

# RAMTECH LABORATORIES, INC.

14104 ORANGE AVENUE, PARAMOUNT, CALIFORNIA 90723-2019 • TELEPHONE (562) 633-4824 • FAX (562) 633-4128

February 11, 2003

Ted Anderson  
Battens Plus, Inc.  
8979 Caselman Road  
Sacramento, CA 95829

Re: Class A Classification  
Laboratory Number 12139A/1871

Dear Mr. Anderson:

Ramtech Laboratories, Inc., at your request, conducted the Class A Roof Classification Series of roof fire test on Regular Weight Concrete Flat Tile installed on Plastic Battens. The tiles used in the tests were purchased from a distributor by Battens Plus and delivered to Ramtech Laboratories, Inc.

**Tile description:** Regular weight concrete tiles. Flat tiles measured 12-1/4 inches wide by 17 inches long. The tiles weigh approximately 10 - 11 pounds each and manufactured by Monier Lifetile LLC. The tiles were purchased by Battens Plus and delivered to Ramtech Laboratories, Inc. by representative of Battens Plus.

**Plastic Batten description:** Plastic battens are 1-1/2 inches wide by 1/2 inch thick. The batten has a top and bottom skins approximately 0.05 inch thick and 0.05 inch thick vertical stiffeners spaced 1/2-inch on centers. The battens were manufactured by Interplast Group LTD. of Lolita, Texas for Battens Plus. The battens were independently sampled by Ronald I. Ogawa, P. E. of Inspection Concepts, Inc. representing Ramtech Laboratories, Inc. on September 17, 2002 at the Interplast Group plant, Lomita, Texas. The battens were received by Ramtech Laboratories, Inc. on November 15, 2002.

The test was conducted according with UBC Standard 15-2. (UBC Standard 15-2 is similar to ASTM E-108 and NFPA 258)

Ramtech Laboratories fabricated four Class A Burning Brand Exposure decks. The testing was conducted between February 4 and February 5, 2003. The results of the roof fire test is described below:

CLIENT: BATTENS PLUS
DATE OF TEST: Deck #1 (2/04/03), Deck #2 (2/04/03), Deck 3 (2/04/03), Deck 4 (2/05/03)
TYPE OF TEST: CLASS A BURNING BRAND, ASTM E-108/UBC STD. 15-2
REASON: CLASS A RATING REQUIRED BY AC-200
LABORATORY NUMBER: 12139A/1871

TASK	YES	NO
CHECK DECK PREPARATION FOR CLASS A	X	
CHECK PROPER SELECTION OF UNDERLAYMT	X	
CHECK INSTALLATION OF ROOFING	X	
CHECK PLACEMENT OF DECK ON FIXTURE	X	
CHECK SLOPE OF TEST DECK	5:12	
CHECK WIND VELOCITY 12MPH±5 MPH	1044 FPM	
DECK PLACED AT 60 INCHES FROM AIR DUCT	X	

IF ANY NO RESPONSE, EXPLAIN BELOW:

UNDERLAYMENT = TYPE 30 FELT , ASTM D226, ICBO ES 5434, FONTANA – VULCA SEAL

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	DECK #1	DECK #2
Brand Wt.	1980 GRAMS	2040 GRAMS
Brand Ignition	1. Each face for 60 seconds 2. Each edge for 45 seconds 3. Each face for 60 seconds	1. Each face for 60 seconds 2. Each edge for 45 seconds 3. Each face for 60 seconds
Start Time	2/04/03/1:11 PM	2/04/03/2:05 PM
Temp./RH	61°F. /38%	68°F. /31%
Time:	<b>DECK #1-Battens Plus/Reg. Wt Tile</b>	<b>DECK #2-Battens Plus/Reg. Wt Tile</b>
0:00	Place brand on deck, top of brand 3 inches above plywood joint. Brand placed over concrete joint	Place brand on deck, top of brand 3 inches above plywood joint. Brand placed between tiles joint.
0:45	Brand fully engulfed. Flame licking beyond end of deck.	Brand burning vigorously, flame already licking beyond end of deck.
2:00	Loud popping sound. Possible tile crack. Not visible due to brand.	Front of brand starting to collapse. No visible crack.
2:20		Loud popping sound. No visible crack in tile. Brand obscure view.
4:30	Front half of brand starting to collapse. No visible effect on Tile.	Only color change under brand area.
6:00	Brand loses shape. All hot embers.	Brand collapsed.
7:00		Very light smoking from underlayment. Deck US cool to touch.
9:30	Small embers entering between headlap but extinguish within 2 to 5 seconds. Slight smoking visible from deck edges.	Smoking still light.
10:00		Very slight smoke from underlayment due to sma embers entering space between cover and pan.
11:30	Underside of plywood deck slightly warm to touch. No charring or asphalt staining. Some evidence of batten melting.	DU lightly warm to touch. Batten under brand are melted. Tiles still engaged. Smoke level increasing. Hot embers 10%.
14:30	Smoke from UL increasing.	
15:00	3 dozen small hot embers remain.	Smoking still moderate. DU warm to touch. Tiles still intact.
16:15	Deck underside still warm to touch. No smoke, no charring or staining of underside of deck.	Large horizontal crack in concrete tile under bran area.
18:00	One small ember remains.	Dozen small hot embers remain. Deck underside warm to touch. No charring or smoke visible from deck underside.
21:37		All embers out. No flaming on deck underside.
22:02	All embers out. No flaming from underside.	4 small embers remain.
22:16	All stop. Tiles still intact. Battens melted.	All embers out.
23:00		Test terminated
	Removed tile Batten melted under brand area only.	Removed tile and underlayment. Slight stain on surface. No charring. Plastic batten melted unde brand area.

