

QUALITY

SAFETY

RELIABILITY



# Coating Application Specialist (CAS)



**THE NEW STANDARD FOR QUALITY, SAFETY  
AND RELIABILITY IN INDUSTRIAL PAINTING**

## 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 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 the National Association of Corrosion Engineers (NACE) International. ACS-1 defines training, experience, and demonstrable proficiency requirements a tradesperson must have in order to qualify for certification. 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 unnecessary maintenance, CAS professionals should be included as part of any project specification.

*"The costs to repair corrosion add up to more than \$2.5 trillion a year"*



## INTRODUCTION

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

The information that follows 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 failures is in corrosion -- as coatings fail, structures degrade. And the costs to repair corrosion add up to more than \$2.5 trillion a year, according to the NACE IMPACT study.

### 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

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 one 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 application?
- » **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.

We can classify 80% of the problems as relating to the process of coating application—surface prep, application, drying, and post-application damage.

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?



*“Industrial coating application involves many variables. Deficiencies in any one of them can lead to failure.”*



*“Because people failures are at the heart of the coating-failure problem, people should be the focus of any solution.”*



*“A worker who is CAS certified has a high level of pride and dedication in the work they are doing and the industry they represent.”*

*~ Executive Director, SSPC*

## **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) and the National Association of Corrosion Engineers (NACE) established the Industrial Coating and Lining Application Specialist Certification program for this purpose.

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

The CAS initiative not only places an SSPC Certified QP-1 and QP-2 / NACE NIICAP 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 50% CAS certified craftsman 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 craftworkers have the opportunity to achieve CAS certification.

### **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.

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.

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 Certification itself is made up of a comprehensive written examination and two hands-on demonstrations in which individuals must prove their skills by blasting and coating a standardized ASTM panel.

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.

**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.

**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) certification as part of any project specification.

*“The CAS program improves the training of the craftsperson and thus the quality of the coatings work performed.”*

*~ Executive Director, SSPC*



**For more information about the Coating Application Specialist program or to contact a Finishing Solutions Network Certified Contractor in your area, please visit [www.FinishingSolutionsNetwork.com](http://www.FinishingSolutionsNetwork.com) or call 410.564.5876.**

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

# Featured Projects From Our Qualified Industrial Coatings Contractors

## BRIDGES

### California

Anaheim Street Offramp  
Anaheim Street Bridge  
Bakersfield Bridge  
Healdsburg Avenue Bridge  
Sixth Street Bridge  
Rio Vista Bridge  
Jibboom Bridge  
Bay Bridge  
San Rafael Bridge  
Salmon Creek Bridge

### Connecticut

Gold Star Memorial Bridge  
Pear Harbor Memorial Bridge (Q Bridge)  
Commodore Hull Bridge

### Illinois

Interstate 474 Shade-Lohman  
Rt. 9 McNaughton Bridge

### Maryland

Chesapeake Bay Bridge

### Michigan

Ambassador Bridge  
Mackinaw Bridge  
Gateway Bridge

### Minnesota

Aerial Lift Bridge  
Richard I. Bong Memorial Bridge  
I-35W Mississippi River Bridge  
MN HWY 36 St. Croix River Bridge  
St. Croix River Lift Bridge

### New Jersey

Commodore Barry Bridge  
Maintenance of 20 Bridges on Route NJ-18  
Route US 22 Maintenance  
Tacony-Palmyra Bridge  
Undergrade Bridge

### New York

The Peace Bridge  
Letchworth NY State Park Train Bridge  
The Irondequoit Bay Bridge

### Rhode Island

Mt. Hope Bridge  
Newport Pell Bridge

### West Virginia

Eugene A. Carter Bridge  
Spring Street Bridge  
East Street Bridge  
William S. Ritchie Jr. Bridge  
Williamstown Bridge

## ENERGY

### Alabama

Lay Dam  
Miller Steam Plant  
Plant Vogtle Nuclear Power Plant Unit 3 & 4

### California

La Cresta  
NRG Energy Plant  
Oroville Dam  
Rock Creek Dam  
Russell City Energy Plant

### Connecticut

PSEG Bridgeport Harbor Station 5  
Lake Road Generating Plant  
Kleen Energy Power Plant  
CPV Towantic Energy Center  
Millstone Nuclear Energy Plant

