

-23

Townsend, David

319101-319150

AIR DILUTION AND FILTRATION



SECRET

No. 26 By c. r. r.



Subject Parameter Study

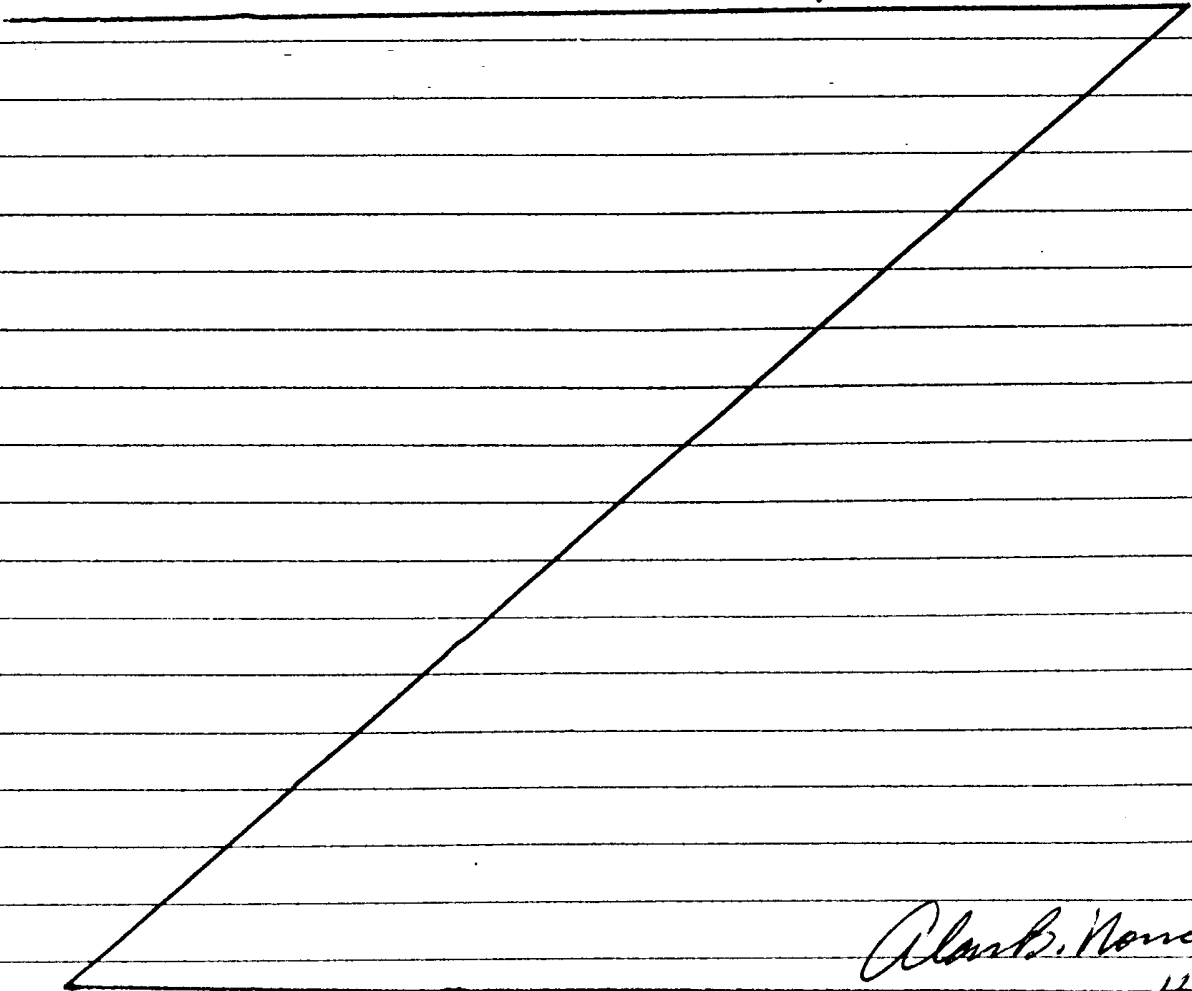
319101

DET 102537-A

6.5 puffs/cig
 7.1 mg/cig TPM
 15.2 mg/cig nicotine
 .7 mg/cig TPM H₂O
 5.9 mg/cig FTL TAR
 6.7 mg/cig CO
 25.9 mg/cig CO₂

DET 102639-A

7.3 puffs/cig
 .8 mg/cig TPM
 1.04 mg/cig nicotine
 .3 mg/cig TPM H₂O
 .4 mg/cig TAR
 1.0 mg/cig CO
 8.7 mg/cig CO₂



Clark B. Nover
H11-80

SIGNATURE AND DATE

D.E. Townsend 11/16/79

READ AND UNDERSTOOD (Signature and Date)

