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The early date of record may mean the difference between getting an important patent for the Research Corporation in your name, or losing it to some other company which can actually keep our stockholder mills from using the idea.

If after further thought and discussion, or a few experiments, you decide that the idea may have value, you may draw up a formal description, either as a memo or on the invention record form provided, for submission to the Patent Division.

It is a function of the Patent Division to review the yellow sheets in this notebook as forwarded by you and to cull from them all ideas having patentable novelty, but the invention record form submitted in this way will serve to accent those ideas considered by you to be most important.

163.34 g
136.96 g
300.3

1) 13.87 ⇒ 7.83% (10.1) 4.62%
2) 13.79 ⇒ 14.48% (20.2) 9.22
3) 13.75 ⇒ 20.22% (30.2) 13.80
4) 13.76 ⇒ 25.25% (41.5%) 18.39
5) 14.23 ⇒ 29.82% 23.13
50.7
6) 13.71 ⇒ 33.72% 60.7
7) 13.70 ⇒ 37.21% 70.7%
96.81 g

110.79

8) 13.68 ⇒ 40.35% 80.7%
9) 13.93 ⇒ 43.24 90.8%
10) 12.54 ⇒ 100%

Purple 300 B 42% R 58%

Burgundy 410 B 23% 360385
R 62% 386
Y 15% 387

Harriet 6
Jusong 6
Brenda 5
Mary 5
Daniel 7

124.17

12.49

INDEX

EQUIPMENT - UNLESS OTHERWISE NOTED, THE FOLLOWING EQUIPMENT IS USED

BALANCE

SARTORIUS BASIC ID # 00190

SARTORIUS ANALYTIC ID # 00084

AMERICAN CONSTANT TEMPERATURE OVEN ID # 00086

SARTORIUS BASIC ID # 00077

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SEE LOTUS NOTES - LABORATORY NOTEBOOKS DATABASE

EVALUATION OF STRASTINT 53-P DISPENSER

OBJECTIVE : EVALUATE THE STRASTINT 53-P DISPENSER AS A CANDIDATE FOR A MANUAL REACTINT DELIVERY SYSTEM. DEFINE THE ACCURACY OF THIS DISPENSER WITH ORANGE X96 (WHICH IS OUR HIGHEST VISCOSITY REACTINT PRIMARY)

THE STRASTINT 53-P IS SUPPLIED BY FLUID MANAGEMENT

THE EQUATION FOR SPECIFIC GRAVITY VS. TEMPERATURE FOR ORANGE X96 WAS DERIVED SEE 9949-74

ORANGE X96 : $Y = -0.000682\,X + 1.1460$

MULTIPLE SHOTS WILL BE DONE AT DIFFERENT SETTINGS ON THE STRASTINT.

1ST SETTING - 5.0 ml - SHOTS WEIGHED INTO A TARED DISPOSABLE BEAKER

5.5 g	5.5 g	5.6 g	5.6
11.1 g	5.6	11.1	5.5
16.7 g	5.6	16.8	5.7
22.2 g	5.5	22.3	5.5
27.8 g	5.6	27.9	5.6
33.4	5.6	33.5	5.6
38.9	5.5	39.1	5.6
44.5	5.6	44.7	5.6
50.1	5.6	50.3	5.6
55.7	5.6	55.8	5.5

PRODUCT TEMP. 24.8°C

Date 11 June 1996 Signature Chris Rohan

Date June 13, 1996 Witness

EVALUATION OF STRATINT 52-P DISPENSER

20 DATA SAMPLES PLUGGED INTO SAC PACK/PLUS

@ 5.0 ml DISPENSE SETTING (20 SHOTS)

MEAN 5.57 g

CONTROL LIMITS (3σ TABULAR) UPPER 5.74 g
LOWER 5.41 g

TARGET WEIGHT: $Y = -0.000682(24.8) + 1.1460$
$Y = 1.1291 \Rightarrow$ SPECIFIC GRAVITY
$(5.0)(1.1291) = 5.65$ g

NEW SETTING 0.5 ml - SHOTS WEIGHED INTO TARED DISPOSABLE BEAKER
PRODUCT TEMP. 24.0°C

0.6 g	0.6	6.1 g	0.6
1.1 g	0.5	6.6	0.5
1.6 g	0.5	7.2	0.6
2.2 g	0.6	7.7	0.5
2.8 g	0.6	8.3	0.6
3.3 g	0.5	8.8	0.5
3.8 g	0.5	9.4	0.6
4.4 g	0.6	9.9	0.5
5.0 g	0.6	10.5	0.6
5.5 g	0.5	11.0	0.5

@ 0.6 ml DISPENSE SETTING (20 SHOTS)

MEAN : 0.55 g

CONTROL LIMITS (3σ TABULAR): UPPER 0.76 g LOWER 0.34 g

TARGET WEIGHT : 0.56 g

Date 11 June 1996 Signature Chris Kobambwiz

Date June 13, 1996 Witness

EVALUATION OF STRASTNT 53-P DISPENSER

NEW SETTING 17.0 ml - SHOTS WEIGHED INTO A TARED DISPOSABLE BEAICER

PRODUCT TEMP. 23.0°C

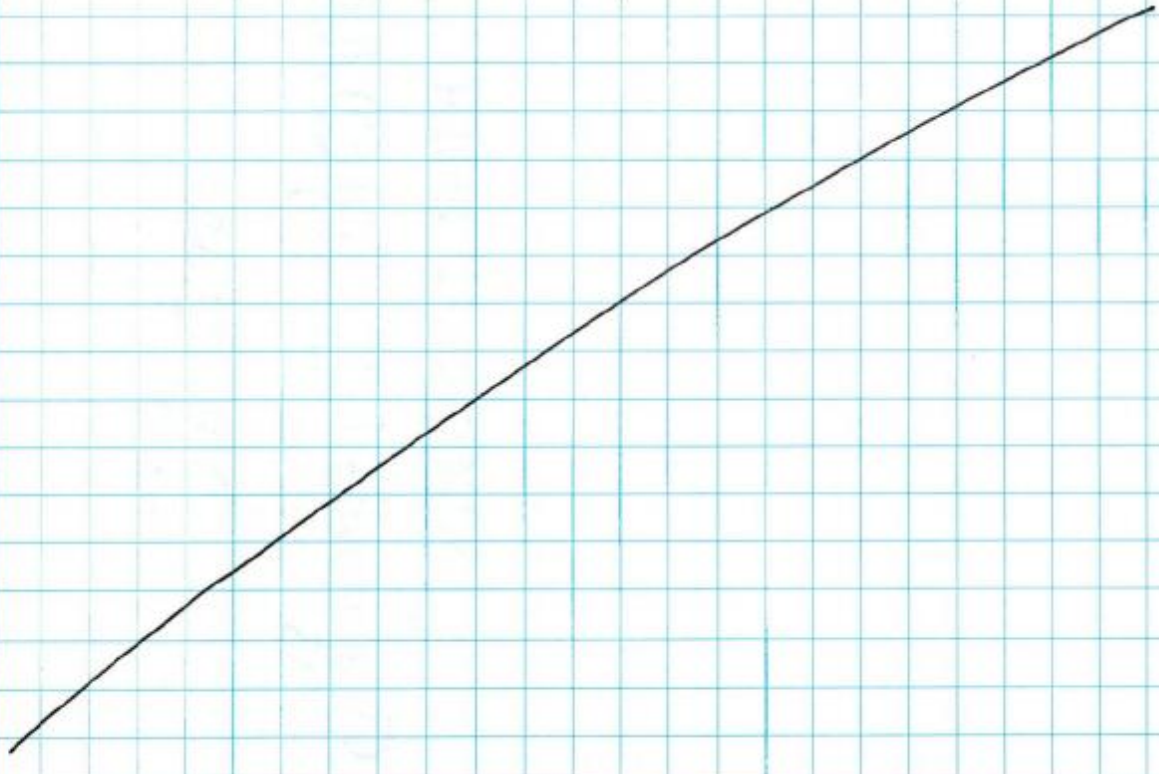
19.0g	19.0g	19.0g	19.0	18.9g	18.9g	18.9g	18.9
38.0	19.0	38.0	19.0	37.9	19.0	37.9g	19.0
56.9	18.9	57.0	19.0	56.9	19.0		
75.9	19.0	76.0	19.0	75.9	19.0		
94.9	19.0	95.0	19.0	94.8	18.9		
113.9	19.0	113.9	18.9	113.8	19.0		

@ 17.0 ml DISPENSE SETTING (20 SHOTS)

MEAN: ~~18.86g~~ CTK 18.97g

CONTROL LIMITS (3σ TABULAR): UPPER 19.09g LOWER 18.86g

TARGET WEIGHT: 19.22g



Date 11 June 1996

Date June 13, 1996

Signature Chris Kocharovich

Witness

EVALUATION OF STRATINT 53-P DISPENSER AT ROOM TEMPERATURE

ORANGE X96 LOT # RD232

PRODUCT TEMPERATURE 25.0°C

OBJECTIVE: PLOT CURVE OF GRAMS DISPENSED VS. DISPENSER SETTING TO DERIVE THE CURVE EQUATION. TEST EQUATION AT VARIOUS TARGET AMOUNTS.

DISPENSER SETTING	WEIGHT GRAMS
1.0	1.08
10.0	12.26
20.0	22.33
30.0	33.25
40.0	44.72
50.0	55.83
60.0	66.97
70.0	78.08
80.0	89.15
90.0	100.46
100.0	111.56
110.0	122.76
120.0	133.93
130.0	145.07
140.0	156.16

A PLOT OF DISPENSER SETTING VS. WEIGHT YIELDED THE FOLLOWING RESULTS:

$R^2 = 0.99996$

$$Y = 0.89792X - 0.18779$$

Date 12 June 1996

Signature Chris Kobrzon

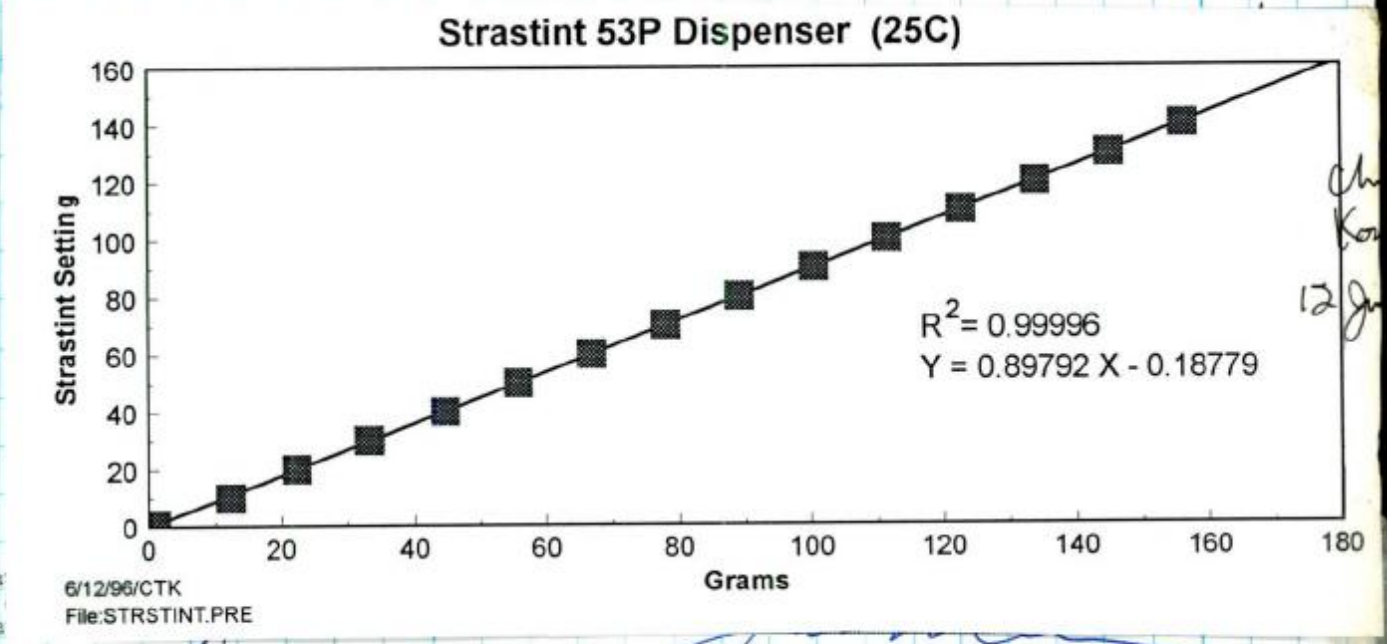
Date June 13, 1996

Witness

EVALUATION OF STRASTINT 53P DISPENSER AT ROOM TEMPERATURE

ORANGE X96 EQUATION AT 25.0°C $Y = 0.89792X - 0.18779$

TARGET WEIGHT	EQUATION RESULT	DISPENSER SETTING	ACTUAL WT DISPENSED	% ERROR
20.0g	17.8	18.0	19.90g	-0.5%
50.0g	44.7	45.0	50.43g	0.9%
75.0g	67.2	67.0	74.98g	-0.03%
90.0g	80.6	80.5	90.05g	0.06%
115.0g	103.1	103.0	115.16g	0.1%
140.0g	125.5	125.5	140.34g	0.2%
350.0g	314.1	157.0 x2	350.95g	0.3%



EVALUATION OF STRASTINT 53-P DISPENSER AT 14°C

THE STRASTINT 53P WAS PLACED IN A TEMP. CONTROLLED ROOM AND TEMP SET AT 55°F. REACTINT ORANGE X96 WAS ALLOWED TO ADJUST TO TEMP OVER NIGHT.

PRODUCT TEMP. 14°C

STRASTINT SETTING	WEIGHT GRAMS
1.0	1.09 g
10.0	11.22
20.0	22.43
30.0	33.79
40.0	44.98
50.0	56.21
60.0	67.50
70.0	78.64
80.0	89.68
90.0	100.97
100.0	112.41
110.0	123.39
120.0	134.94
130.0	145.98
140.0	157.21

A PLOT OF DISPENSER SETTING VS. WEIGHT YIELDED THE FOLLOWING RESULTS:

$R^2 = 0.99999$

$Y = 0.89052X - 0.01420$

Date 13 June 1996

Signature Chris Kochanowski

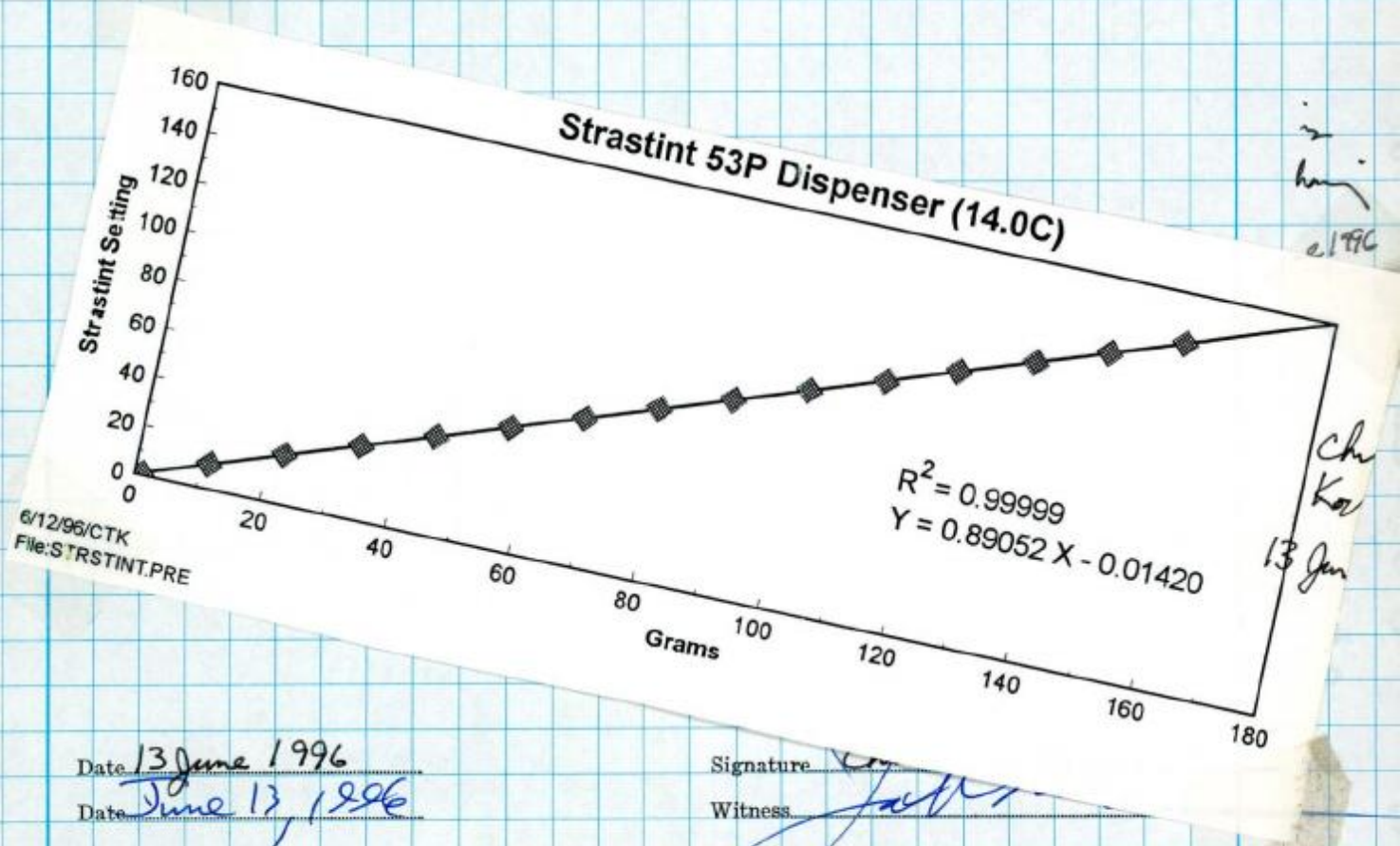
Date June 13, 1996

Witness

EVALUATION OF STRASTINT 53P DISPENSER AT 14°C

ORANGE X96 EQUATION AT 25°C $Y = 0.89052 X - 0.01420$

TARGET WEIGHT	EQUATION RESULT	DISPENSER SETTING	ACTUAL WT DISPENSED (g)	% ERROR
20.0g	17.8	18.0	20.16g	0.8%
50.0g	44.5	44.5 (45.0)	50.09 (50.60)	0.2% (1.2%)
75.0g	66.8	67.0	75.16	0.2%
90.0g	80.1	80.5	90.45	0.5%
115.0g	102.4	102.5 (103.0)	115.12 (115.68)	0.1% (0.6%)
140.0g	124.7	125.0 (125.5)	140.35 (141.04)	0.2% (0.7%)
350.0g	311.7	2×156.0 (2×157.0)	350.23 (352.34)	0.1% (0.7%)



Date 13 June 1996

Date June 13, 1996

Signature

Witness

STRASTINT 53P TEMPERATURE COMPARISON

25°C EQUATION: $Y = 0.89792X - 0.18779$

14°C EQUATION: $Y = 0.89052X - 0.01420$

DISPENSER SETTING	25°C	14°C
1.0	1.08g	1.09g
10.0	12.26	11.22
20.0	22.33	22.43
30.0	33.25	33.79
40.0	44.72	44.98
50.0	55.83	56.21
60.0	66.97	67.50
70.0	78.08	78.64
80.0	89.15	89.68
90.0	100.46	100.97
100.0	111.56	112.41
110.0	122.76	123.39
120.0	133.93	134.94
130.0	145.07	145.98
140.0	156.16	157.21

TARGET	ACTUAL 25°C	ACTUAL 14°C
20.0g	19.90g	20.16
50.0	50.43g	50.09
75.0	74.98	75.16
90.0	90.05	90.45
115.0	115.16	115.12
140.0	140.34	140.35
350.0	350.95	350.23

