



LABORATORY TEST REPORT

TESTING PROJECT: 02040

DATE: August 24, 1982

REPORT #: First

TIME: Final

DATE OF GRADING: 7/19/82

TOTAL DESIGN TEST DURATION: Seven Days REQUESTED BY: Dan McBride

TITLE: LOCA Testing of Carbo Zinc 11 over an SSPC-SP6 Blast

PURPOSE:

To determine the performance of Carbo Zinc 11 over a SSPC-SP6 "Commercial Blast" when subjected to a 340°F BWR (ASTM D3911-80) LOCA condition.

CONCLUSIONS:

Please refer to results.

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PDR FOIA
GARDES5-59 PDR

From the Carboline Research & Development Laboratory

The technical data furnished are true and accurate to the best of our knowledge. However, no guarantee of accuracy is given or implied.

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PROCEDURE:

A. Test Coupons:

2"x4"x 1/4" steel, certified
Carboline ST-1 (See Appendix 1)
Surface Preparation: Gritblasted to SSPC-SP6-63,
"Commercial Blast Cleaning".
Abrasive Medium: 50/1 mix of GFH #40 grit on S230 shot.
Panels were degreased before priming.

B. System Tested:

System Tested	Batch No.	Color	Thinner	Thinning Ratio	DFT Range (Mils)
1c Carbo Zinc 11	Part A: 2B5754M Part B: 2A2678M	Green #300	Thinner #33 1E0964M	12%	1.8-2.0

C. Cure Schedule:

System Tested	Time Cure	Temp °F	Temp °C	Relative Humidity Range
1c Carbo Zinc 11	2 days ambient	69°-76°	21°-24°	56% - 91%
	6 weeks, 3 days (roof)	50°-90°	10°-32°	33% - 97%
	3 days ambient	70°-76°	21°-24°	60% - 70%

D. Exposure:

1. Time-Temperature-Pressure Curve

Time	Temperature*	Pressure*
Initial	Ambient	Ambient
Initial to 6 hours	340°F (171°C)	70 psig
6 hours to 96 hours	250°F (121°C)	30 psig
96 hours to 7 days	200°F (93°C)	10 psig

