

RESEARCH AND DEVELOPMENT PROGRESS REPORT

SRD - Dr. Schnizer
BBQ - Mr. Clark
BBH - Mr. Sutton
BBR - Mr. Wood
PPL - Mr. Hadfield

Corporate Technical Center
Bird & Son, Inc.

Project No. 014

Report No. 1

Written by R.F. Jagocki

Date June 19, 1979

Project Title: ARIB (ARMA) WORK

Subject: Program to Determine the Cause of Clawing

Object: To analyze shingles from the FS test decks which were made of felts with various pH levels. These shingles were analyzed to determine the final pH and total acidity compared to the original. The purpose is to determine the pH and acidity changes after 17-1/2 years exposure at Shreveport.

Conclusions:

1. The felt in shingles tends to move to a very acidic level during long weather exposure no matter what its original level when exposed.
2. Running felt in neutral or slightly basic white water will result in a slightly less acidic final level in the aged shingles.
3. Starting with very acid or very basic felt white water, shingles will result that show severe deterioration from clawing, failure in cut-outs, swelling of exposed edges and granule loss after exposure to the weather.

Results:

1. Felt was run to four pH levels of white water at Phillipsdale's #1 machine in 1961 and processed into 3 tab Master-Bilt (non seal-down shingles) at two machines at FB. The shingles were then exposed on the FS test decks as part of an ARIB (ARMA) program to determine the cause of clawing.

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Data:

See attached table.

Reference:

1. J. Doherty Notebook #335 pp 35-38
2. Memo from PBL to PSL - Mr. Potter, 12/5/61, "Samples for FS Test Decks"
3. Original Data Sheets "Samples for Shreveport Test Deck"

RFJ/ac
attach.

Robert F. Jagocki

BBH Number	FB Shingle Machine	Date Mfg. into Shingles	Number assigned by FS when exposed on 3-13-62	Color	Type	Starting pH White water	Final pH of felt	Final & total Acidity (as SO ₃)
#1-31A	FBPM #1	10/30/61	2508	Black	MasterBilt	4.8-5.0	4.0	0.722
"	"	"	2512	"	"	6.1-6.3	4.0	0.715
"	"	"	2517	"	"	7.0-7.3	4.1	0.588
"	"	"	2521	"	"	8.0-8.4	4.4	0.544
#1-31B	FBPM #9	11/6/61	2527	Sunset Blende	"	4.8-5.0	4.1	0.522
"	"	"	2531	"	"	6.1-6.3	4.2	0.530
"	"	"	2535	"	"	7.0-7.3	4.4	0.467
"	"	"	2536	"	"	8.0-8.4	4.6	0.397

MEMORANDUM

ply to _____ Date 12/5/61 From PBL To PSL- Mr. Potter
 Subject SAMPLES FOR FS TEST DECKS

We are sending you a number of shingles in conjunction with the ARIB program of determining the cause of clawing. Shingles are divided into two groups: #1-31A made on FBPM#1 on 10/30/61, and #1-31B made on FBPM#9. Each one of these groups were further classified according to pH of the felt and to the lane from which the shingle came.

The following data classifies each shingle:

#1-31A

Reel No.	Lane No.	Felt pH
8	1 - 2505	4.8 - 5.0
"	2 - 2506	" "
"	3 - 2507	" "
"	4 - 2508	" "
"	5 - 2509	" "
12	1 - 2510	6.1 - 6.3
"	2 - 2511	" "
"	3 - 2512	" "
"	4 - 2513	" "
"	5 - 2514	" "
14	1 - 2515	7.0 - 7.3
"	2 - 2516	" "
"	3 - 2517	" "
"	4 - 2518	" "
"	5 - 2519	" "
16	1 - 2520	8.0 - 8.4
"	2 - 2521	" "
"	3 - 2522	" "
"	4 - 2523	" "
"	5 - 2524	" "