Date 13 June 1996

Date June 13, 1996

Signature Chris Kohanek

Witness Paul Kohler

STRASTINT 53P STATISTICAL ANALYSIS WITH ORANGE X96

Strastint 53P Statistical Analysis

Orange X96

Sample Size n=20 shots

Strastint Setting	Mean (grams)	3 sigma UCL	3 sigma LCL	± % Variation
Temperature @ 27.8 C				
0.5	0.562	0.597	0.527	6.22
12.0	13.33	13.41	13.33	0.30
12.5	13.93	13.96	13.90	0.22
13.0	14.49	14.54	14.44	0.34
15.0	16.74	16.79	16.68	0.30
25.0	27.85	27.89	27.82	0.14
70.0	78.14	78.18	78.10	0.05
150.0	167.34	167.50	167.18	0.10
Temperature @ 14.0 C				
0.5	0.59	0.62	0.55	5.10
12.5	14.01	14.05	13.97	0.29
15.0	16.84	16.91	16.76	0.42
25.0	28.03	28.09	27.96	0.21
70.0	78.60	78.69	78.51	0.11
150.0	168.39	168.50	168.29	0.06

chr June '96

9/12/96/CTK
File STRSTINT.PRE

Date 21 June 1996

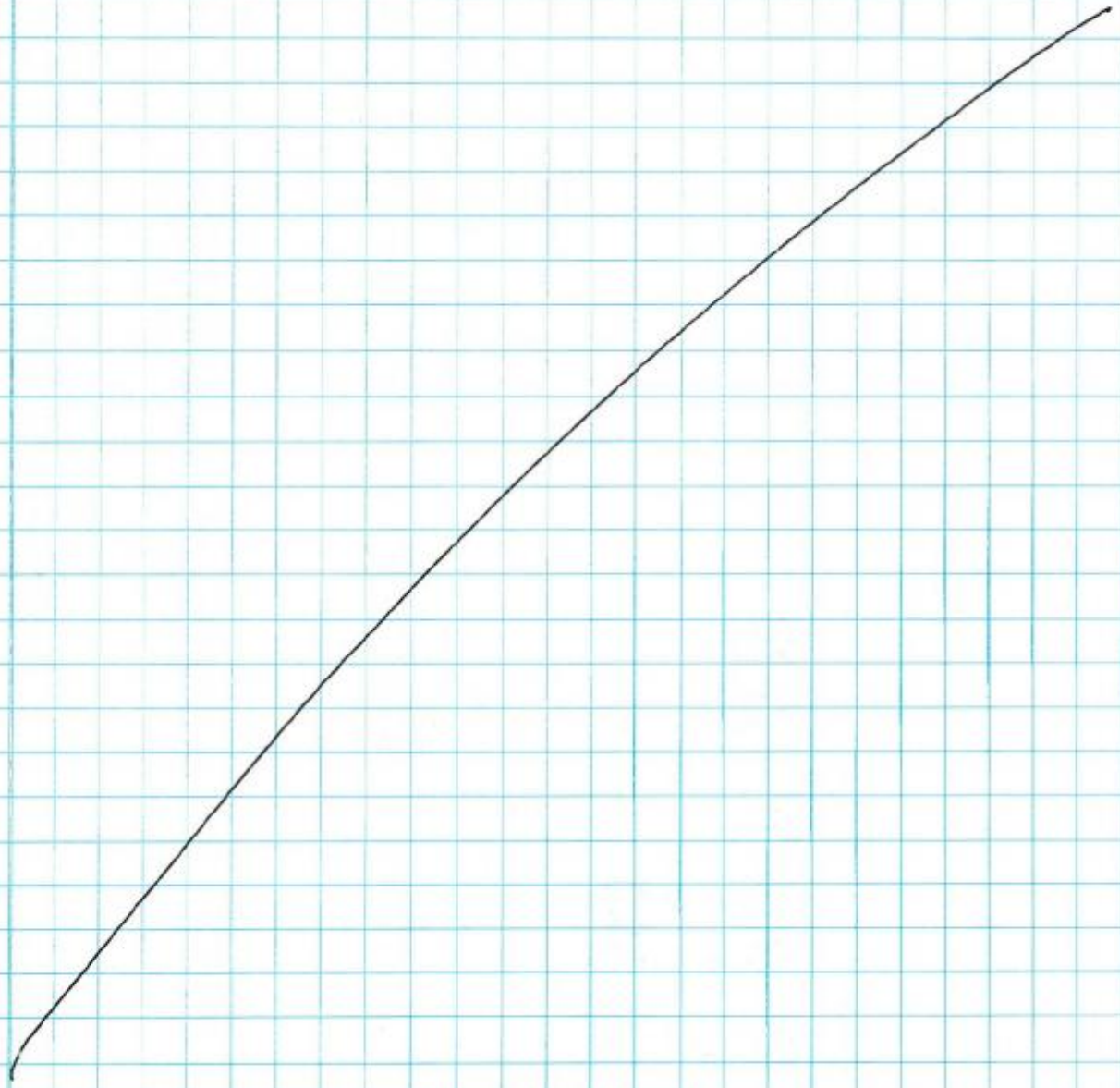
Date June 25, 1996

Signature Chris Kocher

Witness Jack Ro

STRASTINT 53P STATISTICAL ANALYSIS WITH ORANGE X96

BASED ON THE STATISTICAL ANALYSIS CHART (10120-09), THE % VARIATION IS DRASTICALLY REDUCED AS VOLUME INCREASES FOR DISPENING. NEED TO IDENTIFY A LOW END CUTOFF AT ± 1-2% VARIATION. THEREFORE, MORE ANALYSIS NEEDS TO BE PERFORMED AT THE LOWER SETTINGS.



Date 21 June 1996

Date June 25, 1996

Signature Chris Kochis

Witness Jack Rolen

STRASTINT 53P SETTING VS. DELIVERED WEIGHT

AVG. THE 2 EQUATIONS ON 10120-8

$$Y = 0.89422X - 0.100995$$

Orange X96

Weight	Settings	Weight	Settings	Weight	Settings	Weight	Settings	Weight	Settings
0.56	0.5	39.70	35.5	78.84	70.5	117.98	105.5	157.12	140.5
1.12	1.0	40.25	36.0	79.40	71.0	118.54	106.0	157.68	141.0
1.68	1.5	40.82	36.5	79.96	71.5	119.10	106.5	158.24	141.5
2.24	2.0	41.38	37.0	80.52	72.0	119.66	107.0	158.80	142.0
2.80	2.5	41.94	37.5	81.08	72.5	120.22	107.5	159.36	142.5
3.35	3.0	42.50	38.0	81.64	73.0	120.78	108.0	159.92	143.0
3.91	3.5	43.05	38.5	82.20	73.5	121.34	108.5	160.48	143.5
4.47	4.0	43.61	39.0	82.75	74.0	121.89	109.0	161.04	144.0
5.03	4.5	44.17	39.5	83.31	74.5	122.45	109.5	161.59	144.5
5.59	5.0	44.73	40.0	83.87	75.0	123.01	110.0	162.15	145.0
6.15	5.5	45.29	40.5	84.43	75.5	123.57	110.5	162.71	145.5
6.71	6.0	45.85	41.0	84.99	76.0	124.13	111.0	163.27	146.0
7.27	6.5	46.41	41.5	85.55	76.5	124.69	111.5	163.83	146.5
7.83	7.0	46.97	42.0	86.11	77.0	125.25	112.0	164.39	147.0
8.39	7.5	47.53	42.5	86.67	77.5	125.81	112.5	164.95	147.5
8.95	8.0	48.09	43.0	87.23	78.0	126.37	113.0	165.51	148.0
9.51	8.5	48.65	43.5	87.79	78.5	126.93	113.5	166.07	148.5
10.06	9.0	49.21	44.0	88.35	79.0	127.49	114.0	166.63	149.0
10.62	9.5	49.76	44.5	88.90	79.5	128.05	114.5	167.19	149.5
11.18	10.0	50.32	45.0	89.46	80.0	128.60	115.0	167.75	150.0
11.74	10.5	50.88	45.5	90.02	80.5	129.16	115.5	168.30	150.5
12.30	11.0	51.44	46.0	90.58	81.0	129.72	116.0	168.86	151.0
12.86	11.5	52.00	46.5	91.14	81.5	130.28	116.5	169.42	151.5
13.42	12.0	52.56	47.0	91.70	82.0	130.84	117.0	169.98	152.0
13.98	12.5	53.12	47.5	92.26	82.5	131.40	117.5	170.54	152.5
14.54	13.0	53.68	48.0	92.82	83.0	131.96	118.0	171.10	153.0
15.10	13.5	54.24	48.5	93.38	83.5	132.52	118.5	171.66	153.5
15.66	14.0	54.80	49.0	93.94	84.0	133.08	119.0	172.22	154.0
16.22	14.5	55.36	49.5	94.50	84.5	133.64	119.5	172.78	154.5
16.77	15.0	55.92	50.0	95.06	85.0	134.20	120.0	173.34	155.0
17.33	15.5	56.47	50.5	95.61	85.5	134.76	120.5	173.90	155.5
17.89	16.0	57.03	51.0	96.17	86.0	135.31	121.0	174.45	156.0
18.45	16.5	57.59	51.5	96.73	86.5	135.87	121.5	175.01	156.5
19.01	17.0	58.15	52.0	97.29	87.0	136.43	122.0	175.57	157.0
19.57	17.5	58.71	52.5	97.85	87.5	136.99	122.5	176.13	157.5
20.13	18.0	59.27	53.0	98.41	88.0	137.55	123.0	176.69	158.0
20.69	18.5	59.83	53.5	98.97	88.5	138.11	123.5	177.25	158.5
21.25	19.0	60.39	54.0	99.53	89.0	138.67	124.0	177.81	159.0
21.81	19.5	60.95	54.5	100.09	89.5	139.23	124.5	178.37	159.5
22.37	20.0	61.51	55.0	100.65	90.0	139.79	125.0	178.93	160.0
22.93	20.5	62.07	55.5	101.21	90.5	140.35	125.5	179.49	160.5
23.48	21.0	62.62	56.0	101.77	91.0	140.91	126.0	180.05	161.0
24.04	21.5	63.18	56.5	102.32	91.5	141.46	126.5	180.61	161.5
24.60	22.0	63.74	57.0	102.88	92.0	142.02	127.0	181.16	162.0
25.16	22.5	64.30	57.5	103.44	92.5	142.58	127.5	181.72	162.5
25.72	23.0	64.86	58.0	104.00	93.0	143.14	128.0	182.28	163.0
26.28	23.5	65.42	58.5	104.56	93.5	143.70	128.5	182.84	163.5
26.84	24.0	65.98	59.0	105.12	94.0	144.26	129.0	183.40	164.0
27.40	24.5	66.54	59.5	105.68	94.5	144.82	129.5	183.96	164.5
27.96	25.0	67.10	60.0	106.24	95.0	145.38	130.0	184.52	165.0
28.52	25.5	67.66	60.5	106.80	95.5	145.94	130.5	185.08	165.5
29.08	26.0	68.22	61.0	107.36	96.0	146.50	131.0	185.64	166.0
29.63	26.5	68.78	61.5	107.92	96.5	147.06	131.5	186.20	166.5
30.19	27.0	69.33	62.0	108.48	97.0	147.62	132.0	186.76	167.0
30.75	27.5	69.89	62.5	109.03	97.5	148.17	132.5	187.32	167.5
31.31	28.0	70.45	63.0	109.59	98.0	148.73	133.0	187.87	168.0
31.87	28.5	71.01	63.5	110.15	98.5	149.29	133.5	188.43	168.5
32.43	29.0	71.57	64.0	110.71	99.0	149.85	134.0	188.99	169.0
32.99	29.5	72.13	64.5	111.27	99.5	150.41	134.5	189.55	169.5
33.55	30.0	72.69	65.0	111.83	100.0	150.97	135.0	190.11	170.0
34.11	30.5	73.25	65.5	112.39	100.5	151.53	135.5	190.67	170.5
34.67	31.0	73.81	66.0	112.95	101.0	152.09	136.0	191.23	171.0
35.23	31.5	74.37	66.5	113.51	101.5	152.65	136.5	191.79	171.5
35.79	32.0	74.93	67.0	114.07	102.0	153.21	137.0	192.35	172.0
36.34	32.5	75.49	67.5	114.63	102.5	153.77	137.5	192.91	172.5
36.90	33.0	76.04	68.0	115.18	103.0	154.33	138.0	193.47	173.0
37.46	33.5	76.60	68.5	115.74	103.5	154.88	138.5	194.03	173.5
38.02	34.0	77.16	69.0	116.30	104.0	155.44	139.0	194.58	174.0
38.58	34.5	77.72	69.5	116.86	104.5	156.00	139.5	195.14	174.5
39.14	35.0	78.28	70.0	117.42	105.0	156.56	140.0	195.70	175.0

Chris Korbanopoulos

Date 21 June 1996

Date June 25, 1996

Signature Chris Korbanopoulos

Witness Jack Kolen

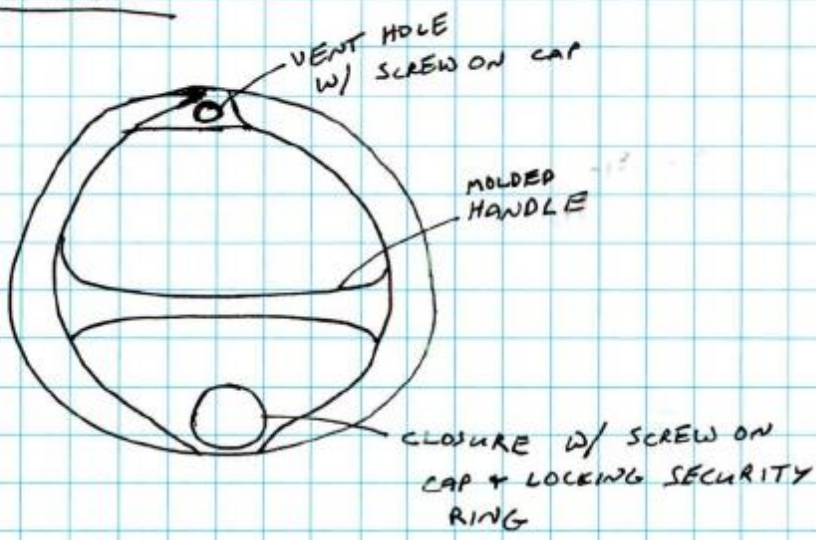
MANUAL DISPENSE SYSTEM PROTOTYPE

OBJECTIVE: PUT TOGETHER A REACTINT MANUAL DISPENSE SYSTEM UTILIZING THE STRASTINT 53P DISPENSER.

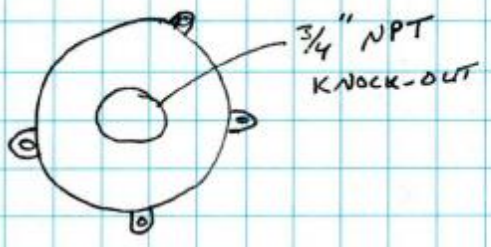
CONNECT THE STRASTINT 53P TO A 5 GALLON PAIL.

PAIL IS A 5 GALLON BLACK 70mm WITH A DELCAN PLUS W/ CLOSURE
- SAMPLE PAIL SUPPLIED BY SMITH CONTAINER.

OVERHEAD VIEW



THE STRASTINT 53P IS MOUNTED TO A ~~DIFFENT~~ DIFFERENT CLOSURE THAN ONE SUPPLIED WITH PAIL.

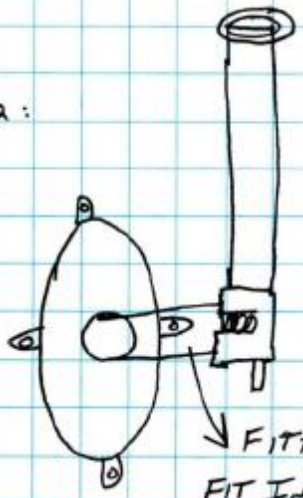


Date 25 June 1996
Date July 22, 1996

Signature Chris Kohanski
Witness

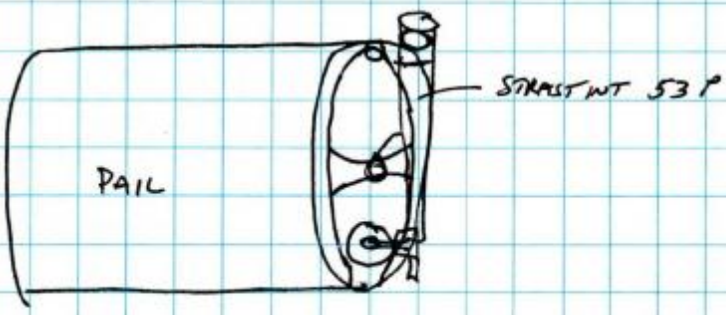
MANUAL DISPENSE SYSTEM PROTOTYPE

CLOSURE CAP 10120-12:



FITTING IS MACHINED TO FIT IN 3/4" KNOCK-OUT ON ONE END AND STRAIGHT ON OTHER END

THIS IS THEN SCREWED ONTO CLOSURE OF PAIL.



Date 25 June 1996

Date July 22, 1996

Signature Chris Rooker

Witness

STRASTINT 53P STATISTICAL ANALYSIS

DETERMINE % VARIATION CURVE AS SETTING IS INCREASED ON THE STRASTINT 53P DISPENSER.

Strastint 53P Statistical Analysis

Orange X96

Sample Size n=20 shots

Chris Kochanski 25 Jun. 1996

Strastint Setting	Mean (grams)	3 sigma UCL	3 sigma LCL	± % Variation
Temperature @ 27.8 C				
0.5	0.562	0.597	0.527	6.22
1.0	1.12	1.15	1.10	2.23
1.5	1.69	1.72	1.66	1.78
2.0	2.24	2.26	2.22	0.89
2.5	2.81	2.83	2.78	0.71
3.0	3.38	3.40	3.36	0.59
12.0	13.37	13.41	13.33	0.30
12.5	13.93	13.96	13.90	0.22
13.0	14.49	14.54	14.44	0.34
15.0	16.74	16.79	16.68	0.30
25.0	27.85	27.89	27.82	0.14
70.0	78.14	78.18	78.10	0.05
150.0	167.34	167.50	167.18	0.10
Temperature @ 14.0 C				
0.5	0.59	0.62	0.55	5.10
12.5	14.01	14.05	13.97	0.29
15.0	16.84	16.91	16.76	0.42
25.0	28.03	28.09	27.96	0.21
70.0	78.60	78.69	78.51	0.11
150.0	168.39	168.50	168.29	0.06

Date 25 June 1996

Signature Chris Kochanski

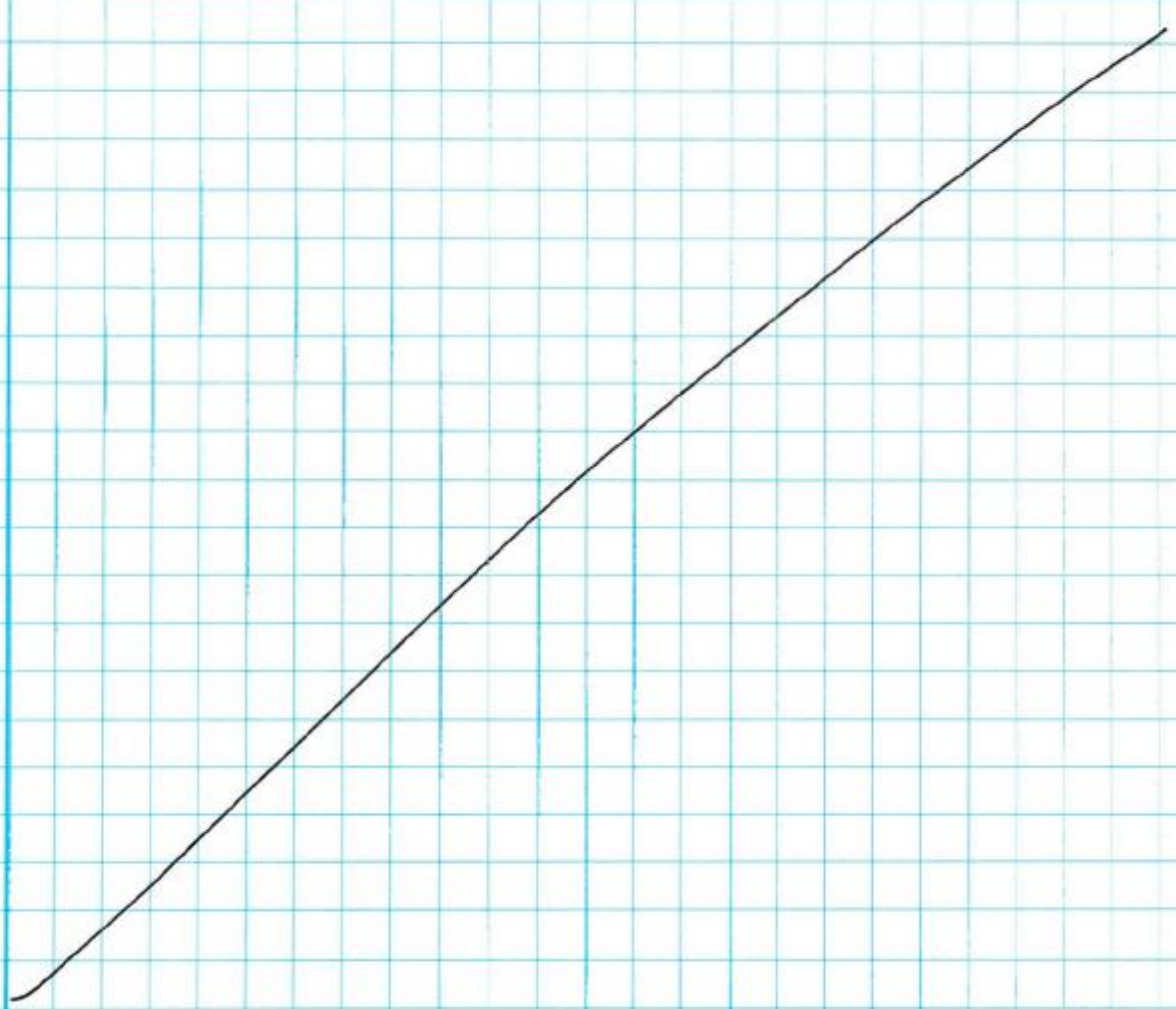
Date July 22, 1996

Witness

STRASTINT 53P STATISTICAL ANALYSIS

FROM THE CHART ON P10120-14, THE RECOMMENDATION BASED ON THE STASTICAL DATA IS THAT THE STRASTINT SETTING SHOULD BE SET AT A MINIMUM OF 2.0 TO GET A % VARIATION OF LESS THAN ±1.0%. THIS IN TURN EQUATES TO A MEAN OF 2.24 grams MINIMUM DELIVERY.

