Protective and Marine Coatings

coatings PLUS

Module 1 v2.0

Best In Class Epoxy Linings with Optically Activated Pigments

Developed for a range of industrial applications, Sherwin-Williams innovative epoxy linings improve resistance and usability, with return to service in as little as 24-hours.

Learn how state of the art Opti-Check® OAP Technology allows for fast, accurate inspection of defects during application.

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Fast Clad ER

A **solvent-free**, **edge-retentive** epoxy amine lining engineered for **extremely fast curing** applications in tanks.

Fast Clad® ER offers ultra fast turnaround with **single coat application** and **24-hour return to service** features.

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What is Rapid Cure Technology?

- Next step in evolution
  - Equal or better performance
  - Apply quicker at reduced costs
- UHS, low VOC
- Edge retentive
- Short minimum recoat time (0-2 hours)
- Short cure to immersion time (24hrs or less)
- Plural pump application
- Potential for single or reduced coats

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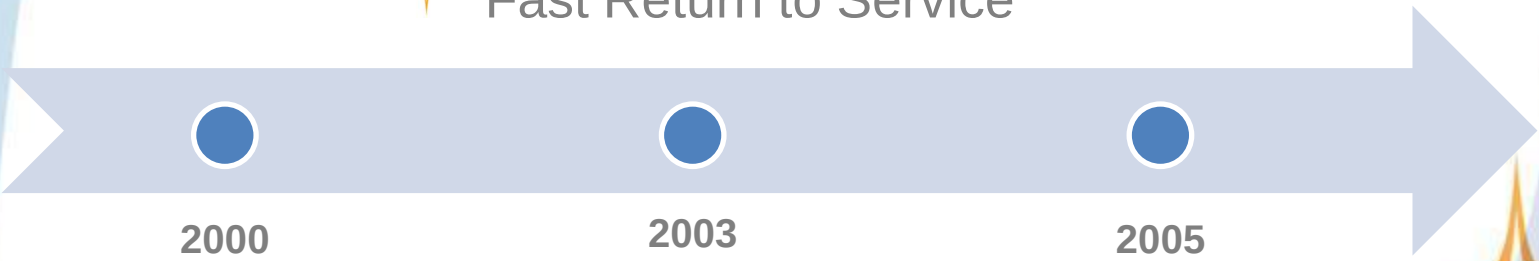
US Navy Improving Durability

Three key requirements for high durability lining systems for ballast tanks:

- Solvent-Free
- Edge retentive
- Fast Return to Service



2000

Dura-Plate UHS & Dura-Plate 301 approved for 20 years durability

2003

Fast Clad ER Launched

2005

Fast Clad ER becomes new standard for ballast tanks in US Navy

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Fast Clad ER

- Solvent Free
- 70-100% edge retention
- 20 years service life

Plus…

- Single coat application (450-550µm)
- 24 hour return to service

U.S.S. CARTER HALL LSD-50, PMA 2006

Rapid Cure Coating Demonstration

Program Sponsor-ONR, Transition Authority-NAVSEA O5M.1, Tech Authority-NRL

NAVSEA
NAVAL SEA SYSTEMS COMMAND

Materials Engineering Office, O5P2

***Full schedule including touch-ups and 1 x stripe coat.**

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Application Times

Technology	Total Application Time
NAVSEA Standard UHS Coating (Prime, Stripe, Topcoat)	216hrs
Two Full Coats Rapid Cure with fluorescent additive in base coat	90hrs
Single Coat Rapid Cure with fluorescent additive	**35hrs**

*Full schedule including touch-ups and 1 x stripe coat.

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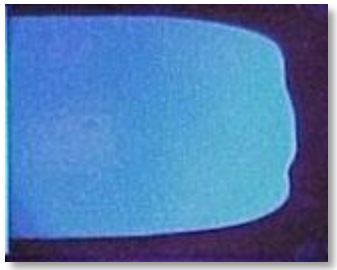
Inspection Challenges