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	DECK #3 – Battens Plus/Reg. Wt Tile	DECK #4 – Battens Plus/Reg. Wt Tile
Brand Wt.	2095 GRAMS	1950 GRAMS
Brand Ignition	1. Each face for 60 seconds 2. Each edge for 45 seconds 3. Each face for 60 seconds	1. Each face for 60 seconds 2. Each edge for 45 seconds 3. Each face for 60 seconds
Start Time	2/4/03/3:50 PM	2/05/03/ 9:45 PM
Temp. /RH	69°F. /31%	65°F. /64%
Time:	<b>DECK #3-Plastic Battens</b>	<b>DECK #4-Plastic battens</b>
0:00	Place brand on deck, top of brand 3 inches above plywood joint. Brand place in pan and cover tile.	Place brand on deck, top of brand 3 inches above plywood joint. Brand placed in pan and leaned on cover tile. Loud popping sound.
0:32		
1:00	Brand burning vigorously. Flame licking past end of deck.	Brand to full capacity, flame already licking past end of deck.
3:00		Popping sound cannot see if tiles are affected.
4:00		
5:00	No change. No visible problem.	No change. No smoking. No evidence of plastic batten melting.
7:00	DU cool to touch. Brand collapsed no outline of initial brand shape.	
8:00	Deck underside slightly warm to touch. No smoking from underlayment.	
9:00	Batten melted under brand area but shape still intact. Tiles still engaged. Light smoking visible.	DU cool to touch. Light smoking from UL. Brand is all hot embers. Tiles still intact.
11:00		Some evidence of batten melt. Shape intact.
12:00	Smoke moderate. Underlayment heating up due radiant heat from tiles. Light smoke visible from plywood joint from underside of deck.	Radiant heat causing UL to smoke.
13:33	Deck underside still warm to touch. No asphalt staining on underside of plywood deck. No flaming.	Deck underside slightly warm to touch. Tiles in good condition. Only color change in heat affected area.
17:00	3-doz small hot embers remain. Smoke continues from plywood joint. No charring or flaming from deck underside.	A few small embers remain.
19:21	DU warm to touch.	
21:15	Smoke from plywood joint stop.	3 small embers remain. Slight smoking continues. DU still warm to touch. Melt of batten more visible.
21:41	All embers out. Some smoking still visible.	
22:00		All embers out. No more smoking from UL. No flaming.
24:15	All visible smoke stop	All stop. Test terminated.
25:00	All stop, test terminated. Removed tile and underlayment. Only slight asphalt stain on plywood surface. Plastic batten melted under brand area.	Removed tile. Only slight asphalt stain on underlayment surface. Plastic batten melted directly under brand area.

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- **Observation:**
  - Tiles had minor cracks under heat affected area and stayed intact.
  - Very little smoking from the underlayments.
  - • Surface color of regular weight concrete tiles in the heat affected areas only.
  - No surface charring of plywood deck and only light staining by asphalt from underlayment melting on the plywood surface.
  - Plastic battens melted under the brand area but kept concrete tiles engaged at their lug position.