THE CUSTOMER RECOMMENDATION IS A MINIMUM SETTING OF 2.0 ON THE STRASTINT DISPENSER.



Date 25 June 1996

Date July 22, 1996

Signature Chris Kahanowich

Witness

SPECIFIC GRAVITY OF PURPLE X 22

OBJECTIVE: COMPARE SPECIFIC GRAVITY DV-VI33 TO SPECIFIC GRAVITY CUP.

DATA FROM NIP FORM E - REACTINT PURPLE X22

TEMP	S.G.
30°F	1.197
60°F	1.190
90°F	1.186
120°F	1.184

NOTEBOOK REF 10107-25

$R^2 = 0.93620$

$Y = -0.000258X + 1.1954$

DATA FROM SPECIFIC GRAVITY CUP

TEMP	WEIGHT ~~S.G.~~ dk	FACTOR ×0.01202	S.G.
25.3°C	99.51g		1.196
33.0°C	99.06g		1.191
39.1°C	98.72g		1.186
51.9°C	97.95g		1.177
45.0°C	98.27g		1.181

$R^2 = 0.99613$

$Y = -0.000718X + 1.2143$

BASED ON R^2 LINEARITY - THE SPECIFIC GRAVITY CUP APPEARS TO BE MORE ACCURATE THAN DV-VI-33.

Date 9 July 1996 Signature Chris Kochanski

Date July 22, 1996 Witness

SPECIFIC GRAVITY CURVE OF REACTINT BLACK X77

- REACTINT BLACK X77 LOT E1004
- GARDCO SPECIFIC GRAVITY CUP

OBJECTIVE ⇒ DETERMINE SPECIFIC GRAVITY CURVE OF X77 USING GARDCO CUP

TEMP	WEIGHT	(× 0.01202)	S.G.
24.0°C	93.19 g		1.1201
30.9°C	92.87 g		1.1163
42.7°C	92.29 g		1.1093
49.8°C	91.87 g		1.1043
61.7°C	91.27 g		1.0971

A PLOT OF TEMP VS. VISCOSITY YIELDS A STRAIGHT LINE WITH THE FOLLOWING EQUATION:

$$Y = -0.000615X + 1.1351 \qquad R^2 = 0.99950$$

Y IS S.G.
X IS TEMP IN °C

Date 29 July 1996 Signature Chris Koppang
Date September 4, 1996 Witness Bill Hopkins

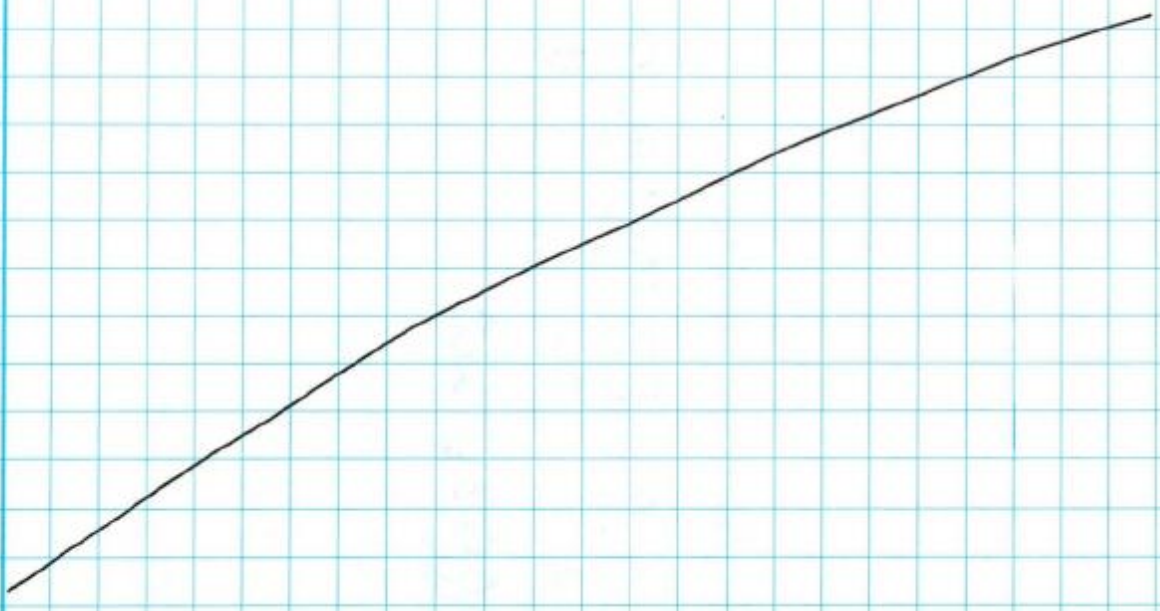
OPTIMUM UV STABILIZER PACKAGE FOR RIM

OBJECTIVE: TO PARTICIPATE IN THE STEERING WHEEL MARKET, IT MAY BE NECESSARY TO INCORPORATE A UV STABILIZER PACKAGE IN WITH OUR COLORS (OR SPECIFY TO OUR CUSTOMERS) AS IS CURRENTLY DONE BY PIGMENT COMPETITORS FOR NON-BLACK STEERING WHEELS. MUST DETERMINE WHICH PACKAGE OFFERS THE GREATEST PROTECTION WHILE BEING COMPATABLE WITH OUR COLORANTS.

GENERAL PREPARATON FOR LIGHTFASTNESS SAMPLES.

A 30.0g OTTOBOCK SAMPLE WILL BE PREPARED IN THE 30g MOLD. MAKE SURE MOLD RELEASE IS USED.

WEIGH CORRECT AMOUNT OF COLOR X php THEN ADD 30g POLYOL (OTTOBOCK B-SIDE) - MIX THOROUGHLY THEN ADD THE MDI (A-SIDE) AND MIX ON MIXER. POUR INTO MOLD AND LET CURE 10-15 MINUTES BEFORE EXTRACTING FROM MOLD.



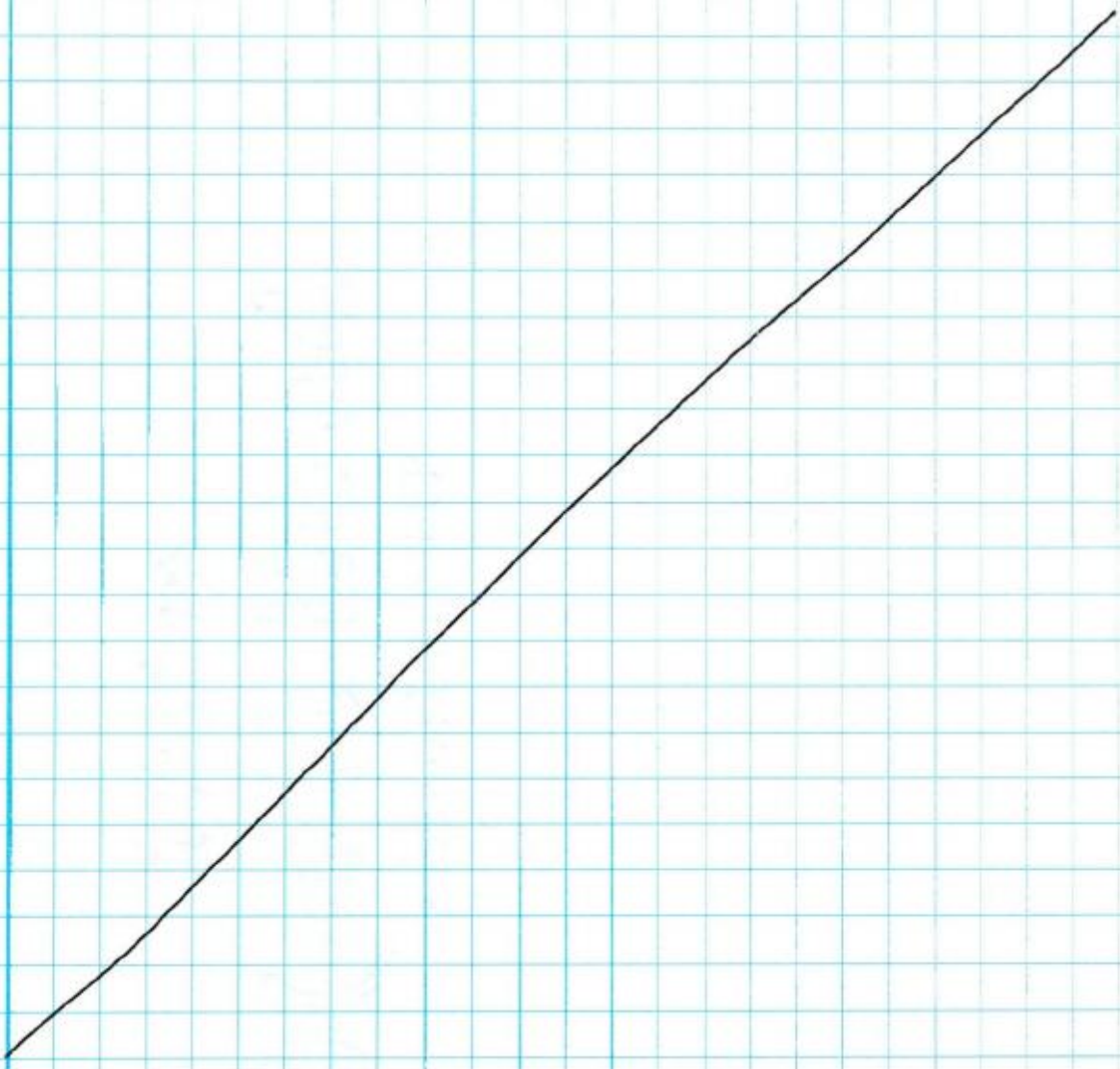
Date 8 August 1996 Signature Chris Kopkins

Date September 4, 1996 Witness Bill Hopkins

UV STABILIZERS FROM CIBA

CONTACT : JOHN O'KEEFE
TECH. SALES REP.
(914) 785-4425 / 2000

CIBA - ADDITIVES DIVISION



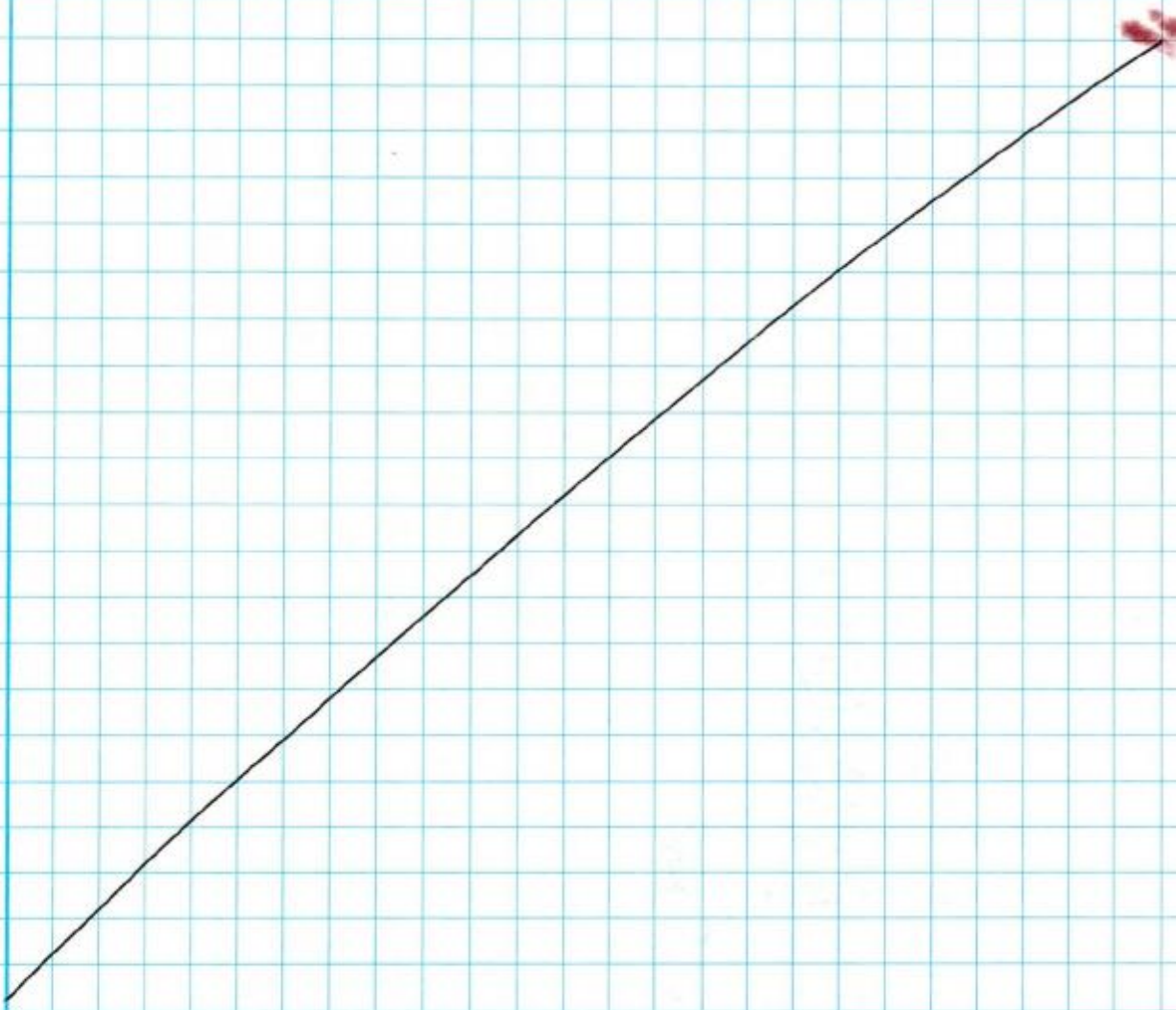
Date 8 August 1996
Date September 4, 1996

Signature Chris Kostyo
Witness Bill Hopkins

GM STEERING WHEEL SHADE MATCH

YELLOW X15	34.0%	⇒	3.40 g
VIOLET X80LT	17.5%	⇒	1.75 g
RED X64	48.5%	⇒	4.85 g
			10.0 g

FORMULATION FROM NOTEBOOK 10014-3



Date 8 August 1996

Signature Chris Kyle

Date September 4, 1996

Witness Bill Hopkins

LIGHTFASTNESS TESTING ON UV STABILIZERS FOR A/B SYSTEMS

A 20.0g COLOR SAMPLE WAS PREPARED USING THE FORMULATION ON 10120-20 :

YELLOW X15	6.7986g	33.79%
VIOLET X90CT	3.5040g	17.42%
RED X64	9.8168g	48.79%
	20.1194g	

THE FOLLOWING SAMPLES OF UV ABSORBERS, STABILIZERS, ANTI-OXIDANTS WERE USED IN PREPARING THE 30.0g A/B SAMPLES.

GENERALLY, UV STABILIZERS ARE IN PACKAGES(IE SEVERAL UV ABSORBERS ETC.) THE IDEA IS TO TEST EACH INDIVIDUALLY TO SEE WHICH ONE(S) HAVE THE BEST IMPACT ON LIGHTFASTNESS, THEN, COMBINE THOSE TO COMPLIMENT A PACKAGE FOR TESTING.

COMPONENT		MANUF.	
TINUVIN	213	CIBA	UV LIGHT ABSORBER λ_{max} 342 nm
"	328	"	UV " " FOR PLASTICS & COATINGS
"	571	"	
"	765	"	HINDERED AMINE LIGHT STABILIZER
"	P	"	
IRGANOX	245	"	
	1010	"	
	1520	"	
UVITEX	OB	"	
CGA	1135	"	

Date 9 August 1996 Signature Chris Hopkins

Date September 4, 1996 Witness Bill Hopkins

LIGHTFASTNESS TESTING ON UV STABILIZERS FOR A/B SYSTEMS

SAMPLE PREPARATION — 30.0 g OTTOBOCK SAMPLE

FORMULA

STANDARD :

POLYOL OTTOBOCK	30.0 g
COLOR (10120-21)	0.33 g
MDI	14.4 g

GENERAL

UV STABILIZER :

POLYOL OTTOBOCK	30.0 g
COLOR (10120-21)	0.33 g ~~(1 php)~~ (1 php)
UV STABILIZER	0.15 g
MDI	14.4 g

SAMPLES OF EACH WERE MADE TO SCREEN FOR THE MOST EFFECTIVE STABILIZER :

SAMPLE # 1)	TINUVIN	213
2)	"	328
3)	"	571
4)	"	765
5)	"	P
6)	IRGANOX	245
7)	"	1010
8)	"	1520
9)	UVITEX	OB
10)	CGA	1135

THE AMOUNT OF EACH IN THE FORMULATION WAS 0.15 g

10 SAMPLES AND A STANDARD ARE SUBMITTED FOR LIGHTFASTNESS TESTING.

Date 10 August 1996 Signature Chris Korfmacher

Date September 4, 1996 Witness Bill Hopkins

CUSTOMER

BLENDS PREPARE WITH LOW VOLUME DISPENSE SYSTEM

SCALE: SARTORIUS BASIC ID # 00077

SAMPLE # 1 RED 2043 - 200.0g

60.5% RED X64 ⇒ 121.0g
39.5% ORANGE X96 ⇒ 79.0g

FROM WEIGHT TO VOLUME TABLES
PUMP SETTINGS:

RED X64 ⇒ SET 105.5 (121.15g) ⇒ ACTUAL 119.58g ⇒ 60.3%
ORANGE X96 ⇒ SET 70.5 (78.84) ⇒ ACTUAL 78.89g ⇒ 39.7%
198.47g

PASS QC: NO ⇒ ORANGE

SAMPLE #2 RED 2042 - 200.0g

44.1% X96 ⇒ 88.2g
14.8% X80LT ⇒ 29.6g
41.1% X64 ⇒ 82.2g

PUMP SETTINGS:

X96 ⇒ SET 79.0 (88.35g) ⇒ ACTUAL 88.39g 44.1%
X80LT ⇒ SET 27.0 (29.75g) ⇒ ACTUAL 29.88g 14.9%
X64 ⇒ SET 71.5 (82.08) ⇒ ACTUAL 82.09g 41.0%
↳ + 2x0.5 SHOTS
200.36g

PASS QC: YES

Date 26 September 1996
Date October 1, 1996

Signature Chris Kachaj
Witness

CUSTOMER BLENDS PREPARED WITH LOW VOLUME DISPENSE SYSTEM

SCALE SARTORIUS BASIC ID # 00077

REMAKE SAMPLES FROM 10120-23

SAMPLE #1 RED 2043 ⇒ POST ADD OF RED X64
SET 0.5 ml (0.57g) ACTUAL (0.63g)

RED X64 ⇒ SET CTK 9/26/96
ORANGE X96 ⇒ SET

PASS QC: STILL ORANGE

SAMPLE #1 RED 2043

RED X64 ⇒ SET (106.0) (121.69g) ACTUAL (120.08g) + 0.61g 60.5% ±0.5-1 Add
ORANGE X96 ⇒ SET ACTUAL 78.81g 39.5% (120.69g)
199.5g

PASS QC: YES - slight orange shade

Date 26 September 1996
Date October 1, 1996

Signature Chi Kwan
Witness

REMAKE OF CUSTOMER SAMPLE BASED ON % ONLY

DOES % ONLY FORMULATION WORK AS WELL OR BETTER THAN WEIGHT TO VOLUME TABLES.

REMAKE OF SAMPLE RED 2043 (10120-23, 24)

REX 64	60.5%	PUMP SETTING	60.5	WT DELIVERED	68.52g 60.82%
ORANGE X96	39.5%	PUMP SETTING	39.5	WT DELIVERED	44.14g 39.18%
					112.66g

PASS QC - YES

THIS APPEARED TO BE A BETTER VISUAL MATCH TO THE STANDARD THAN THE 2043 SAMPLE PREPARED ON PAGES 10120-23, 24.

Date 26 September 1996

Signature Chris Kochis

Date October 1, 1996

Witness Jack Roberts

CUSTOMER SAMPLE PREPARATION - TAN 2036 PEAN Farm

PREPARE SAMPLE WITH LOW VOLUME DISPENSE SYSTEM.