Non Fluorescent Coating

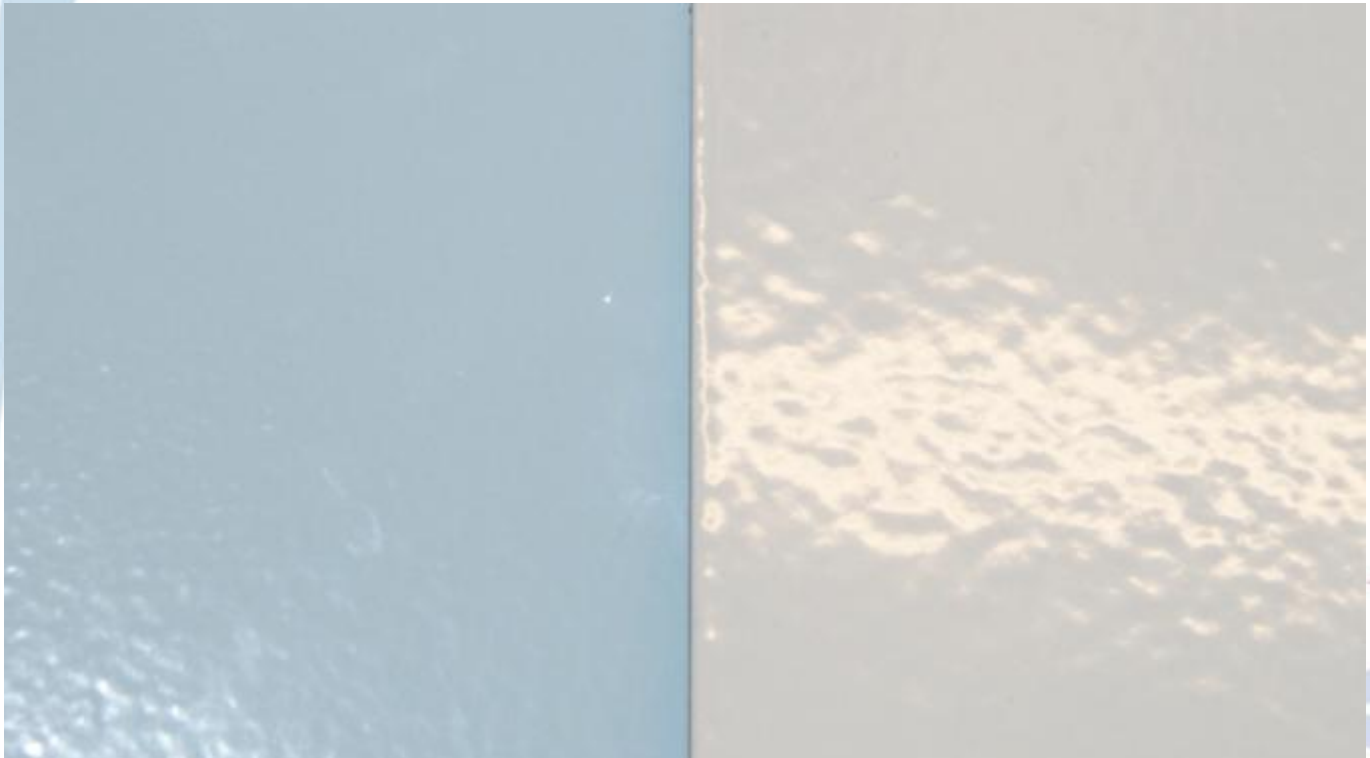


Fluorescent Coating

OAP Visual

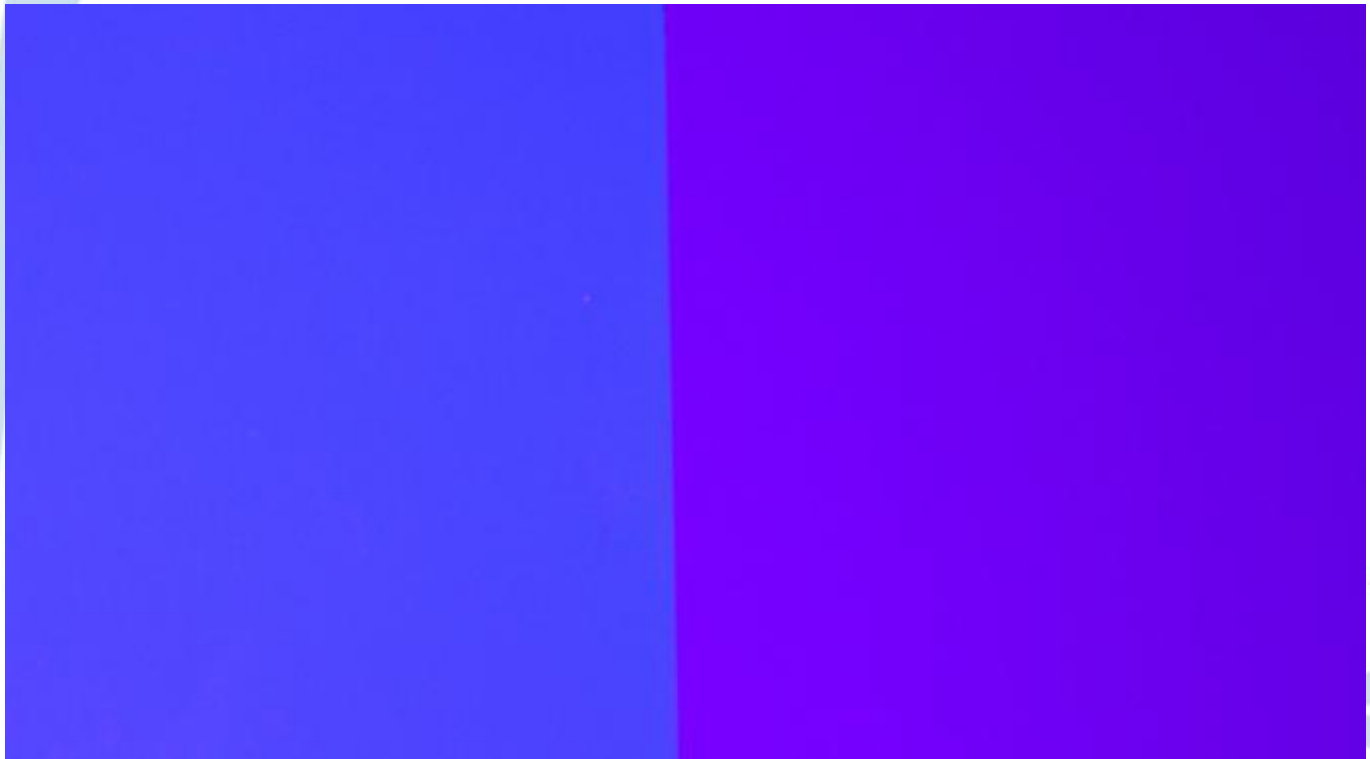
Fast Clad ER Blue OAP Fast Clad ER White