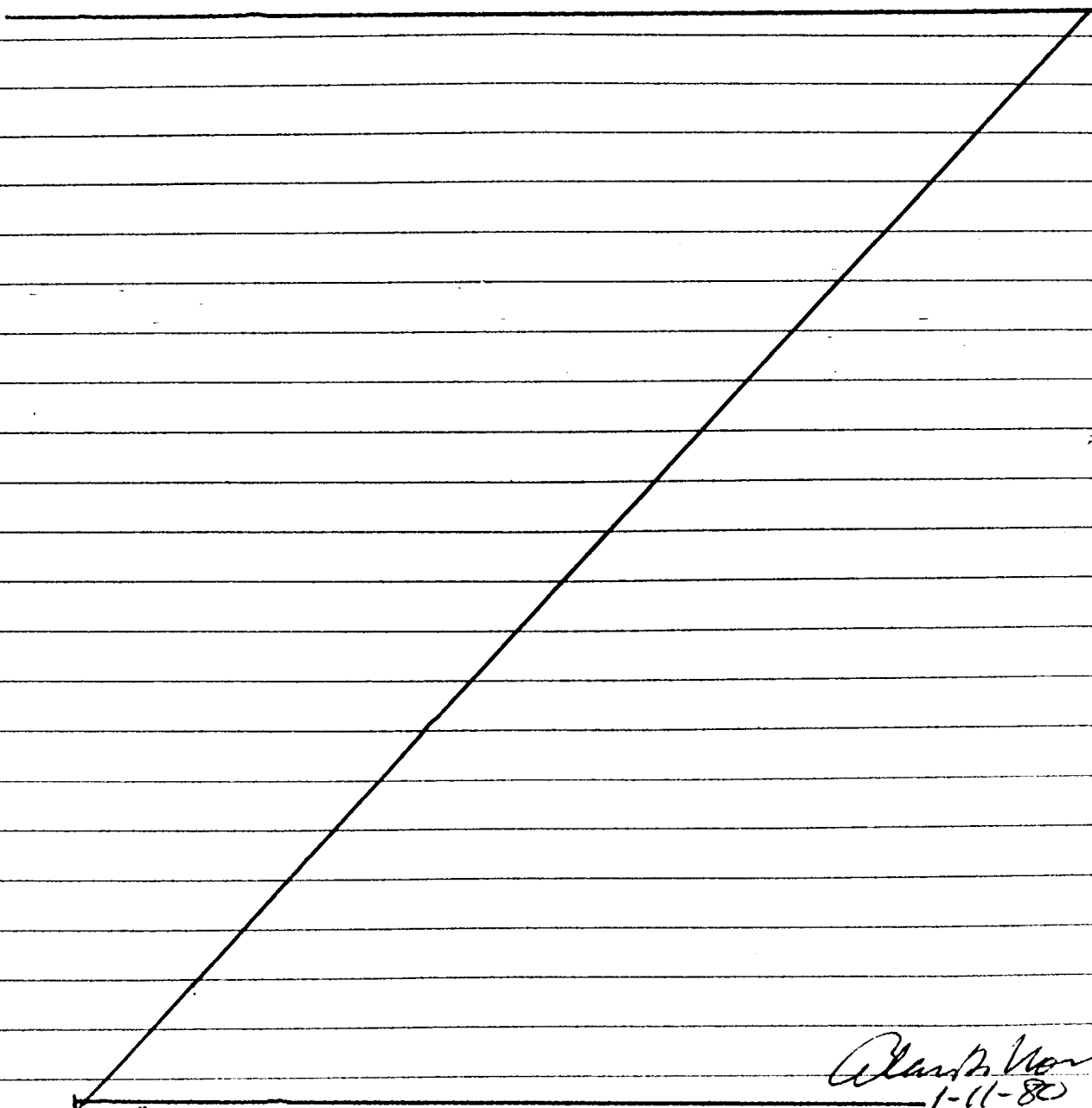


Subject

Cigarette Variability

The following samples were submitted for smoke analysis.

- DET 112179-A Winston Lts - Unglued - 7 ports WTPM NICO 140 FTCT Co Co₂
- B Donald II - Unglued -
- C Camel Lts - Unglued -
- D Winston Lts - Glued -
- E Donald II - Glued -
- F Camel Lts - Glued -



50418 1001

Charles Warren
1-11-80

SIGNATURE AND DATE

David E. Johnson 11/21/79

READ AND UNDERSTOOD (Signature and Date)

Subject

Titanium mentholateDate 11/29/79

319103

The following cigarettes were submitted for smoke analyses.

