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Fire Resistance Testing of a Walking Deck Assembly with the GACO UB64/A38 Deck Coating System

(Testing performed in accordance with the non-loadbearing 5'x5' test modification described in ICC ES AC39)

Conducted For:

GACO Western

WFCi Report #08040

Test Performed: September 12, 2008

Report Issued: November 6, 2008

IAS ACCREDITED
TL 180

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INTRODUCTION

This report documents the one hour fire resistance testing of a deck coating system performed by Western Fire Center, Inc. (WFCi) for:

GACO Western
Seattle Washington

Mike White and Howard Stacy of WFCi conducted the testing with the assistance of Wayne Beres and Nick Martin (WFCi) on September 12, 2008.

The 5' x 5' walking deck assemblies were constructed by a GACO Western subcontractor and provided to WFCi ready-to-test. A detailed description of the assemblies is provided beginning on page four of this report.

The testing was witnessed by Narciso Delacruz and Warner Hobart representing GACO Western.

The purpose of this project was to test the GACO UB64/A38 Deck Coating System as an alternative to the double wood floor for one-hour fire-resistance-rated construction described in Footnote 13 to Table 7-C of the 2006 International Building Code (IBC). These were "small-scale" ASTM E119 fire tests, and were conducted in general accordance with Section 4.14 of ICC-ES AC39, with the exception that ¾" plywood decking was used in the constructions.

This test method is designed to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions.

SUMMARY OF TEST METHOD

Testing was performed using a small-scale horizontal fire resistance test configuration employing the fire endurance conditions and standard time-temperature curve described in ASTM E119 "Fire Tests of Building Construction and Materials". WFCi's horizontal E119 test furnace was modified to provide for the evaluation of the 5' x 5' walking deck test assembly by closing off the perimeter of the standard 12' x 17' furnace opening with noncombustible insulated steel decking.

The exposed surface was subjected to the standard E119 time-temperature curve, with temperature measurements taken inside the furnace using 9 thermocouples connected to a computerized data acquisition system. The neutral pressure plane was maintained approximately 1' below the sample surface in the ceiling of the furnace. The temperature rise of the unexposed floor surface was measured by 5 thermocouples (TCs 1-5) placed at various locations to obtain representative information of the constructions under test.

SAMPLE DESCRIPTION

The 5' x 5' test assemblies consisted of nominal 2-by-10 wood joists spaced at 16 inches on center (oc), with two additional 2-by-10s forming the parallel closures at the ends of the assembly. The unexposed surface consisted of the walking deck system(s) as described below installed over ¾" plywood. Two assemblies were tested, Assembly "A" with metal lath incorporated in the floor coating, and Assembly "B" with fiber glass mesh replacing the metal lath. The fire-exposed surface consisted of one layer of ½" type C gypsum board directly attached to the joists using 5d drywall nails at 6" oc. A drywall joint was incorporated over the joist in the nominal center of the assembly.

Walking Deck System (Assemblies "A" and "B")

According to information provided by the client, the test decks were constructed with ¾" ACX plywood. The GACO UB64/A38 Deck Coating System consisted of the following components:

1. Metal Lath **(Assembly "A")** or GacoFlex fiber glass mesh scrim **(Assembly "B")**
2. GacoCrete
3. GacoFlex UB-64 liquid urethane rubber base coat
4. GacoShell granules
5. GacoFlex A-38 water-based elastomeric coating.

GACO Western described the application of the UB64/A38 Deck Coating as follows:

1. GacoFlex fiber glass mesh scrim or metal lath mechanically fastened to the ¾" plywood.
2. A scratch coat of GacoCrete was applied over the mesh scrim or metal lath and allowed to dry.
3. GacoCrete applied to a nominal ¼" thickness and allowed to dry.
4. GacoFlex UB-64 roller applied at a coverage rate of 1.5 gal/100 sq.ft. and allowed to dry for 24 hrs.
5. GacoFlex UB-64 trowel applied at a coverage rate of1.5 gal/100 sq.ft. and allowed to dry for 24 hrs.
6. GacoFlex UB-64 roller applied at a coverage rate of ¾ gal/100 sq.ft.
7. GacoShell granules applied into the wet UB-64 at a rate of 9 lbs/100 sq.ft. and allowed to dry for 24 hrs.
8. GacoFlex A-38 roller applied at a coverage rate of ¾ gal/100 sq.ft. and allowed to dry for 24 hrs.
9. GacoFlex A-38 roller applied at a coverage rate of ¾ gal/100 sq.ft and allowed to dry for 24 hrs.

