



Benjamin Moore®

An Introduction to  
**HIGH-PERFORMANCE  
COATING SYSTEMS**



# Course Overview

This CEU will increase your general awareness of not only what high-performance coatings are and where they are used but also factors that influence performance, service life, and selection.

# Learning Objectives

Upon completing this course, you should be able to:

- Explain the purpose and common applications of high-performance coatings.
- Discuss how high-performance coatings help control corrosion.
- Describe the benefits of a three-coat system.
- Identify the factors that influence the coating-system selection.



# SECTION 1

Basic Principles of High-Performance Coatings

# The Big Picture of High-Performance Coatings



Protection | Performance | Aesthetics



# SECTION 2

Why High-Performance Coatings Are Used



## Why Are High-Performance Coatings Used?

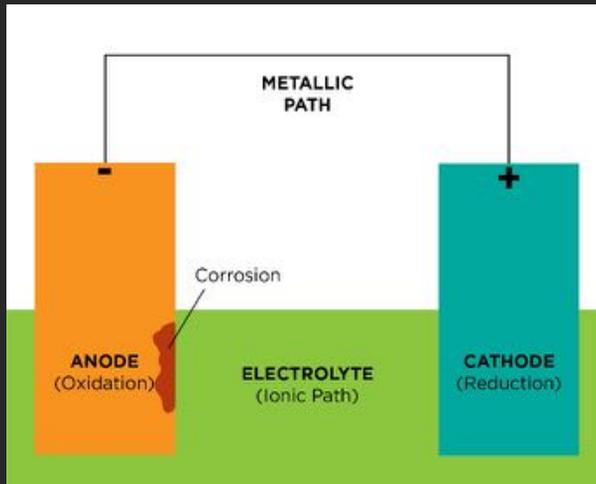
- Protect substrate from corrosion
- Provide resistance to chemical and abrasion
- Ensure durability and safety
- Improve appearance



## What Is Corrosion?

Corrosion is the deterioration of a material (primarily metals).

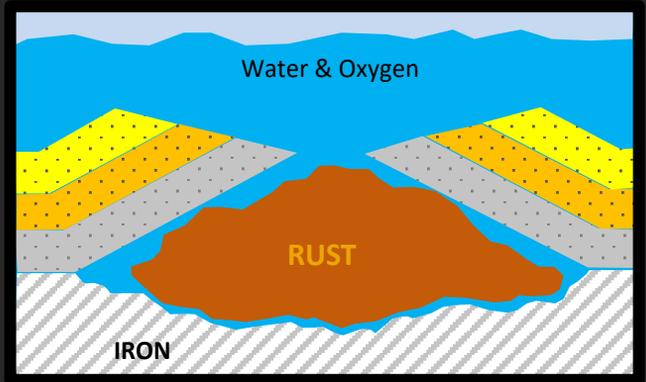
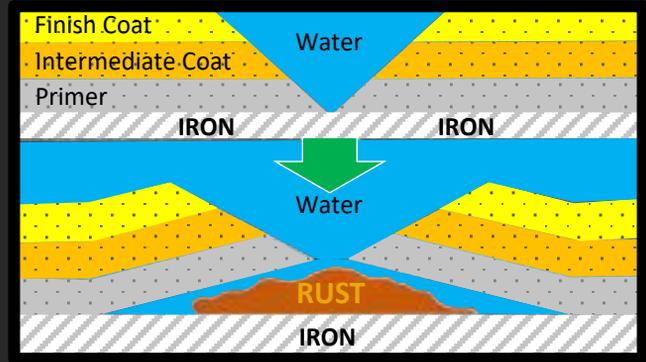
# Metallic Corrosion



- **Four components are required for corrosion to occur:**
  - **Anode:** an “active” metal component
  - **Cathode:** a less-active metal component
  - **Metallic Pathway:** a direct connection between the anode and cathode
  - **Electrolyte:** a medium that conducts electricity, like water

# Metallic Corrosion

- Metal expands up to 23 times original size
- High-performance coatings control corrosion



# Metal Corrosion



## Corrosion Rate

- Several factors influence corrosion
  - Chemicals
  - Temperature
  - Moisture
  - Substrate Design