DET 112679-A Ti(OH)₄ - 5 ports FTCT WTPM NICO H₂O CO CO₂

B - 3 reps Menthol

C Control - 5 ports FTCT WTPM NICO H₂O CO CO₂

-D SnO₂-100mg - 3 ports FTCT WTPM NICO H₂O CO CO₂

-E - 3 reps HCN

F 3 reps NO

G 3 reps CH₂CHO TCHO TH

H Control for SnO₂ - 3 ports FTCT WTPM NICO H₂O CO CO₂

I - 3 reps HCN

J - 3 reps NO

-K - 3 reps CH₂CHO TCHO TH

50418 1002

Alan B. Norman

1-11-80

SIGNATURE AND DATE

De J... 11/29/79

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Subject

Date 11/30/79Cigarette Variability319104

The following cigarettes were submitted for smoke analysis

DET 113079-A	L-13040-L - unglued -	7 parts FTCT WTPM NICO CO CO ₂
B	L-13040-L - glued -	"
C	L-13040-J - unglued -	"
D	L-13040-J - glued -	"
E	TiO ₂ additive cigs	5 parts FTCT WTPM NICO H ₂ O CO CO ₂
F		3 rep NO
G		3 rep CH ₃ CHO ITCHO MI
H	Control	5 parts FTCT WTPM NICO H ₂ O CO CO ₂
I		3 rep NO
J		3 rep CH ₃ CHO ITCHO MI
K	SiO ₂ additive cigs	5 parts FTCT WTPM NICO H ₂ O CO CO ₂
L		3 rep NO
M		3 rep CH ₃ CHO ITCHO MI
N	Control	5 parts FTCT NICO H ₂ O WTPM CO CO ₂
O		3 rep NO
P		3 rep CH ₃ CHO ITCHO MI

50418 1003

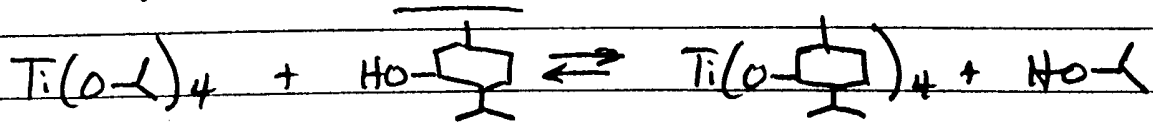
Alan B. Nowe
1-11-80

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D. E. Townsend 11/30/79

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The following preparation of Titanium mentholate was attempted.



The reaction was driven to completion by vac. distillation (1 mmHg) / 40°C of HO-L.

To a RB flask - (500ml) - was added 18.8g menthol (natural) and 8.5g Ti(O-L)₄ (P&B). The mixture was stirred ~ 1 hr until solution achieved & vac applied (~ 1 mmHg). The solution was held under vacuum for 2 hrs followed by warming to 40°C & holding for 1 hr. The soln. was cooled to RT & opened to atmosphere. Faint menthol odor was noticed.

A clear liquid was trapped in the vac distillation which was tentatively identified by odor to be isopropanol.

$$\left. \begin{array}{l} \text{wt} = 6.7 \text{ g} \\ \text{theor.} = 7.32 \text{ g} \end{array} \right\} \Rightarrow 91.5\% \text{ recovery of HO-L}$$

The clear, viscous liquid remaining in RB flask was left uncovered for 6 days during which crystallization occurred. Strong odor of menthol noted.

left to stand additional 4 days before loading into cigarettes.

Alan B. Kover
1-11-80

De Tournay 11/30/79



Subject Parameter Study

319106

DET 101518 - G	1. ug/cig	Formaldehyde
DET 110855 - B	11.7 ug/cig	HCN
DET 110849 - B	9.5 ug/cig	"
DET 110644 - B	34.5 ug/cig	"
DET 110751 - B	93.9 ug/cig	"
DET 110854 - B	9.8 ug/cig	"
DET 110747 - B	28.8 ug/cig	"
DET 110855 - H	4.3 ug/cig	NH ₃
DET 110848 - H	4.7 ug/cig	NH ₃
DET 110957 - H	7.0 ug/cig	"
DET 110956 - H	16.0 ug/cig	"
DET 110855 - D	105. ug/cig	Acetaldehyde
	20. ug/cig	acrolin
	49. ug/cig	Isoprene
DET 110956 - C	122. ug/cig	NO
DET 110957 - C	48. ug/cig	NO
DET 100849 - G	12. ug/cig	Formaldehyde
DET 100450 - G	26. ug/cig	"
DET 110854 - D	88. ug/cig	acetaldehyde
	18. ug/cig	acrolin
	64. ug/cig	isoprene
DET 110848 - D	99. ug/cig	acetaldehyde
	19. ug/cig	acrolin
	69. ug/cig	isoprene
DET 110644 - A	8.9 puff/cig	
	4.7 mg/cig	TPM
	.46 mg/cig	nicotine
	.3 mg/cig	TPM H ₂ O
	4.0 mg/cig	Tar
	2.4 mg/cig	CO
	15.3 mg/cig	CB ₂

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D. Journal 1/3/80

Alan B. Norman
1-11-80
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50418 1005



Subject

Parameter Study

319107

DET 110747-A

7.2 puffa/cig

4.0 mg/cig TPM

38 mg/cig nicotine

.3 mg/cig TPM H2O

3.4 mg/cig TAR

2.1 mg/cig CO

13.3 mg/cig CO2

DET 101923-B

14.8 ug/cig HCN

DET 101822-B

123.6 ug/cig HCN

DET 110957-D

123. ug/cig acetal.