FORMULATION: ORANGE X96: 46.2%
YELLOW X15: 43.6%
VIOLET X80 LT: 10.2%

TOTAL PREPARATION 200.0g

1) PREPARE BY WT TO VOLUME TABLES

X96 ⇒ 92.4g ⇒ PUMP SET 82.5
X15 ⇒ 87.2g ⇒ PUMP SET 80.0g
X80LT ⇒ 20.4g ⇒ PUMP SET 18.5

DELIVERED WT: 92.23g 46.1%
85.40g + 1.83g 43.6%
20.08 + 0.59 10.2%
200.13g

PASS QC: YES

2) PREPARE ONLY BY %

X96 ⇒ PUMP SET 92.5
X15 ⇒ PUMP SET 87.0
X80LT ⇒ PUMP SET 20.5

DELIVERED WT 103.49g 47.1%
93.67g 42.6%
22.79g 10.4%
219.95g

PASS QC: YES

CHOOSE #1 ALTHOUGH EITHER ONE WAS ACCEPTABLE

Date 18 October 1996
Date October 25, 1996

Signature Chris Kahl
Witness

CUSTOMER SAMPLE PREP - BROWN 2051

PREPARE 2 SAMPLES AS ON 10120-26

FORMULATION

YELLOW X15	43.8%
ORANGE X96	41.4%
VIOLET X80	14.8%

WT TO VOL. TABLES

1) PREPARE 200.0g

X15	87.6g	→ PUMP SET	80.5	WT	86.63g +0.5g +0.67g (43.8%)
X96	82.8g	⇒	74.0		82.82g (41.3%)
X80	29.6g	⇒	27.0		29.90g (14.9%)
					200.54g

PASS QC : YES

2) PREPARE ONLY BY %:

X15 ⇒	PUMP SET	87.6⇒87.5	WT	94.17g (42.9%)
X96 ⇒		83.0		92.83g (42.3%)
X80 ⇒		29.5		32.57g (14.8%)
				219.57g

PASS QC : YES

#2 USED FOR CUSTOMER

Date 18 October 1996

Signature Chris K

Date October 25, 1996

Witness

10120-28

CUSTOMER SAMPLE PREP - GREEN 8218

PREPARE 200.0g SAMPLE FOR CUSTOMER

FORMULATION	BLUE X3 LV	82%	164.0g ~~⇒ 162.45g~~ CTR 10/22/96
	YELLOW X15	18%	36.0g

1) X3 ⇒ PUMP SET 144.0 ⇒ 162.45g ⇒ 82.03%
X15 ⇒ PUMP SET 33.0 ⇒ 35.59g ⇒ 17.97%

PASS QC: OK

Date 22 Octk 1996

Signature Chi Kocha

Date October 25, 1996

Witness

CUSTOMER SAMPLE PREP — TAN 2034

PREPARE 1 GALLON SAMPLE FORMULATION WITH MANUAL SYSTEM:

FORMULATION: ORANGE X96 60.0% ⇒ 2340.0 g
YELLOW X15 28.5 % ⇒ 1111.5 g
VIOLEX 80LT 11.5% ⇒ 448.5 g
3900.0 g

PREPARE 3900.0 g SAMPLE

X96 15 SHOTS X PUMP SET 139.5 TO DELIVER 156.00 g

1)	156.1 g	6)	156.0	11)	156.1
2)	156.0	7)	156.1	12)	156.1
3)	156.0	8)	156.0	13)	156.2
4)	156.1	9)	156.1	14)	156.0
5)	156.1	10)	156.0	15)	156.1
	780.3		780.2		780.5

TOTAL = 2341.0 g

X15 10 SHOTS X PUMP SET 102.0 TO DELIVER 111.16 g

1)	108.7 g AIR	6)	109.8
2)	108.5 g AIR	7)	109.8
3)	109.7	8)	109.8
4)	109.8	9)	109.8
5)	109.8	10)	109.8
	546.5		549.0

TOTAL 1095.5 g

*POST ADD → PUMP SET 15.0 ⇒ 16.3 g

TOTAL = 1111.8 g

X80LT 3X PUMP SET 135.5 TO DELIVER 149.28 g

1) 149.1 g
2) 149.0 g
3) 148.9 g

TOTAL = 447.0 g

PASS QC: YES

FINAL

X96	2341 g	60.0%
X15	1111.8 g	28.5%
X80	447.0 g	11.5%
	3899.8 g	

Date 25 October 1996
Date October 29, 1996

Signature [signature]
Witness [signature]

CUSTOMER SAMPLE PREP – GREEN 8218LV

FORMULATION 82% BLUE X3
18% YELLOW X15
PREPARE 200g SAMPLE

1) PREPARE BY % ONLY FORMULATION

PUMPSET : X3 = 82×2 = 164.0
X15 = 18×2 = 36.0

PASS QC: ~~NO~~ YES - ACCEPTABLE ⇒ SAMPLE SHIPPED 10/25/96
- SAMPLE IS ON YELLOW SIDE COMPARED TO RETAIN ⇒ NEEDS MORE BLUE

2) PREPARE BY WT TO JOLUNG TABLES

X3: ⇒ 164.0g PUMP SET 144.0 ⇒ 158.97g → (81.7%)
X15: ⇒ 36.0g " " 33.0 ⇒ 35.62g → (18.3%)
194.59g

POST ADD BLUE X3 PUMP SET 4.0 ⇒ 4.66g

FINAL X3: 163.63g (82.1%)
X15: 35.62g (17.9%)
199.25g

PASS QC: YES ⇒ BETTER MATCH THAN #1

Date 25 October 1996
Date October 29, 1996

Signature Chris Kochanowski
Witness

CUSTOMER SAMPLE GREEN 2058

OBJECTIVE: PREPARE 2½ GALLONS OF RT BLEND USING MANUAL LOW VOLUME DISPENSE SYSTEM.

GREEN 2058 FORMULATION

YELLOW X15: 70%
BLUE X3LV: ~~3C~~ CTK 27%
ORANGE X96: 3%

PREPARE FIRST 3900g (1 gal) SAMPLE

YELLOW X15: 2730 g 70%
BLUE X3LV: 1053 g 27%
ORANGE X96: 117 g 3%
3900g

X15 g (PUMP SETTING)

1)	174.7 g (162.5)	11)	10.9 (10)	21)	96.8 g (90)
2)	174.7 g "	12)	10.9 (10)	22)	107.5 (100)
3)	174.8 "	13)	21.6 (20)	23)	118.3 (110)
4)	180.2 (167.5)	14)	21.6 (20)	24)	129.0 (120)
5)	181.3 (168.5)	15)	32.4 (30)	25)	139.8 (130)
6)	181.7 (169)	16)	43.0 (40)	26)	150.5 (140)
7)	181.8 (169)	17)	53.9 (50)	27)	16.2 (15)
8)	107.6 (100)	18)	64.6 (60)	28)	2.2 (2)
9)	10.2 (10) AIR	19)	75.4 (70)	29)	0.7 (0.5)
10)	181.8 (169)	20)	86.2 (80)		761.0
	1548.8g		420.5g		

TOTAL YELLOW X15 = 1548.8+420.5+761.0 = 2730.3g

CONTINUE 10120-32

Date 1 November 1996 Signature Chris Kosh

Date November 26, 1996 Witness Sheila Mintz

CUSTOMER SAMPLE GREEN 2058 -CONT. FROM 10120-31

BLUE X3LV g (PUMP SETTING)

1) 11.3 (10)	6) 56.7 (50)	11) 113.1 (100)	16) 6.7 (0.5)
2) 11.3 (10)	7) 67.8 (60)	12) 124.1 (110)	0.7g
3) 22.7 (20)	8) 79.2 (70)	13) 135.5 (120)	
4) 34.0 (20)	9) 90.4 (80)	14) 146.7 (130)	
5) 45.3 (40)	10) 101.7 (90)	15) 12.9 (11.5)	
124.6g	395.8g	532.3g	

TOTAL BLUE X3LV = 124.6 + 395.8 + 532.3 + 0.7 = 1053.4g

X96

1) 117.0g (104.5)

X15:	2736.3	70.0%
X3LV:	1053.4	27.0%
X96:	117.0	3.0%
	3900.7g	

PASS QC: YES

BASED ON ABOVE INFO FOR X15 AND X3LV, REPLOT WEIGHT TO VOLUME SETTING TO GET THE CURVE AND EQUATION:

YELLOW X15 EQUATION: $Y = 0.93036X - 0.08321$

$R^2 = 0.99999$

Y = PUMP SETTING, X = X15 WEIGHT

BLUE X3LV EQUATION: $Y = 0.88600X - 0.08169$

$R2 = 0.99999$

CONT. 10120-33

WEIGHT TO VOLUME TABLES RECALCULATED BASED ON ABOVE EQUATIONS.

Date 1 November 1996 Signature Chi Kong

Date November 26, 1996 Witness Sheila Mintz

CUSTOMER SAMPLE GREEN 2058 - CONT. FROM 10120-32

PREPARE SECOND 3900g (1 GALLON) SAMPLE

X15

1) 151.8 (141)	6) 151.7 (141)	11) 188.3 (175)
2) 10.8 (10.0)	7) 151.8 (141)	12) 188.3 (175)
3) 21.6 (20)	8) 188.3 (175)	13) 941.5 (175 x 5)
4) 107.6 (100)	9) 188.3 (175)	14) 90.4 (84)
5) 161.4 (150)	10) 188.3 (175)	1408.5g
453.2g	868.4g	

TOTAL X15 = 2730.1g

X3LV

1) 22.6 (20)	6) 612.2 (135.5 x 4)
2) 11.4 (10)	7) 152.6 (135)
3) 34.0 (30)	
4) 84.8 (75)	TOAL X3LV = 1053.2g
5) 135.6 (120)	

X96

1) 117.0 (104.5)

X15 :	2730.1g	70.0%
X3LV :	1053.2g	27.0%
X96 :	117.0g	3.0%
	3900.3g	

PASS QC : YES

CONT. 10120-34

Date 4 November 1996

Signature Chi Kwok

Date November 26, 1996

Witness Akiba Mintz

CUSTOMER SAMPLE - GREEN 2058 - CONT. FROM 10120-33

PREPARE LAST 1950g (½ GALLON)

X15:	1365g	70.0%
X3LV:	526.5g	27.0%
X96	58.5g	3.0%
	1950g	

X15: 1) 1364.3g (158.5 x 8 SHOTS)
2) 0.7g (0.5)
1365.0g

X3LV: 1) 525.8g (93.0 x 5 SHOTS)
2) 0.8g (0.5)
526.4g

X96: 1) 58.3g (52.0)

X15:	1365.0g	70.0%
X3LV:	526.4g	27.0%
X96:	58.3g	3.0%
	1949.7g	

PASS QC:

Date 4 November 1996 Signature Chris Kosky
Date November 26, 1996 Witness Alicia Mintz

CUSTOMER SAMPLE PREP FOR RUBBER URETHANES

1) FORMULATION : X96 80%
X64 20%

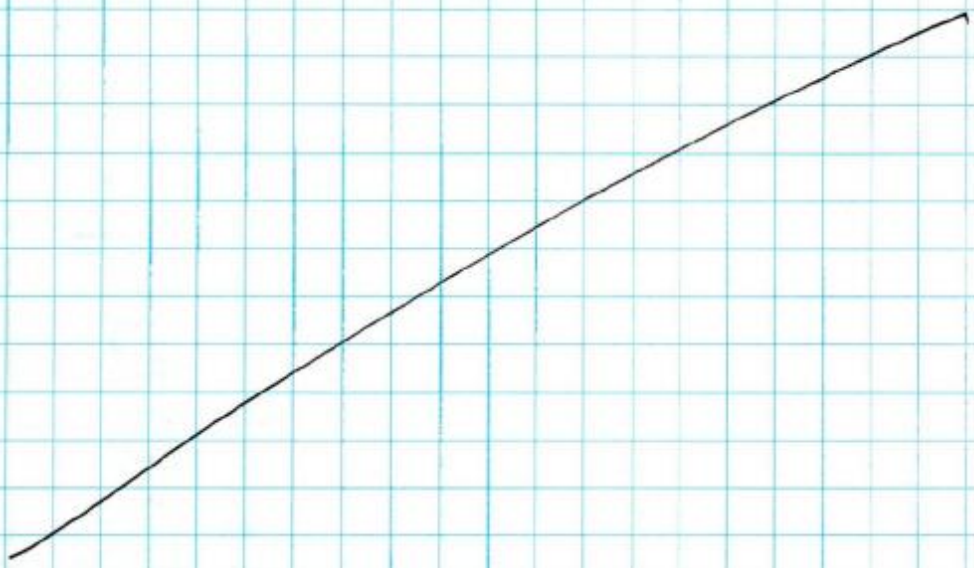
PREPARE 200.0g ⇒ X96 160.0g
X64 40.0g

X96 160.0g (PUMPSET 143.0) ⇒ 79.9%
X64 39.7g PUMPSET (35.0) + 0.5g PUMPSET (0.5) 20.1%
200.2g

PASS QC : YES

2) 4oz SAMPLE OF X96

X96 120.2g (PUMPSET 107.5)



Date 7 November 1996
Date November 26, 1996

Signature Chris Kong
Witness Sheila Mintz

CUSTOMER SAMPLE PREPARATION TAN 2036

OBJECTIVE – PREPARE ½ GALLON OF THE FOLLOWING FORMULATION: (1950g) MATCH TO RETAIN

ORANGE X96	46.2%	⇒ 900.9g
YELLOW X15	43.6%	⇒ 850.2g
VIOLET X80LT	10.2%	⇒ 198.9g
		1950.0g

ORANGE X96 WT DELIVERED (PUMP SET)

1) 179.8g (161.0) AIR
2) 180.0g (161.0)
3) 180.0g (161.0)
4) 359.9g (161.0)×2
5) 2.2g (2.0)

901.9g

YELLOW X15

1) 141.4 (132.0) AIR
2) 142.0g "
3) 425.8 (132.0)×3
4) 142.0 (132)

851.2g

~~ORANGE~~ 11/13/96 CTK

VIOLET X80LT

1) 99.4g (90.5)
2) 99.4g "

198.8g

X96 : 901.9g ⇒ 46.2%
X15 : 851.2g ⇒ 43.6%
X80 : 198.8g ⇒ 10.2%

1951.9

PASS QC: NO ⇒ NOT VIOLET ENOUGH

CONTINUE : 10120-37

Date 13 November 1996 Signature Chris Kohn

Date November 26, 1996 Witness Sheila Mintz

TAN 2036

CONTINUE : 10120-36

~~X15 POST ADD~~ ~~4) 1.~~ CTK 11/14/96

X80LT POST ADD

1) 0.6g (0.5)
2) 0.6g (0.5)
1.2g

⇒ SAMPLE IS USUALLY MORE ORANGE COMPARED TO RETAIN

X15 POST ADD

1) 1.2g (1.0)

SAMPLE IS CLOSE TO RETAIN ⇒ RETAIN IS REMADE FOR COMPARISON ⇒ TAN 2036 PASS

FINAL FORMULATION

X96	901.9g	(46.15%)
X15	852.4g	(43.62%)
X80LT	200.0g	(10.23%)
	1954.3g	

Date 14 November 1996
Date November 26, 1996

Signature Chris Karl
Witness Sheila Mintz

CLEARTINT REDESIGN - QC METHOD FOR CONCENTRATES

OBJECTIVE : DEVELOP A ROBUST QC METHOD FOR CLEARTINT CONCENTRATES THAT WILL ACCURATELY MEASURE PRODUCT QUALITY THUS ALLOWING PRODUCT SCALE-UP.

EQUIPMENT : ANALYTICAL BALANCE SARTORIUS ID#00070
METTLER PC 2200 PL ID#00032
KILLION 32:1 EXTRUDER
ARBURG #2 MOLDER

1) IDENTIFY PROCESS VARIATION WITH CURRENT QC METHOD FOR CONCENTRATES - CLEARTINT SPI - CTSPI 105.R3

PREPARE PLAQUES WITH QC & BASE RESINS FROM PLASTICS LAB AND CYPRESS & MEASURE DE

- QC RESIN - PLASTICS LAB - FINA 7525 MZ RCP
  IOMFR PP
  RANDOM COPOLYMER
  CLARIFIED W/ 2500 PPM MILLAD 3988
  LOT # 17875
  } RESIN #1P
  CYPRESS - FINA 7525 — RESIN #1C

CARRIER "BASE" RESIN - PLASTICS LAB EXXON ESCORNE PD 3345-E5
30 MF PP HOMOPOLYMER
STABILIZED, NOT CLARIFIED, PELLETIZED
LOT 7241213
} RESIN #2P
CYPRESS - EXXON PP - RESIN #2C

WEIGH OUT 1000.00g to the nearest pellet in large mixing bowls each of the above resins, 1P, 1C, 2P, 2C

-CONT ON PAGE 10120-39

Date 2 April 1992 Signature
Date April 14, 1997 Witness

-CONT FROM 10120-38

EXTRUDE Each of the 1000.00g sample resins on the Killion 33:1 following extrusion procedure.

Take extruded samples and mold plaques at 0.04" thickness and measure dE.

	RESIN	# Plaques	Avg. dE CIELAB	Avg dE CMC	Diff
QC -	Plastics Lab	20	0.85	0.88	> 7.79
	CYPRESS	16	0.07	0.11	
Base -	Plastics Lab	20	0.23	0.11	> 0.07
	CYPRESS	20	0.08	0.07	

NEXT - LET DOWNS OF 40:1 & 50:1 of Base resing in QC resins. and measure dE

40:1 ⇒ Base resing - 25g both virgin resing
QC resing - 975 g

50:1 ⇒ Base resin 20g both virgin resing
QC resing 980g

	RESIN	# Plaques	Avg dE CIELAB	Avg dE CMC	
40:1	Plastics Lab	20	0.12 ~~0.23~~	0.07 ~~0.11~~	> 0.36
	CYPRESS	20	0.06 ~~0.08~~	0.07 ~~0.07~~	
50:1	Plastics lab	~~20~~ 10	0.21	0.12	> 0.42
	CYPRESS	15	0.08	0.06	

The variation in dE seen by just running the virgin resins throug the process is unacceptable especially in #1 w/ the QC resing from the Plastics lab & Cypress

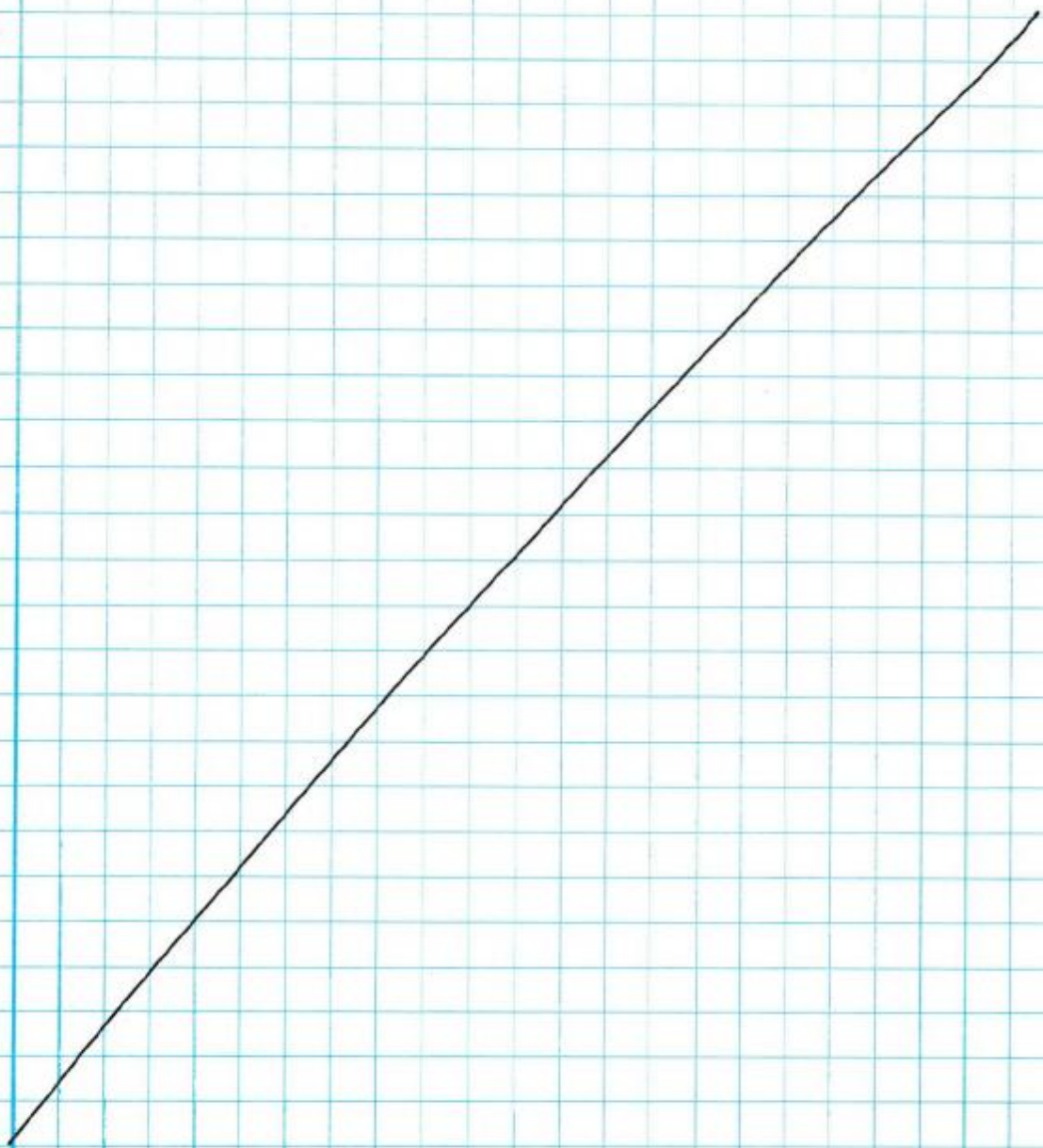
- CONT. 10120-40

Date 27 April 1997
Date April 14, 1997

Signature Chris Kelly
Witness Lynn Kelly

-CONT. 10120-39

Rerun new batch of QC resin from Plastics lab when it is received to see if the difference is real.