# High-Performance Coatings: Corrosion Control

**Barrier**  
between  
substrate and  
water

**Insulates**  
the substrate  
from contact  
with soil

**Protects**  
substrate from  
contact with  
chemicals



# SECTION 3

Where High-Performance Coatings Are Used

# Industrial Project



Structures exposed to  
harsh environmental  
conditions

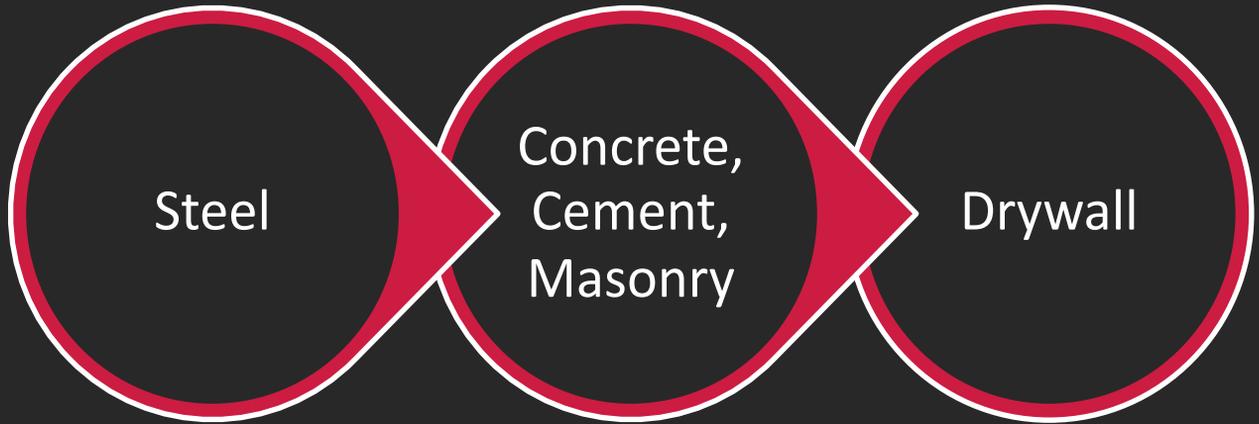
# Non-Industrial Project



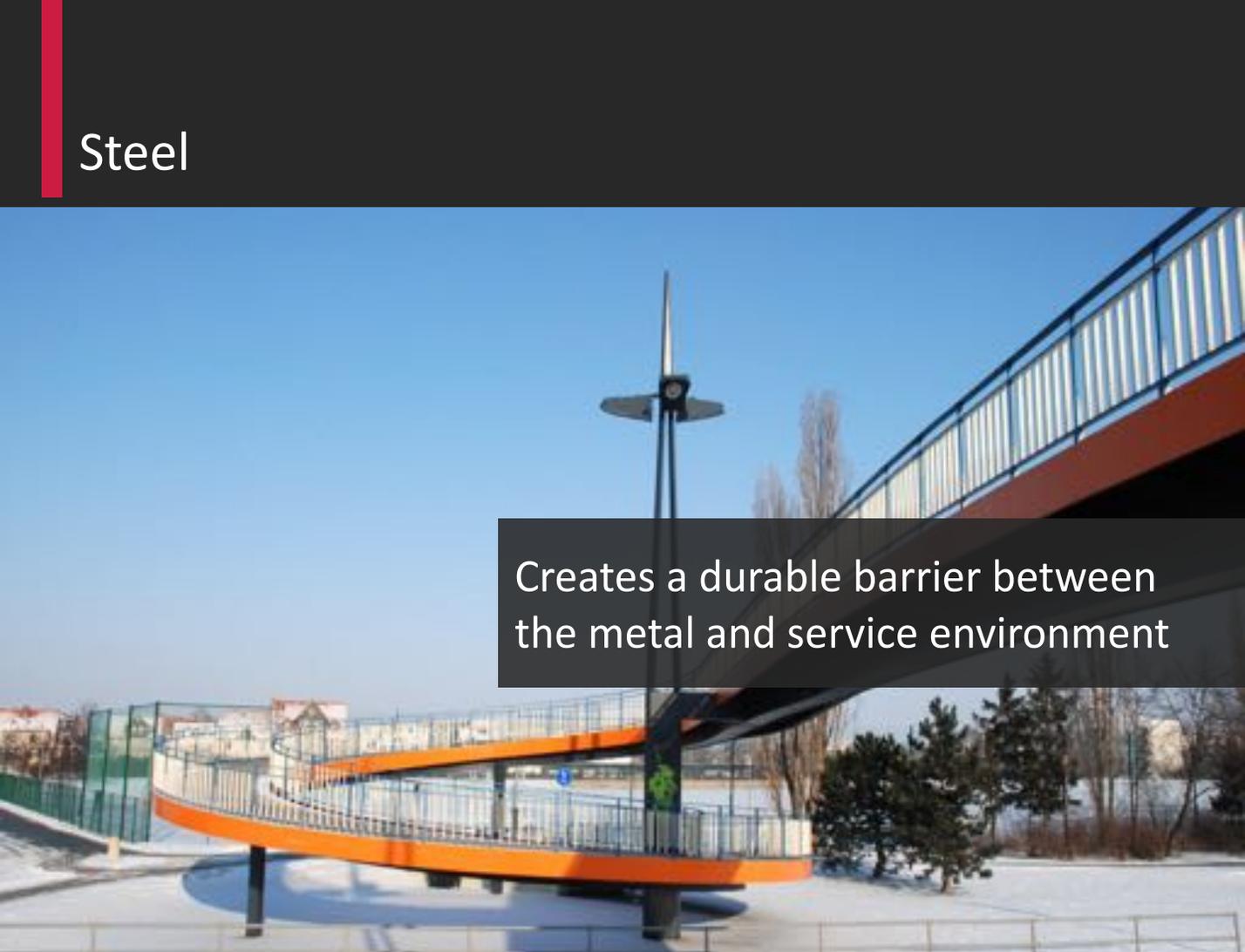


High-performance coatings are not limited to industrial purposes.

# Construction Materials



# Steel



Creates a durable barrier between  
the metal and service environment

# Concrete, Cement, & Brick Masonry



Protection from potentially  
damaging environment

# Drywall



Enhanced durability, resistant to harsh chemicals, abrasion, and marring



What other types of spaces and structures require exceptional durability?

