



# Common pitfalls

in coating  
specifications

**Specified to Last**



# Identifying common pitfalls in coating specifications

## Introduction

When specifying protective coatings for infrastructure, precision is key. Corrosion protection and passive fire protection coatings shield your assets from metal loss due to corrosion and structural collapse in a fire accident. A small oversight can have major consequences.

There are many factors that can cause a coating to fail, even if it is suitable for the intended application. For example, improper surface preparation, the wrong selection of coating layers, incorrect application methods, insufficient curing time, or exposure to adverse environmental conditions can all compromise

the performance and durability of a coating. These failures can result in cracking, peeling, blistering, flaking, or delamination of the coating, which can reduce its protective function and aesthetic appearance. More severe consequences of failure include weakening of the structural integrity or reduced fire resistance.

In short, failure can jeopardise safety, increase maintenance costs, and cause delays due to repairs and downtime. In this article, we will share some of the common pitfalls in coating specification and how to avoid them, based on our experience and expertise.

# Common pitfalls in coating specifications

## 1.

### **Picking the wrong corrosivity category**

Getting the corrosivity category wrong means the coating may not cope with the environment. This can lead to pre-mature corrosion, safety risks and high repair costs.

Accurate assessment ensures the right protection and avoids unnecessary expenses. The corrosivity categories are classified from C1 to CX, which span environments with the lowest to the highest corrosion risk, with CX designated for offshore conditions.

For a detailed exploration of these categories, read our paper [“How to specify for corrosion protection”](#) here.

## 2.

### **Overprotection or underprotection**

Choosing the right protection level is key. A mismatch can lead to overprotection or underprotection. Overprotection is a waste of time and money; underprotection risks early failure. Correct categorisation saves costs and extends lifespan, but precise categorisation can be easier said than done.

Some situations require careful analysis and expert guidance before deciding on the level of coating protection. For example, an indoor parking lot may seem to be a low-corrosion environment, but steel beams can easily be exposed to rain and humidity coming from the entrance to the parking lot. This underprotection can cause early coating failure and structural damage. Therefore, conducting a thorough pre-analysis is essential. It should account for both the required protective standards and the specific environmental conditions of the material's application.

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## 3.

### **Overreliance on outdated specs**

Coating specifications can sometimes become a routine task, with professionals defaulting to using an existing specification from a previous project that seems similar.

While using previous specifications can be relevant, it is not without risk. Conditions and standards evolve; old specs may not meet current needs. This can result in inadequate protection or non-compliance. Always review and update specs to ensure they're fit for purpose.

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## 4.

### **Long-term costs and environmental impact**

Ignoring the long-term cost of corrosion is short-sighted. Continuous maintenance and the environmental cost of steel replacement carry considerable consequences.

The environmental impact of corrosion is substantial, with projections suggesting it could account for 4.1% to 9.1% of CO<sub>2</sub> emissions by 2030 EU and U.S. greenhouse gas reduction targets. Opting for adequate protection not only mitigates future expenses but also benefits the environment.

## 5.

### **Missing out on technological advancements**

As an advisor, it is imperative to be on top of the latest advancements in coating technologies. Given that standards may not always reflect the most recent technological developments, it is advisable not to rely solely on existing standards when specifying requirements.

Instead, strive to surpass these benchmarks by staying informed and incorporating cutting-edge solutions. For instance, Hempel's Avantguard technology demonstrates superior efficacy in zinc activation, surpassing the performance levels outlined by existing standards.

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## 6.

### **Contractor choices**

Leaving coating choices to contractors is inadvisable. They might choose cheaper options that compromise quality or inflate costs over the lifetime of the structure. You should specify clearly to ensure the right balance between cost and quality.

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## 7.

### **Understanding corrosion protection**

Different methods protect against corrosion in unique ways. Barrier coatings block, galvanic coatings sacrifice themselves, inhibitors interfere with the corrosion process.

Not appreciating these different methods in relation to the context of the project can lead to a less optimal choice, affecting performance and safety. For example, the decision to galvanize a 15-meter-tall steel section overlooked the fact that zinc baths typically accommodate lengths up to 7 meters. This particular choice would have required the steel to be dipped twice or cut into lengths that fit the zinc bath, leading to higher cost and project time in terms of double handling and rework.

Therefore, while a method may appear appropriate in theory, it is crucial to also evaluate its practicality and cost-effectiveness in the specific context of the project.

# Learnings from other cases

The specification of protective coatings in structural engineering is a critical task that, if mishandled, can lead to dire consequences.

## CASE 1

### Restaurant Raiz saved by Hempel's intumescent coating

"Without the protection of the intumescent coating, the Fire Department believe that the structure would have collapsed. Thanks to this added protection, the structure is in place, and we can rebuild as good as new."

Owner of Raiz

In a testament to the efficacy of advanced protective coatings, Hempel's intumescent product proved instrumental in saving the restaurant, Raiz, from a devastating blaze that lasted three hours. The specialised coating, known for its durable and attractive finish, played a critical role in preventing structural collapse under extreme heat. The local fire department has credited the intumescent coating with maintaining the integrity of the building, which has been fundamental in enabling the swift start of rebuilding efforts.

This incident highlights the critical nature of precise fire protection specifications in architecture and construction. Such foresight in fire protection can make the difference between a recoverable incident and a catastrophic loss.

## CASE 2

### Shutdowns and traffic restrictions on the Clifton Bridge



Photo by Alan Murray-Rust

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The Clifton Bridge in Nottingham, UK, serves as an example of the consequences of insufficient corrosion protection.

After discovering extensive corrosion damage, the bridge endured more than 18 months of traffic restrictions and partial shutdowns. This not only caused considerable inconvenience but also highlighted the enduring consequences of neglecting proper specification.

These real-world scenarios underscore the necessity for engineers to diligently assess environmental conditions and regulatory requirements to avoid the pitfalls that have compromised the safety and functionality of such structures.

## Conclusion

In structural engineering, choosing the right protective coatings is vital. It's about detail and best practices. We must keep learning and applying new insights to avoid mistakes in our specs.

By staying informed about the latest advancements in corrosion protection and passive fire protection, engineers can ensure that their specifications meet the highest

standards of safety and durability. It's more than picking a product; it's about understanding the project's environment, context, and long-term needs.

Let's embrace a culture of ongoing education and collaboration, where sharing knowledge and experiences leads to lasting, secure infrastructure that stands the test of time.

## Let's talk protective coatings for your project

Still have questions after reading this paper? Set up a meeting with our Hempel team to craft a coating plan that's just right for your project. We'll help you hit the mark on compliance and quality.

If you want to deepen your understanding of specifying corrosion and fire protection, visit our coating specification hub:

**[specifiedtolast.com](https://www.specifiedtolast.com)**

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