#1-31B

Reel No.	Lane No.	Amt. Backing	Felt pH
8	2 - 2525	R (regular)	4.8 - 5.0
"	2 - 2526	H (heavy)	" "
"	4 - 2527	R	" "
"	4 - 2528	H	" "
12	2 - 2529	R	6.1 - 6.3
"	2 - 2530	H	" "
"	4 - 2531	R	" "
"	4 - 2532	H	" "

POSED 3-12-1962

MEMORANDUM

Reply to _____ Date _____ From _____ To _____
 Subject _____ - 2 -

Reel No.	Lane No.	Amt. Backing	Felt pH
14	2 - 2533	R	7.0 - 7.3
"	2 - 2534	H	" "
"	4 - 2535	R	" "
"	4 - 2536	H	" "
16	2 - 2537	R	8.0 - 8.4
"	2 - 2538	H	" "
"	4 - 2539	R	" "
"	4 - 2540	H	" "

Analysis sheets will be sent later. Also included are a series of Fry shingles, 220#, 255#, and 290#.

Best regards.

↓ ↓ ↓
 2541 2542 2543

ARA/rp

ARA

Amli

SAMPLES FOR SHREVEPORT TEST DECK

Product Specially prepared Materials Date _____
Manufactured by FB Date Manufactured 10-30-61
Obtained from FBPM-1 ^{Sample marked:} ~~Date obtained~~ #1-31A-8-4

ANALYSIS OF MATERIAL (Ref: - Book RBH#1, pg. 31)

	Wt./Sq.	Wt./100 Sq. Ft.	Felt No.	Felt Make
Felt Dry Wt.	25.6		57	DF
			% Kerosene	179 % Voids Filled 102
			% Sat.	172 Condition of Sheet
Saturation	48.3		S.P.	Pen. ^{pH = 4.8-5.0} Penp.
			S.P. (Filled)	Pen (Unfilled)
1st Coating	19.2		Temp.	% Filler 47.8
1st Filler	17.6		Grade	Material
			S.P. (Filled)	Pen (Unfilled)
2nd Coating	9.8		Temp.	% Filler 48.2
2nd Filler	9.1		Grade	Material
1st Surf.	58.5		Mesh No.	Color
			Mfr.	Abrasion Loss
2nd Surf.	31.4		Mesh No.	Color
			Mfr.	Abrasion Loss
Backing	3.5		Material	
Total (Ex. Pkg.)	223.0		A.W.T. Test	Slide Test
			Oliensis Exudation	
Less Cut-Outs			Test	Stain Test
New Wt.			Oliensis Spot Test	
Bdle. Wt.		No. Shingles/Bdle.	Gross Area Shingle	
Shingle Size:	Length	Width	Cut-Outs	No. Tabs
Aligning Devices				
Patent Marks				
Underwriters' Label				
Method of Packing				
General Appearance				
Remarks	Rec'd 8, Lane 4 Samples			

Object of Test - To determine possible effect of felt pH on drawing
Lab: ARIB Cl'ing Test Results - Considerable drawing

SAMPLES FOR SHREVEPORT TEST DECK

Product Specially prepared Mortar Date _____
 Manufactured by FB Date Manufactured 10-30-61
 Obtained from FB PM-1 Sample marked Date obtained #1-31A-12-3

ANALYSIS OF MATERIAL

(Ref: - Book BBH #1, pg. 31)

Wt./Sq.	Wt./100 Sq. Ft.	Felt No.	Felt Make
Felt Dry Wt. 25.4		50	DC
		% Kerosene 187	% Voids Filled 106
		% Sat. 198	Condition of Sheet
Saturation 50.3		S.P. Pen.	Temp. pH = 6.1-6.3
		S.P. (Filled)	Pen (Unfilled)
1st Coating 15.5		Temp.	% Filler 49.5
1st Filler 15.2		Grade	Material
		S.P. (Filled)	Pen (Unfilled)
2nd Coating 11.5		Temp.	% Filler 42.5
2nd Filler 8.5		Grade	Material
1st Surf. 54.9		Mesh No.	Color
		Mfr.	Abrasion Loss
		Mesh No.	Color
2nd Surf. 28.2		Mfr.	Abrasion Loss
Backing 2.2		Material	
Total (Ex. Pkg.) 211.7		A.W.T. Test	Slide Test
		Oliensis Exudation	
Less Cut-Outs		Test	Stain Test
New Wt.		Oliensis Spot Test	
Bdle. Wt.	No. Shingles/Bdle.	Gross Area Shingle	
Shingle Size: Length	Width	Cut-Outs	No. Tabs
Aligning Devices			
Patent Marks			
Underwriters' Label			
Method of Packing			
General Appearance			
Remarks	Reel 12, Lane 3 Samples.		