Date 2 April 1997

Signature

Date April 14, 1997

Witness

-CONT. 10120-40

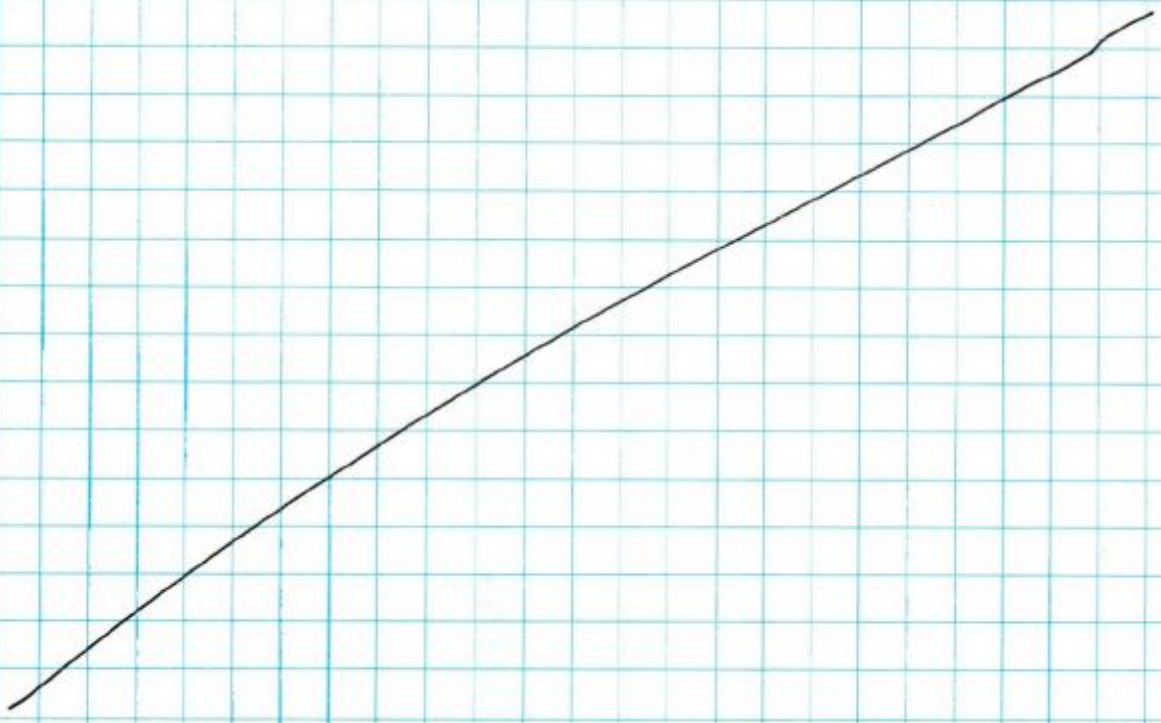
Rerun QC resin in Plastics lab with new order resin - still same lot # and do same dE comparison.

	RESIN	# PLAQUES	Ave dE CIELAB	Avg. dE CMC	DIFF.
QC	Plastics lab	20	0.08	0.04	> 0.21
	CYPRESS	16	0.07	0.11	

This new batch is much closer in dE to the Cypress QC resin, However, the variation is still unexceptable.

Need to evaluate different resins for less process variation.

IDEA - evaluate styrene based resins.

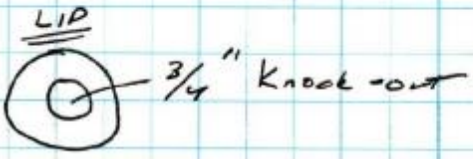


Date 3 April 1997 Signature Chris Koenig

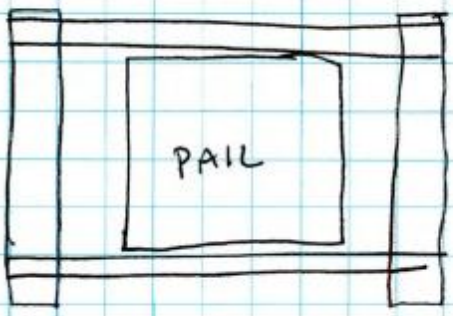
Date April 14, 1997 Witness Chris B. Berg

FINAL - PAIL DOSING SYSTEM DESIGN.

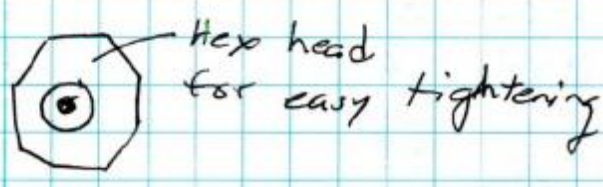
PAIL SWITCHED TO A RECTANGULAR PAIL INSTEAD OF THE ROUND PAIL.



THE PAIL IS SST 1520 (20ℓ)



A NEW CONNECTOR HAD TO BE FABRICATED TO Accomodate the new pail



CONT. - 10120-43

Date 7 April 1997 Signature Chris Kosh

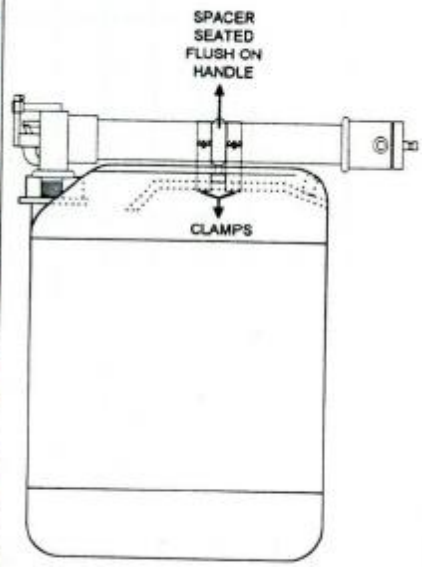
Date April 14/1997 Witness Lynn Ray

-cont. 10120-42

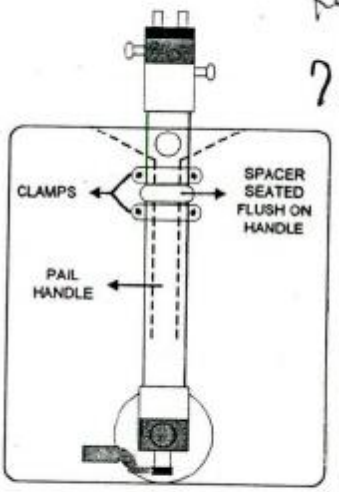
CONNECTING PUMP TO PAIL

SIDE VIEW

- THREAD PUMP INTO PAIL LID UNTIL GASKET IS SEATED.
- SEAT SPACER FLUSH ON PAIL HANDLE.
- ATTACH CLAMPS ON EACH SIDE OF SPACER.



TOP VIEW



2/11/97/CTK

PAGE 3

Chris Kurtis 7 April 1997

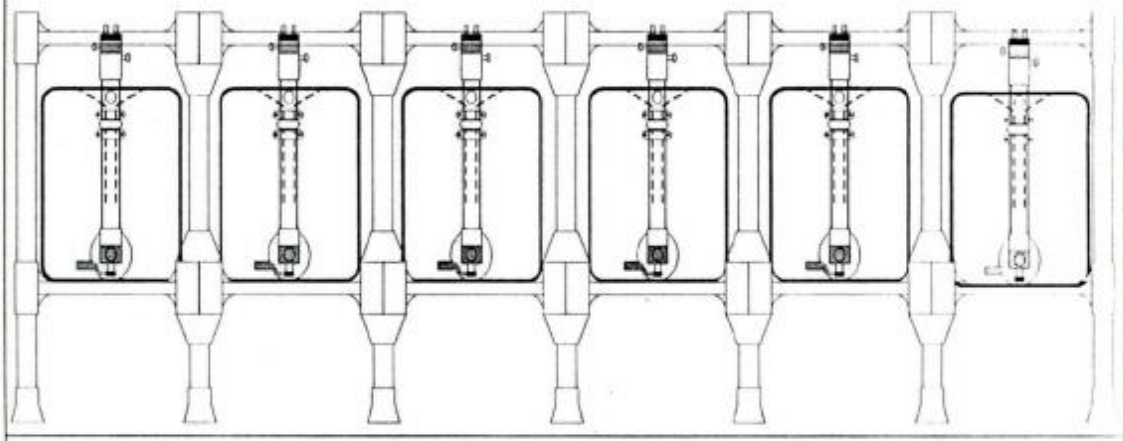
-cont. 10120-44

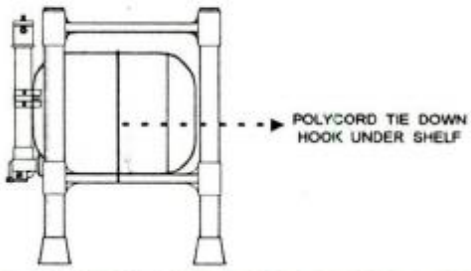
Date 7 April 1997 Signature Chris Kurtis

Date April 14, 1997 Witness

-CONT. 10120-43

FULLY ASSEMBLED DOSING SYSTEM





Chris Kortman
7 April 1997

2111/97/CTK

PAGE 6

-cont. 10120-45

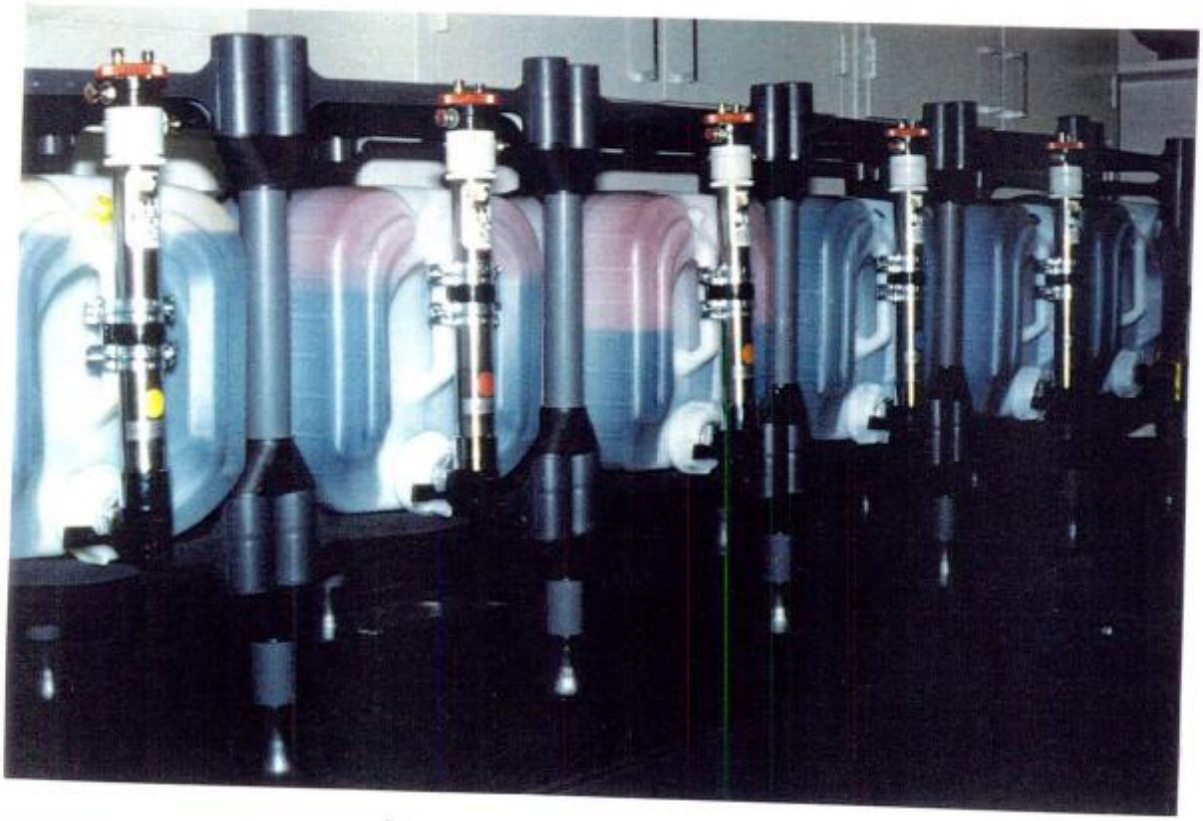
Date 7 April 1997

Date April 14, 1997

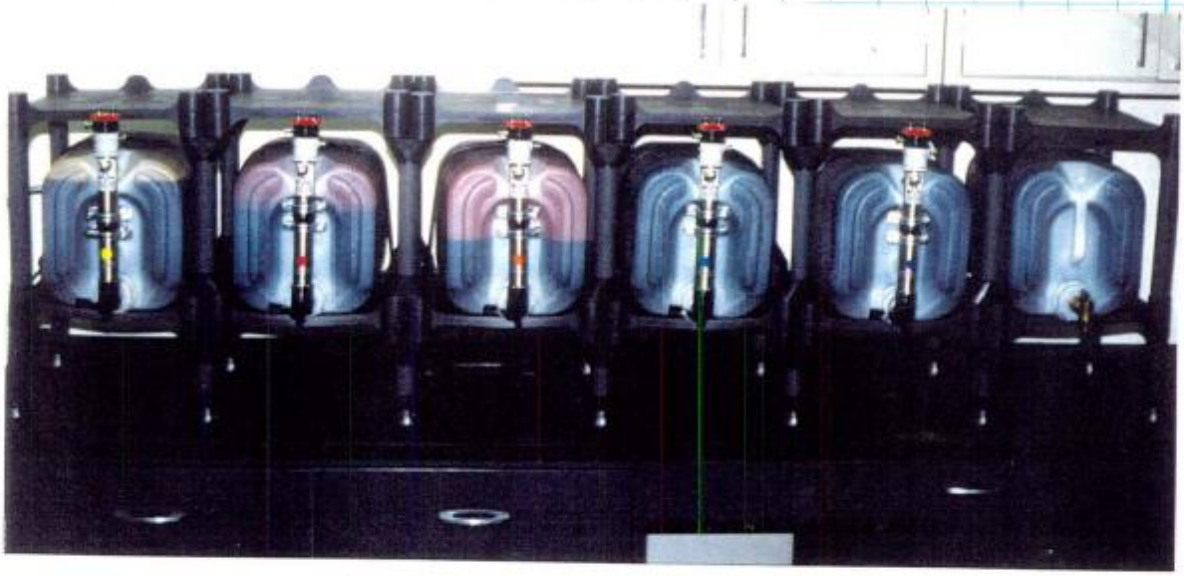
Signature Chris Kortman

Witness Lynn B. Kay

~CONT. 10120-44



Chris Kozhanov 7 April 1997



Chris Kozhanov 7 April 1997

Date 7 April 1997

Date April 14, 1997

Signature Chris Kozhanov

Witness Lynn Kaufman

Identify Possible New QC Resin for ClearTint Concentrate

Objective: Determine if there is a better QC resin for ClearTint Concentrate. Currently, Fina 7525 is used as the QC resin for CT concentrate. The base (carrier) resin used in the concentrate has switched from Exxon 3345 to Fina 7620. FINA has a clarified version Fina 7620MZ that should be evaluated as a QC resin for the concentrate. The qualities for the QC resin must contain the following: highly stabilized, high purity, and lowest but consistent haze values. Also consistent, low yellowness (b value).

FINA 7525MZ 2500 ppm Millad LOT 21077 } MOLD 10
FINA 7620MZ (N97296) 2200ppm Millad } 50mm PLAQUES

	FINA 7525MZ CNC				FINA 7620MZ		
	HAZE	D b Value	Plaque Thickness		HAZE	b Value	Plaque Thickness
1)	13.4	2.87	0.5005	1)	17.2	2.65	0.4990
2)	13.2	2.85	0.4965	2)	18.0	2.65	0.4990
3)	13.0	2.86	0.5015	3)	17.7	2.63	0.4970
4)	13.0	2.84	0.4990	4)	19.4	2.67	0.4985
5)	13.0	2.83	0.4970	5)	17.9	2.66	0.4990
6)	12.5	2.89	0.5030	6)	18.4	2.65	0.4985
7)	12.4	2.89	0.4995	7)	18.6	2.65	0.4995
8)	12.8	2.85	0.4975	8)	17.7	2.66	0.5000
9)	12.7	2.85	0.4965	9)	18.8	2.68	0.5000
10)	12.8	2.86	0.4970	10)	18.1	2.62	0.4985
$\bar{X}$	12.9	2.86	0.4988		18.2	2.65	0.4991

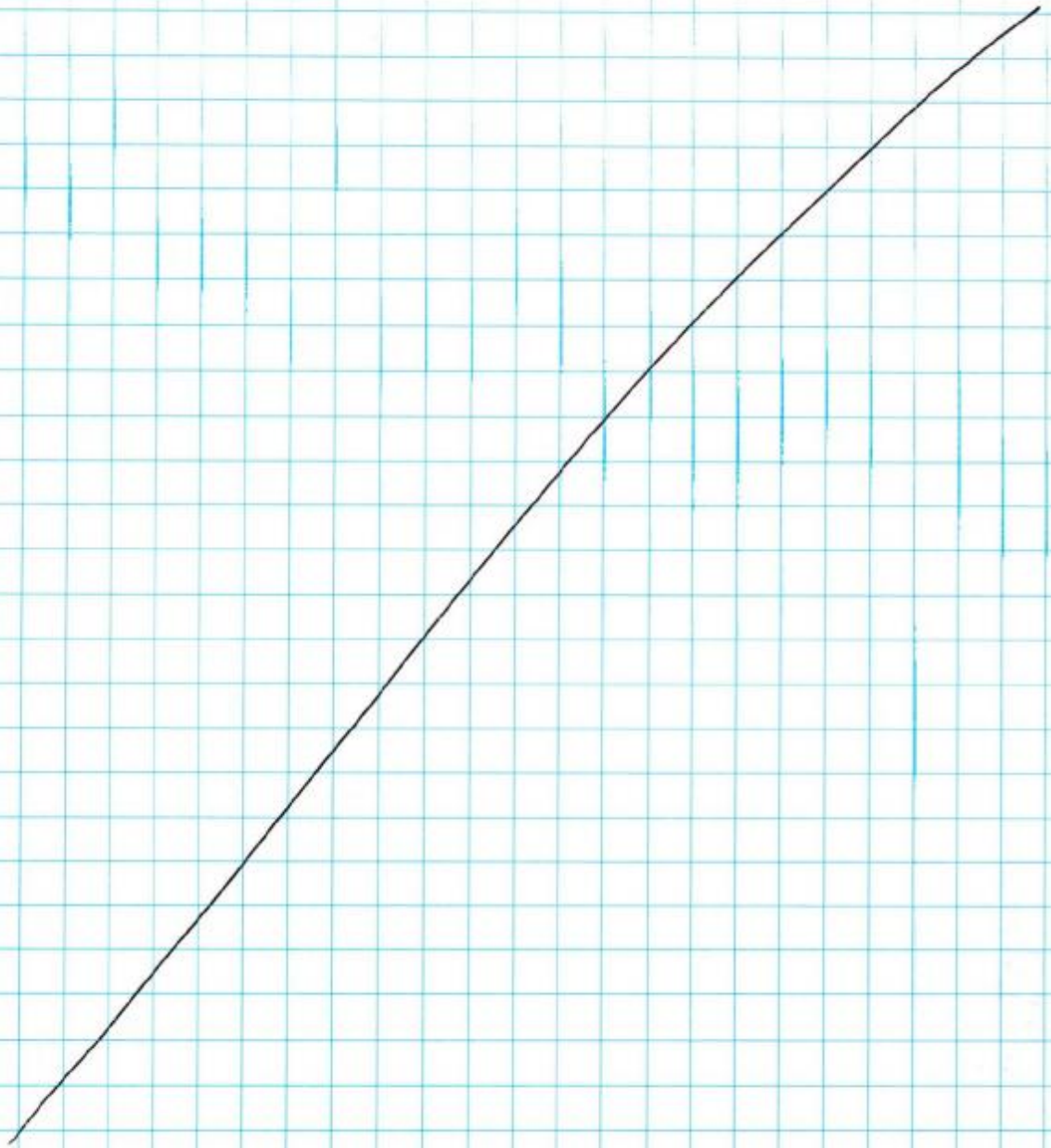
Micrometer - Mitutoyo 15L-101
BYK Gardner Haze-meter ID # 00167
ACS color computer

Date 25 February 1998
Signature Chris Koch

Date 25 February 1998
Witness Beth N. Ramsey

CONT FROM PAGE 10120-46

Results: It appears that the Fina 7620 MZ probably won't make a good QC resin due to the haze being higher than the Fina 7525. This effect is due to the different loadings of Millad in these resins.



Date 25 February 1998

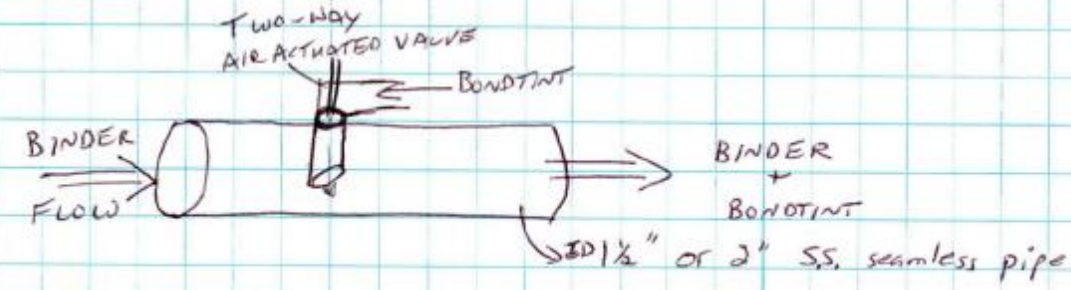
Signature

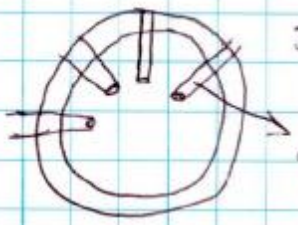
Date March 25, 1998

Witness Philip Edmonds

BondTint Manifold Design

IDEA AND OBJECTIVE: DESIGN A ROBUST BINDER MANIFOLD FOR BONDTINT SUCH THAT IT ALLOWS FOR EASY ADDITION OF BONDTINT INTO THE BINDER STREAM AND REDUCES OR ELIMINATES THE MANIFOLD PLUGGING DUE TO BINDER BUILD-UP.