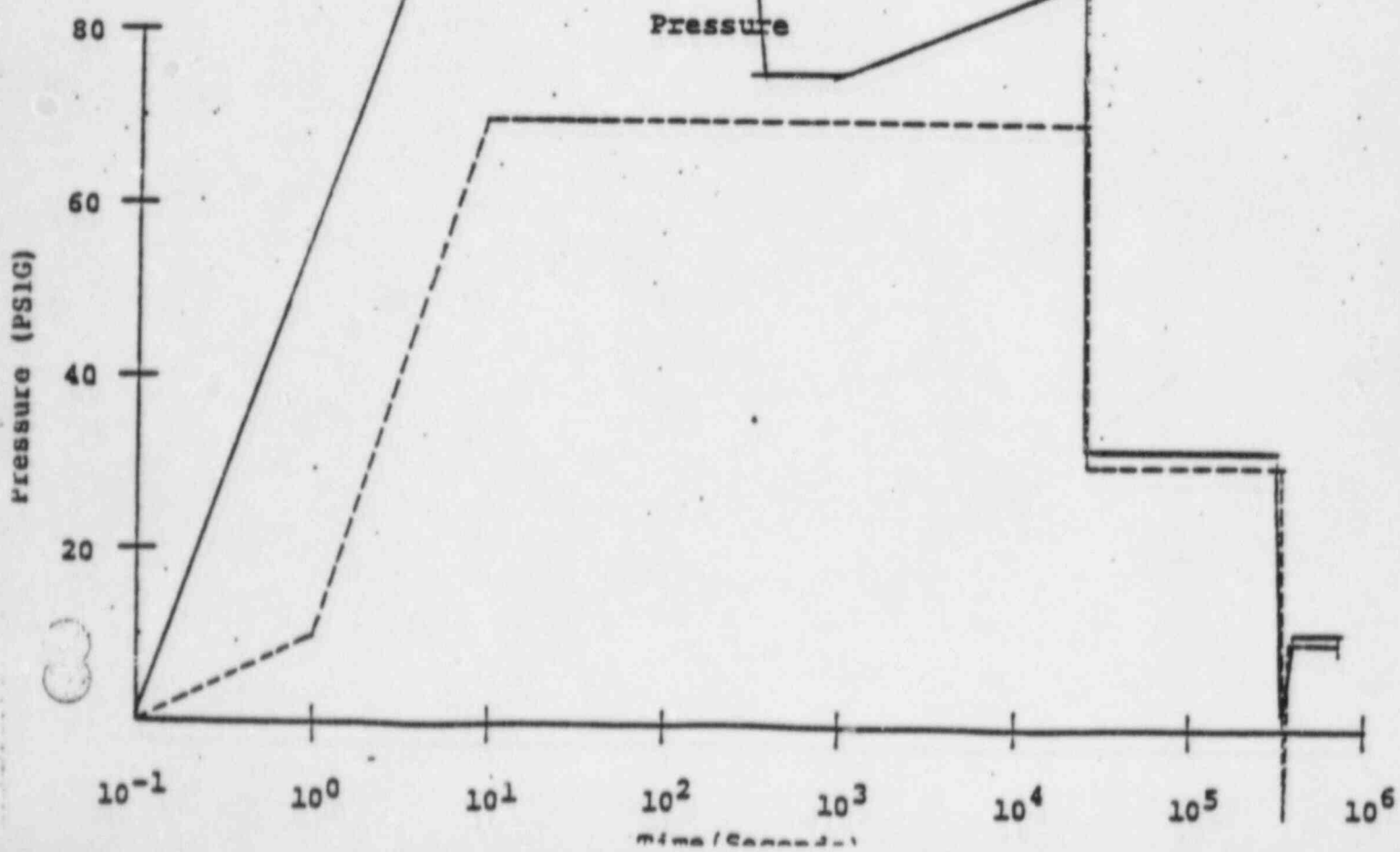
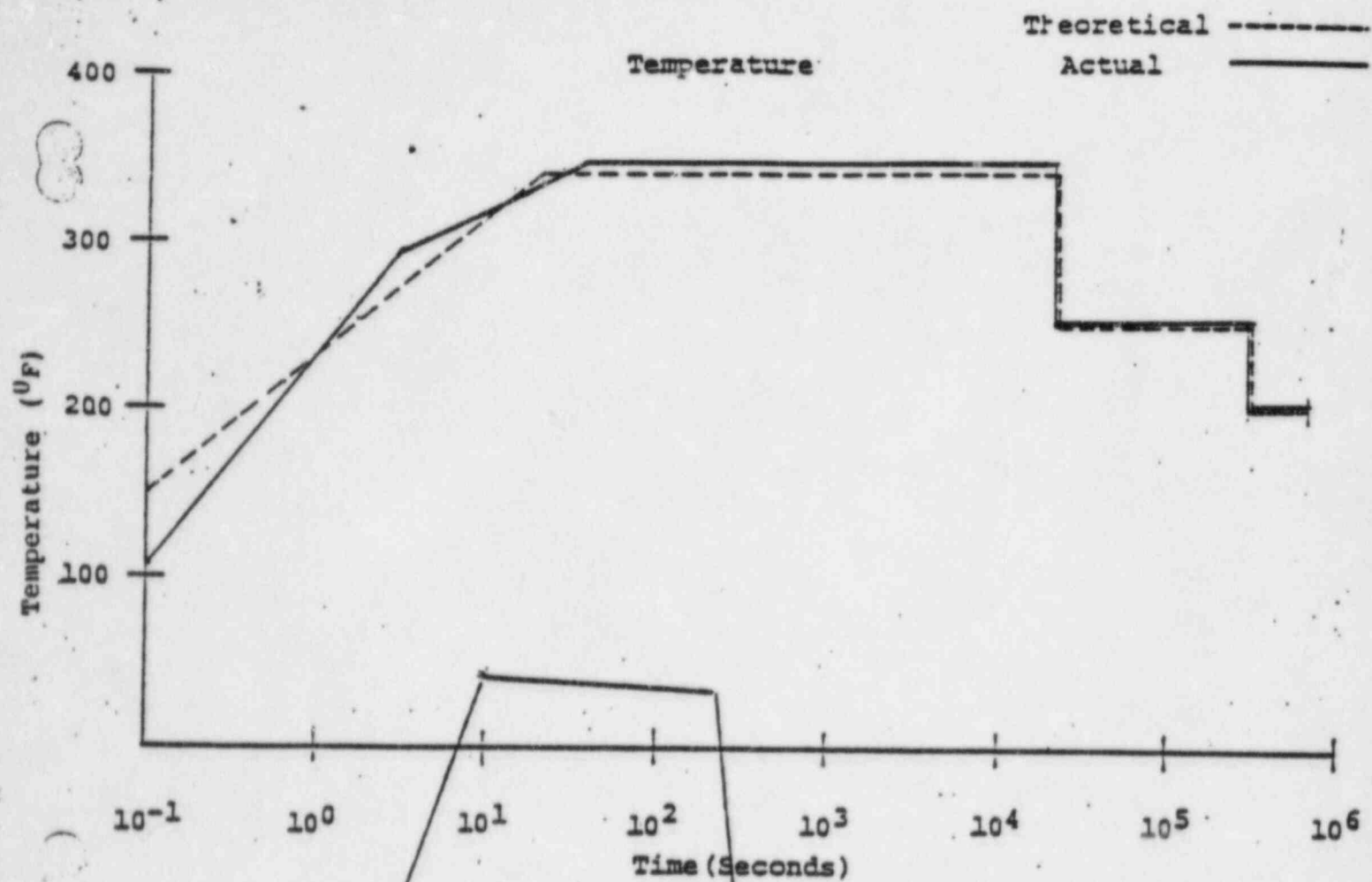
*These are theoretical values. The next page includes graphs of theoretical and actual LOCA temperature and pressure curves. The data for the actual LOCA curves are from the chart recording for this test are found on page 131, Lab Book #230.