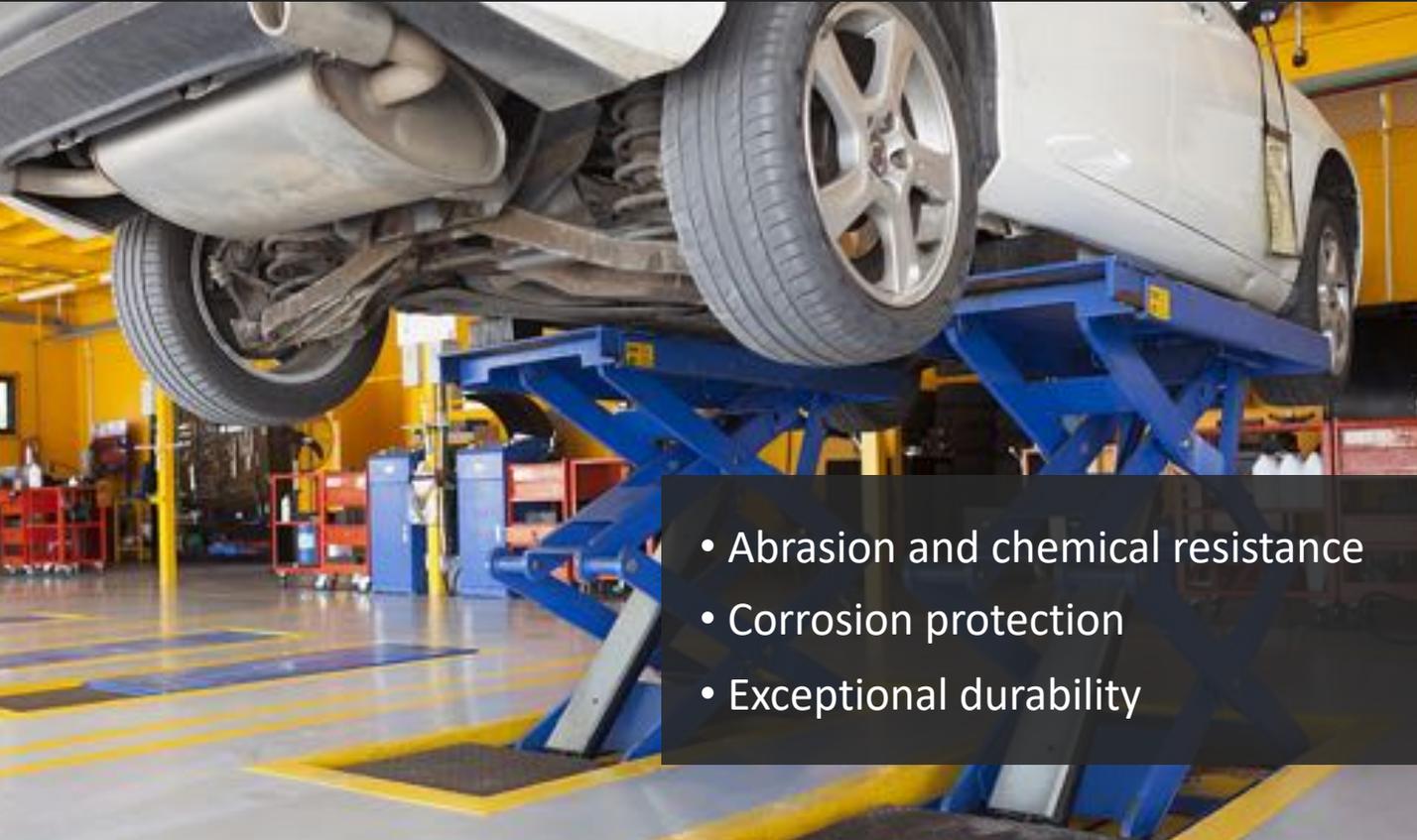


## Non-Industrial Projects

- Hospitals and health-care facilities
- Restaurants, hotels, and retailers

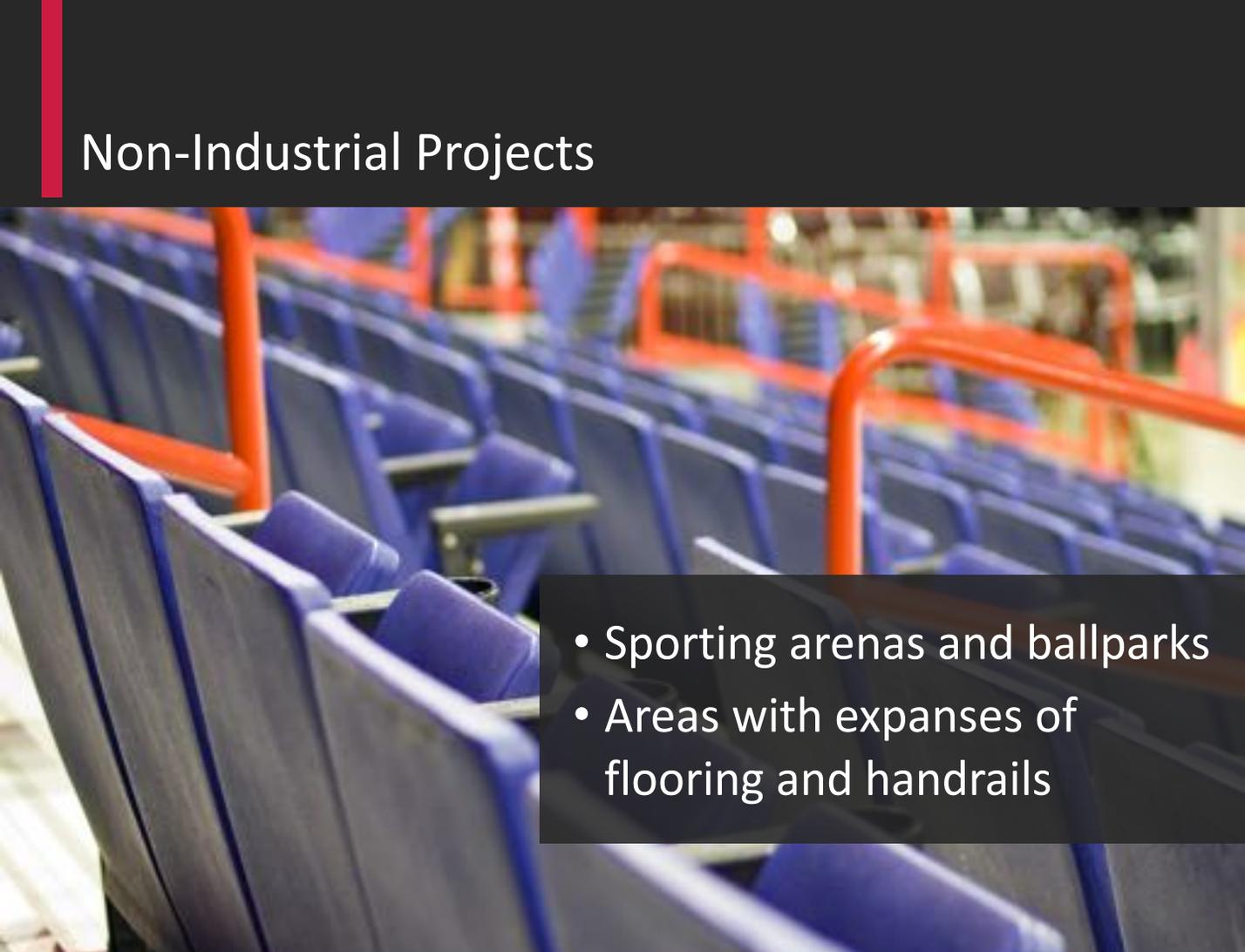


# Non-Industrial Projects



- Abrasion and chemical resistance
- Corrosion protection
- Exceptional durability

# Non-Industrial Projects

- 
- Sporting arenas and ballparks
  - Areas with expanses of flooring and handrails