3 BONDTINT COLORS + BLACK

MANIFOLD WILL CONSIST OF 4 PORTS

MANIFOLD INSERTS WILL CONSIST OF TEFLON FABRICATED FROM TEFLON HOLLOW ROD

QUESTION? - CAN THE INSIDE OF THE S.S. PIPE BE TEFLON COATED AND DOES THE BINDER SHOW ANY SIGNS OF STICKING TO THE TEFLON. BINDER/TEFLON TESTING NEEDS TO BE DONE.

Date 19 Octobr 1998

Date October 19, 1998

Signature Chi K

Witness

HAYWARD / BONOTINT EXPERIMENT

OBJECTIVE: TRY TO REPRODUCE GELLING THAT WAS SEEN IN THE BINDER TANK AT HAYWARD.

RAW MATERIALS ARE THOSE BROUGHT BACK FROM HAYWARD

POLYOL
OIL - CYCLOLUBE 210
BONOTINT 1090 - LOT M1115, DRUM #2

RATIO ADDED TO BINDER TANK and order

			ADD. TIME
TDI	4,640 lbs.	22.7%	32.0 min
Polyol	6,680 lbs.	33.0%	21 min
Color	267 lbs.	1.3%	?
Polyol	6,680 lbs.	33.0% ~~32.9%~~	21 min
O:I	2,003 lbs	~~19.9%~~ 19.8%	22.5 min
	20,270 lbs		

Sample Prep. 150g

			W/o N_2	Temp	W/ N_2	Temp
TDI	34.35g	→ ACTUAL	35.0g	94.3°C	35.0g	25.3°C
POLYOL	49.5g	→ ACTUAL	49.5g		49.5g	
COLOR	1.95g	→ ACTUAL				
POLYOL	49.5g	→ ACTUAL				
OIL	~~14.7g~~ 14.3g	→ ACTUAL				
	150g					

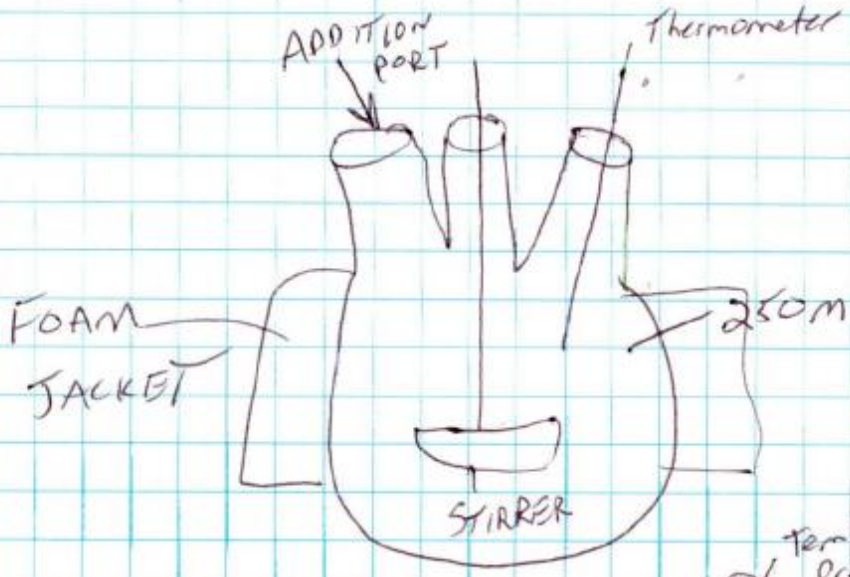
CONT 10120-50

Date 1 February 1999
Date February 1, 1999

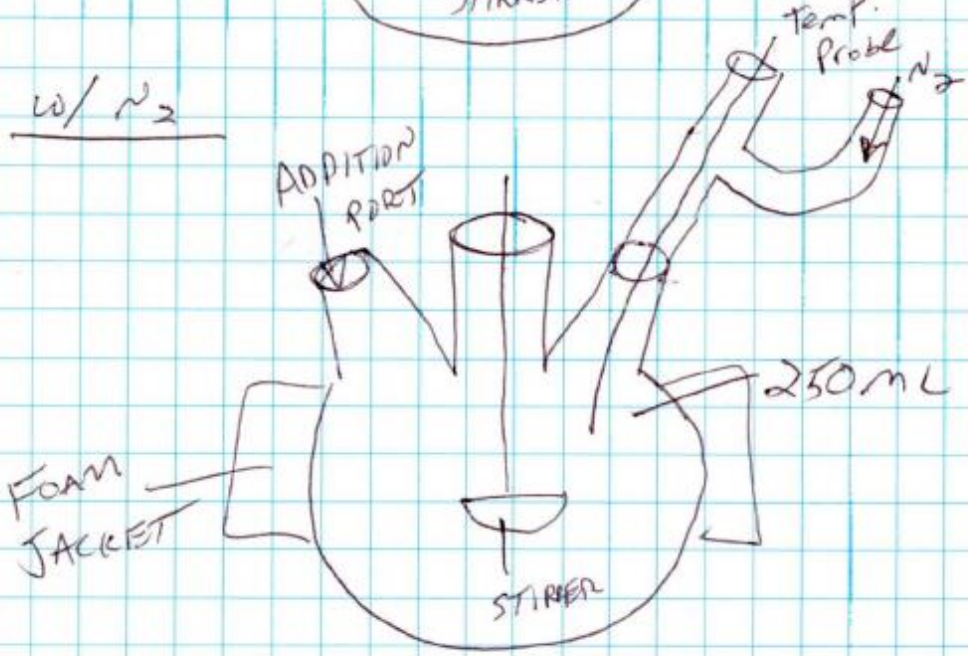
Signature Chris Kraft
Witness

CONT. FROM 10120-49

REACTION SET-UP W/O N_2



W/ N_2



CONT. 10120-51

Date 1 February 1998

Date February 10 1998

Signature

Witness

CONT. 10120-50

w/ N_2		w/o N_2	
TDI 35.0g		TDI 35.0g	
ADD Polyol 49.5g	INITIAL TEMP 25.3°C	Polyol 49.5g	INITIAL TEMP 24.3°C
	10 Minutes 26.1°C		10 Minutes 25.7°C
	21 Minutes 26.7°C		21 Minutes 26.4°C
ADD BT 1.95g	1 minute 28.0		35.6°C
	2 minute 29.0		39.9°C
	3 Minutes 36.0°C		44.0°C
	4 Minutes 42.8°C		44.6°C
	5 Minutes 44.0		44.0
	6 Minutes 42.9		43.1
	No observed viscosity increase w/either		
	7 Minutes 42.2°C		42.2°C
	8 Minutes 41.8		41.6
	9 Minutes 41.3		41.1
	10 Minutes 40.7		40.7
	11 Minutes 40.3		40.1
	12 Minutes 39.7		39.5
	15 Minutes 38.4		38.6
	17 Minutes 36.5		37.8
ADD Polyol 49.5g	1 minute 38.4		40.7
	2 minute 38.4		43.4
	3 minute 37.6		45.5
	4 minute 38.1		46.0
	5 Minute 39.1		45.9
	6 minute 39.7		45.6
	7 Minute 40.2		45.3
	8 minute 40.8		44.8
	9 minute 40.7		42.9
	10 minute 40.5		42.3
	11 min. 40.2		41.6

CONT. 10120-52

Date 1 February 1999

Signature Chi Kong

Date February 1, 1999

Witness

		N_2	w/o N_2
CONT 10120-51			
	12 min	39.8°C	41.4°C
	13 min	39.5°C	41.2°C
	14 min	39.2	41.2
	15 min	38.9	41.3
	16 min	38.9	41.1
	17 min	38.7	40.8
	18 min	38.5	40.5
	VISCOSITY OBSERVED - NO INCREASED VISCOSITY		
	19 min	38.2	40.3
	20 min	37.9	39.9
	21 min	37.4	37.4
ADD OIL 14.7g	1 min	33.8	36.2
	2 min	35.3	36.1
	3 min	38.1	37.0
	4 min	38.1	36.6
	5 min	37.7	36.2
	6 min	37.3	35.8
	7 min	37.0	35.6
	8 min	36.4	35.2
	9 min	36.1	35.0
	10 min	35.8	34.7
	11 min	35.5	34.4
	12 min	35.3	34.2
	13 min	35.3	34.2
	14 min	35.1	33.9
	15 min	35.0	34.7
	16 min	34.7	33.3
	17 min	34.6	33.2
	18 min	34.4	33.1
	19 min	34.0	33.0
	20 min	33.7	32.7
	3hr 35 min	23.6	23.0
STARTED HEATING MANTLE - SET POINT 32.2°C			
	4hr 10 min	40.3	35.7
	5hr 36 min	32.3	32.7

CONT - 10120-53

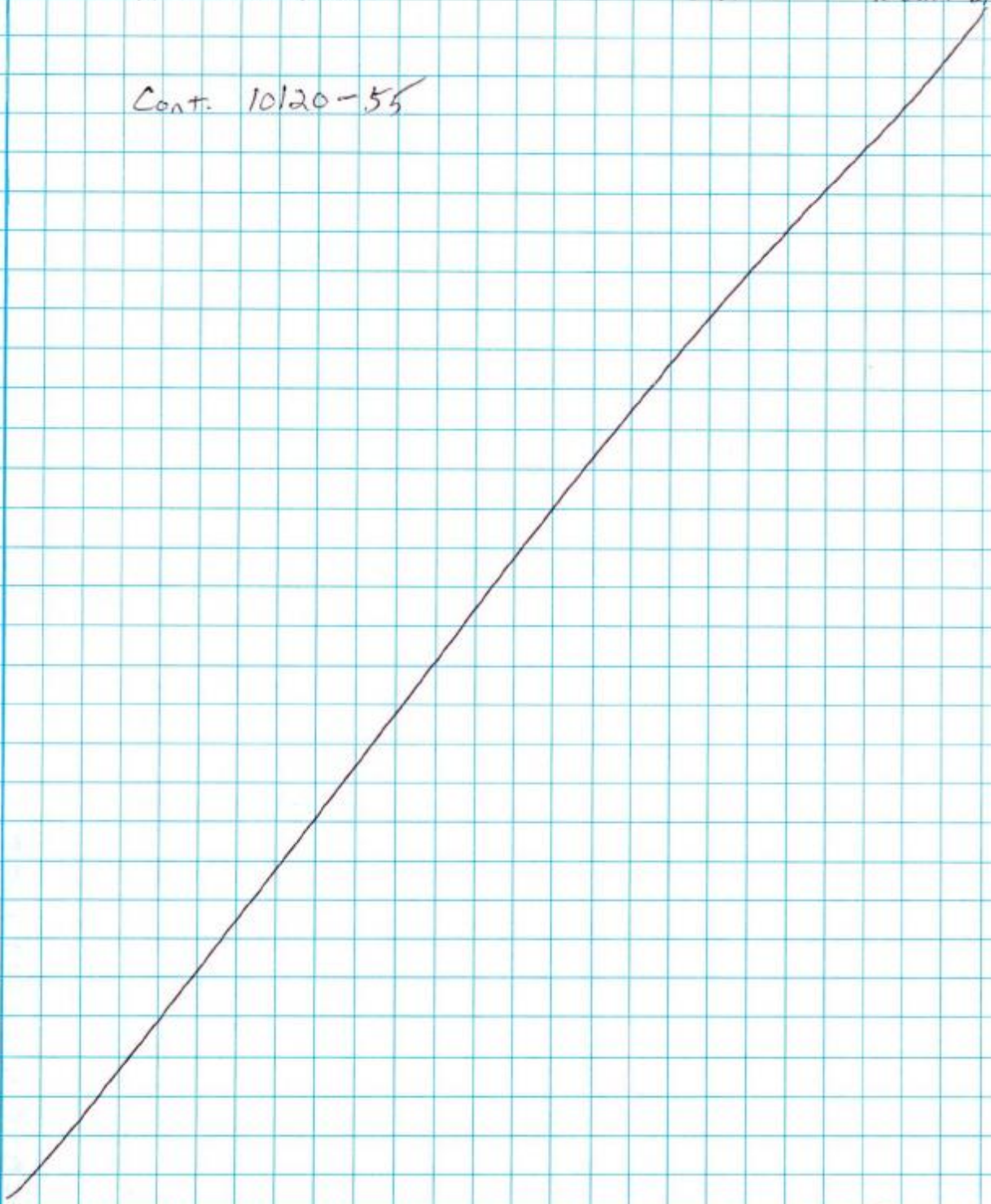
Date 1 February 1999 Signature

Date February 1, 1999 Witness

CONT. 10120-52

	N_2	W/o N_2	(TOTAL TIME 7hr 9min)
	6hrs 8min 32.0°C	32.0°C	
11:57PM	7hrs 2min 32.0	32.2°C	
	Note: Observed increased viscosity but still very flowable		
	7hr 55min 32.3°C	32.1°C	TOTAL TIME 8hr 57min 12:25AM 2/2/99

Cont. 10120-55



Date 1 February 1999

Signature [signature]

Date February 1, 1999

Witness [signature]

HAYWARD - BT ANALYSIS

OBJECTIVE: DETERMINE ROOT CAUSE FOR BINDER GELLING AND TANK SET-UP

- RUN TWO REACTIONS - 1) DOUBLE BT AMOUNT
2) RUN W/O COLOR

~~IDI~~ 21.1Kg ~~COR~~

	BINDER ONLY	2x BT	
TDI	35.0g - 24.3°C	35.0g - 23.8°C	START APPROX 7:00PM
ADD POLYOL 49.5g	10min 24.5	24.7°C	
	21min 24.5	24.5°C	
ADD 4g BT	1 min	35.8	
	2 min	38.8	
	3 min	43.3	
	4 min	43.1	
	5 min	42.5	
	6 min	41.8	
	10 min	39.8	
	15 min	37.8	
	17 min	36.2	
ADD POLYOL 49.5g	1 min 24.1	38.5	
	2 min 24.1	42.0	
	3 min 24.1	42.5	
	4 min 24.2	42.0	
heat mantle →	15 min 24.6	36.6	
	45 min 32.2°C	32.1°C	
	10:50PM 32.1°C	32.1°C	
	11:58PM 32.1°C	32.1°C	

NOTE: Both are still very flowable

Feb 2, 1999 12:30AM 32.2 32.2

Cont. 10120-55

Date 1 February 1999

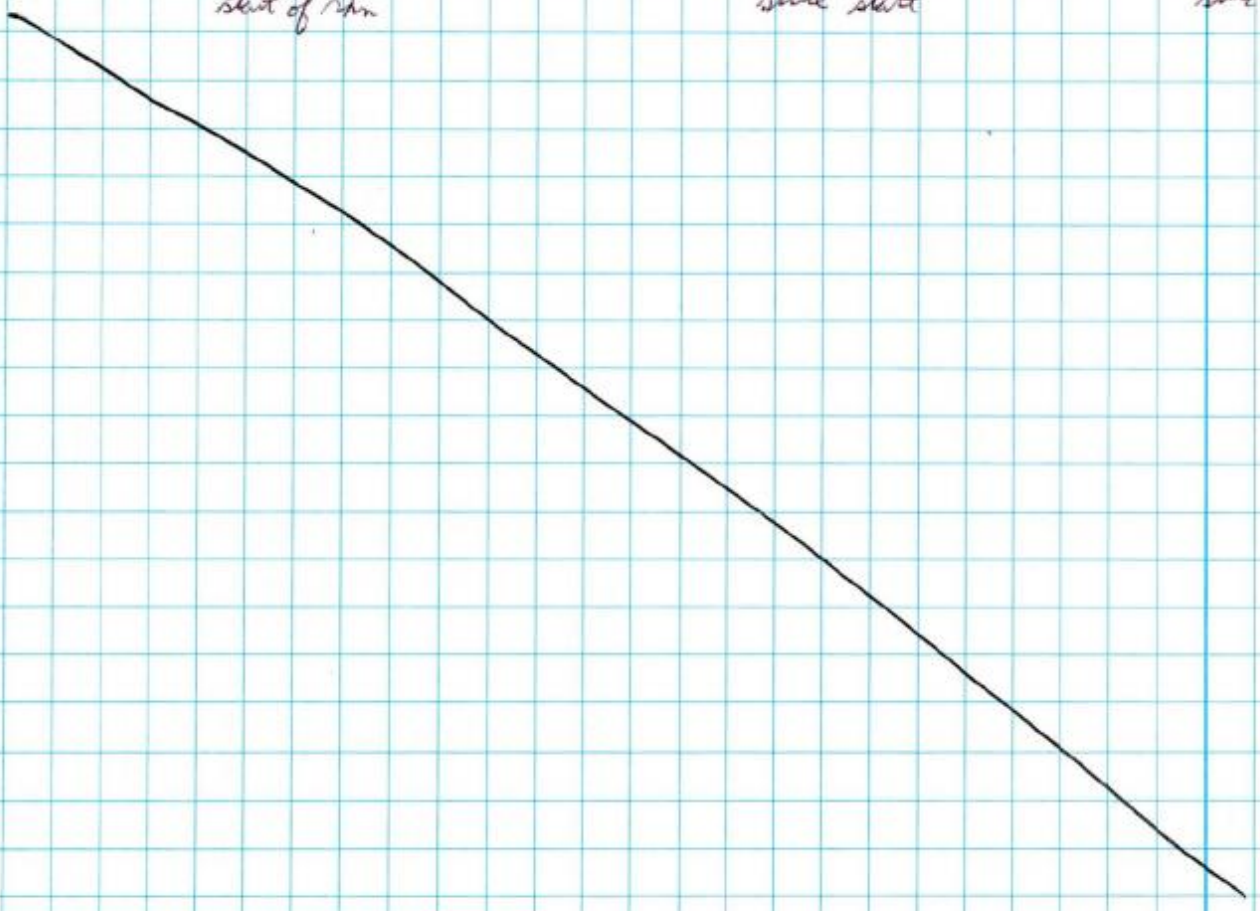
Date February 1, 1999

Signature Chi Kim

Witness

CONT. 10120-53, 54

	W/ N_2	W/o N_2	BINDER ONLY	2x BT	2x TDT
2/2/99 5:50AM	32.2°C 13hr 21min ~~total~~ 14hr 22min	32.2°C 13 hr 21 min 14 hr 22 min	31.8°C	32.4°C	SAME FORMULATION AS N_2 except 2x TDI addition
7:20AM	32.3°C increased viscosity but floatable	32.2°C increased viscosity but flowable	31.9 °C slight incr. in viscosity	32.1°C increased viscosity still flowable	START 9:33 AM
9:58AM	31°C 17hr 28min 18hr 29min Changed temp controller Temp up to 44°C	32.0°C	31.9°C	31.7°C	
1:31PM	33°C 22 hrs 2min since start of run	32.5°C	32.3°C 18hr 33min since start	32.2	37°C 3hr 58min since start



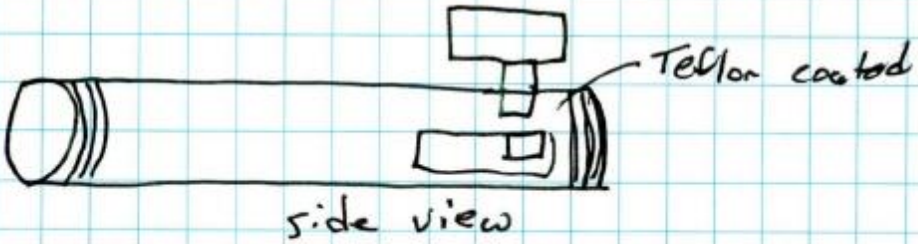
Date 2 February 1999 Signature

Date February 7, 1999 Witness

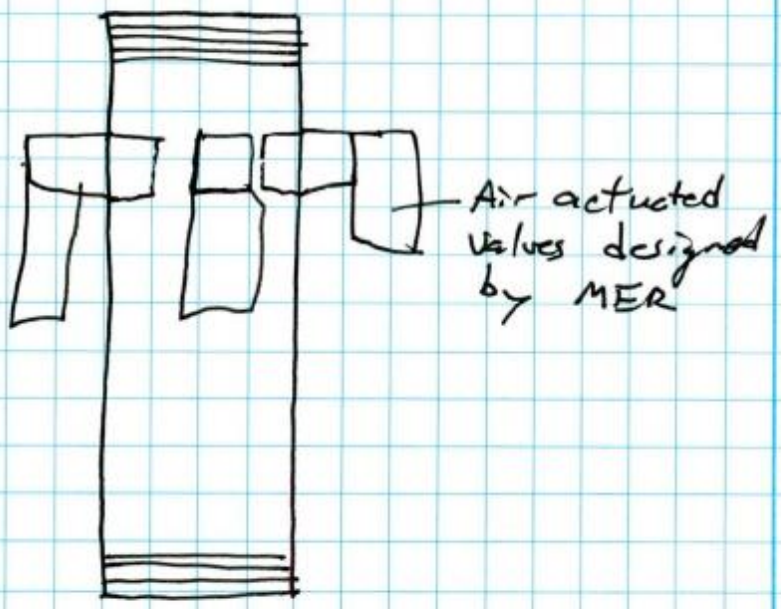
BondTint Manifold Design

-Cont. from 10120-48

Revised idea for BondTint manifold. This incorporates MER's new valve technology into a Stainless Steel 2" ID teflon (FEP) coated interior. The valve ports on this manifold will be located radially on the manifold as opposed to the typical in-line design. The valve are positioned close to one end of the manifold so as to position them as close to the binder pump as possible.



