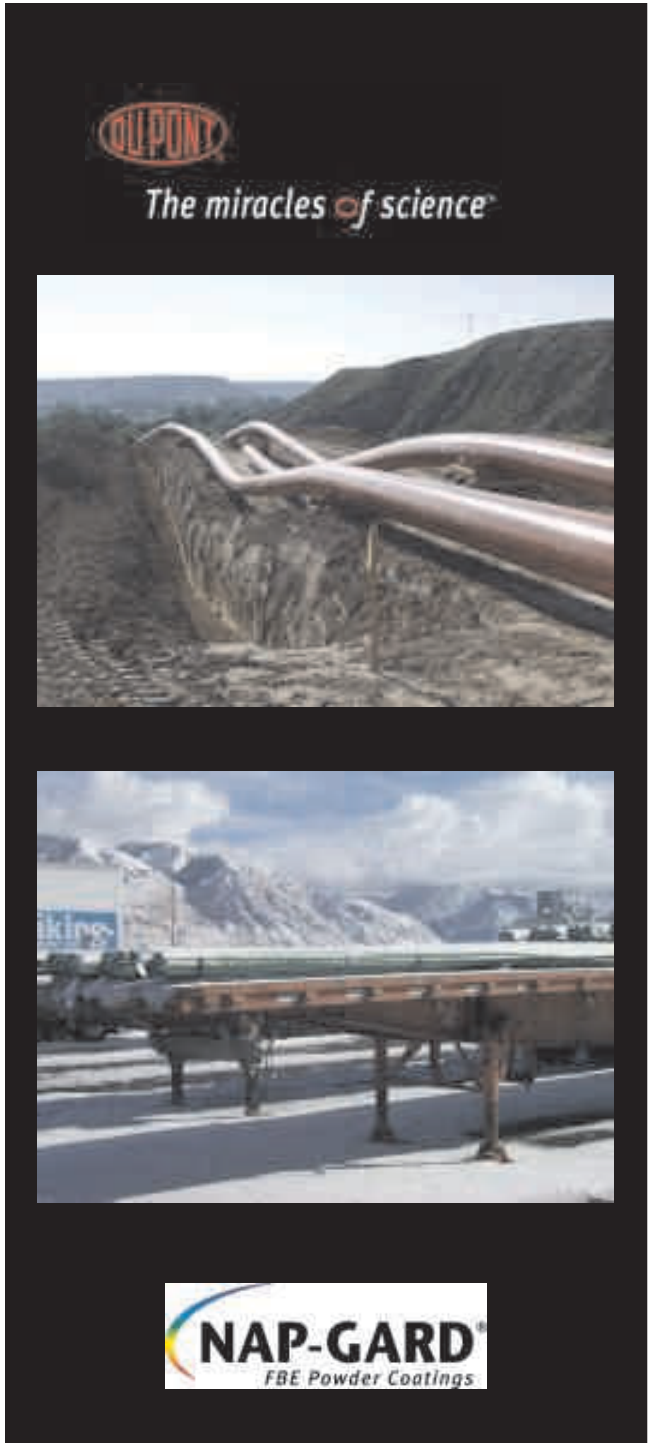

NAPCA WORKSHOP 2009

A Dual Powder System for UV Protection of Coated Line Pipe

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DuPont Pipeline Solutions

Areas Needing UV Protection

- Pipes for above ground service
- Pipes stored and replacement pipes
- Exposed pipe sections in crossing area or desert area due to sand movement
- Application of UV protection topcoat after the FBE coating involves additional handling/re-labeling the pipe etc.

