



**polyguard**

# 38th Annual Corrosion Control Seminar Barton Community College Great Bend, KS

## Common Inspection Tools Used in the Coating Application Process

From ambient and substrate conditions, to coating application, to curing...



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## About Me

BSEET University of Akron, OH  
NACE Coating Inspector Level 2 - Certified CIP No. 27922  
19 years coating experience

# Inspection Equipment

“You have to have the right tools for the job.”

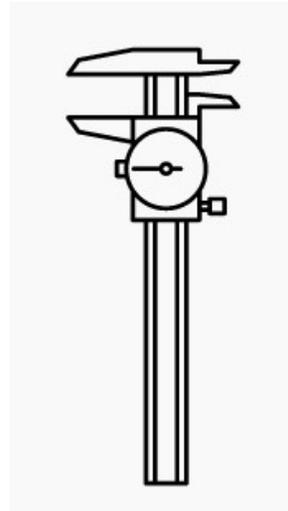
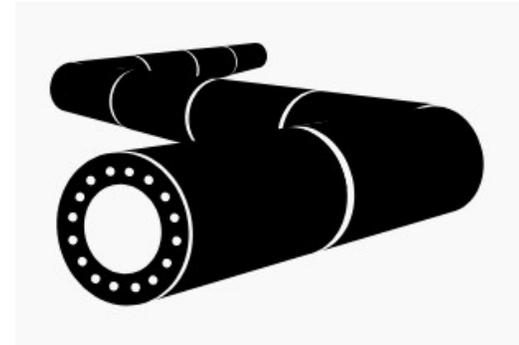
During any coating application project, we need to measure and record data throughout the entire process.

- Do you understand what is to be measured?
- Do you have the proper instrument?
- Do you know how to use it?
- Why is this important?



# What We Need to Measure and Observe

- Ambient Conditions
- Status of the Substrate
- Coating Thickness
- Coating Cure
- Holidays



# Ambient and Environmental Conditions

Temperature Measurement

Relative Humidity\*

Dew Point

Wind Speed

Chance of Precipitation

Wildlife



# Temperature, RH and Dew Point

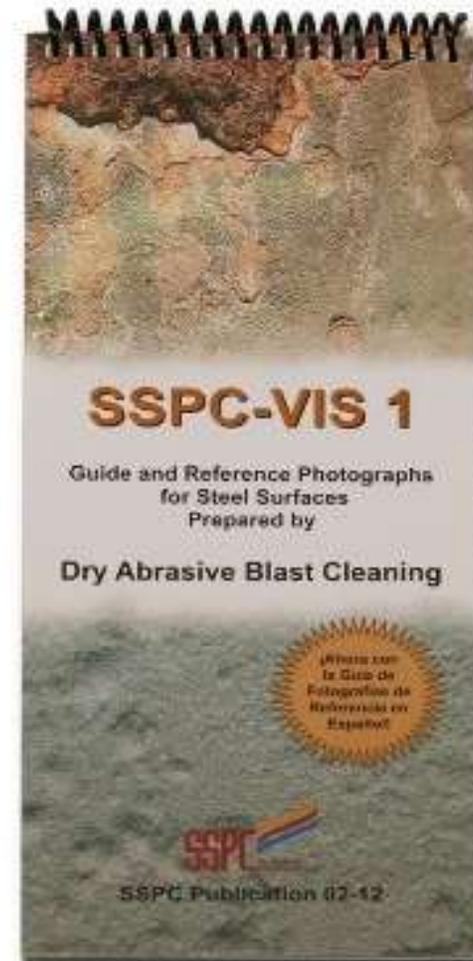
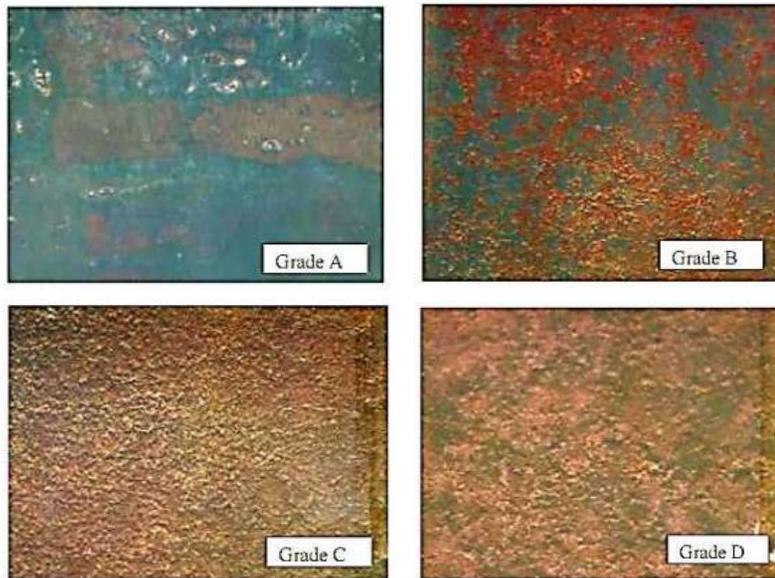