21. ug/cig acrolein

75. ug/cig isoprene

DET 110956-D

447. ug/cig acetaldehyde

48. ug/cig acrolein

236. ug/cig isoprene

DET 110854-A

12.4 puffa/cig

1.2 mg/cig TPM

1.5 mg/cig nicotine

.1 mg/cig TPM H2O

1.0 mg/cig TAR

10.7 mg/cig CO

1.1 mg/cig CO

DET 110751-A

6.8 puffa/cig

7.0 mg/cig TPM

1.56 mg/cig nicotine

.6 mg/cig TPM H2O

5.8 mg/cig TAR

5.5 mg/cig CO

23.9 mg/cig CO2

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Alan B. Norman

SIGNATURE AND DATE

D. Journal 1/3/80

1-11-80

READ AND UNDERSTOOD (Signature and Date)



Subject Parameter Study

Date 12-4-79

319108

DET 110348-A

7.8 puffs/cig
1.1 mg/cig TPM
.14 mg/cig nicotine
.1 mg/cig TPM H₂O
.9 mg/cig TAR
1.3 mg/cig CO
10.5 mg/cig CO₂

DET 110957-A

7.1 puffs/cig
2.6 mg/cig TPM
2.5 mg/cig nicotine
.2 mg/cig TPM H₂O
8.1 mg/cig TAR
12.2 mg/cig CO₂
1.7 mg/cig CO

DET 110855-A

11.6 puffs/cig
1.1 mg/cig TPM
.13 mg/cig nicotine
.1 mg/cig TPM H₂O
.8 mg/cig TAR
8.6 mg/cig CO₂
.7 mg/cig CO

DET 110956-A

9.1 puffs/cig
7.0 mg/cig TPM
.60 mg/cig nicotine
.6 mg/cig TPM H₂O
5.8 mg/cig TAR

DET 10228-B

36.4 ug/cig HCN

DET 110854-E

3.0 ug/cig Phenol

DET 110751-E

18.7 ug/cig "

DET 110747-E

17.3 ug/cig "

DET 110540-E

17.7 ug/cig "

DET 110955-E

1.0 ug/cig "

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Subject Parameter Study

DET	110957 E	4.7	ug/ug	Phenol
DET	110956- E	15.3	ug/ug	"
DET	110848- E	2.0	ug/ug	"
DET	100853- G	1.	ug/ug	Formaldehyde
DET	100532- G	2.	ug/ug	"
DET	162536- B	21.5	ug/ug	HCN
DET	102537- B	77.1	ug/ug	"
DET	110644- E	14.0	ug/ug	Phenol
DET	101118- G	14.0	ug/ug	Formaldehyde
DET	100913- G	11.	ug/ug	"
DET	110540- H	18.3	ug/ug	NH ₃
DET	162330- B	7.8	ug/ug	HCN
DET	102433- B	101.0	ug/ug	"
DET	110747- H	7.3	ug/ug	NH ₃
DET	102329- B	7.1	ug/ug	HCN
DET	110751- H	16.3	ug/ug	NH ₃
DET	110854- H	4.0	ug/ug	NH ₃
DET	110644- H	11.3	ug/ug	"
DET	102639- B	18.1	ug/ug	HCN
DET	110542- B	108.2	ug/ug	HCN

Alan B. Norman

SIGNATURE AND DATE

Journal 1/3/80

1-11-80

READ AND UNDERSTOOD (Signature and Date)



Subject Effects of Air Dilution on Smoke Deliveries

319110

AP 30-35

Effects of Air Dilution on Smoke Deliveries 12-4-79

HD	HC	AP	HD	HC	AP	HD	HC	AP
1. 30	64	34	28. 34	67	33	57. 40	74	34
2. 30	58	21	30. 35	63	26	58. 45	72	27
3. 28	58	30	31. 39	68	29	59. 35	63	21
4. 33	63	30	32. 34	65	31	60. 39	69	30
5. 29	57	28	33. 36	64	28	61. 36	70	34
6. 35	70	35	34. 33	63	30	62. 42	74	32
7. 21	59	31	35. 36	63	27	63. 39	70	31
8. 30	59	28	36. 39	76	37	64. 44	71	27
9. 29	59	30	37. 47	80	33	65. 38	69	31
10. 31	61	30	38. 37	70	33	66. 36	67	31
11. 31	60	29	39. 40	71	31	67. 49	84	35
12. 34	74	30	40. 34	70	32	68. 31	62	31
13. 29	59	30	41. 37	66	29	69. 44	72	28
14. 29	59	31	42. 41	73	32	70. 37	72	35
15. 34	68	34	43. 37	66	29	71. 39	66	27
16. 27	56	29	44. 35	62	27	72. 33	59	26
17. 35	65	30	45. 39	65	27	73. 37	68	31
18. 32	67	35	46. 37	67	30	74. 37	65	28
19. 34	63	29	47. 39	69	30	75. 37	64	27
20. 47	81	33	48. 39	71	32			
21. 34	66	32	49. 34	70	36			
22. 39	70	31	50. 37	73	36	HD 36.2 ± 4.6	31-40	
23. 35	68	33	51. 35	72	37	HC 67.4 ± 5.7	61-23	
24. 35	69	34	52. 34	65	31	AP 31.0 ± 2.7	28-33	
25. 37	71	34	53. 41	70	29			
26. 40	73	33	54. 48	78	36			
27. 38	69	31	55. 37	70	33			
28. 38	70	32	56. 42	73	31			

50478 1009

SIGNATURE AND DATE Reynolds 1/3/80

Alan B. Norman
1-11-80
READ AND UNDERSTOOD (Signature and Date)



Subject

Effects of Air Pollution on Smoke Detectors

Project No.