under normal light



OAP Visual

Fast Clad ER Blue OAP Fast Clad ER White
under deep purple light



OAP Visual

Fast Clad ER Blue OAP Fast Clad ER White
under deep purple light & yellow filter glasses

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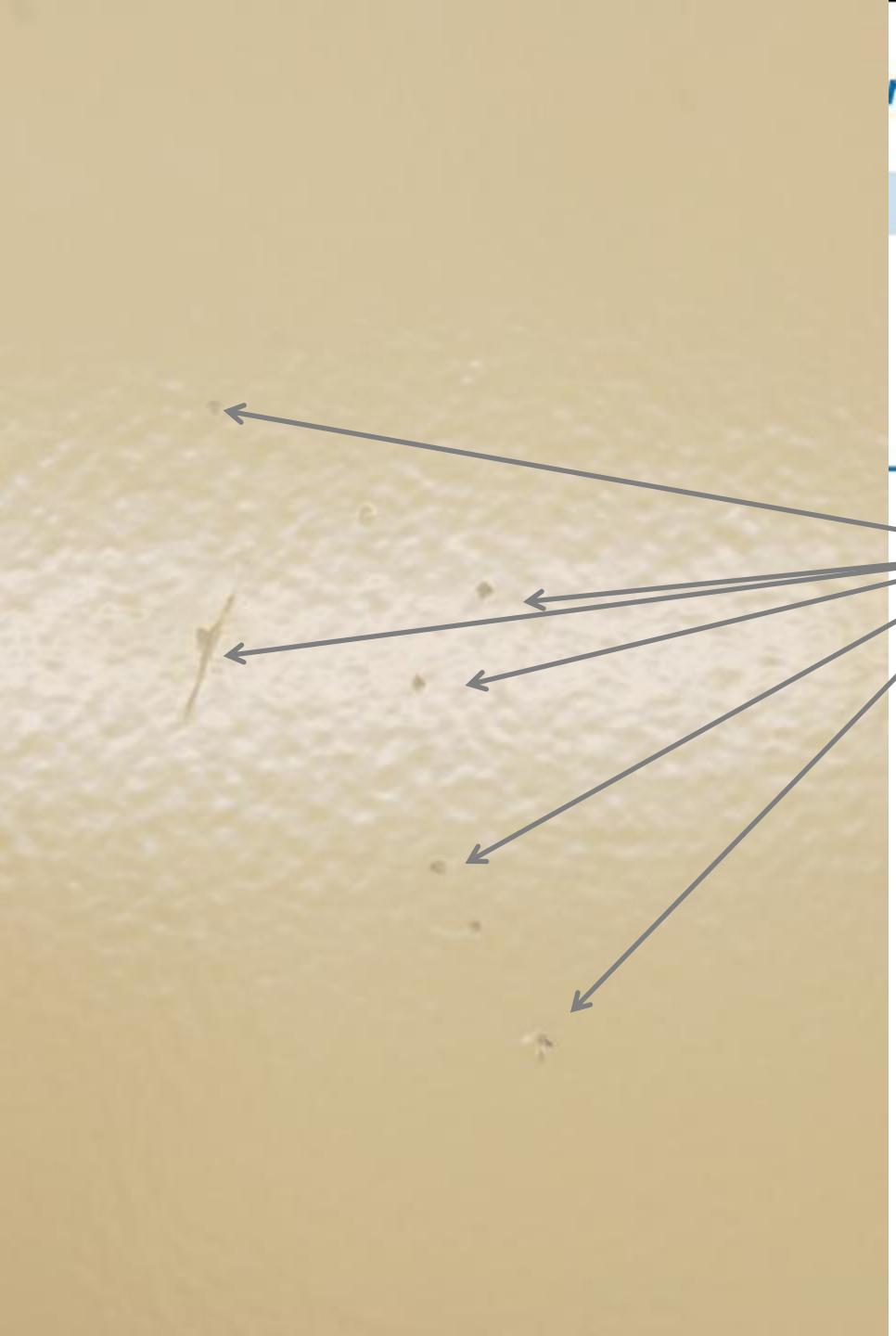
Inspection Lights