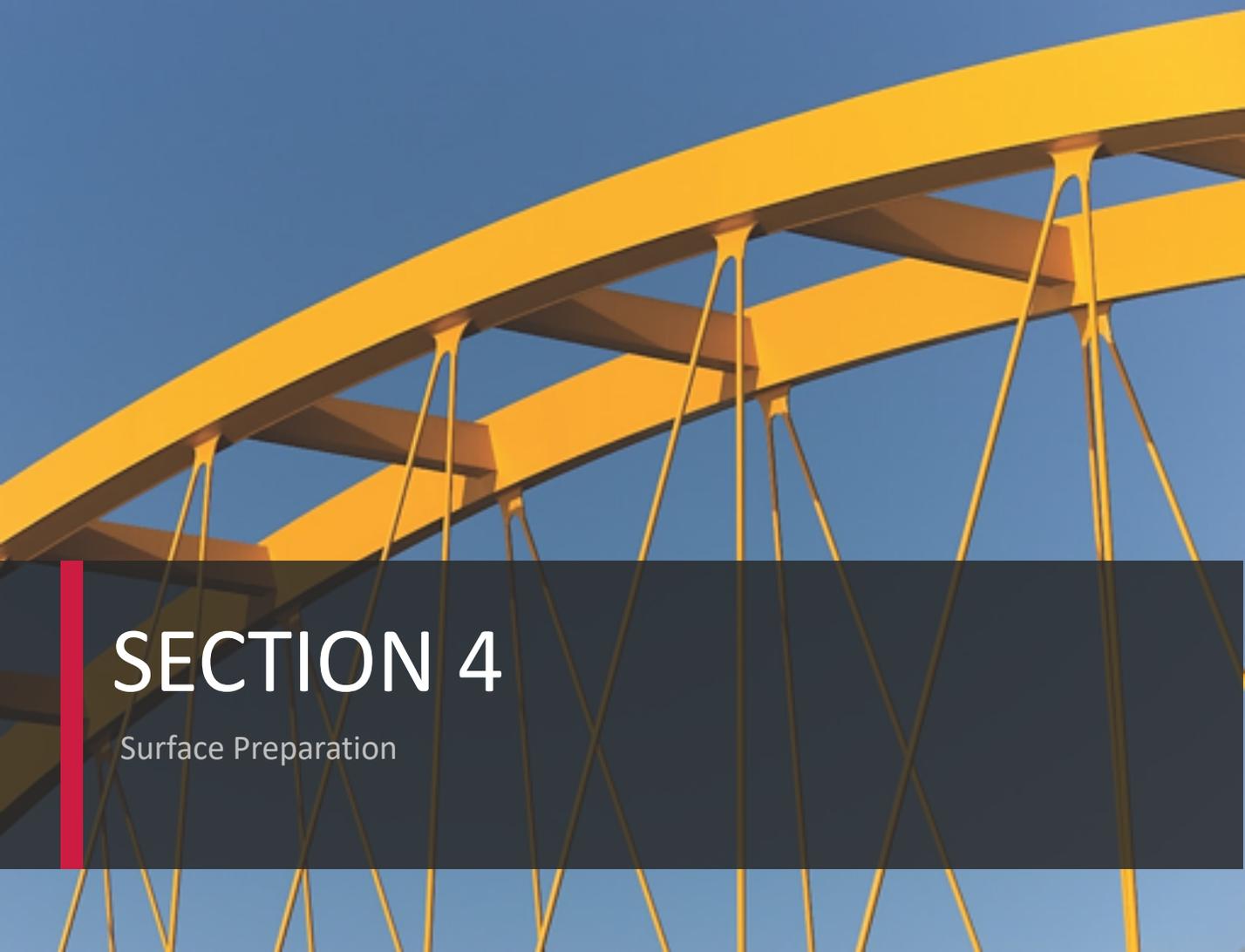
## Warehouse and Distribution Centers

- Wear and tear of construction equipment
- Heavy machinery
- Lift tires, oil fuel, and material spills



## Building Maintenance & Facilities Room

- Tanks and pipes
- Color coding



# SECTION 4

Surface Preparation



Surface preparation is a result not a process.



## Surface Preparation

Ninety percent of premature coating failures are a result of improper surface preparation.



## Surface Preparation

Techniques vary based on:

- Coating
- Service environment

# SSPC

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The Society for Protective  
Coatings