DPS Specified in CSA Z245.20-06

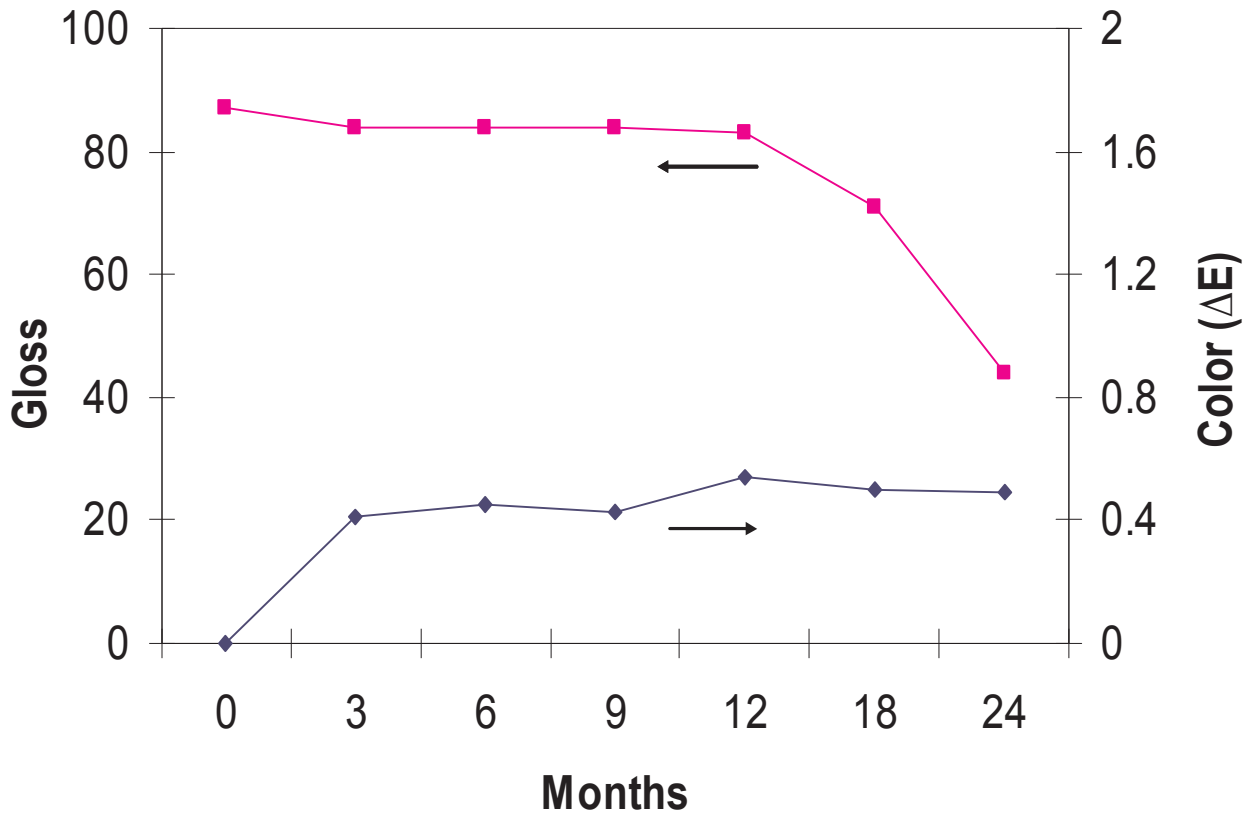
- FBE-Based Protective Overcoat (CSA Z245.20-06)
  - 2A: Corrosion coating with a protective overcoat
  - 2B: Corrosion coating with an abrasion-resistant overcoat
  - 2C: Corrosion coating with an anti-slip overcoat
  - 3: Corrosion coating/ protective overcoat / anti-slip overcoat

No system specified for UV protection of coated line pipe

Design of UV-Resistant Topcoat

- Excellent exterior durability (gloss, color)
- High reactivity to meet application speed
- Outstanding melting flow characteristics for smooth appearance
- Great flexibility
- Additional corrosion barrier