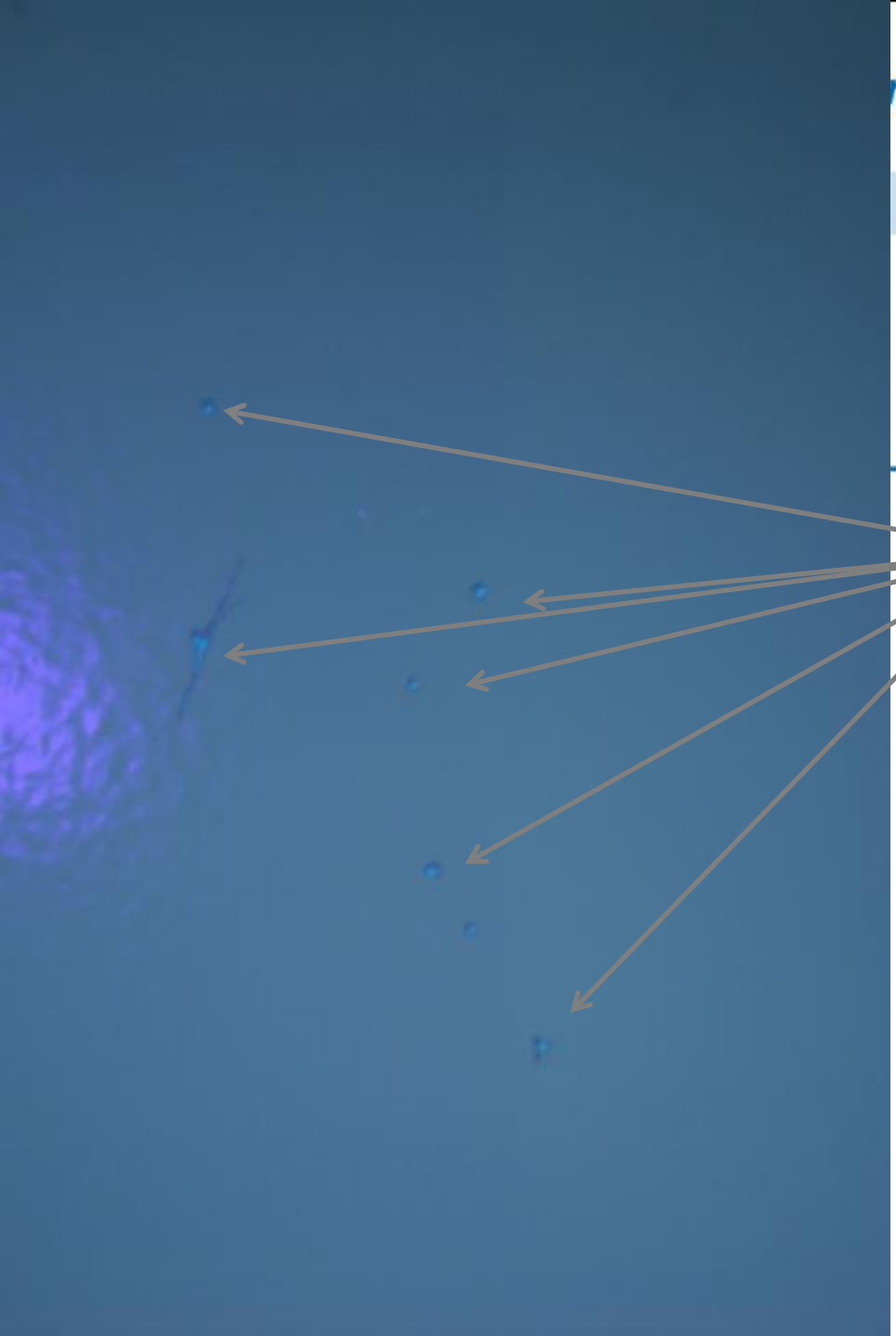
- Eye safe UV light (400µm)
- Quickly highlights defects, holidays and pinholes
- Highlights low film thickness