1246

Date

12-4-79

319111

Prepared AP by 30

11-29-79

	HD	HL	AP		HD	HL	AP		HD	HL	AP
	1. 40	57	17		29. 38	61	23		57. 36	54	18
	2. 37	54	17		30. 39	60	21		58. 40	66	26
	3. 42	61	19		31. 41	58	17		59. 36	56	20
	4. 40	59	19		32. 37	60	23		60. 32	47	15
	5. 40	55	15		33. 47	70	23		61. 38	55	17
	6. 37	56	19		34. 38	59	21		62. 42	60	18
	7. 37	59	22		35. 37	57	20		63. 38	59	21
	8. 45	66	21		36. 37	58	21		64. 43	63	20
	9. 34	49	15		37. 48	80	32		65. 35	52	17
	10. 52	37	15		38. 34	58	20		66. 37	57	20
	11. 40	62	22		39. 42	66	24		67. 42	65	23
	12. 37	53	16		40. 42	61	19		68. 39	57	18
	13. 46	70	24		41. 37	54	17		69. 40	60	20
	14. 39	55	16		42. 53	77	24		70. 37	55	18
	15. 36	55	19		43. 33	51	18		71. 46	69	23
	16. 50	74	24		44. 39	58	19		72. 43	66	23
	17. 42	67	25		45. 38	57	19		73. 37	58	21
	18. 38	57	19		46. 36	56	20		74. 38	58	20
	19. 41	63	22		47. 40	61	21		75. 45	66	21
	20. 35	52	17		48. 39	58	19				
	21. 34	49	15		49. 39	63	24				
	22. 33	48	15		50. 38	59	21		S.D		
	23. 44	73	29		51. 40	63	23		HD 39.8 ± 4.5	35-44	
	24. 35	50	15		52. 46	62	22		HL 59.6 ± 7.2	52-66	
	25. 41	69	21		53. 37	55	18		AP 20.2 ± 3.3	17-23	
	26. 56	76	28		54. 43	63	20				
	27. 34	51	17		55. 38	60	22				
	28. 41	65	24		56. 41	60	19				

50418 1010

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D. Journal 1/3/80

Alan B. Norman

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Subject

Effects of Air Dilution on Smoke Delivered

Project No.

1246

Date

12-4-79

319112

Original 7-10 AP

11-29-79

	HO	HC	AP	HO	HC	AP					
1	49	58	9	29	53	61	8	57	42	49	7
2	49	57	8	30	43	50	7	58	46	54	8
3	43	52	9	31	50	59	9	59	43	53	7
4	50	59	9	32	57	68	11	60	54	61	7
5	61	75	14	33	49	57	8	61	42	49	7
6	52	62	10	34	48	55	7	62	50	59	9
7	51	60	9	35	46	54	8	63	48	56	8
8	64	74	10	36	52	62	10	64	49	57	8
9	51	60	9	37	41	49	8	65	52	62	10
10	51	60	9	38	49	57	8	66	50	60	10
11	51	60	9	39	48	56	8	67	54	64	10
12	55	62	7	40	63	71	8	68	50	58	8
13	50	59	9	41	50	58	8	69	50	60	10
14	48	54	6	42	48	58	10	70	50	58	8
15	52	61	10	43	46	54	8	71	45	53	8
16	51	61	10	44	49	58	9	72	54	61	7
17	49	59	11	45	60	71	11	73	52	62	10
18	49	58	9	46	50	60	10	74	50	60	10
19	47	55	8	47	55	65	10	75	51	59	8
20	53	62	9	48	52	59	7	76	59	69	10
21	58	69	11	49	53	62	9				
22	51	61	10	50	47	56	9				
23	54	61	7	51	47	56	9				
24	46	54	8	52	49	59	10				
25	47	54	7	53	52	62	10				
26	49	58	9	54	49	56	7				
27	52	61	9	55	51	60	9				
28	43	50	7	56	46	54	8				

HO 50.1 ± 4.3 45-54
 HC 52.8 ± 5.0 53-63
 AP 8.6 ± 1.1 7-9

SIGNATURE AND DATE

Journal 1/3/80

Alan B. Norman

READ AND UNDERSTOOD (Signature and Date)

