



White Paper
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Coating Application Specialist (CAS):

The New Standard for Quality, Safety, and Reliability in Industrial Painting

Coating Application Specialist

Abstract

Industrial painting has become a highly technical profession, with the introduction of more sophisticated coatings and application techniques. The need for qualified craft workers is greater than ever. The Society for Protective Coatings (SSPC) Coating Application Specialist (CAS) certification is the newly recognized standard of quality for facility owners concerned with avoiding and mitigating corrosion. The goal of the CAS is to strengthen the qualifications of the current workforce and lay the groundwork for development of a strong industrial painter workforce for the decades to follow.

To avoid costly repairs and maintenance, a CAS professional should be included as part of any project specification.

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Introduction

Every year, huge financial losses occur due to failures of industrial paints and coating. Coating failures can occur for dozens of reasons, although they are typically a result of poor application or an inadequate specification.

This white paper will first examine the most common types of coating failures and their causes. Then, it will describe how a new program of industry training and certification is solving this problem--and saving millions of dollars in repair and maintenance costs.

The Problem: Coating Failures and People Failures

One way to measure the cost of coating failure is in the corrosion—as coatings fail, structures degrade. And the costs to repair corrosion add up to more than \$276 billion a year, according to U.S. Federal Highway Administration research.

Those figures have no doubt increased dramatically in the decade since the 2001 study was done. The costs of failure can involve:

- Labor and material costs to re-coat structures as quickly as 1-3 years after construction, instead of the 10-20 years originally intended
- Lost productivity and/or revenue as work spaces are closed for repairs
- Injuries or damages due to corrosion-related equipment failures
- Surprise maintenance costs to mitigate corrosion or coating breaches that don't yet require full replacement



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Whether it involves a storage tank, bridge, industrial equipment, or ocean vessel, when a coating fails, the finger pointing begins. Who should take responsibility? The engineer?

The coating manufacturer? The contractor on site?

Yet, the most common causes of coating failure may surprise some.

Industrial coating application involves many variables. Deficiencies in any of them can lead to failure. These variables include:

- **Coatings** – Has the manufacturer produced a coating that meets specifications?
- **Processes** – Are the specifications correct? Does the application meet those specs? Has the surface been prepared adequately prior to applications?
- **Equipment** – Are the right application tools being used?
- **People** – Do the applicators have the right experience? Training? Certification? Has the project been inspected by a qualified professional?

In search of specific causes, the research done by George T. Bayer, Ph.D. and Mehrooz Zamanzadeh, Ph.D. (Failure Analysis of Paints and Coatings; 2004) is essential. Their findings point to 5 causes for most coating-related failures:

1. **Improper surface preparation** – The substrate is not adequately prepared for the coating to be applied. This may include washing, a solvent cleaning, an abrasive blast cleaning or a power tool and hand tool cleaning.
2. **Improper coating selection** – The paint or coating specified is not suitable for the environment in which it is used, or it is not compatible with the surface itself.
3. **Improper application** – This problem can involve shop-applied or field applied coatings. It occurs when required specifications for the application are not met.
4. **Improper drying, curing and over coating** – This failure, like number 3, happens when specifications for the application are not met.
5. **Mechanical damage** – This occurs due to improper handling of the painted or coated surface, resulting in a breach in the paint or coating itself.

In Pareto Principle fashion, 4 of the 5 causes -- 80% -- could be classified as relating to the process of coating application -- surface prep, application, drying, and post-application damage.





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Yet, because people are behind every process . . . and because people must design the specifications for every coating and then apply it . . . the root cause of nearly every coating failure is, ultimately, people.

Because people failures are at the heart of the coating-failure problem, people should be the focus of any solution. And perhaps the most-effective way to improve quality is to answer this question: What standards should apply to the people who apply industrial coatings?

Specifically:

- What training and skills are essential?
- How much experience should be required?
- What standards should be observed to ensure quality and minimize costs?

The Solution: Training and Certification

Just as welders, electricians, and other skilled professionals are qualified by nationally recognized certification, a similar program was developed for industrial coating. The Society of Protective Coatings (SSPC) established the Painter, Industrial Coating and Lining Application Specialist Certification program for this purpose.