Inspection Challenges



White light inspection

Pinholes difficult to see



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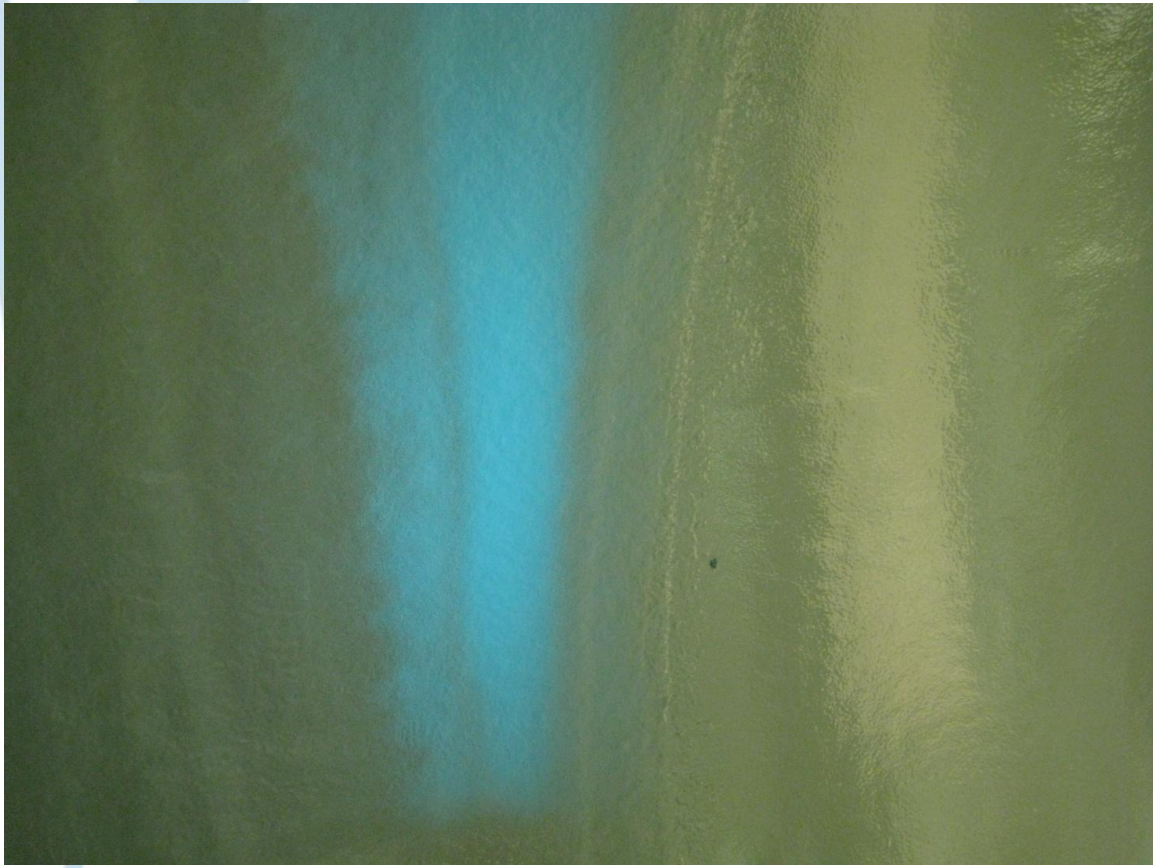
Inspection Challenges