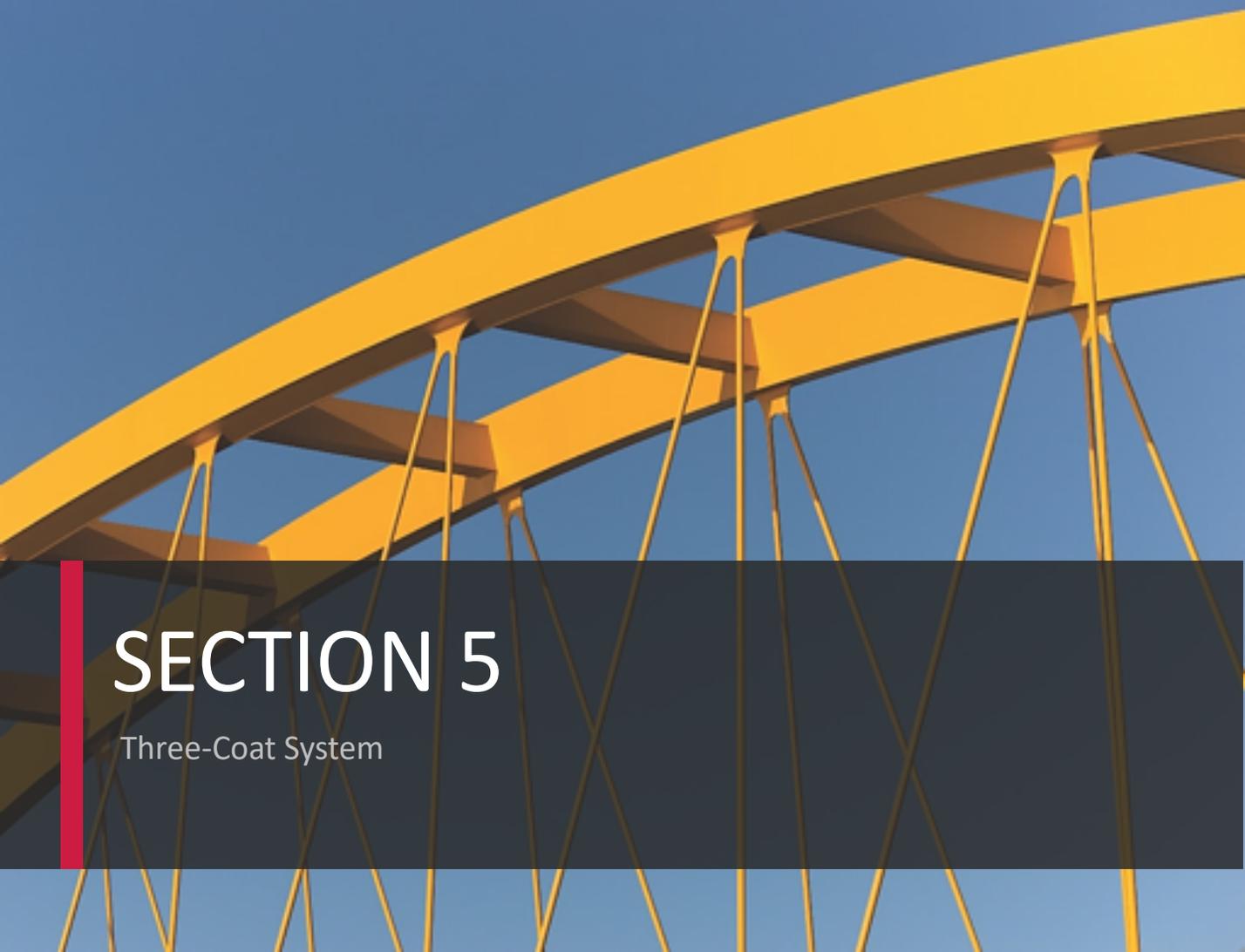
# NACE

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The Worldwide Corrosion  
Authority