side view



Top View

Date 21 April 1999

Date 29 April 1999

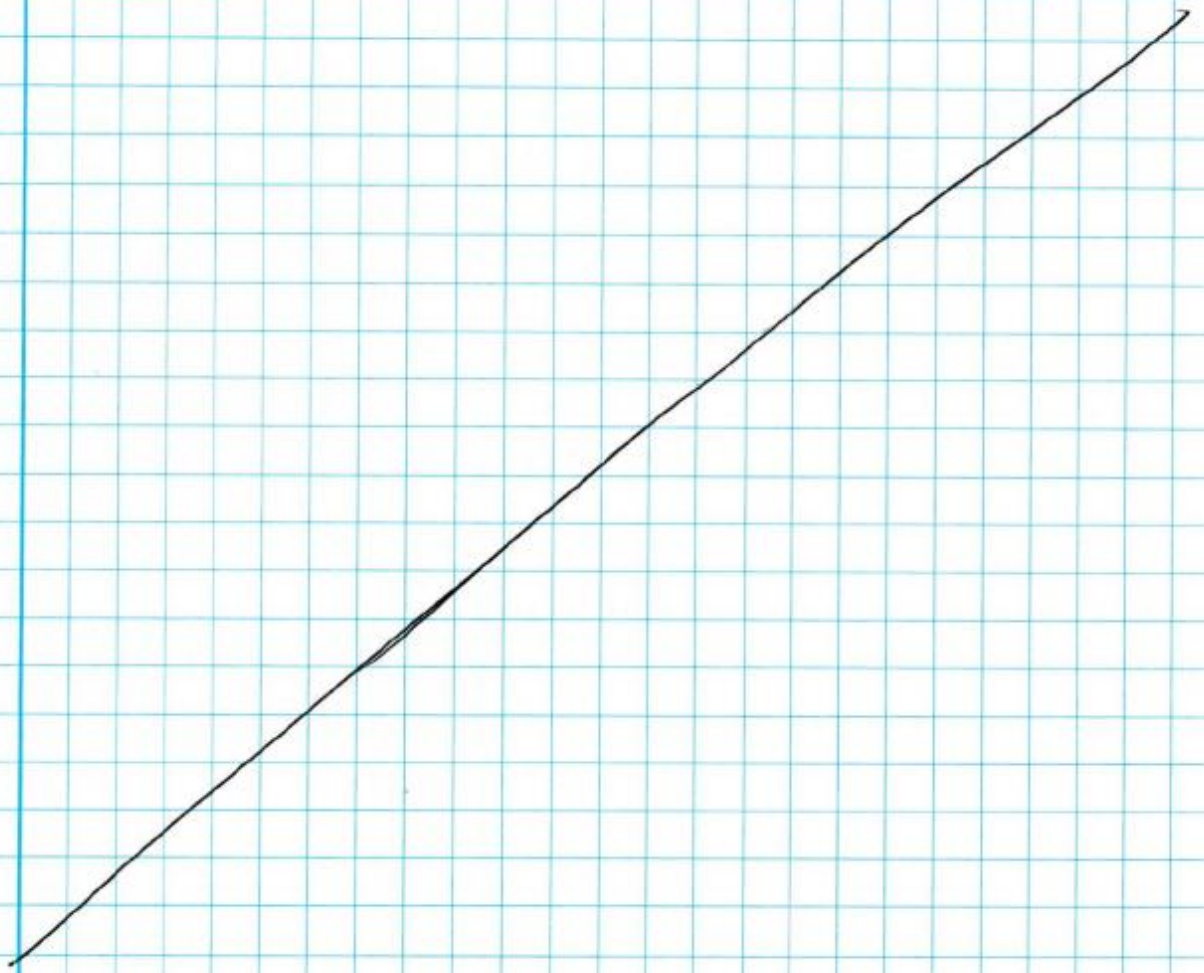
Signature Chi Ki

Witness John D Hoffman

IDEA – POLYMERIC COLORANTS USED IN PAINTBALL APPLICATION

THE POPULARITY OF THE GAME OF PAINTBALL CONSUMES LARGE AMOUNTS OF PAINTBALLS DURING THE GAME. THE PAINT USED IS NON-STAINING AND SEEMS TO WIPE OFF OF CLOTHES FAIRLY EASILY.

QUESTIONS! IS THERE A CURRENT POLYMERIC COLORANT THAT CAN REPLACE THE CURRENT PAINT USED IN PAINTBALLS? WHAT IS THE MARKET SIZE?



Date 28 April 1999

Signature Chris K

Date 17 May 1999

Witness

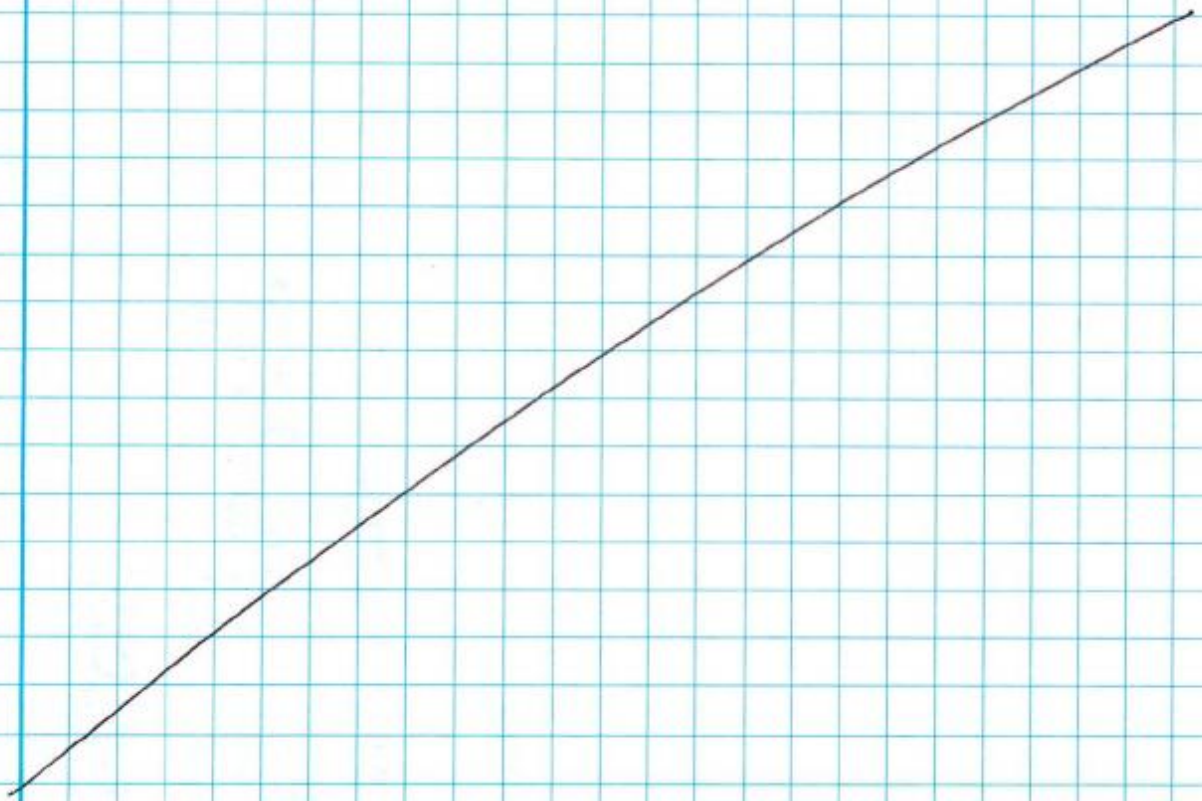
PAINTBALL ANALYSIS

ZAP PAINTBALLS WERE OBTAINED FOR ANALYSIS OF PIGMENT OR DYE COLOR AND TYPE OF CARRIER USED FOR THE PIGMENT / DYE.

MEASURE WEIGHT OF 4 PAINTBALLS.

1) 3.2313 g
2) 3.2460 g
3) 3.2521 g
4) 3.2348 g

$\bar{x} = 3.2410$ g



Date 17 May 1999

Signature

Date 17 May 1999

Witness

10120-59

ANALYTICAL ANALYSIS OF PAINTBALL CONTENT

MILLIKEN

Bill Sims
06/09/99 11:59 AM

To: Chris Kochanowicz
cc:
Subject: Yellow Paint

MILLIKEN RESEARCH CORPORATION, ANALYTICAL CHEMISTRY DEPARTMENT

Request No.: 11401
Date Submitted: 05/17/1999
Date Reported: 06/09/1999

Submitted By: Chris Kochanowicz
Location: RMC M-401

Processed By: Bill Sims (M-425, x-2484)

Subject: Yellow Paint

Background and Work Requested:

DETERMINE TYPE OF PIGMENT OR DYE USED AND THE CARRIER FOR THE PIGMENT OR DYE

Samples Evaluated:

1 VIAL CONTAINING YELLOW PAINT

Results and Conclusions:

Analysis of the paint showed the following components:

Carrier - An ethoxylated fatty alcohol or amine (cannot differentiate by FTIR)

Filler - Titanium Dioxide

Dye - Appears to be a polymeric yellow colorant (based on poly EO/PO). The colorant shows a lambda max at 385 nm in water. This is characteristic of several dyes based on 4-phenylazo aniline.

Chris Kochanowicz, June 9, 1999

Date 9 June 1999 Signature Chris K

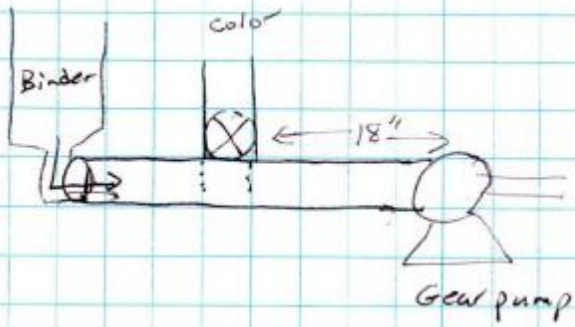
Date September 30, 1999 Witness

RESPONSE TIME OF COLOR ADDITION (WALL VS. CENTER STREAM)

OBJECTIVE - DETERMINE RESPONSE TIME OF COLOR ADDITION ALONG WALL VS. CENTER STREAM IN A BINDER FORMULATION.

BINDER FORMULATION: LAKEWOOD MDI

SET-UP - BONDTIT TRIAL UNIT WITH DUAL PUMPS LO FLOW & HIGH FLOW



A TRIAL WAS RUN INTRODUCING COLOR ALONG THE WALL OF THE MANIFOLD AND IN THE CENTER OF THE BINDER STREAM AND THE RESPONSE TIME OF COLOR/BINDER OUTPUT MEASURED. ALSO, BINDER PURGE TIME WAS MEASURED TO WHERE COLOR WAS CLEARED OUT OF THE MANIFOLD USING A BINDER FLUSH.

COLOR CENTER STREAM	COLOR ALONG WALL
COLOR RESPONSE: 17 sec	COLOR RESPONSE: 35 sec
PURGE TIME: 31 sec	PURGE TIME: > 2 min

CONT. 10120-61

Date 10 June 1999

Date September 30, 1999

Signature

Witness

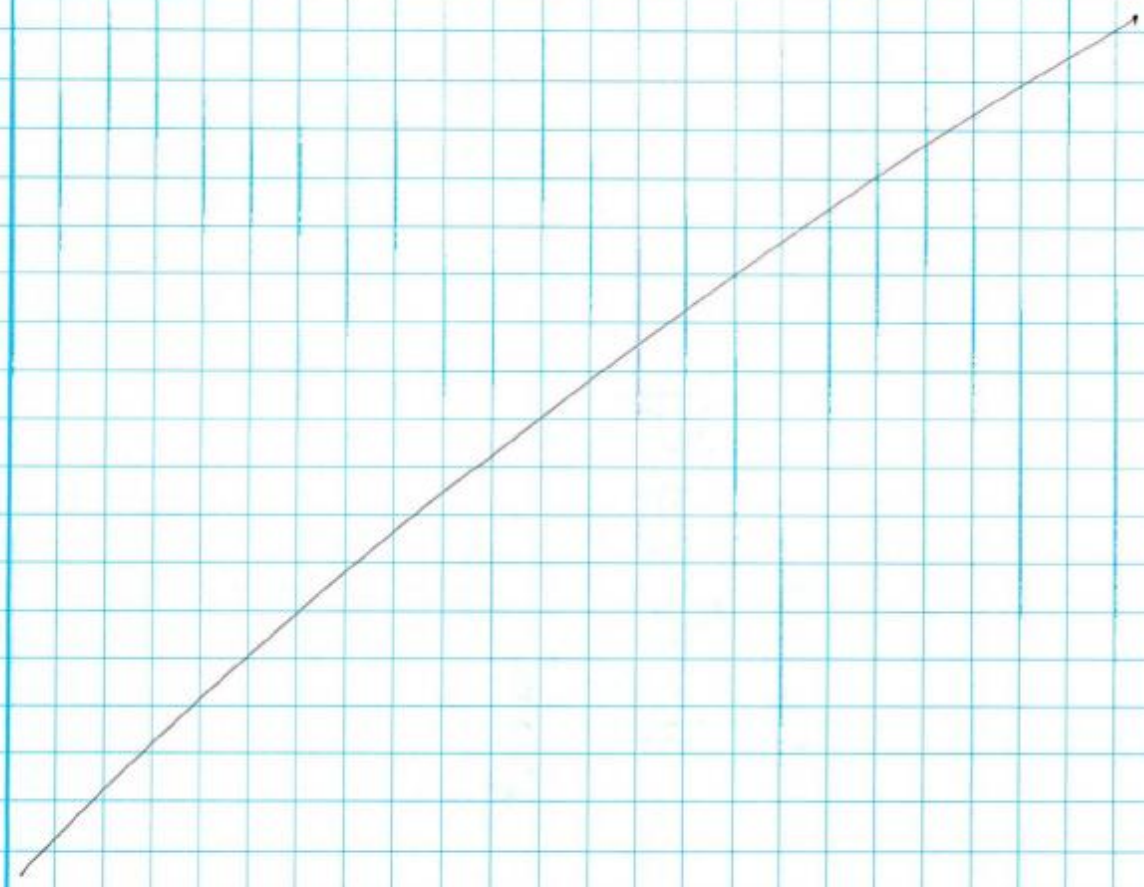
-cont. from 10120-60

Samples collected from the trial where color was introduced center stream & run along the wall were collected in 4oz jars to be studied for gelation over time.

Motor rpm for this trial was 200rpm

@ 200 rpm ⇒ binder flow - 466.5g } from pump
⇒ color flow 11.1g } calibration chart

Uncut BlueX3LV with 4% catalyst and cut with Bearflex Lac to a CV of 20 was run through the manifold



Date 10 June 1999

Signature Chris Kozlowski

Date September 30, 1999

Witness Jeff H. Hall

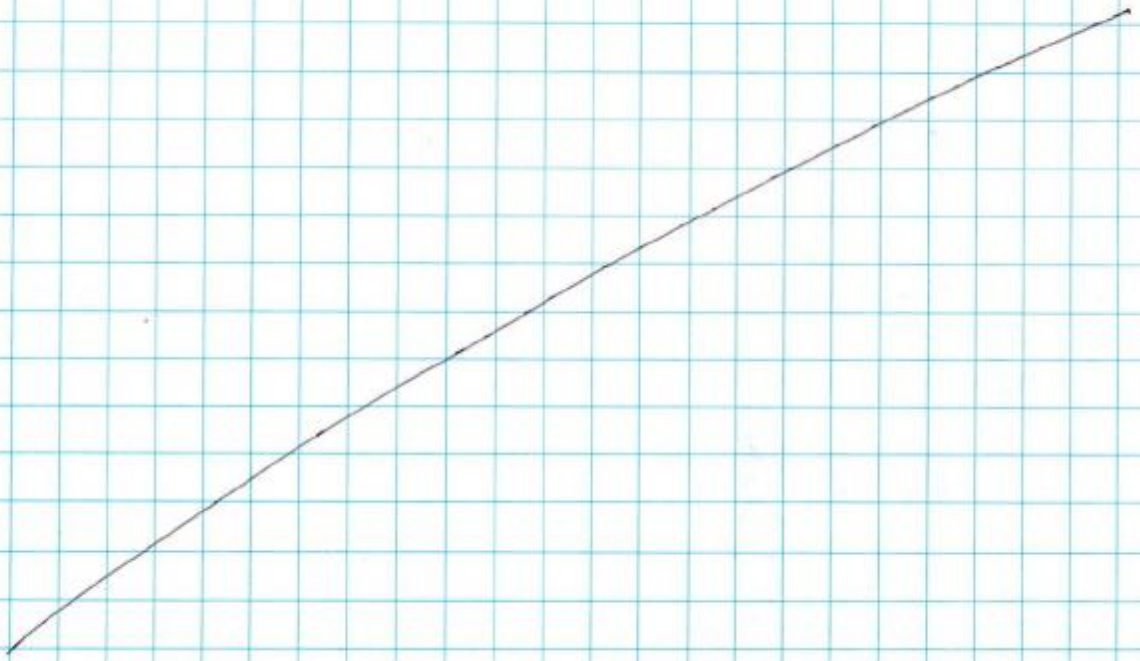
SAMPLE UPDATE FROM SAMPLES COLLECTED 10120-61

THE Samples collected were purged with N_2 and tightly capped.

The sample collected from the center stream run was ~~CAKE~~ 6/15/99 is still flowable although has high viscosity.

The sample collected where color ran along the wall had completely gelled and was not flowable.

Conclusion: Color introduced in center stream is a much more effective means of introducing color into the binder stream. This greatly enhances color response time and drastically reduces purge time. Also, binder stability is much improved by this method of color introduction



Date 15 June 1999

Signature Chi Kong

Date September 30, 1999

Witness

LIQUITONE BLUE 92 LP AS BONDTINT

OBJECTIVE: TEST LIQUITONE BLUE 92 LP FOR A POSSIBLE LOW COST BLUE REPLACEMENT FOR BONDTINT BLUE 458.

RAW MATERIALS: LIQUITONE BLUE 92 LP – STOCK #680500 LOT: PP009
330-LN-L OIL

LIQUITONE BLUE 92LP — COLOR VALUE 52.79
% WATER 21.09%

CORRECTED COLOR VALUE $\frac{52.79}{1-0.2109} = 66.90$

weighed into 500 ml round bottom the following:

LIQUITONE BLUE 92 LP	84.82g
330-LN-L OIL	156.16g

THIS MIXTURE WAS PUT ON THE ROTOVAPOR UNTIL THE % WATER WAS LESS THAN 0.5%. FINAL % H_2O IS 0.02%.