2. Water Chemistry
Deionized Water pH=6.1

LOCA GRADING PROCEDURE (ASTM-D3911-80)

The test coupons are examined and evaluated within 4 hours after removal from test chamber for the following coating defects:

- Delamination - report extent
- Cracking - report extent
- Peeling - report extent
- Blistering - report in accordance with ASTM Method D714.



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340°F LOCA VAPOR PHASE

COATING SYSTEM	DFT RANGE	FLAKING	DELAMINATION OR PEELING	BLISTERING	CRACKING	OTHER PERFORMANCE CHARACTERISTICS
1A Front						
1c Carbo Zinc 11	1.8	10	None	None	None	None
1A Back						
1c Carbo Zinc 11	1.8	10	None	None	None	None
2A Front						
1c Carbo Zinc 11	1.9	10	None	None	None	None
2A Back						
1c Carbo Zinc 11	1.9	10	None	None	None	None
3A Front						
1c Carbo Zinc 11	2.0	10	None	None	None	None
3A Back						
1c Carbo Zinc 11	1.8	10	None	None	None	None

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340°F LOCA LIQUID PHASE

COATING SYSTEM	DFT RANGE	FLAKING	DELAMINATION OR PEELING	BLISTERING	CRACKING	OTHER PERFORMANCE CHARACTERISTICS
1B Front						
1c Carbo Zinc 11	1.9	10	None	None	None	None
1B Back						
1c Carbo Zinc 11	1.8	10	None	None	None	None
2B Front						
1c Carbo Zinc 11	2.1	10	None	None	None	None
2B Back						
1c Carbo Zinc 11	2.1	10	None	None	None	None
3B Front						
1c Carbo Zinc 11	1.8	10	None	None	None	None
3B Back						
1c Carbo Zinc 11	2.0	10	None	None	None	None

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APPENDIX 1

Carboline Specification CB1

Preparation of Concrete Specimens:

Concrete Composition

Cement, ASTM C150, Type II. Low alkali
Gravel, ASTM C33, size 3/8 inch
Sand, ASTM C33
Water reducing admixture, ASTM C494
Air entraining admixture, ASTM C260
Pozzolans, ASTM C618
Water - Demineralized or distilled water

Concrete Proportions

Cement, 7 sacks per cubic yard
Sand-Gravel ratio, 55 sand, 45 gravel by volume
Pozzolans, to 15 percent replacement of cement
Air entraining admixture, 4-7 percent
Water reducing admixture, as per manufacturer's instructions
Water, to produce a 3 inch slump

Preparation of Test Specimen:

Make and cure the specimen according to ASTM C192, except that no form oils may be used. The face to be tested shall be composed to the form to simulate poured walls and the wood troweled surfaces: Broom finish top surface to simulate floors. No test face shall be saw cut. When applicable, concrete curing agents compatible with the coating system shall be used.

Panels:

The size for concrete panels shall be 2 by 4 inches by 2 inches thick \pm 0.2 inches.

Curing Time:

Before concrete specimens are coated, they shall be cured a minimum of 28 days in accordance with ACI 301, "Specifications for Structural Concrete for Buildings." If a concrete curing primer is used, it shall be applied on the concrete within 24 hours after removal of the forms.

Carboline Specification ST1

Steel Test Specimens

Panels: The size for carbon steel panels shall be 2 by 4 inches by $\frac{1}{2}$ inch thick \pm 0.1 inches with rounded edges and corners. The steel for each specimen shall meet the requirements of ASTM A36, "Standard Specifications for Structural Steel".