## Surface Preparation and Priming Standards

- Industry standards
- Technical publications
- Training and certification

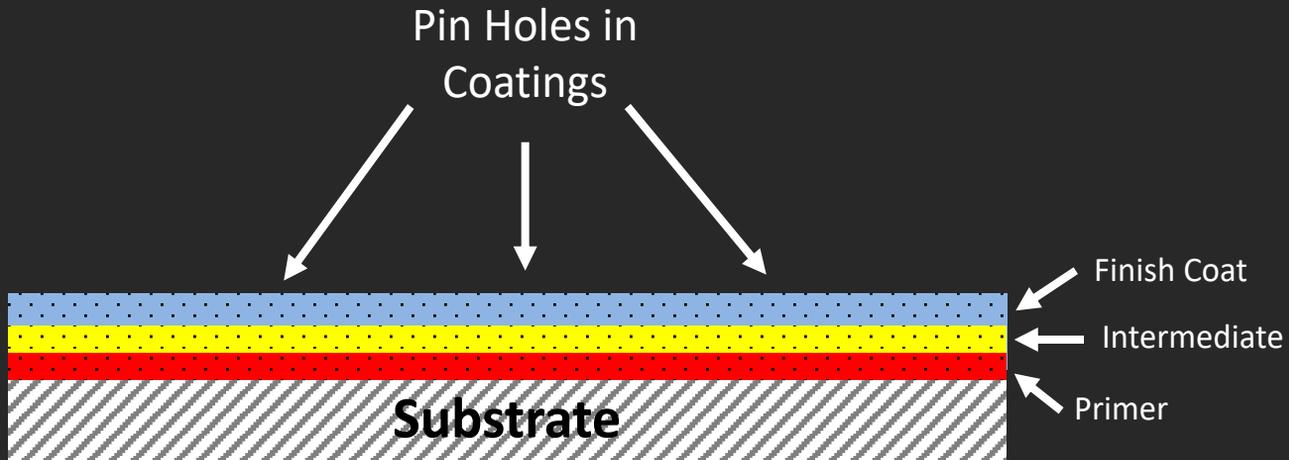


# SECTION 5

Three-Coat System

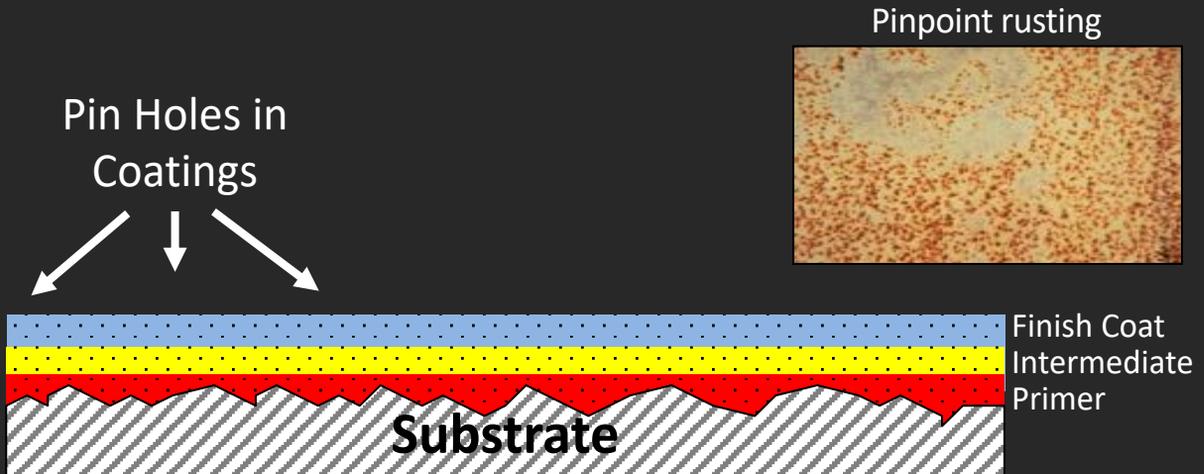
# Three-Coat System

- Number of coats is more important than thickness
- Protection in layers

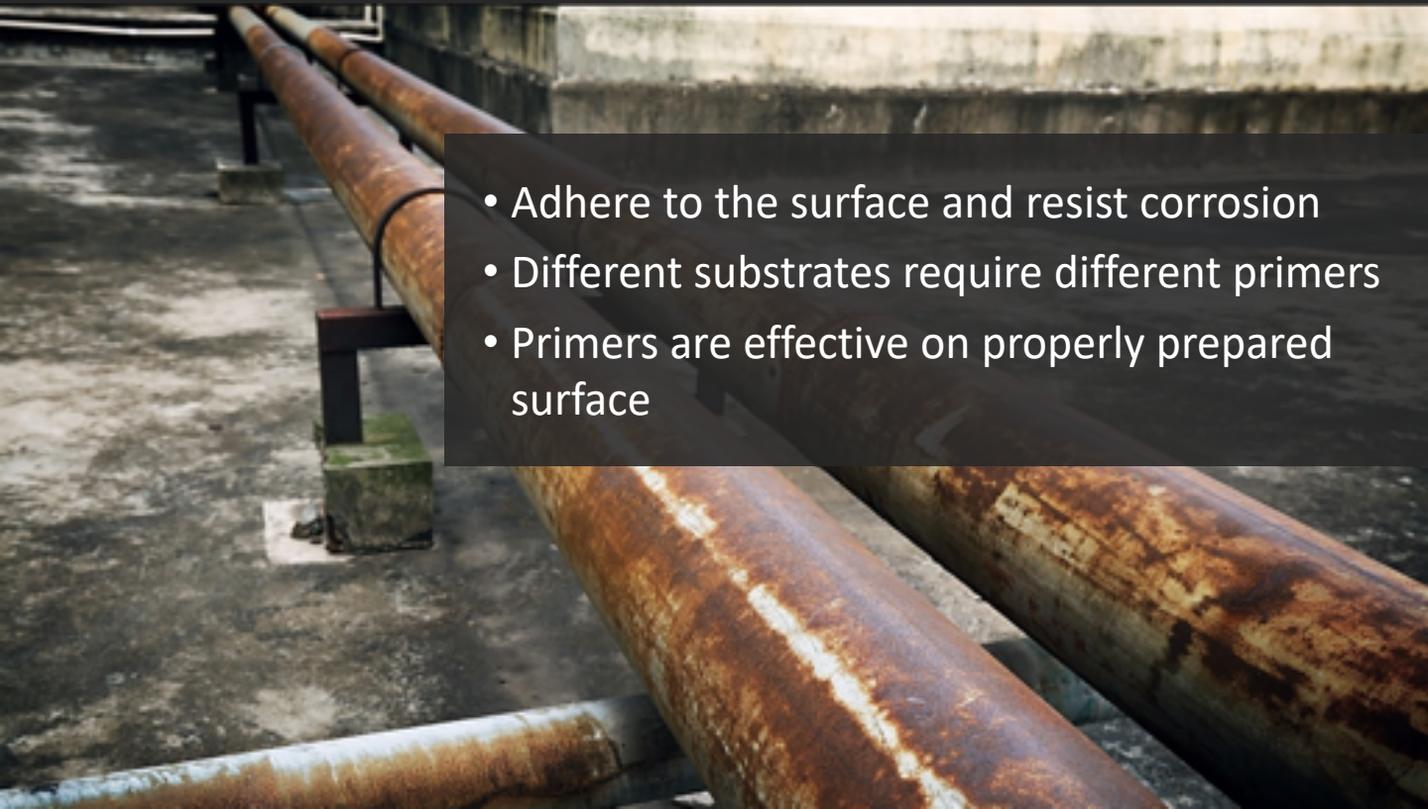


# Three-Coat System

- Surface profile should be buried by the dry film of primer
- Insufficient coating results in pinpoint rusting



# Three-Coat System: Primers

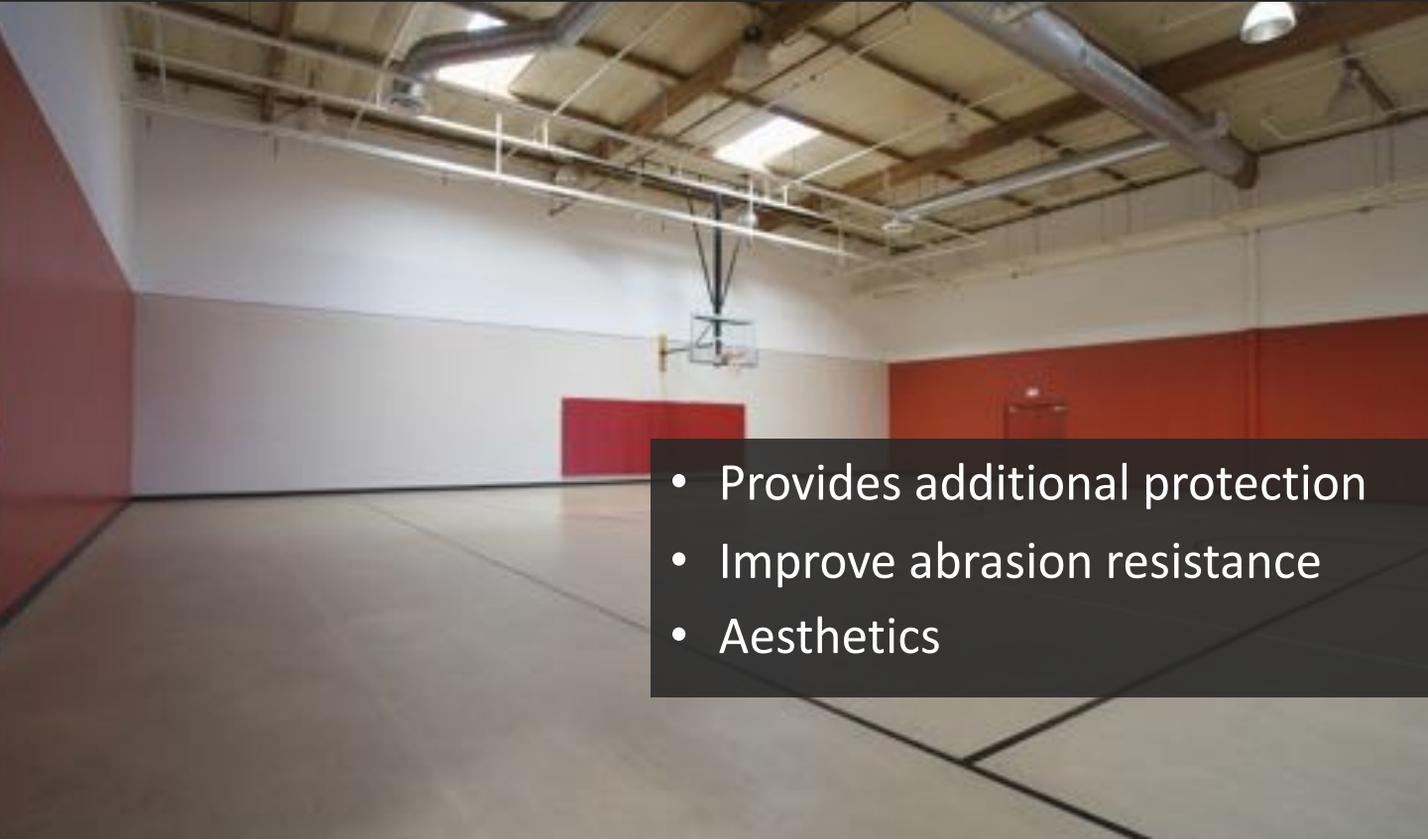
- 
- A photograph of several large, horizontal industrial pipes that are heavily rusted and browned. The pipes are supported by metal brackets and concrete blocks. The background shows a concrete wall and a dark, possibly wet, ground surface.
- Adhere to the surface and resist corrosion
  - Different substrates require different primers
  - Primers are effective on properly prepared surface