Deep Purple light inspection with yellow filter glasses

Pinholes easy to identify and visible through glow of OAP pigments

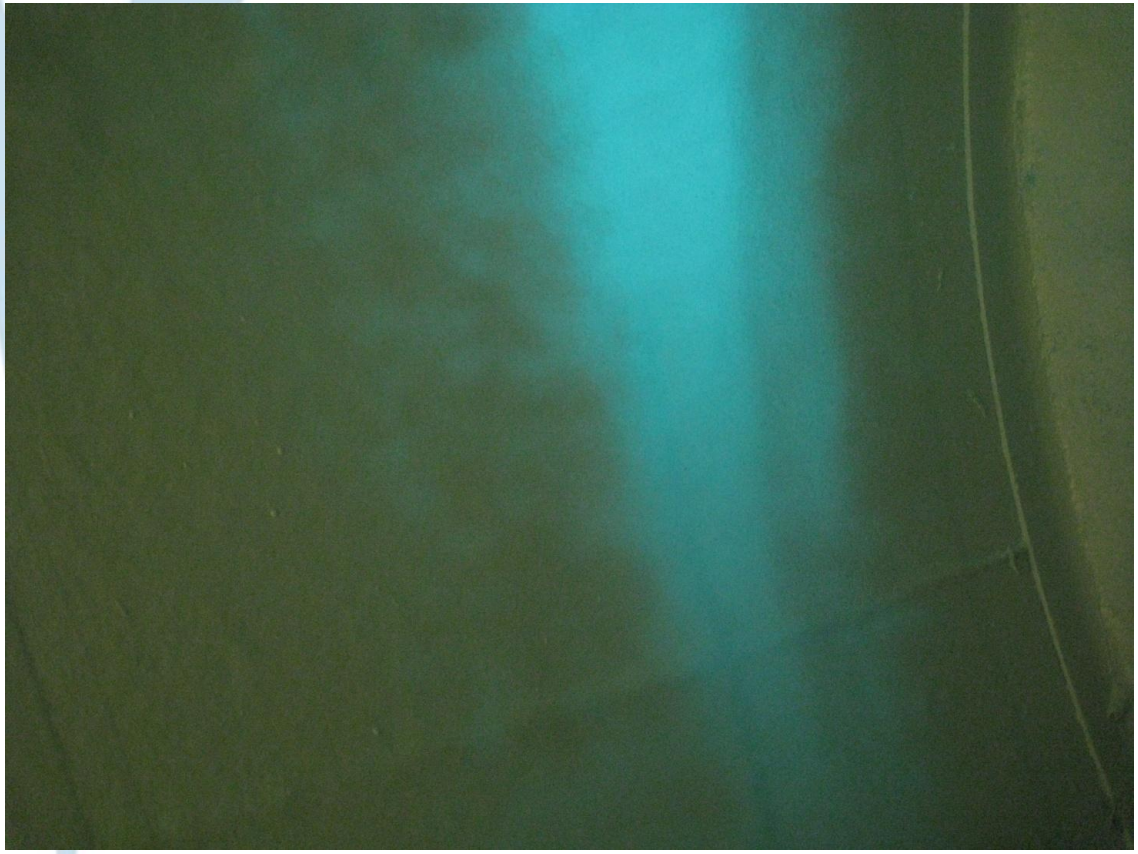
No flash light glare

OAP technology



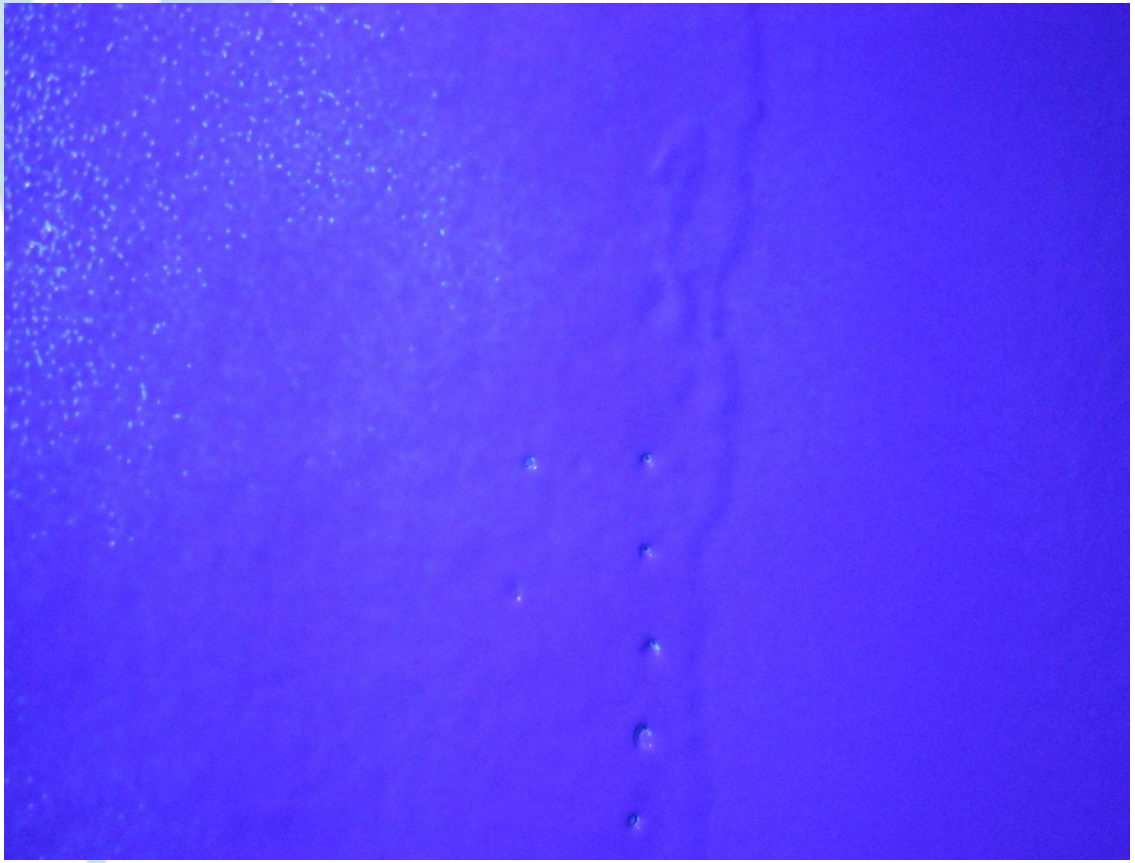
The OAP technology can make it easier for the sprayer to see the applied coats during the application.

OAP technology



Areas of incomplete film are more obvious to the sprayer

OAP technology



Pinholes become more obvious

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US Navy Inspector Results

- 50-70% improved productivity
- 25% more defects revealed
- Visibility of low film thickness on edges
- Pinhole defects visible from 2X standoff

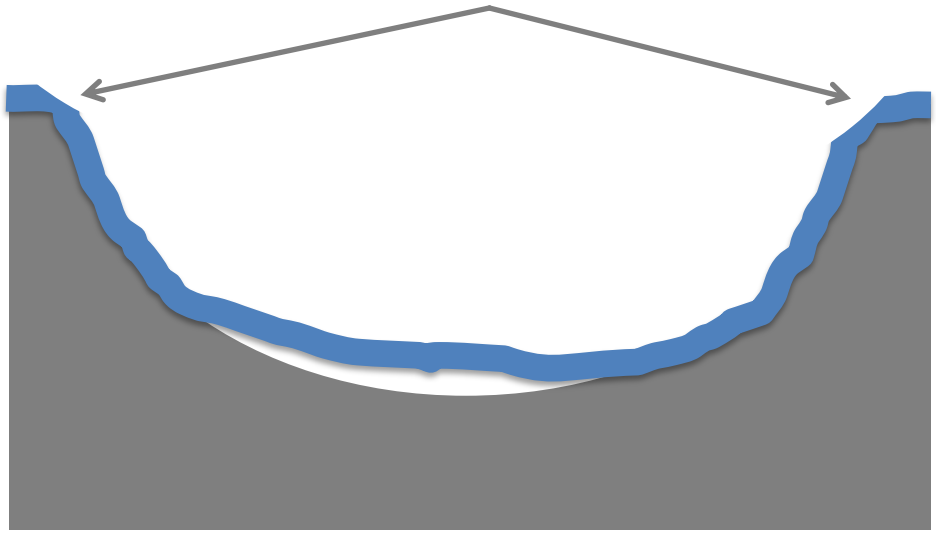
Tank Bottom Corrosion

- Storage tank standards provide a corrosion allowance (extra steel thickness)
- Only effective when corrosion is slow and even
- In practice metal loss is often concentrated in small areas (pitting)