50418 1011



Subject Cigarette Variability

319113

L12040L
80 cig

11-07-79

CIGARETTE VARIABILITY

	<u>HD</u>	<u>HC</u>	<u>AP</u>		<u>HD</u>	<u>HC</u>	<u>AP</u>
1.	117	139	20	29.	113	134	21
2.	108	137	19	30.	116	135	19
3.	109	129	20	31.	107	126	19
4.	108	133	25	32.	120	140	20
5.	123	145	20	33.	121	147	26
6.	114	133	19	34.	107	127	20
7.	117	135	18	35.	116	123	24
8.	124	150	26	36.	115	137	22
9.	117	135	18	37.	112	125	16
10.	120	142	22	38.	117	141	24
11.	120	142	22	39.	114	139	25
12.	114	136	22	40.	114	134	22
13.	117	136	19	41.	113	124	21
14.	126	147	21	42.	107	124	17
15.	105	125	20	43.	98	103	10
16.	112	132	28	44.	109	126	17
17.	123	145	22	45.	107	123	12
18.	109	128	19	46.	119	139	20
19.	101	117	16	47.	109	123	11
20.	112	140	22	48.	107	125	12
21.	125	153	28	49.	106	117	11
22.	121	144	23	50.	97	104	7
23.	120	133	31	51.	113	133	20
24.	121	141	20	52.	114	135	21
25.	120	141	20	53.	107	123	10
26.	119	135	20	54.	116	139	23
27.	107	129	22	55.	117	138	21
28.	109	131	22	56.	85	97	12

50418 1012

SIGNATURE AND DATE

D. Journal 11/3/80

Oliver B. Norman

READ AND UNDERSTOOD (Signature and Date)

1-11-80



Subject

Cigarette Variability

Project No.

1246

Date

12-5-79

319114

L 13040 L
80 cig Lon.

11-27-79

	<u>HO</u>	<u>HL</u>	<u>AP</u>
57	108	117	14
58	113	131	18
59	121	142	21
60	113	131	18
61	112	133	21
62	112	131	19
63	120	141	21
64	100	117	17
65	127	150	23
66	109	129	20
67	105	123	18
68	117	137	20
69	111	135	24
70	126	146	20
71	107	129	22
72	114	135	21
73	112	131	19
74	123	149	26
75	106	125	19
76	115	134	19
77	131	155	24
78	112	132	20
79	116	135	19
80	113	134	21

HO 113.4 ± 9.7 135-121
HL 133.4 ± 10.6 172-144
AP 20.0 ± 3.7 16-23

50418 1013

SIGNATURE AND DATE

D. Starnes 1/3/80

Alan B. Norma
1-11-80

READ AND UNDERSTOOD (Signature and Date)



Subject

Cigarette Variability

Project No. 1246

Date 12-5-79

319115

L13040L

11-27-79

40 pellets by cig for smoking analysis

	HO	HL	AP		HL	HL	AP
1.	108	127	19	21.	113	134	21
2.	106	128	22	22.	114	134	20
3.	115	134	19	23.	115	132	17
4.	114	133	19	24.	107	126	19
5.	105	124	19	25.	115	133	15
6.	115	136	21	26.	118	126	18
7.	118	147	23	27.	116	136	20
8.	106	123	17	28.	114	130	16
9.	118	139	21	29.	108	127	19
10.	119	141	22	30.	115	134	19
11.	113	136	23	31.	111	132	21
12.	114	136	22	32.	106	127	21
13.	115	135	20	34.	112	132	20
14.	107	127	20	35.	107	126	19
15.	118	140	22	36.	108	126	20
16.	115	133	18	37.	118	141	23
17.	113	136	23	38.	117	137	20
18.	118	138	20	39.	107	127	20
19.	116	134	22	40.	113	133	20
20.	106	123	17				

HO 113.4 ± 7.7 105-121
 HL 133.4 ± 10.6 122-144
 AP 20.0 ± 3.7 16-23

Range for above cig.
 selected for the 80 cig

HO 112.4 ± 4.3
 HL 132.6 ± 5.1
 AP 20.0 ± 1.8

SIGNATURE AND DATE

Journal 1/3/80

Robert B. Norman
 1-11-80
 READ AND UNDERSTOOD (Signature and Date)

50418 1014



Subject

Cigarette Variability

Project No.

1246

Date

12-5-79

319116

L 130404
40 cig before of low room

11-27-79

	<u>HL</u>	<u>HC</u>	<u>OP</u>		<u>HL</u>	<u>HC</u>	<u>OP</u>
1.	115	134	19	21.	112	135	23
2.	117	139	22	22.	115	135	23
3.	115	131	16	23.	110	133	23
4.	115	135	20	24.	107	125	18
5.	110	132	22	25.	110	129	18
6.	114	135	21	26.	117	141	23
7.	109	127	18	27.	114	139	21
8.	107	129	22	28.	110	130	20
9.	111	133	22	29.	111	129	18
10.	120	141	21	30.	115	135	20
11.	118	138	20	31.	112	134	22
12.	108	128	20	32.	117	133	16
13.	119	141	22	33.	121	142	23
14.	111	128	17	34.	110	130	20
15.	113	136	23	35.	110	127	17
16.	107	129	22	36.	121	144	23
17.	116	137	21	37.	105	121	16
18.	105	121	16	38.	118	138	20
19.	118	139	21	39.	105	124	17
20.	114	130	16	40.	110	130	22
				41.	110	130	21
				42.	110	135	18

50418 1015

SIGNATURE AND DATE

D. Starnes 1/3/80

READ AND UNDERSTOOD (Signature and Date)

Alan B. Roman
1-11-80

Subject

Cigarette Variability

Project No.

