, leaving mill scale and rust behind.
- The coating applied did not meet the specified salt spray resistance during prequalification tests (which were, unfortunately, skipped to save time).

As a result, moisture permeated the coating, accelerating corrosion at the steel surface. The repair costs exceeded **\$3 million**, not including traffic disruption losses and legal liabilities.

This case highlights how skipping or undervaluing proper coating testing—particularly surface preparation checks and performance qualification—can lead to dramatic failures.

## **Final Thoughts**

In industries where structural integrity is non-negotiable, investing time and resources in coating testing isn't optional—it's a necessity. Proactive testing helps ensure durability, safety, and cost-effectiveness over the life of the structure.

#### Reference:

• Revie, R. W., & Uhlig, H. H. (2008). Corrosion and Corrosion Control: An Introduction to Corrosion Science and Engineering (4th ed.). Wiley.