The heat-affected area was confined to the immediate area of the brand placement and marginally above the brand. There was some major cracking of the products and but no displacement the product observed during or after the tests. Removal of the Regular weight concrete tiles and the Type 30 underlayment indicates the plywood deck has small light asphalt staining with no charring. The plastic battens melted but only under the heat affected area. The Concrete tiles did not slide or dislodge from initial position. Based on the results of these Class A Burning Brand Tests, it is our professional opinion that the Battens Plus plastic battens meet the Class A Burning Brand Requirements when installed with regular weight concrete tiles over Type 30/ASTM D226 underlayment on 15/32" thick CDX plywood.

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**INTERMITTENT-FLAME EXPOSURE TEST AND RESULT (Tested 2/05/03)**

Two test deck specimens, with Battens Plus plastic battens and regular weight concrete flat tiles were subjected to the fifteen cycles Class A Intermittent-Flame Exposure Test. The plastic battens were fastened to the plywood deck with 16 gage x 1-inch crown x 1-1/4-inch long staples spaced at 6 inches on center. The crown of the staple was oriented parallel to the length of the battens (perpendicular to the vertical stiffeners). The framework was moved to 33 inches from the air duct as required by the standard. The test deck was exposed to fifteen, 4-minute cycles composed of 2 minutes of 1400°F flame application followed by 2 minutes flame off. The wind continued during the off cycle. Test 1IF was started at 1:25 PM and Test 2IF was started at 3:00 PM, 2/5/2003.

At no time during the conduct of the intermittent Flame Exposure Test did any of the regular weight concrete tiles tested show any signs of distress. Slight color change was noticeable only in the heat-affected area for the tested assembly. Virtually no smoke was visible from the edges of test deck during the entire test and the underside of the deck remained cool to warm during the entire test. The plastic battens performed well and no evidence of concrete tiles slipping or dislodging from their position were observed.

It should be noted that none of the test decks, after the fifteen cycles of flame exposure, showed any evidence of displacement, sliding, spalling, or flaming on the underside of the decks. It was also noted that there were some discoloration of the heat-affected area and a total absence of lateral flame spread. No charring but with some discoloration of the plywood deck observed. After removal of the concrete tile, only slight melting and some compression due to tile, weight was observed on the plastic batten. The tested decks met the requirements for Class "A" Intermittent Flame Exposure.

The results of Fire Classification test, in accordance with ASTM E-108/UBC Standard 15-2 for Class A Burning Brand and Class A Intermittent Flame Exposure, indicate the Battens Plus plastic batten, installed over a Type 30 underlayment (ASTM D226) and regular weight concrete tiles meets the Class A Roof Fire Classification.

Reported by:

Ronald I. Ogawa, P.E.  
Laboratory Consultant



Reviewed and Approved by

Steve Berggren  
Laboratory Administrator

Encl. Attachment A - Photographs (1-16)

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DESCRIPTION OF PHOTOGRAPHS

1. Type 30, ASTM D226 Type II underlayment used for all Class A Test decks.
2. Slope of test deck monitored before start of each test. Slope set at 5:12, which is most critical.
3. Ignition sequence of Class A burning brand.
4. Placing the flaming brand on the test deck. Brand placed with the rear edge of the brand 3 inches above the horizontal plywood deck joint.
5. View of flaming Class A brand just as front of the brand drops.
6. View of area between underlayment and underside of concrete tile showing the light smoke and outline of the plastic batten.
7. Removing the concrete tiles to view the battens. Note the color change of the concrete tile surface under the brand area. Plastic brand fastened to the plywood deck with 16 ga. X 1" crn x 1-1/4" long staples spaced at 6" oc. Crown parallel with length of batten.
8. View of test deck no. 2.
9. View of melting extent of plastic batten under the heat affected area.
10. Close up of the extent of melting of plastic batten (Test 2). Typical of all tests.
11. View of plastic batten extent of melting (test 1).
12. Close up of extent of melting of plastic batten (test 1)
13. Flame pattern of intermittent flame exposure test.
14. Thermocouple reading at front edge of test deck. Temperature ranged from 1385 to 1425 °F.
15. Surface condition of intermittent flame exposure test. Only slight color change. No cracks of dislodging of tiles from initial location.
16. Removal of concrete tiles shows only slight melting of plastic battens. No extreme melting as indicated after burning brand test. Evidence of some compression of battens due to heat.



**FONTANA**  
**Vulcaseal**  
**30** 2 Square  
210.5q. ft  
100% silicone  
NSFM 01-226-000