Florida Weathering Test for Topcoat



Results

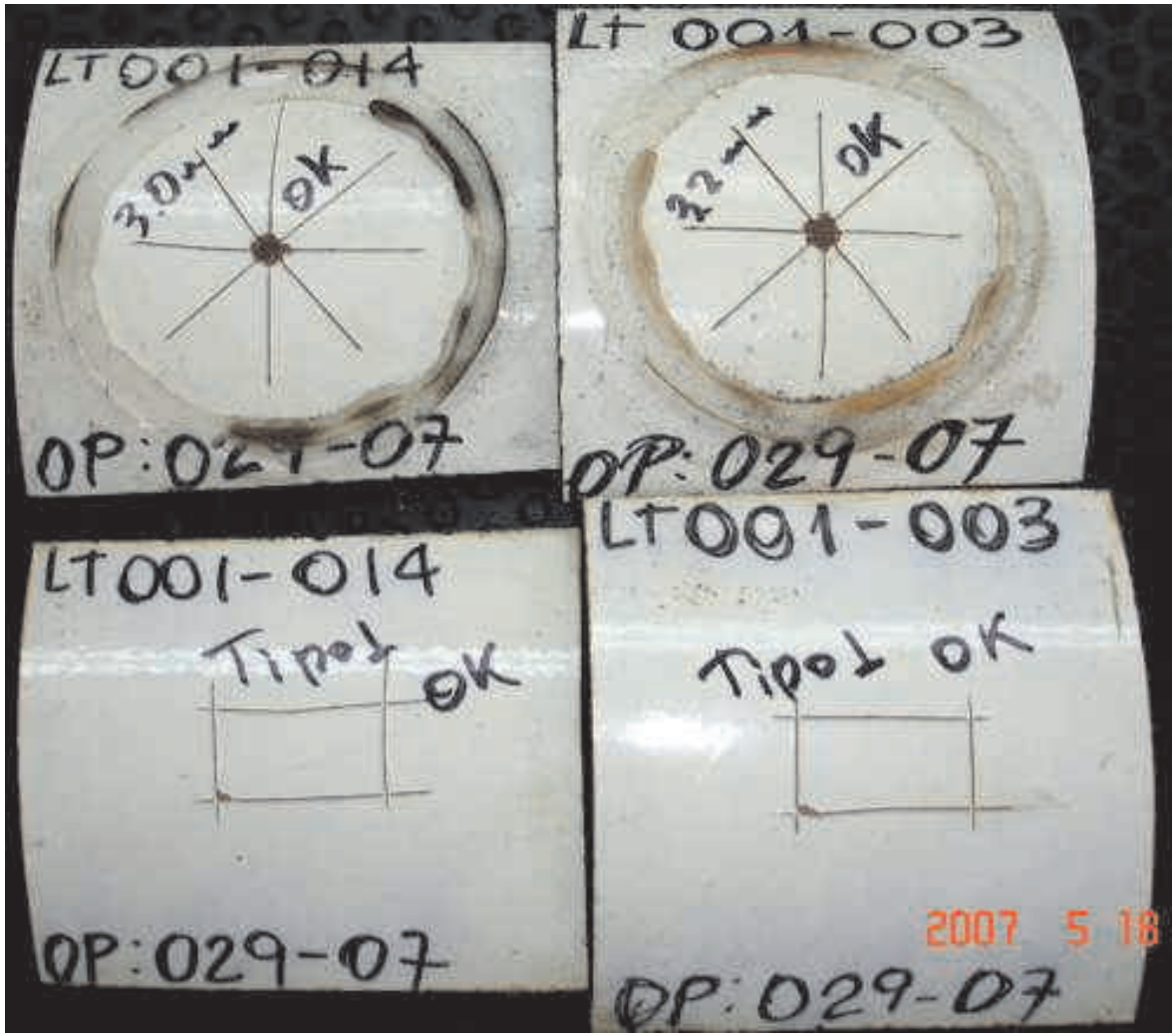
TEST	ACCEPTANCE CRITERIA	RESULTS		
Cathodic Disbondment (24h/3.5 V/65°C)	≤6.5mm	3.0mm	3.2mm	Pass
Adhesion (24h/75°C)	1– 3 rating	1	1	Pass
2.5° Flexibility @-30°C	No cracking or tear	Pass	Pass	Pass
3.0 J Impact@ -30°C	No holidays	Pass	Pass	Pass
Interface Porosity	1– 4 rating	2	2	Pass
Cross-Section Porosity	1– 4 rating	2	1	Pass
DSC Cure	ΔTg <5°C	0.4°C	0.2°C	Pass
Surface Contamination	≤35%	10%	15%	Pass

- Coating was applied at 463°F with a quench time of 90 sec

Results

CDT
(24h/3.5V/65°C)