### Iowa

Exelon Power  
Marshalltown Generating Station  
Ottumwa Generating Station

### Minnesota

Monticello Nuclear Generating Plant  
Prairie Island Nuclear Generating Plant  
Pine Bend Oil Refinery

### Montana

Exxon Refinery

### North Dakota

Garrison Dam on the Missouri River

### New Jersey

Hope Creek Nuclear Power Plant  
Salem Nuclear Power Plant  
Co-Gen Resiliency Upgrades Project  
Delaware No 1 Anaerobic Sludge Digester & Combo Facility

### New York

James A Fitzpatrick Nuclear Plant  
Nine Mile 1 Nuclear Plant  
Nine Mile 2 Nuclear Plant

## MANUFACTURING

### Alabama

Honda Plant

### California

Dow Chemical  
Genentech  
Gillig  
Oracle

Shell Chemical

### Connecticut

Pratt & Whitney  
Electric Boat

**MANUFACTURING (CONTINUED)**

**Connecticut**

Pfizer  
Sikorsky Aircraft Corporation  
Amgen

**Iowa**

John Deere Harvester

**Illinois**

Caterpillar – Aurora  
Caterpillar – East Peoria  
Caterpillar – Mapleton  
Caterpillar – Mossville

**New York**

Frito-Lay  
Thermo Fisher  
Sunoco Ethanol Plant  
Carestream  
General Motors  
Kodak

**WATER**

**Alabama**

Valley Creek Water Reclamation Facility

**California**

City of Pinole Waste Water Treatment Plant  
Contra Costa Sanitary District  
Ensinatas Water District  
Fallbrook Water District  
Mill Valley Sewage Treatment Plant  
Olivan Hain Water District  
Rainbow Water District  
Silicon Valley Clean Water  
South East Sewage  
Water Filtration/Reclamation Piping  
West Basin Water District

**Connecticut**

Waste Water Treatment Plant

**Illinois**

Aurora Water Department  
Bloomington Water Treatment Plant  
Dixon Water Treatment Plant  
City of Rockford Waste Water Treatment Plant  
Normal Waste Water Treatment Plant

**Minnesota**

Billings, MT Municipal Waste Water Treatment Plant  
Brooklyn Center, MN Water Treatment Plant  
Cloquet Pump Station  
Interceptor Rice Lake  
Potable Water Treatment  
Interceptor Fiberglass Pipe Rehab  
Waste Water Treatment – St Francis, Winsted & Two Harbors

**WATER (CONTINUED)**

**Minnesota**

St. Paul, MN Regional Water Services  
Wrenshall Pump Upgrade

**New Jersey**

Ridgewood Water Southside Reservoir Rehabilitation  
Pipe Coating High Lift Pump Station  
Pump Station  
Passaic Valley Waste Water Treatment Plant  
Lafayette Reservoir Improvements

**New York**

City of Oswego East Side Waste Water Treatment Plant  
Van Lare Water Treatment Plant  
Binghamton-Johnson City Waste Water Treatment Plant  
Webster Waste Water Treatment Plant

**Rhode Island**

Waste Water Treatment Plant Upgrade  
Fields Point Waste Water Treatment Facility  
Putnam Waste Water Treatment Plant  
Jillson Ave Waste Water Treatment Plant

**STORAGE TANKS**

**California**

Petroleum Storage Tanks (4 locations)  
Water Storage Tanks  
Elevated Water Storage Tank

**Connecticut**

Water tank (4 locations)  
Oil tanks

**Illinois**

City of Aurora  
Illinois American Water (2 locations)  
Eureka Water  
City of Peoria Heights