# Three-Coat System: Intermediate



- Intermediate layers offer more protection
- Additional coats protect against pinholes

## Three-Coat System: Finish Coat



- Provides additional protection
- Improve abrasion resistance
- Aesthetics



# SECTION 6

Top Down and Bottom Up

# Top-Down & Bottom-Up Approaches

Top-Down  
Coating  
Goal



Aesthetics



Service/operational environment



Bottom-Up  
Substrate



Type of prep



Substrate requirements





# SECTION 7

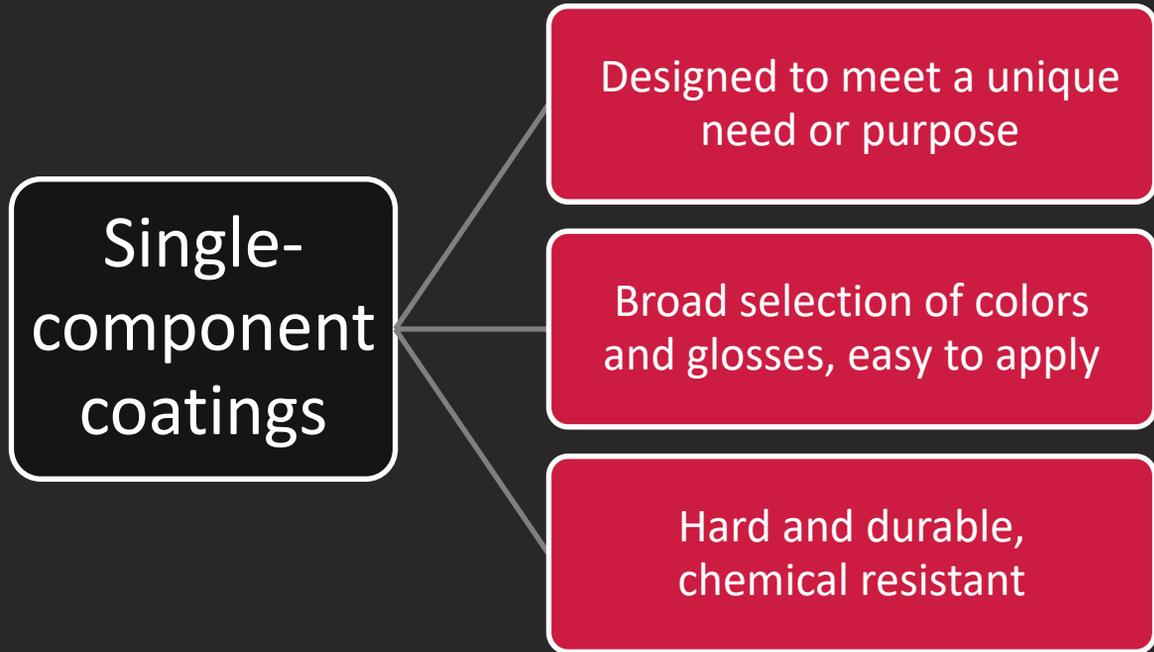
High-Performance Single-Component and Dual-Component Formulas