Date 30 September 1999

Signature Chris Kuo

Date September 30, 1999

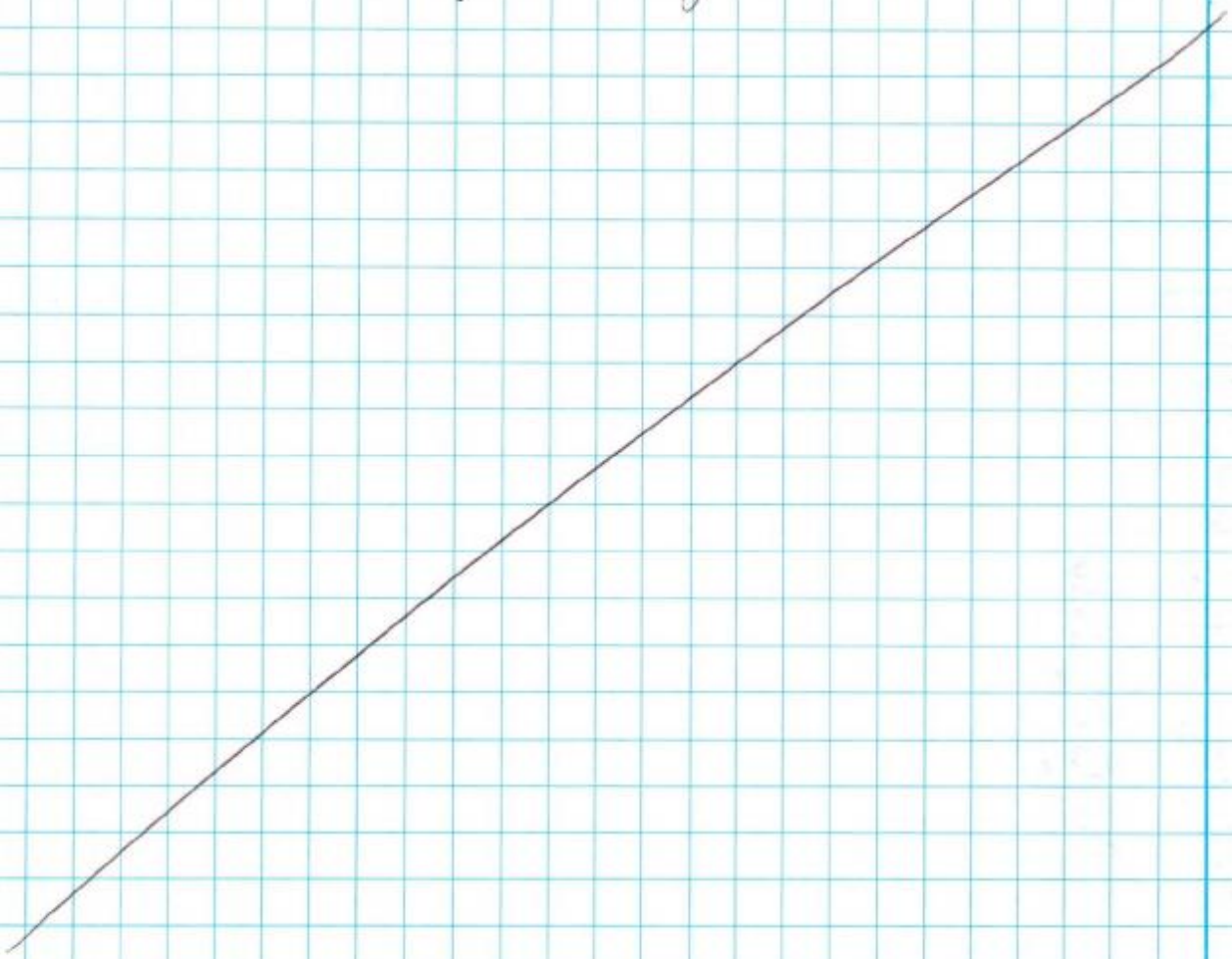
Witness Thu H. Nguyen

BondTint Blue 458 @ CV=17

Objective: Run analysis on BT Blue 458 batch PP005 run in the Pilot Plant at Dewey.

Top Sample: color value: 0.4105g Abs = ~~0.0~~ 0.7003 λ=620.0 CV=17.04
% water: 0.0319g 0.166%

Bottom Sample: Color value: 0.3716g Abs. 0.6264 λ=620.0 CV=16.86
% water 0.321g 0.172%



Date 20 November 1999

Date January 5, 2000

Signature

Witness Daniel

CARBON BLACK PIGMENT DISPERSED IN REACTINT BLACK X77

IDEA: The idea is to disperse carbon black pigment into Reactint Black X77 to produce a stable, super strong black product offering.

RAW materials: Cabot (Monarch) Black Pearls 1100 CS-3396
Cabot (Monarch) Black Pearls 880 CS-5669
RT Black X77 Lot L1703
Span-80 Lot P5491
Propylene Carbonate (Arconate HP)

The key to success for this idea is to make a stable, medium to low viscosity product that is at least as strong as the Ferro "Supra" Black product. Also, this should give better lightfastness properties than X77 by itself.

The Eiger Mill located in SAB will be used to disperse the carbon black in the X77.

Initial formulation with carbon black

- X77	~~130.0 g~~ 130.61 g	
- Carbon Black (1100)	~~50.0 g~~ 50.05 g	
- Propylene Carbonate	~~10.0 g~~ 10.12 g	
- Span-80	~~10.0 g~~ 10.03 g	
	200.0 g	

Formulation has high viscosity.

Date 15 February 2000
Date April 11, 2000

Signature
Witness Daniel

BondTint Blue 458 Viscosity vs. Oil Charge

IDEA: Is there a viscosity spike in the curve when adding oil to the Blue 458 such that it determines if the emulsion has become homogeneous.

Raw Materials: Uncut Blue X3LV Lot V10,18 CV = 50.85
Uncut Violet X80LT Lot B1010 CV = 24.43
Bicat V
Span-80
350LN-L Oil → @ CV = 17

Prepare 300.0 g of BT Blue 458 and add oil at 10% increments and check viscosity on Brookfield Viscometer ID #514.

	Calculated	Actual	
Blue X3LV ⇒ $\frac{300 \times 17}{50.85}$ =	100.29 g	100.32 g	163.34 g
Violet X80LT ⇒ $\frac{300 \times 17}{24.43} \times 10\%$ =	20.88 g	30.90 g	
SPAN-80 ⇒ 300 × 10% =	30.0 g	30.02 g	
Bicat V ⇒ 300 × 4% =	12.0 g	12.10 g	
Oil 300 − 100.29 − 20.88 − 30 − 12 =	136.86		

HEAT 140°F AFTER EACH OIL CHARGE FOR 5 MIN AND MIX

Oil Addition

	Calc.	Act.	Visc. @ 30°C 2/16/00
1ST Charge	13.69 g	13.87	

END OF DAY - CONT. 10120-67

Date 16 February 2000
Date April 11, 2000

Signature Chris K
Witness Daniel

- CONT. 10120-66

Oil Addition

	Calc.	Actual		Viscosity @ 30°C
1st Charge	13.69g	13.87g		3449 cps
2nd Charge	13.69g	13.79g		2705
3rd Charge	"	13.76g	83.11g	2193
4th charge	"	13.76g		1858
5th charge	"	14.23g		1484
6th charge		13.71g		1272
7th Charge	"	13.76g		1087
8th charge		13.68g		952.8
9th charge		13.93g		861.8
10th charge	"	12.64g		765.8
		136.96g		

Viscosity of 330-LN-L oil @ 30°C ⇒ 86.3cps

Date 17 February 2000

Signature

Date April 11, 2000

Witness Daniel Conn

Paintball Analysis

OBJECTIVE: Determine composition of paint in a variety of paintballs.

	Paintball Color ~~Weight~~	Color Paint Inside	Paintball Total Weight (g)	Weight of Shell	Weight of Paint
1)	Yellow	Yellow	3.0274 g	~~0.3339~~ ~~2.6935 g~~	2.6935 g
2)	Yellow	"	3.0039 g	0.3202	2.6837 g
3)	Yellow	"	3.0196	0.3283	2.6913 g
4)	Blue	Pink	3.2187	0.3416	2.8771 g
5)	Blue	Pink	3.2014		
6)	Blue	Pink	3.2134		
7)	Green/orange	Orange	3.2752	0.3441	2.9311 g
8)	Green/orange	Orange	3.2976		
9)	Green/orang	Orange	3.2629		
10)	Green/white	White	3.2469	0.3037	2.9432 g
11)	Green/white	White	3.2555		
12)	Green/white	White	3.2515		
13)	Red	Red	2.9928	0.2915	2.7013 g

19.5212 g

$\bar{x} = 2.7887$ g

Date 24 February 2000

Signature Chi Kah

Date April 11, 2000

Witness Danie

Low Viscosity Liquitint Analysis with A peristaltic pump

OBJECTIVE: DETERMINE OUTPUT CONSISTENCY OF LOW VISCOSITY PRODUCT

- Pink AL / Acid Red 52 Int. 1 cps
- Liquitint Crimson 12 cps

- Masterflex CL Model 77120-60 Peristaltic Pump

Tubing size 0.0449" ⇒ 1.8697g → 1 min
1.8858g "

Date 27 March 2000
Date April 11, 2000

Signature
Witness April 11, 2000
Daniel Camm

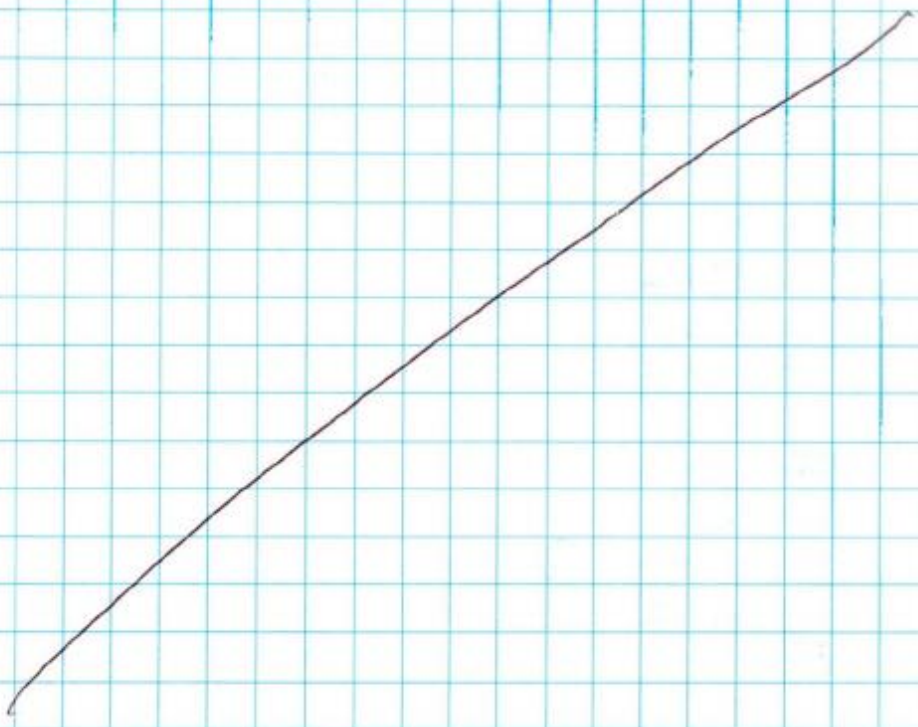
REPEAT OF 10120-69

Pink AL/Acid Red 52 Int. 1 cps. LOT W1009

Tubing size: 0.0449"
pump setting ~~low~~ 3/10/00, medium

31.5 rpm
1) 1.5546 g
2) 1.5592 g
3) 1.5426 g
4) 1.5640 g
5) 1.5508 g

51.0 rpm
1) 2.4583 g
2) * clumps in bottle - bottle taken to Jim Stavrakas for analysis



Date 30 March 2000
Date April 11, 2000

Signature [illegible]
Witness Daniel Comm

Repeat of 10120-69 except using Liquitint Crimson

Liquitint Crimson 12 cps
Tubing 0.0449" - ID

20 rpm
1) 0.9899 g
2) 0.9653 g
3) 0.9744 g
4) 0.9599 g
5) 0.9720 g
$\bar{X}$ = 0.9723

32 rpm
1) 1.5266 g
2) 1.5296 g
$\bar{X}$ = 1.5281

40 rpm
1) 1.8992 g
2) 1.8781 g
3) 1.8970 g
$\bar{X}$ = 1.8914

64 rpm
1) 2.9229 g
2) 3.0140 g
3) 2.9503 g
$\bar{X}$ = 3.0044

Tubing - 0.0812" ID

22 rpm
1) 3.2909 g
2) 3.2859 g
$\bar{X}$ = 3.2634

34 rpm
1) 5.0434 g
2) 5.0125 g
$\bar{X}$ = 5.0280

41 rpm
1) 6.0009 g
2) 6.1183 g
3) 6.0403 g
$\bar{X}$ = 6.0532

65 rpm
1) 9.4418 g
2) 9.4632 g
3) 9.5631 g
$\bar{X}$ = 9.4894

Date 30 March 2000 Signature [illegible]

Date April 11, 2000 Witness Daniel Cannon

Test Telura 619 as possible BT diluent replacement

Uncut Blue X3 Lot V1018 CV = 50.85
Uncut Violet X80 Lot B1010 CV = 24.43
SPAN-80 Lot P5491
BiCat V
330-LN-L

Prepare 20g sample of BT Blue 458 using Telura 619 oil as diluent and check for separation.

Formulation

$X3 \Rightarrow \frac{(20.0g)(17)}{50.85} = 6.69g$

$X80 \Rightarrow \frac{(20.0)(17)}{24.43}(10\%) = 1.39g$

Span-80 $\Rightarrow (20.0)(10\%) = 2.0g$

BiCat V $\Rightarrow (20.0)(4\%) = 0.8g$

Oil $\Rightarrow 20 - 6.69 - 1.39 - 2 - 0.8 = 9.12$

Slide test reveals emulsion and after several hours separation.

Date 6 April 2000
Date April 11, 2000

Signature Chris Kaufmann
Witness Daniel Connors

Test Cyclolube 210 same formulation as 10120-72

1) X3 ⇒ 6.69g

2) X80 ⇒ 1.39g

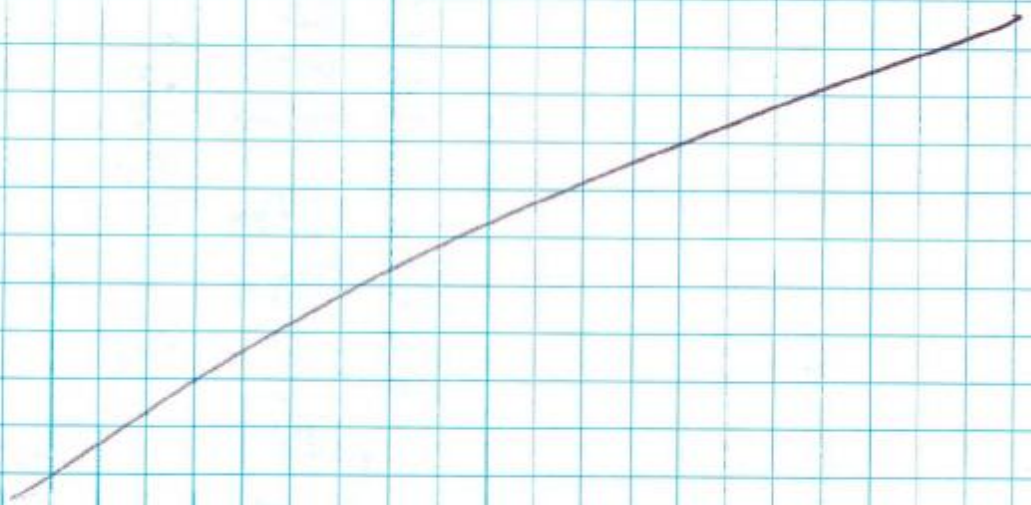
3) Span-80 ⇒ 2.0g

4) Bicat V ⇒ 0.8g

Cyclolube 210 ⇒ 9.12g

Mix 4 ingredients and heat to 60°C and mix. Then add Cyclolube, heat back to 60°C and mix. Check for separation on slide.

Separation on slide



Date 10 April 2000

Date April 11, 2000

Signature

Witness Daniel

10120-72 + Stearic Acid.

Take sample made on 10120-72 and add stearic acid.

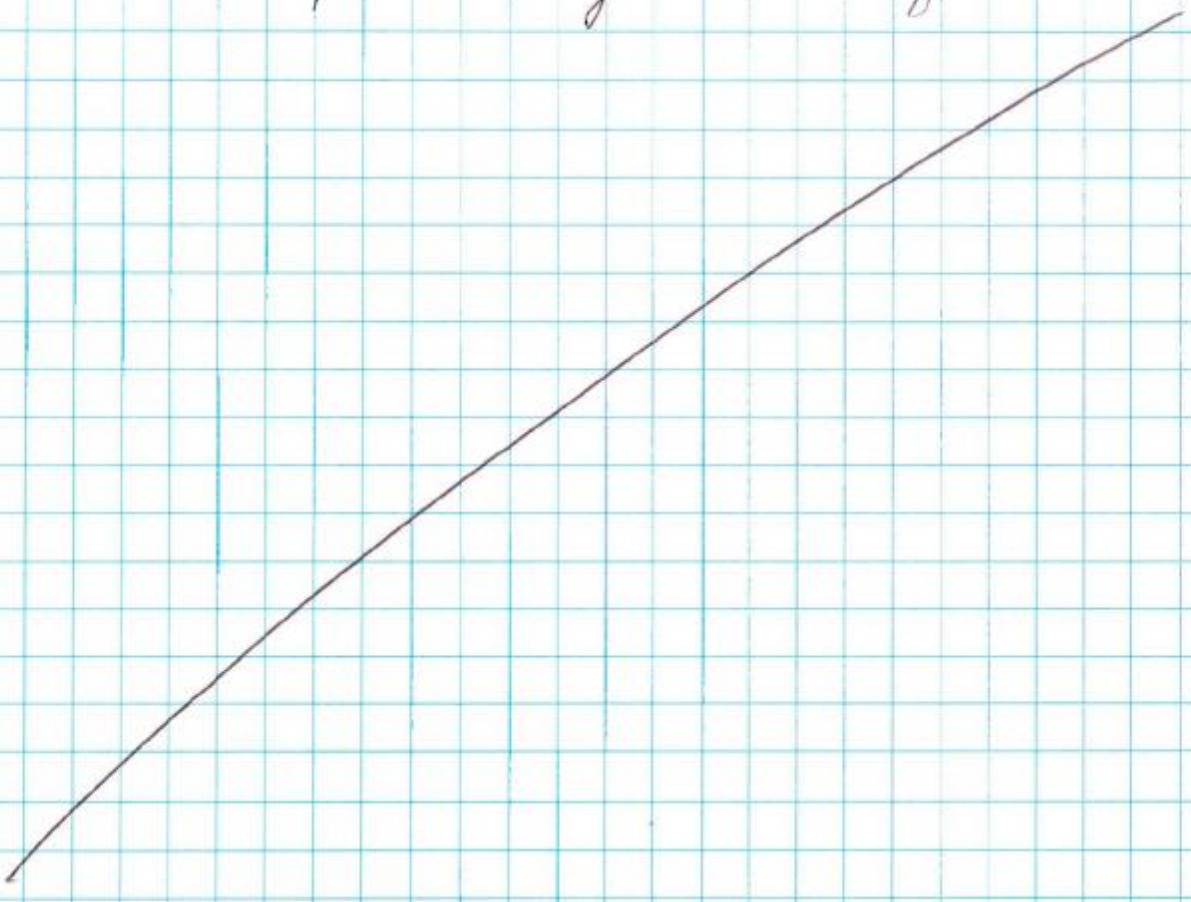
stearic acid 1.7698g

Result: Separation on slide

Add Stearic Acid 6 EO to formulation

Result Separation on slide

Note: Material gelled at room temp. but upon re-heating became a liquid.



Date 4 April 2000

Date April 11, 2000

Signature

Witness

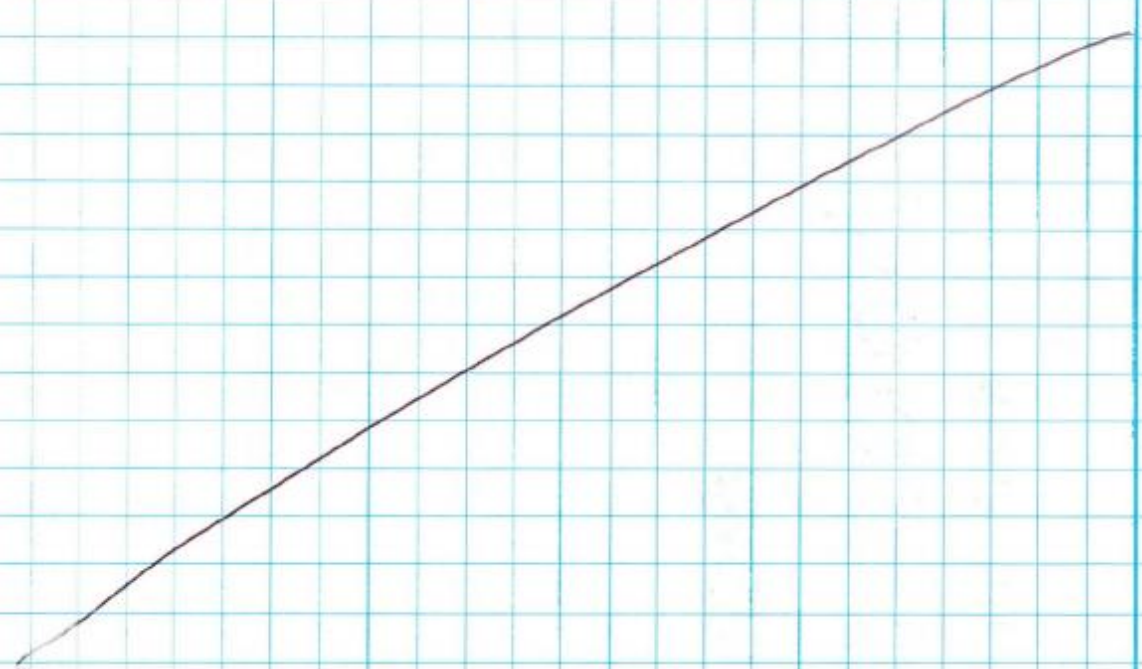
BT Blue 458 made with Blue X3 using Stratcor AMV

- Two samples of uncut Blue X3 using Stratcor AMV
- Test for extraction and stability in BT formulation

uncut Blue X3 Lot D1224 CV = 53.98
" " Lot PP004 CV = 52.75

Prepare 20g Sample

X3 Lot D1224	6.30g	Lot PP004	6.44g
X80	1.39g		1.39g
Span-80	2.00g		2.00g
BiCat V	0.80g		0.80g
330 LNL	9.51g		9.37g
	20.00g		20.00g



Date 10 April 2000
Date April 11, 2000

Signature
Witness Daniel