1246

Date

12-5-79

319117

Sample L13040L
after beam glued.

11-29-79

	HD	HC	AP		HD	HC	AP
1.	109	130	21	22.	111	131	20
2.	119	136	17	23.	110	129	19
3.	107	123	16	24.	110	126	16
4.	101	116	15	25.	111	131	20
5.	118	139	21	26.	104	122	18
6.	130	134	18	27.	111	127	16
7.	111	126	15	28.	105	122	17
8.	117	136	19	29.	110	128	18
9.	110	130	20	30.	103		
10.	108	128	20	31.	116	137	21
11.	113	132	19	32.	114	133	19
12.	106	122	16	33.	111	128	17
13.	112	130	18	34.	114	133	19
14.	114	132	18	35.	111	129	18
15.	120	141	21	36.	112	129	17
16.	111	129	18	37.	115	134	19
17.	111	129	18	38.	100	114	14
18.	109	125	16	39.	114	129	15
19.	114	132	18	40.	108	126	18
20.	105	135	20	41.	118	135	17
21.	115	133	18	42.	117	139	22

S.D

$\overline{HD} \quad 111.5 \pm 4.7$
 $\overline{HC} \quad 129.6 \pm 5.8$
 $\overline{AP} \quad 18.0 \pm 2.0$

note - no. 30. 11 - n sig.

SIGNATURE AND DATE

D. Journal 1/3/80

READ AND UNDERSTOOD (Signature and Date)

Alan B. Norman
1-11-80



Subject

Cigarette Variability

319118

HO 104-118
HC 132-141
AP 17-23

Sample L13640J
CIGARETTE VARIABILITY

11-26-79

HO	HC	AP	HO	HC	AP	HO	HC	AP
1. 111	131	20	29. 109	130	21	57. 112	132	20
2. 116	140	24	30. 116	136	20	58. 117	140	23
3. 107	130	23	31. 121	144	23	59. 110	132	22
4. 105	123	18	32. 116	136	20	60. 111	134	23
5. 111	132	21	33. 101	121	20	61. 113	137	24
6. 98	111	13	34. 126	150	24	62. 101	128	19
7. 119	141	22	35. 108	130	22	63. 109	129	20
8. 83	91	8	36. 104	128	21	64. 114	138	19
9. 107	126	19	37. 109	128	19	65. 109	130	21
10. 116	137	21	38. 109	127	18	66. 109	131	22
11. 105	125	20	39. 120	145	25	67. 115	136	21
12. 105	122	17	40. 115	136	21	68. 115	138	23
13. 105	125	20	41. 128	135	7	69. 117	144	27
14. 109	129	20	42. 114	135	21	70. 109	127	18
15. 108	128	20	43. 104	127	23	71. 115	138	23
16. 109	128	19	44. 114	136	22	72. 114	135	21
17. 114	134	20	45. 110	129	19	73. 119	139	20
18. 123	143	20	46. 113	135	22	74. 113	131	18
19. 113	133	20	47. 115	139	24	75. 109	130	21
20. 86	95	9	48. 114	135	21	76. 115	135	20
21. 111	132	21	49. 116	141	25	77. 118	141	23
22. 110	130	24	50. 108	129	21	78. 122	144	22
23. 105	128	23	51. 114	134	20	79. 124	148	24
24. 117	140	23	52. 111	127	16	80. 114	134	20
25. 111	134	23	53. 106	128	22			
26. 107	127	20	54. 124	147	23			
27. 109	127	18	55. 110	132	22			
28. 111	132	21	56. 109	127	18			

HO 111.2
HC 139.0
AP 21.5

111.2
139.0
21.5

111.2
139.0
21.5

50418 1017

SIGNATURE AND DATE

Thomas 1/3/80

READ AND UNDERSTOOD (Signature and Date)

Alvin B. Norman
1-11-80



Sample L13040 J
40 cig selected in Range.