Tank Bottom Corrosion

Tank Bottom Corrosion

Solvent-borne technology has limitations over pitted surfaces



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The Solution

Fast Clad ER

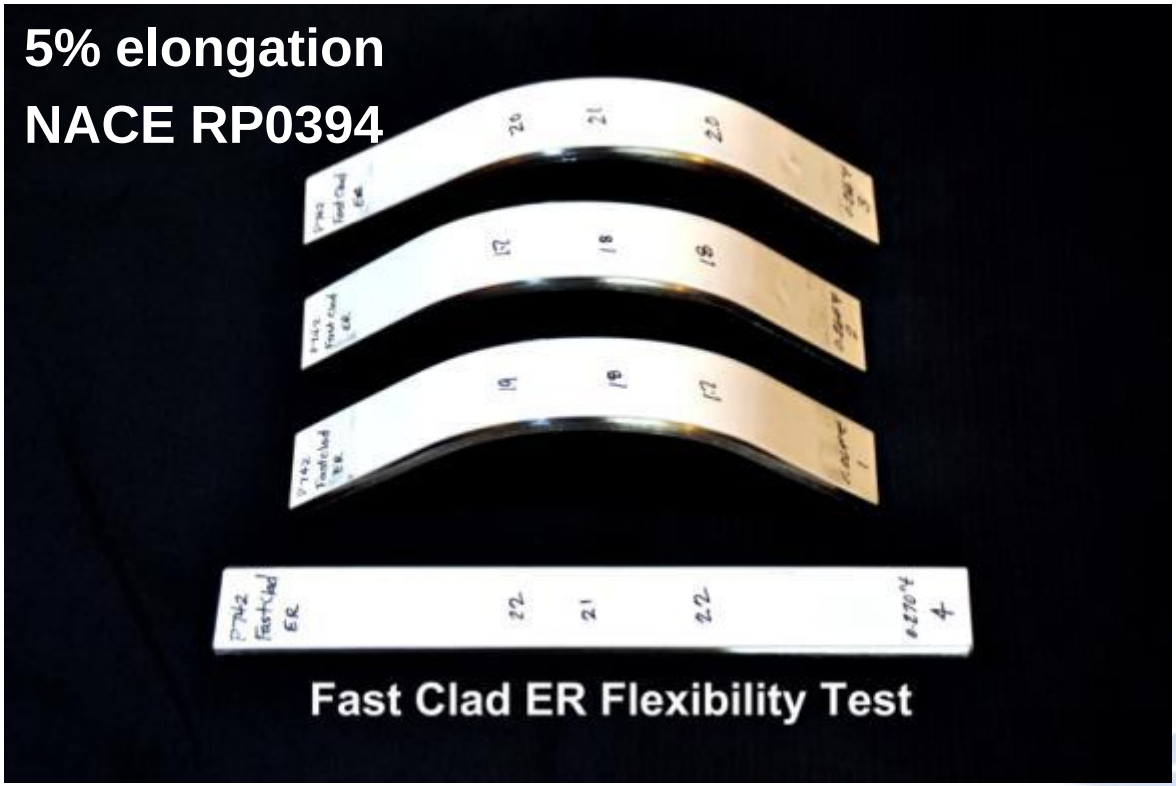
- Flexibility to move with steel
- Excellent adhesion
- Excellent pit filling characteristics
- No shrinkage
- Good edge retention
- Suitable for Cathodic Protection
- Fast curing

Flexibility

Key to performance

5% elongation

NACE RP0394



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Qualifying Fast Clad ER

Example: oil major lining approval

Environment	System Code	Coating System	DFT (µm)
Gasoline, crude oil, diesel, kerosene, heating oil, jet fuel, lubricating oils storage, *Temp max 50°C*	LT1-N, LT1-M LT12-N, LT2-M	Fast Clad ER	450

Application

Application	
Method	Plural Pump Airless Spray Brush & Roller for stripe coat & repair
Temperature	5˚C min. / 43˚C max. For application at 2˚C- 5˚C, specific guidelines are required: see data sheet
RH	85% max

Fast Clad® ER is valuable where rapid return to service and edge protection film build properties are required.

