June 5, 1970

TESTING PROJECT: 4-997

SUBJECT: DBA evaluation of Carboline materials.

REFERENCE: Report N101.5-1970 of The American National Standards Institute - Protective Coatings for Light Water Nuclear Reactor Containment Facilities.

PURPOSE: To determine whether certain Carboline materials would pass standards for PWR and BWR nuclear facilities put down in sections 4 and 5 of The American National Standards Institute's Report N101.5-1970 concerning Protective Coatings for Light Water Nuclear Reactor Containment Facilities.

CONCLUSIONS: From the results of this test, it can be concluded that, all Carboline materials tested have passed all the standards set down for PWR and BWR in sections 4 and 5 of the above mentioned report.

PROCEDURE:

A) Test Coupon

1) As per Paragraph 4.3.1:
2" x 5" x 1/8" sandblasted steel panels.

2) As per Paragraph 4.3.2:
2" x 4" x 1" concrete blocks.

B) Systems Tested

1) Over Steel Panels:
a) 1 c Carbo Zinc 11 @ 3 mils
1 c Phenoline 305 Fin. @ 4 mils

b) 1 c Phenoline 368 Primer @ 3.5 mils
1 c Phenoline 368 Finish @ 3.5 mils

2) Over Concrete Blocks:
a) 1 c Phenoline 305 Finish @ 4 mils

b) 1 c Phenoline 305 Primer @ 3 mils
1 c Phenoline 305 Finish @ 3 mils

c) 1 c Phenoline 305 Primer @ 5 mils
1 c Phenoline 305 Finish @ 5 mils

d) 1 c Phenoline 305 Primer @ 7.5 mils
1 c Phenoline 305 Finish @ 7.5 mils

TESTING PROJECT: 4-997

PROCEDURE: (Continued)

B) Systems Tested

2) Over Concrete Blocks:

e) 1 c Carboline 195 Surfacer @ 10-15 mils
1 c Phenoline 305 Finish @ 4 mils

f) 1 c Carboline L-63-31 Surfacer @ 10-15 mils
1 c Phenoline 305 Finish @ 4 mils

C) Cure Time

As per Paragraph 5.3.2:
1) Between coats - 24 hours @ R.T.
2) Final cure - 2 weeks @ 150° F. ± 5° F.

D) Repairability

As per Paragraph 5.3.2:
1) Remove ½ inch diameter of coating down to substrate;
2) Paint denuded area with entire coating system;
3) Coat area around denuded area with overcoating system;
4) After completed, cure for two (2) weeks @ 150° F. ± 5° F.

E) Exposure

As per Table 3, page 8:
1) 1 liter of water
2) 20 gm Sodium Thiosulfate
3) 8 gm Sodium Hydroxide (0.2 Normal)
4) 5 gm boric acid (2000 to 4000 ppm)

TESTING PROJECT: 4-997

PROCEDURE: (Continued)

F) Test Conditions

As per Figures 1 and 2, Page 6:

Temperature Interval			Time at Interval
RT	-	285° F.	40 Sec.
285°	-	260° F.	16 min. 30 sec.
260°	-	250° F.	43 min. 20 sec.
250°	-	240° F.	1 hr. 47 min.
240°	-	235° F.	2 hr. 46 min.
235°	-	230° F.	5 hr. 34 min.
230°	-	225° F.	8 hr. 20 min.
225°	-	215° F.	8 hr. 20 min.

Total time in test = 27 hrs. 46 min. 50 sec.
Maximum Temperature = 290° F.
Minimum Temperature = 215° F.

RESULTS: As per Paragraph 4.5, there was no effect to any of the steel panels or concrete blocks used in this test. That is, there was no flaking, delamination and/or peeling, blistering or chalking to any degree.

David L. Krombach
Testing Department

DLK:ep
OR: Test Dept.
OR: J. O. Lea
XC: HDT

LABORATORY TEST REPORT

June 5, 1970

TESTING PROJECT: 4-997

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From the Carboline Research & Development Laboratory

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TESTING PROJECT: 4-997

PROCEDURE: (Continued)

B) Systems Tested

2) Over Concrete Blocks:

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1 c Phenoline 305 Finish @ 4 mils

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1 c Phenoline 305 Finish @ 4 mils

C) Cure Time

As per Paragraph 5.3.2:
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2) Final cure - 2 weeks @ 150° F. ± 5° F.

D) Repairability

As per Paragraph 5.3.2:
1) Remove ¼ inch diameter of coating down to substrate;
2) Paint denuded area with entire coating system;
3) Coat area around denuded area with overcoating system;
4) After completed cure for two (2) weeks @ 150° F. ± 5° F.

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