- Whirling hygrometer or sling psychrometer
- Electronic dew point meter
- Smart phone\*\*



# Substrate Status

SSPC-VIS 1 visual reference for blasted steel.



# Substrate Status

- Chloride content using a soluble salt test kit or Bresle patch.
- Quantifies chloride levels in  $\mu\text{g}/\text{cm}^2$



# Substrate Status

## Surface temperature

- IR Gun\*\*\* – emissivity issues on blasted steel
- Contact probe
- Magnetic thermometer



# Substrate Status

## Anchor Profile Depth

- Testex tape and micrometer
- Electronic pinpoint measurement
- Surface roughness stylus or surfometer



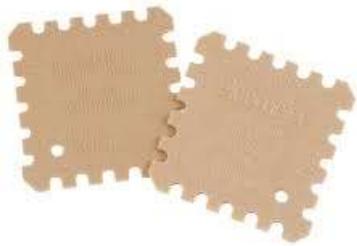
# Common Steel Surface Preparation Standards

Joint Standards			Similar ISO Standards	
NACE	SSPC	Description	ISO	Description
NACE No. 1	SSPC-SP 5	White Metal Blast	ISO Sa 3	Blast Cleaning to Visually Clean Steel
NACE No. 2	SSPC-SP 10	Near White Metal Blast	ISO Sa 2.5	Very Thorough Blast Cleaning
NACE No. 3	SSPC-SP 6	Commercial Blast	---	---
NACE No. 8	SSPC-SP 14	Industrial Blast	ISO Sa 2	Thorough Blast Cleaning
NACE No. 4	SSPC-SP 7	Brush Off Blast	ISO Sa 1	Light Blast Cleaning
NACE No. 6	SSPC-SP 13	Surface Preparation of Concrete	---	---
---	SSPC-SP 2	Hand Tool Cleaning	---	---
---	SSPC-SP 3	Power Tool Cleaning	ISO St 2	Thorough Hand and Power Tool Cleaning
---	SSPC-SP 11	Power Tool Cleaning to Bare Metal	ISO St 3	Very Thorough Hand and Power Tool Cleaning
---	SSPC-SP 15	Commercial Grade Power Tool Cleaning	---	---

# Coating Thickness

Wet film thickness

Dry film thickness



# Coating Cure

Surface and Product Temperature	Pot Life	Tack Free	Recoat Window ("Thumbnail" hard)	Backfill Time (Shore D 75)
50°F (10°C)	30 min	3 hrs	5 hrs	15 hrs
60°F (16°C)	25 min	2 hrs	4 hrs	6 hrs
70°F (21°C)	18 min	1.5 hrs	3 hrs	4 hrs
80°F (27°C)	12 min	1 hr	2 hrs	3 hrs
90°F (32°C)	8 min	45 min	1 hr	2 hrs
110°F (43°C)	5 min	30 min	45 min	1.5 hrs
125°F (52°C)	N/R	15 min	30 min	1.2 hrs
140°F (60°C)	N/R	10 min	15 min	50 min

\*The times listed above are approximations. Epoxy temperature and ambient conditions may contribute to the rate of cure.

# Coating Cure

Shore D Hardness for liquid coatings

DSC Scan - Differential Scanning Calorimetry for FBE



# Holiday Detection

Per the NACE/ASTM G193 joint document, “Standard Terminology and Acronyms Relating to Corrosion”

**holiday**—a discontinuity in a protective coating that exposes unprotected surface to the environment.



# Holiday Detection Standards

- NACE SP0274  
 $V = 1250 \times \text{sqrt}(t)$
- NACE SP0188
- NACE SP0490
- ASTM G62
- ASTM D5162
- “Rule of Thumb”  
 $V = 100 \times t$

NOTE:  $t$  = coating thickness in mils

**Always check the coating manufacturer’s recommendations!**





# Questions?

## Open Discussion