Object of Test - To determine possible effect of felt pH on clauing
 Sub. ARIB C' ing Test Results - Sub. B' clauing

2517

SAMPLES FOR SHREVEPORT TEST DECK

Product Specialty prepared Masterblits Date _____
Manufactured by FB Date Manufactured 10-30-61
Obtained from FB PM-1 Sample marked #1-31A-14-3

ANALYSIS OF MATERIAL

(Ref: - Book BBH*1, Pg. 31)

Wt./Sq.	Wt./100 Sq. Ft.	Felt No. <u>52</u>	Felt Make <u>PP</u>
Felt Dry Wt. <u>26.2</u>		% Kerosene <u>183</u>	% Voids Filled <u>104</u>
		% Sat. <u>196</u>	Condition of Sheet _____
Saturation <u>49.7</u>		S.P. _____ Pen. <u>PH = 9.0-9.5</u>	Temp. _____
		S.P. (Filled) _____	Pen (Unfilled) _____
1st Coating <u>16.5</u>		Temp. _____	% Filler <u>47.3</u>
1st Filler <u>14.8</u>		Grade _____	Material _____
		S.P. (Filled) _____	Pen (Unfilled) _____
2nd Coating <u>14.2</u>		Temp. _____	% Filler <u>37.7</u>
2nd Filler <u>8.6</u>		Grade _____	Material _____
1st Surf. <u>54.0</u>		Mesh No. _____	Color _____
		Mfr. _____	Abrasion Loss _____
		Mesh No. _____	Color _____
2nd Surf. <u>36.2</u>		Mfr. _____	Abrasion Loss _____
Backing <u>1.1</u>		Material _____	
Total (Ex. Pkg.) <u>215.3</u>		A.W.T. Test _____	Slide Test _____
Less Cut-Outs _____		Oliensis Exudation _____	
New Wt. _____		Test _____	Stain Test _____
Bdle. Wt. _____	No. Shingles/Bdle. _____	Oliensis Spot Test _____	
Shingle Size: Length _____ Width _____		Gross Area Shingle _____	
Cut-Outs _____		No. Tabs _____	
Aligning Devices _____			
Patent Marks _____			
Underwriters' Label _____			
Method of Packing _____			
General Appearance _____			

Remarks Reel 14, Lane 3 samples.

Object of Test - To determine possible effect of felt pH on clawing
Sub. ARIB Clawing Test Results - 100% Bad clawing

SAMPLES FOR SHREVEPORT TEST DECK

Product Specialty prepared Mastic Date _____
Manufactured by FB Date Manufactured 10-20-61
Obtained from FB PM-1 ^{Sample marked} Date Obtained #1-31A-16-2

ANALYSIS OF MATERIAL (Ref: - Encl B&H #1, pg. 31)

	Wt./Sq.	Wt./100 Sq. Ft.	Felt No.	Felt Make
Felt Dry Wt.	26.3		52	PP
Saturation	47.3		% Kerosene 188	% Voids Filled 96
1st Coating	15.8		% Sat. 180	Condition of Sheet
1st Filler	13.7		S.P. Pen.	Temp. pH=8.0-8.4
2nd Coating	9.8		S.P. (Filled)	Pen (Unfilled)
2nd Filler	8.3		Temp.	% Filler 46.8
1st Surf.	65.8		Grade	Material
2nd Surf.	29.6		S.P. (Filled)	Pen (Unfilled)
Backing	2.2		Temp.	% Filler 45.9
Total (Ex. Pkg.)	218.8		Grade	Material
Less Cut-Outs			Mesh No.	Color
New Wt.			Mfr.	Abrasion Loss
Bdle. Wt.			Mesh No.	Color
No. Shingles/Bdle.			Mfr.	Abrasion Loss
Gross Area Shingle			Material	
Shingle Size: Length			A.W.T. Test	Slide Test
Width			Oliensis Exudation	
Cut-Outs			Test	Stain Test
No. Tabs			Oliensis Spot Test	
Aligning Devices				
Patent Marks				
Underwriters' Label				
Method of Packing				
General Appearance				