**Maryland**

Water Tank

**Montana**

Elevated Water Tanks

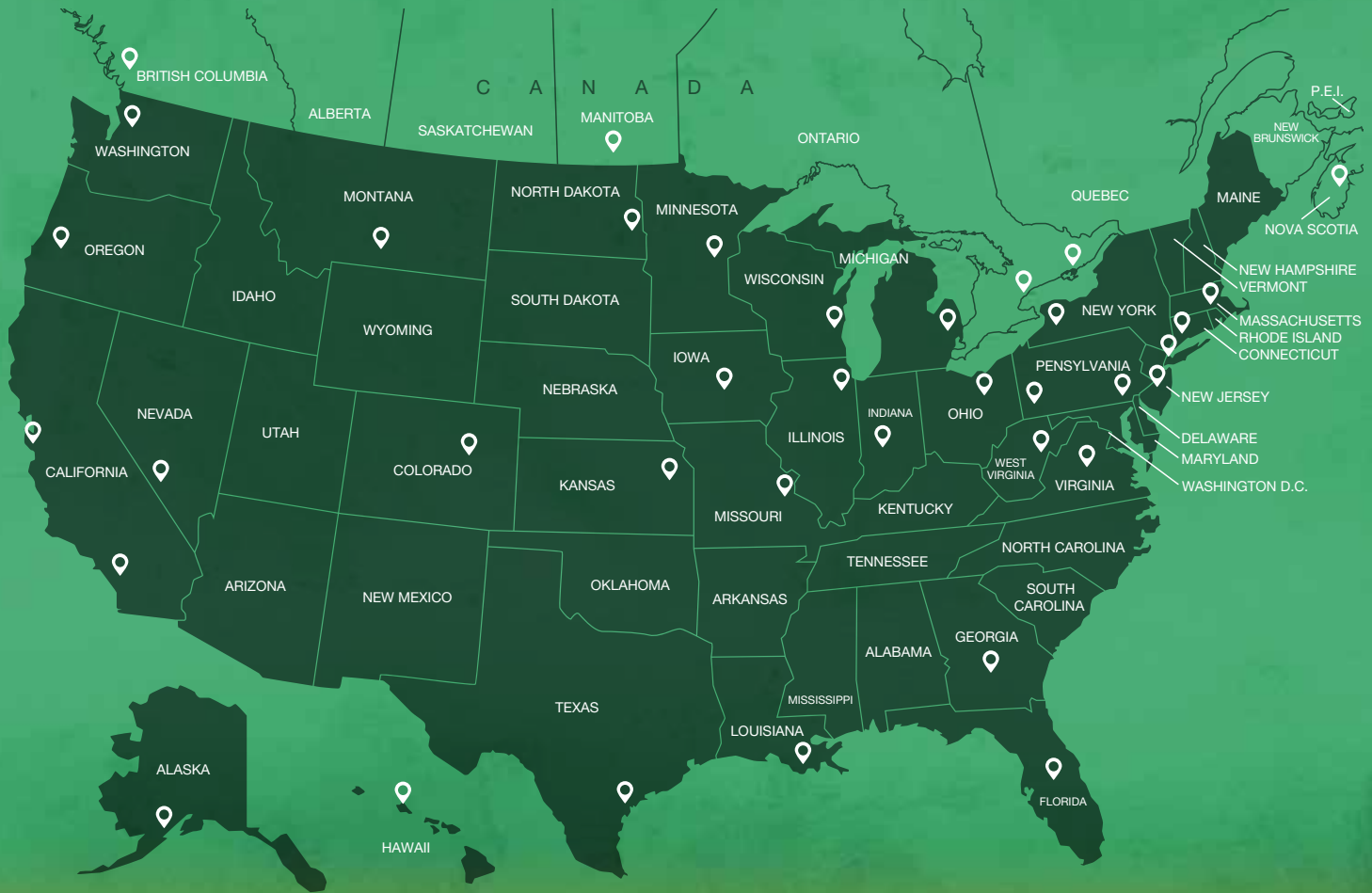
**New Jersey**

39th Street Water Storage Rehabilitation  
Benson Avenue Water Tank Exterior  
Mary Street Tank & Goffle Hill Drainage  
Ridgewood Water Ames Tank Rehab  
Riviera Parkway Water Treatment

**New York**

Amherst Tank  
Churchville Tank  
Gates Tank  
Hilton Tank  
Penfield Tank  
Webster Tank





# Regional Offices

**QUALITY WORK. DONE RIGHT. ON TIME. ON BUDGET.**

FSN-Industrial makes it easy to find, vet, and hire skilled contractors for new construction, maintenance, and renovations. Our project consultants match you with contractors who specialize in paint, industrial coatings, wall covering, glazing, drywall, flooring, and more. With over 30 years of experience in the construction industry, our project consultants have helped owners, asset managers, general contractors, engineers, and design firms manage countless projects. We provide this as a FREE service in the U.S. and Canada. Contact us today to discuss your next project.



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