The test specimen identification is as provided by the client and WFCi accepts no responsibilities for any inaccuracies therein. WFCi did not select the specimen and has not verified the composition, manufacturing techniques or quality assurance procedures.

TEST RESULTS

Two non-loadbearing fire resistance tests were performed on the test decks on September 12, 2008. The tests were controlled to the standard Time-temperature curve as required by ASTM E 119-00a.

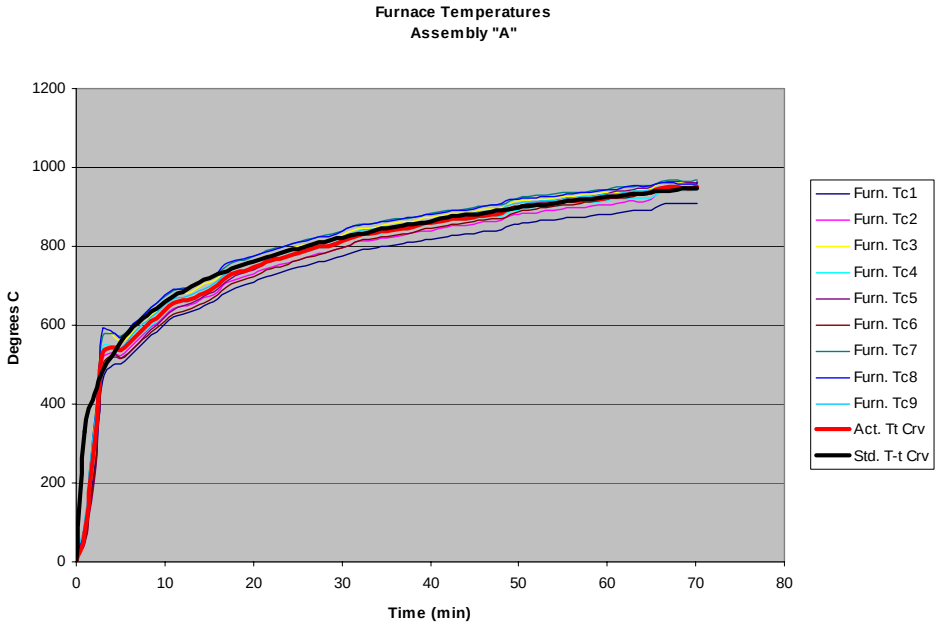
Test No. 1 – Assembly "A" Walking deck with metal lath
Test Date: 9/12/08, 9:40 am
Furnace: Large-Scale Horizontal Exposure Furnace configured for 5'x5' sample testing
Laboratory Temp: 17°C **Relative Humidity:** 69%
Cameras: 1 digital still camera
Sample Moisture Content: 9% at Joists

Observations

Test Time (h:mm:ss)		**Event**
0:00:00		Start Test
0:01:30		Ignition GWB paper face
0:15:00		Joint compound and tape falls, exposing GWB joint
0:24:00		Flames emitting from joint
0:43:00		GWB sagging along joint, flame increasing
1:00:00		Temperature rise on unexposed surface remains within limiting conditions; **Pass one hour test exposure;** test continued at request of client; GWB joint open approximately 5"
1:10:00		Test terminated; unexposed temperatures remain within limiting conditions, no evidence of through openings or transmission of hot gases on surface of deck