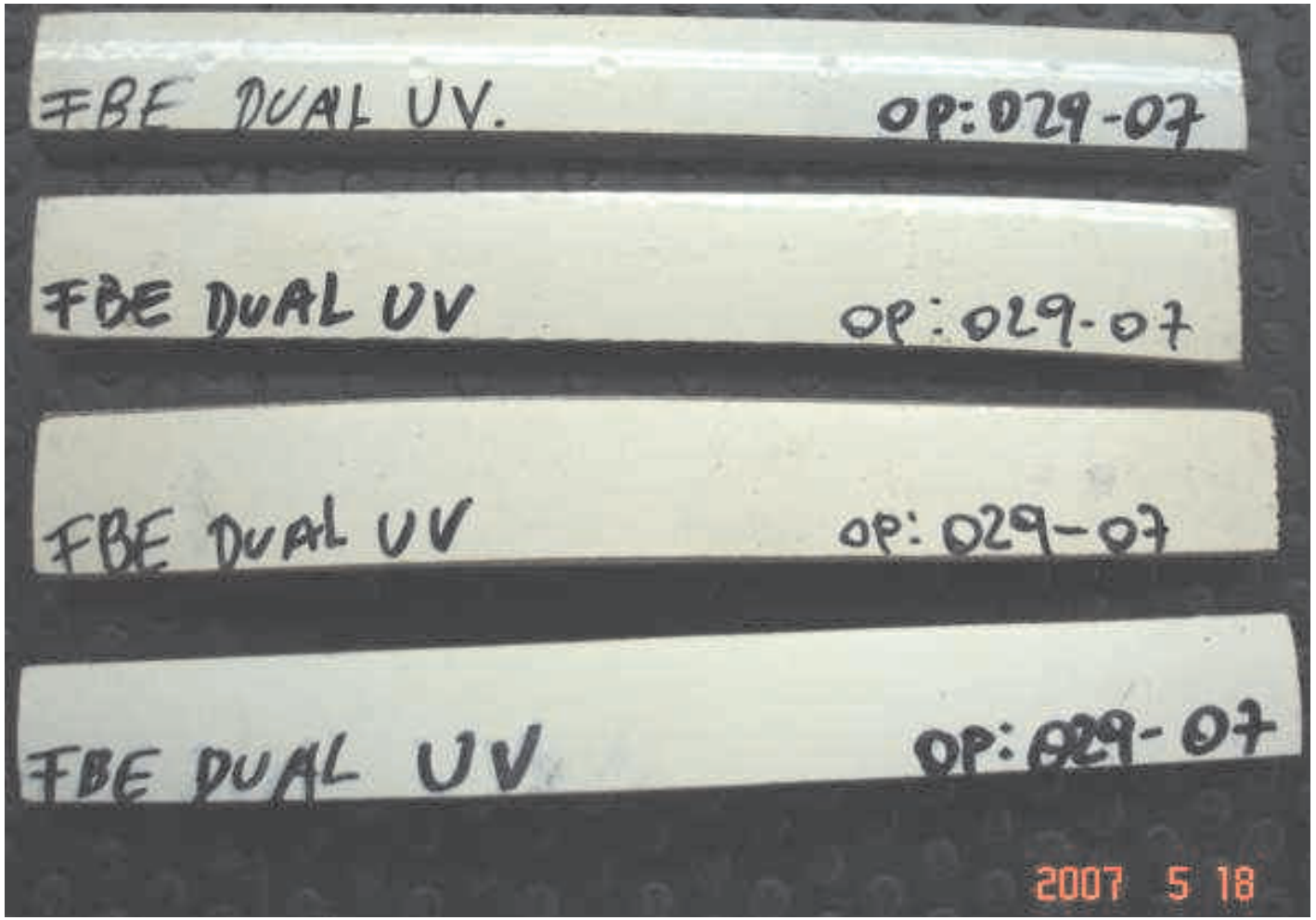
Adhesion
75°C, 24 h



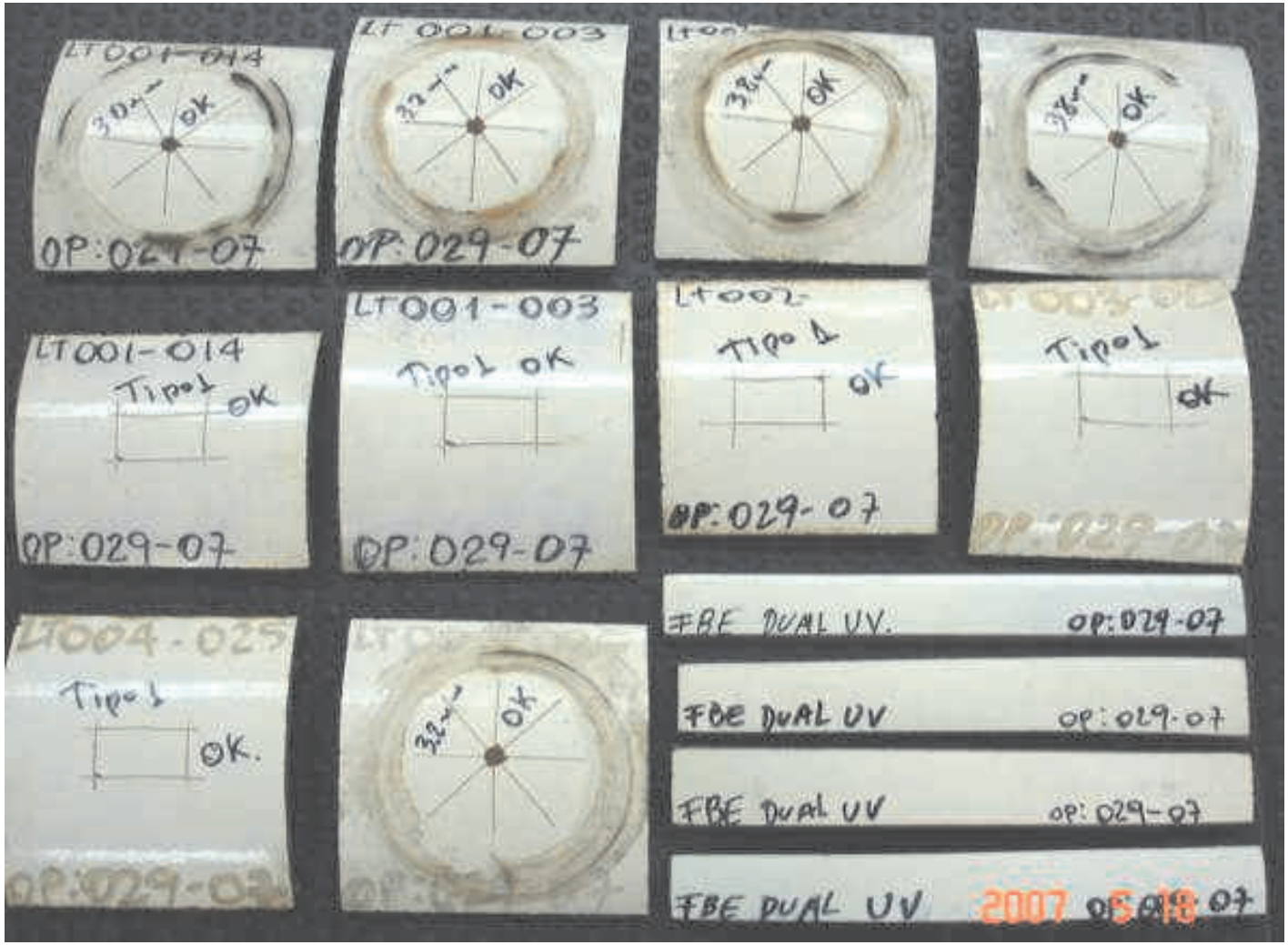
Results

3.0 J Impact
@ -30°C

2.5° Flexibility
@ -30°C



Results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FBE DUAL UV. OP:029-07
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FBE DUAL UV OP:029-07
FBE DUAL UV

Summary

- Easy to apply/handle
- Very good resistance to UV radiation
- Good flexibility in field bending
- Good adhesion to corrosion protection layer