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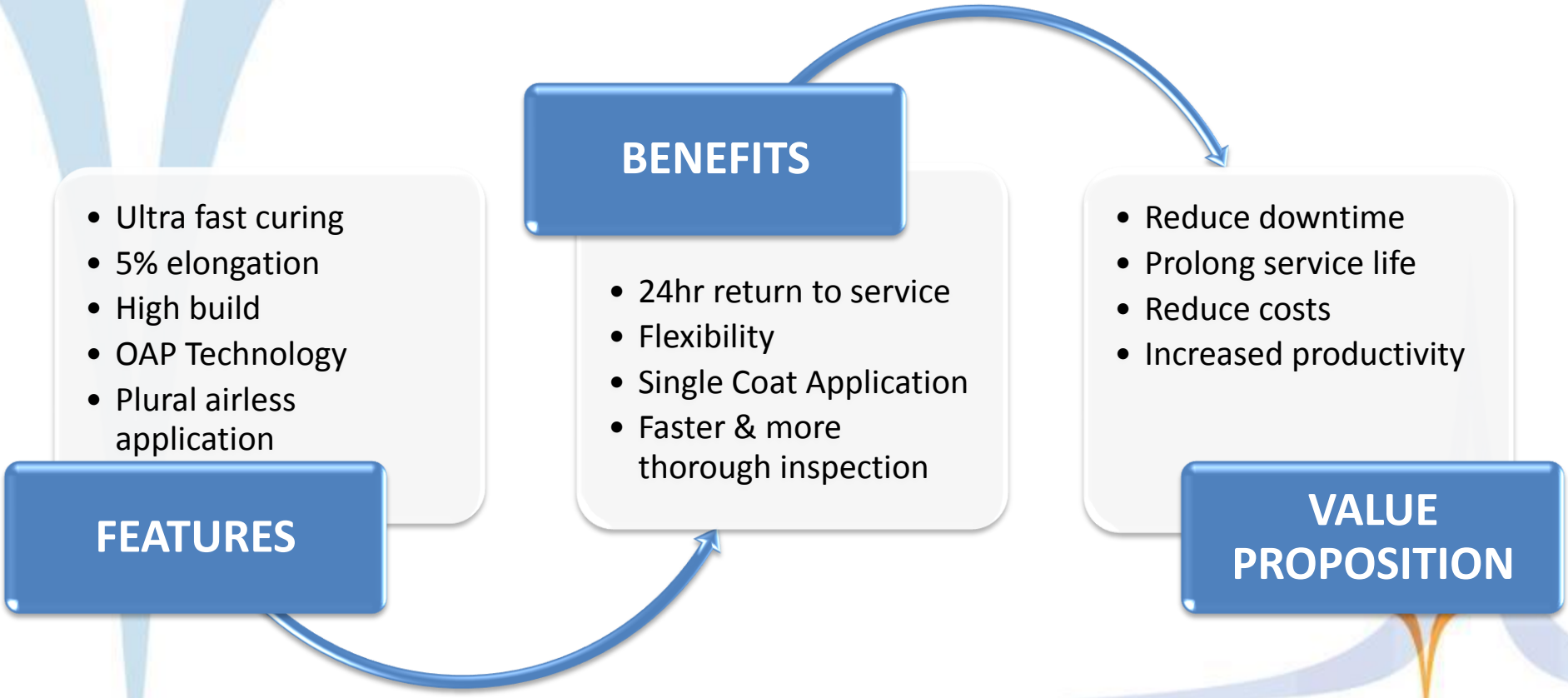
Value Proposition



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Fast Clad ER key data

- Base (Part A): 10ltr in 20ltr container
- Additive (Part B): 10ltr in 12.5ltr container
- Weight: 1.4 Kg/L ± 0.04, mixed

Thinner .....Not recommended

Cleanser .....No 13

Plural Component Equipment

Pump	WIWA DUOMIX 1:1, Graco Extreme Mix, Graco XM, or Graco XP
Pressure	4000 psi
Hose	3/8" ID
Tip	.021" - .025"
Pump heater setting	21°C - 27C
Material temperature at gun tip	29°C-54°C (vary as needed)

Brush .....For stripe coating and repair only

Brush.....Nylon/Polyester or Natural Bristle

Roller .....For stripe coating and repair only

Cover .....3/8" woven with solvent resistant core

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PRODUCT CHARACTERISTICS	
Finish:	Gloss
Colour:	White-Base, Blue OAP
Volume Solids:	98%, ± 2%, mixed
Weight Solids:	98%, ± 2%, mixed
VOC:	<85 g/ltr, mixed
Mix Ratio:	1:1 by volume

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet microns	**450**	**550**
Dry microns	**450**	**550**
Theoretical Coverage m^2/ltr	**2.2**	**1.8**

*Can be applied up to 1500 microns dft if required.

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 500 microns:

	@ 4.5°C	@ 25°C *50% RH*	@ 38°C
To touch:	6 hours	1 hour	35 minutes
To handle:	8-12 hours	3 hours	55 minutes
To recoat:			
minimum:	6 hours	1 hour	35 minutes
maximum:	14 days	14 days	14 days
Foot traffic:	8-12 hours	3 hours	1 hour
Cure to service:	36 hours	24 hours	12 hours
Pot Life:		7 minutes	
Induction-Time:		None required	

Shelf Life:	24 months Store indoors at 4.5°C to 38°C
Flash Point:	110°C, mixed
Thinner:	Not recommended
Cleanser:	No 13

Fast Clad ER key data

- Air & surface: 4.5°C minimum*, 43°C maximum
- For application at 2°C to 4.5°C, specific guidelines are required
- The material should be 29°C-54°C (vary as needed) at the mixing block for optimal atomization
- Do not heat above 60ºC

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Any Questions?

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