Assembly “A” Temperature Data

Furnace Temperatures

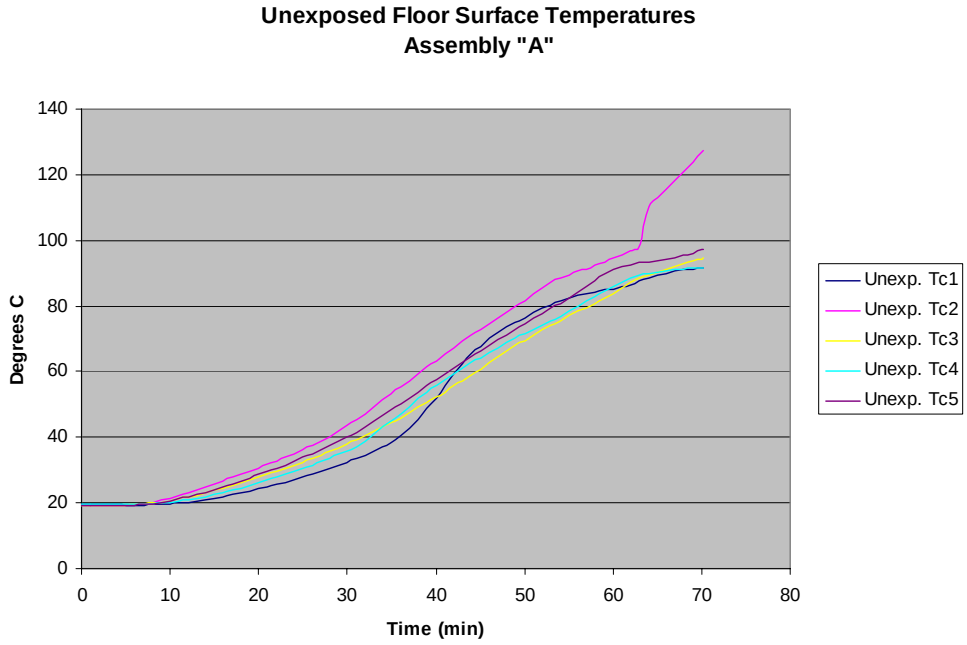


Unexposed Floor Surface Temperatures

Limiting Temperature Rise Conditions:

Average: 159°C (139°C + ambient)

Maximum single point: 201°C (181°C + ambient)



Test No. 2 – Assembly "B" Walking deck with fiber glass mesh scrim

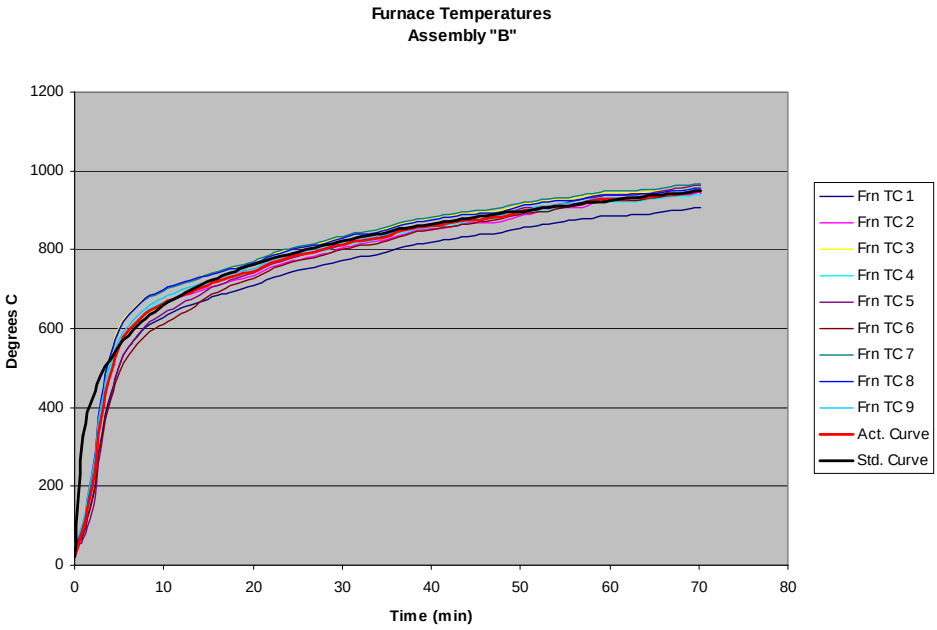
Test Date: 9/12/08, 1:10 pm
Furnace: Large-Scale Horizontal Exposure Furnace configured for 5'x5' sample testing
Laboratory Temp: 21°C
Cameras: 1 digital still camera
Sample Moisture Content: 10% Average at Joists