# High-Performance Finish Coats

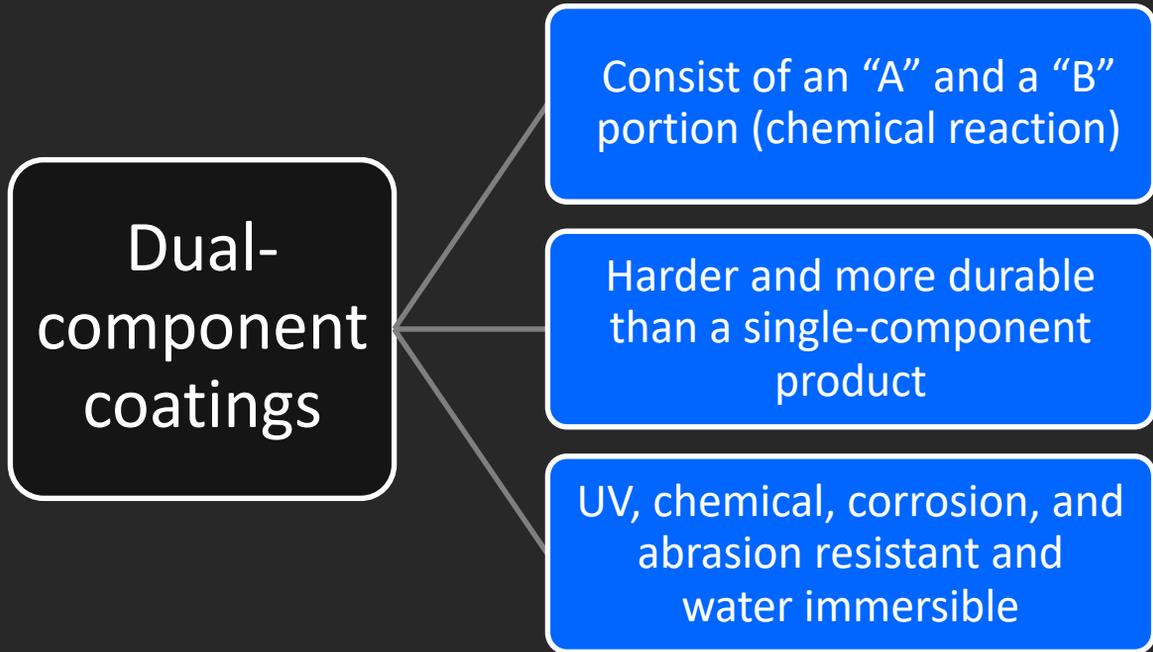
Single-  
component  
coatings

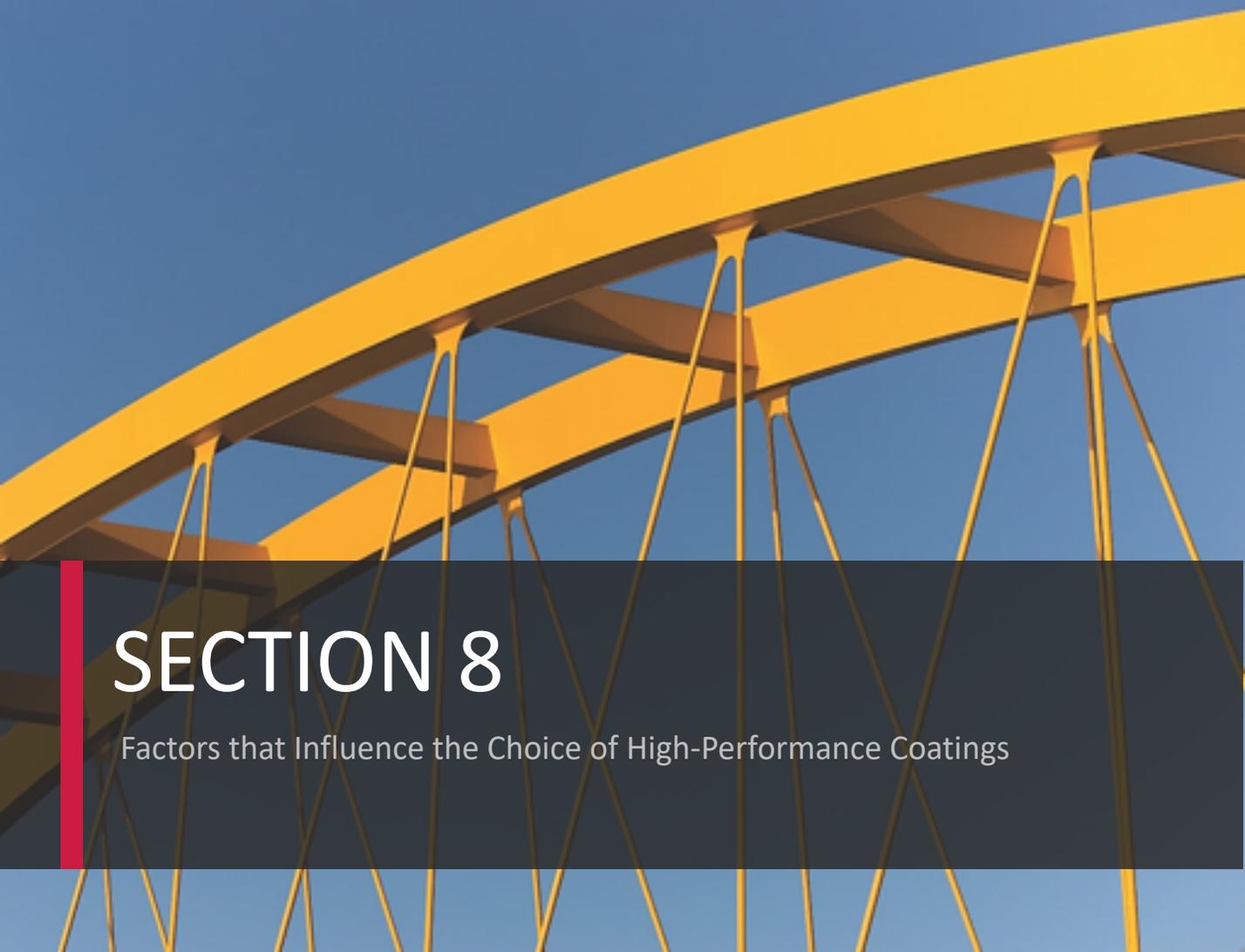
Dual-  
component  
coatings

# Single-Component Coatings



# Dual-Component Coatings





# SECTION 8

Factors that Influence the Choice of High-Performance Coatings



# Environmental & Operations Conditions

- **Interior and exterior spaces**
  - Interior spaces: heat, high humidity, and particulate matter
  - Exterior spaces: freeze-thaw conditions, heat and humidity, UV exposure, salt

# Environmental & Operations Conditions



- Environmental conditions
- Healthy indoor environments for occupants
- Occupied spaces vs. new construction

# Factors that Influence the Choice of a High-Performance Coating System

- **Anticipated use and exposure**
  - ✓ Service environment
  - ✓ Expected exposure
  - ✓ Job type
  - ✓ Substrate type
  - ✓ Surface Preparation
  - ✓ Budget
  - ✓ Customer Expectations



# Standards and Specialists

- **Rely on standards and specialists**
  - Applications and surface preparation standards can mitigate confusion
  - Coating manufacturers are a valuable resource
  - With guidance, projects can be done properly



## Summary

At first glance, the world of high-performance coatings may appear overwhelming. But a good starting point for understanding these coatings is to recognize that the same benefits high-performance coatings provide for large-scale industrial projects can be applied to non-industrial projects.

So when exceptional durability, safety, and longevity are needed or required, specify a high-performance coating system. These coatings are designed specifically to protect substrates from chemicals, abrasion, and corrosion and enhance project aesthetics.



# Thank You



**Benjamin Moore**<sup>®</sup>

Thank you for your interest in high-performance coating systems. This concludes the American Institute of Architects Continuing Education Systems and IDCEC Course.

[www.benjaminmoore.com](http://www.benjaminmoore.com)



# Resources

**Master Painters Institute**

[www.paintinfo.com](http://www.paintinfo.com)

**NACE International**

[www.nace.org](http://www.nace.org)

**National Paint & Coatings Association**

[www.paint.org](http://www.paint.org)

**Society for Protective Coatings**

[www.sspc.org](http://www.sspc.org)

**Benjamin Moore & Co.**

[www.benjaminmoore.com](http://www.benjaminmoore.com)