Remarks Reel 16, Lane 2 Samples

Object of Test - To determine possible effect of felt pH on clawing
Lab. ARIB Clawing Test Results - Considerable clawing

2527

SAMPLES FOR SHREVEPORT TEST DECK

Product Specially prepared Mastic Date _____
Manufactured by FB Date Manufactured 11-6-61
Obtained from FB PM-9 Sample marked Date obtained #1-31B-8-4 R

ANALYSIS OF MATERIAL (Ref: - Book BBH #1, pg. 31)

	Wt./Sq.	Wt./100 Sq. Ft.	Felt No.	Felt Make
Felt Dry Wt.	25.0		50	DP
			% Kerosene	189 % Voids Filled 98.5
			% Sat.	18.6 Condition of Sheet
Saturation	46.4		S.P.	Pen. <u>Temp.</u> <u>PH = 4.8-5.0 (w/late water)</u>
			S.P. (Filled)	Pen (Unfilled)
1st Coating	15.7		Temp.	% Filler 45.2
1st Filler	13.0		Grade	Material
			S.P. (Filled)	Pen (Unfilled)
2nd Coating	10.3		Temp.	% Filler 40.6
2nd Filler	7.0		Grade	Material
1st Surf.	52.6		Mesh No.	Color
			Mfr.	Abrasion Loss
			Mesh No.	Color
2nd Surf.	34.0		Mfr.	Abrasion Loss
Backing	6.1		Material	
Total (Ex. Pkg.)	210.1		A.W.T. Test	Slide Test
			Oliensis Exudation	
Less Cut-Outs			Test	Stain Test
New Wt.			Oliensis Spot Test	
Bdle. Wt.		No. Shingles/Bdle.	Gross Area Shingle	
Shingle Size: Length		Width	Cut-Outs	No. Tabs
Aligning Devices				
Patent Marks				
Underwriters' Label				
Method of Packing				
General Appearance				

Remarks Reel 8, Lane 4 Samples, regular amt. backing.
Object of Test - To determine possible effect of felt pH on drawing.
Lab. ARIB Drawing Test Results - (some) drawing

2531

SAMPLES FOR SHREVEPORT TEST DECK

Product Specially prepared Mastic Date _____
Manufactured by FB Date Manufactured 11-6-61
Obtained from FB PM-9 ^{Samples marked} Date Obtained #1-31B-12-4R

ANALYSIS OF MATERIAL

(Ref: - Birk B6H #1, pg. 31)

Wt./Sq.	Wt./100 Sq. Ft.	Felt No.	Felt Make
Felt Dry Wt.	26.1	% Kerosene	187 % Voids Filled 96
		% Sat.	179 Condition of Sheet
Saturation	46.6	S.P.	Pen. ^{pH = 6.1-6.3 (white water)}
		S.P. (Filled)	Pen (Unfilled)
1st Coating	16.5	Temp.	% Filler 44.6
1st Filler	13.3	Grade	Material
		S.P. (Filled)	Pen (Unfilled)
2nd Coating	8.3	Temp.	% Filler 44.3
2nd Filler	6.6	Grade	Material
1st Surf.	46.0	Mesh No.	Color
		Mfr.	Abrasion Loss
2nd Surf.	31.4	Mesh No.	Color
		Mfr.	Abrasion Loss
Backing	4.5	Material	
Total (Ex. Pkg.)	199.3	A.W.T. Test	Slide Test
Less Cut-Outs		Oliensis Exudation	
New Wt.		Test	Stain Test
		Oliensis Spot Test	
Bdle. Wt.		No. Shingles/Bdle.	Gross Area Shingle
Shingle Size:	Length	Width	Cut-Outs
			No. Tabs
Aligning Devices			
Patent Marks			
Underwriters' Label			
Method of Packing			
General Appearance			

Remarks Reel 12, Lane 4 Samples, regular amt. Packing.