Observations

Test Time (h:mm:ss)		**Event**
0:00:00		Start Test
0:01:30		Ignition GWB paper face
0:20:00		Exposed side (E)-Joint compound and tape falls, exposing 80% of GWB joint
0:30:00		E- Flames emitting along length of GWB joint
0:50:00		E- GWB sagging along joint, flame increasing
0:53:00		Unexposed (UE) side- a circular bubble beneath deck membrane, approximately 2' in diameter rising 3-4" above deck surface appears, TCs 1, 2 & 3 become dislodged
0:57:00		E- GWB joint open 3-4" ; - slight venting of gas at one location of deck membrane, remainder of surface remains intact, cotton pad applied to site of gas venting –no charring or discoloration of pad, no evidence of adverse temperature rise, TCs 4 & 5 remaining in place over bubble indicate unexposed temperatures remain within limiting conditions; IR thermographic scan of deck surface shows temperatures well within limits
1:00:00		Temperature rise on unexposed surface remains within limiting conditions; **Pass one hour test exposure;** test continued at request of client
1:10:00		Test terminated; unexposed temperatures remain within limiting conditions

Assembly “B” Temperature Data

Furnace Temperatures



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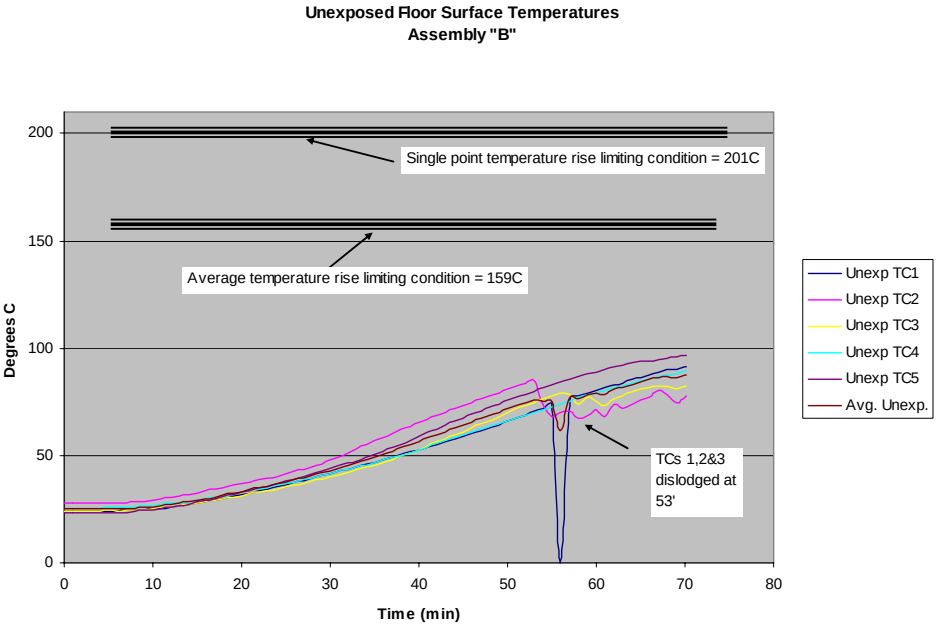


DISCUSSION

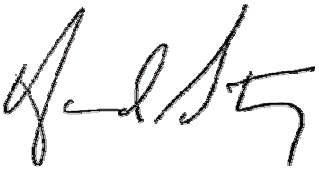
Walking deck system test assemblies as described in this report and employing the GACO UB64/A38 Deck Coating System with either metal lath or fiberglass scrim (Assemblies “A” and “B”) over ¾” plywood decking met the limiting conditions for temperature rise when tested to the modified E119 test conditions described in ICC ES AC39.

SIGNATURES

Testing performed by,

Mike White
Laboratory Manager

Reviewed by,



Howard Stacy
Director, Commercial Testing Services

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