The Painter, Industrial Coating and Lining Application Specialist Certification program (Also referred to as CAS) is based on the requirements of SSPC ACS-1/NACE 13, a standard published jointly in 2008 by SSPC and National Association of Corrosion Engineers (NACE) International. ACS-1 defines training and experience requirements that a tradesperson must have in order to qualify to be assessed for certification.

In addition, CAS certification meets all requirements of International Standards Organization (ISO) 17024.

The CAS initiative not only places an SSPC Certified QP-1 Contractor at the forefront of improving the quality of industrial and marine coating work performed for facility owners, but also provides an invaluable tool for the QP-1 Contractor in meeting its obligation to its customers to have a qualified, professional workforce on every project.

***As of Jan. 1, 2013, SSPC QP-1 contractors are required, as part of their worker assessment programs, to have at least one CAS certified craftsperson on eligible industrial painting job sites. The long-range implementation plan calls for increasing the ratio of CAS Certified Applicators to non-certified applicators for eligible jobs as more craft-workers have the opportunity to achieve CAS certification.*

Coating Application Specialist



A Coating Application Specialist specializes in corrosion mitigation of steel and concrete on structures that include:

- Bridges
- Food and beverage facilities
- Offshore drilling platforms
- Ships (ocean-going and lake vessels)
- Power generation facilities
- Petro chemical plants
- Storage tanks
- Wastewater treatment facilities

To qualify for the Coating Application Specialist exam, the applicants must first have 2,000 recordable work hours and 150 hours of accepted formal training, or 3,000 recordable hours of experience blasting and spraying industrial coatings.

In 2012, the Finishing Trades Institute (FTI) received approval by the Federal Department of Labor for a separate career path for Painter, Industrial Coating and Lining Application Specialist.

The CAS apprenticeship program requires apprentices to complete 576 hours of Related Instruction, and a range of On Job Learning hours of 4632-6032, followed by a comprehensive examination and two hands-on demonstrations in which individuals must prove their skills in blasting a standards training material (ASTM) panel.

The Objective of the Certification Examination Program is to determine, through proctored written and practical examination, whether an individual craft worker has the skills and knowledge to perform quality surface preparation and protective coatings application. The CAS program meets the need and provides criteria for the education, training, experience, knowledge, and motor skills required to prepare and apply protective coatings to steel and concrete surfaces of complex industrial and marine structures. FTI administers the Certification Examination Program through the auditing eye of SSPC.

Training required by the ACS-1 standard, on which the CAS is based, includes skills in corrosion protection of steel and concrete, with courses in surface preparation and coating materials; quality control and assurance; and health and safety awareness. Specialty application courses include water-jetting, electrostatic spray, powder coatings, thermal spray, and pipeline coatings.

“The CAS certification program is designed to quantify the workers actual knowledge and skill set through a written examination and a grade of 90% or better in the hands on blast and spray competencies,” says Anton Ruesing, Director of The Finishing Trades Institute.



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In summary, benefits of CAS certification include the following:

- Streamlined decision-making. Facility owners and specification writers now have a way to ensure that qualified craft workers are hired to perform surface preparation and coating application work.
- Reduced costs. It can be 14 times more expensive to replace corroded steel and other materials than to apply a coating during new construction, according to U.S. Dept. of Transportation research (2001).
- Increased quality. Equipment and facilities can last up to 5-10 times longer when industrial coatings are applied properly by a trained, skilled workforce.
- Improved safety. Lead abatement, scaffolding safety, hazardous materials, and other issues are largely avoided by a trained coating workforce.

“The CAS certification program is designed to quantify the workers knowledge and Skillset.”

What To Do Next

When designing any structure, coating failures will likely occur unless they are considered during the design phase. While long-term structural integrity can be assured through corrosion protection, that protection largely depends on being delivered by a highly trained professional.

Therefore, because the expertise required to apply industrial coatings without failures is beyond the training of most personnel, it is advised that design engineers, facility owners, and contractors include a Coating Application Specialist (CAS) as part of any project specification.

For more information about the Coating Application Specialist program or to contact a certified QP-1 Contractor in your area, please visit online at www.iupat.com