Object of Test - To determine possible effect of felt pH on clawing
Lab. AR1B Clawi Test Results - Considerable clawing.

2538

SAMPLES FOR SHREVEPORT TEST DECK

Product Specially prepared Material Date _____
Manufactured by FB Date Manufactured 11-6-61
Obtained from FB PM-9 ^{Sample marked} ~~Date Obtained~~ #1-31B-16-2H

ANALYSIS OF MATERIAL (Ref: B.R. BRH#1, Pg. 31)

Wt./Sq.	Wt./100 Sq. Ft.	Felt No.	50	Felt Make	DP
Felt Dry Wt.	26.4	% Kerosene	187	% Voids Filled	98
		% Sat.	184	Condition of Sheet	
Saturation	48.5	S.P.	Pen.	pH = 8.0 - 8.4 (white water)	
		S.P. (Filled)		Pen (Unfilled)	
1st Coating	15.3	Temp.		% Filler	43.5%
1st Filler	11.4	Grade		Material	
		S.P. (Filled)		Pen (Unfilled)	
2nd Coating	9.2	Temp.		% Filler	53%
2nd Filler	10.4	Grade		Material	
1st Surf.	47.4	Mesh No.		Color	
		Mfr.		Abrasion Loss	
		Mesh No.		Color	
2nd Surf.	28.6	Mfr.		Abrasion Loss	
Backing	21.3	Material			
Total (Ex. Pkg.)	218.9	A.W.T. Test		Slide Test	
		Oliensis Exudation			
Less Cut-Outs		Test		Stain Test	
New Wt.		Oliensis Spot Test			
Bdle. Wt.		No. Shingles/Bdle.		Gross Area Shingle	
Shingle Size:	Length	Width		Cut-Outs	No. Tabs
Aligning Devices					
Patent Marks					
Underwriters' Label					
Method of Packing					
General Appearance					
Remarks	Reel 16, Lane 2, Heavy ant. backing				
Object of Test	To determine possible effect of felt pH on clawing.				
Lab. ARIB Clawing Test Results	No clawing.				

MEMORANDUM

BMGA- Mr. Jones
 BMGA- Mr. Bussiere
 To → BBQ- Mr. Homan

In Reply to _____ Date 5/4/77 From BBH _____
 Subject COST ESTIMATE: WIND SEAL SHINGLE

Please supply BBH and BBQ with cost estimates of the Wind Seal shingle made at Shreveport, La. The shingle constructions are flat and thick butt. The labor budget, RCD operating speed, finishing materials and size for both shingle constructions are the same.

- A. See standard card for standard thick butt Wind Seal shingle made at FS.
 B. Proposed flat Wind Seal shingle made at FS.

Raw Mtls./sq. - 240 sq. ft.	<u>Net</u>	<u>Gross</u>	<u>Net lbs./100 sq.ft.</u>
Felt, 55# x 48"	27.0#	30.2#	11.3#
Saturation, #14 1/2 (175%)	47.2	48.6	19.7
Coating, #21 1/2	38.8	40.0	16.3
Filler, 53%	43.9	45.2	18.3
Backing, Talc Pioneer 36	2.0	3.4	0.8
Surfacing, #11 Base Glenwood-Oiled	22.5	24.1	
Surfacing, #11 Colored Oiled	52.6	56.3	31.3
Wind Seal Adhesive	1.8	1.8	0.7
Bradford Flakes	0.2	0.2	-
Total	236.0#	249.8#	98.4#
Cut outs, 2.07 sq. ft.	2.0		
Wt./sq.	234.0#		
Finishing Materials	1.0		
Shipping Wt.	235.0#		

Clifford J. Pataude

CJPataude/rp