11-27-79

	HD	HC	AP		HD	HC	AP
1.	108	125	17	23.	105	124	19
2.	112	129	17	24.	108	127	19
3.	110	130	18	25.	106	123	17
4.	109	129	20	26.	109	127	18
5.	110	130	20	27.	108	126	18
6.	108	127	19	28.	108	126	18
7.	107	124	17	29.	112	129	17
8.	111	129	18	30.	114	131	17
9.	106	124	18	31.	108	127	19
10.	110	127	17	32.	111	128	17
11.	109 111	128	17	33.	118	138	20
12.	113	132	19	34.	116	133	17
13.	116	132	16	35.	108	126	18
14.	117	135	18	36.	114	131	17
15.	107	126	19	37.	116	136	20
16.	106	124	18	38.	104	121	17
17.	109 116	127 134	18	39.	107	124	17
18.	111	128	17	40.	114	133	19
19.	104	121	17	41.	112	131	19
20.	112	130	18	42.	114	131	17
21.	113	132	19				
22.	104	123	19				

HD 104-118
 HC 122-141
 AP 17-23
 (Stat. analysis)

S.D.
 HD 110.1 ± 3.8
 HC 127.1 ± 4.0
 AP 19.0 ± 1.0

50418 1018

SIGNATURE AND DATE

D. Johnson 1/3/80

READ AND UNDERSTOOD (Signature and Date)

Alan B. Newman
1-11-80



Subject

Cigarette Variability

319120

Sample L13040-5
Before glue

11-27-79

	<u>HB</u>	<u>HC</u>	<u>AP</u>				
1	116	138	22	28	111	131	20
2	117	137	20	29	113	134	21
3	113	133	20	30	118	140	22
4	111	133	22	31	113	121	15
5	116	136	20	32	114	136	23
6	106	124	18	33	106	125	19
7	113	135	22	34	111	131	20
8	112	132	20	35	115	135	20
9	109	128	19	36	107	125	18
10	107	124	17	37	118	137	19
11	115	137	22	38	113	133	20
12	113	135	22	39	116	137	21
13	111	132	21	40	118	140	22
14	105	124	19	41	116	128	22
15	116	133	17	42	116	137	21
16	116	139	23		113	134	21
17	116	139	23		117	139	22
18	114	134	20				
19	110	133	23				
20	112	134	22				
21	108	127	19				
22	113	131	18				

S.D

HD 110.3 ± 16.3
HC 133.3 ± 4.6
AP 20.4 ± 1.6

HC 104 - 118
HC 122 - 141
AP 17 - 23

Range for the
 Above eight sets
 out of the 80

40 cig.

50478 1019

SIGNATURE AND DATE

Journal 1/3/80

Alan B. Norman
1-11-80

READ AND UNDERSTOOD (Signature and Date)



Subject *Cigarette Variability*

Project No. 1246
Date 12-5-79

319121

*Sample L13040J
after beam flush.*

11-28-79

CIGARETTE VARIABILITY

	<u>HD</u>	<u>HC</u>	<u>AP</u>		<u>HD</u>	<u>HC</u>	<u>AP</u>
1.	111	129	18	20.	115	134	19
2.	115	135	20	21.	121	141	20
3.	103	129	24	22.	110	126	16
4.	116	131	15	23.	105	123	18
5.	114	133	19	24.	110	130	20
6.	116	135	19	25.	114	133	19
7.	111	129	18	26.	114	130	18
8.	111	127	16	27.	118	136	18
9.	105	122	17	28.	117	135	18
10.	115	138	13	29.	106	123	17
11.	114	124	10	30.	111	130	19
12.	111	127	16	31.	113	135	22
13.	114	132	18	32.	112	128	16
14.	120	138	18	33.	113	131	18
15.	116	138	22	34.	114	134	20
16.	107	126	19	35.	113	133	20
17.	110	127	17	36.	110	130	20
18.	114	132	18	37.	110	128	18
19.	110	129	19	38.	104	120	16
				39.	117	136	19

S.D

HD 112.3 ± 4.1
HC 130.4 ± 4.7
AP 18.1 ± 2.5

50418 1020

SIGNATURE AND DATE

D. Journal 1/3/80

Alan B. Newman

READ AND UNDERSTOOD (Signature and Date)



Subject *Cigarette Variability*

Project No. 1246
Date 12-5-79

319122

12/3/79
E.S.T.

Win P.D.

RANGE
[112-124]

- 17 117 117
- 25 116 113
- 37 120 114
- 47 117 116
- 57 124 104
- 67 117 106
- 77 119 113
- 87 113 112
- 97 118 114
- 107 123 110
- 117 117 112
- 127 125 119
- 137 120 119
- 147 120 110
- 157 126 110
- 167 124 124
- 177 129 119
- 187 112 122
- 197 123 129
- 207 113 128
- 217 115 125
- 227 118 118
- 237 108 128
- 247 117 117
- 257 111 120

PERFORATED WINSTON
RANGE

118 ± 6

50418 1021

SIGNATURE AND DATE

Robert 1/3/80

Alan B. Noma
1-11-80

READ AND UNDERSTOOD (Signature and Date)

Subject *Cigarette Variability*

Project No. 1246
Date 12-5-79

319123

(65019) P.O. on Menthol For D.P.T. 11-20-79
[153-163] (10-12 M.M.)
plus control

1)	160	152	159	160	150
2)	145	166	150	163	162
3)	162	164	155	148	165
4)	157	157	161	158	155
5)	155	168	167	168	157
6)	161	164	157	165	
7)	150	162	155	160	
8)	160	154	151	162	
9)	160	160	161	160	
10)	165	156	160	149	
11)	155	164	160	163	
12)	158	162	152	159	
13)	166	155	158	161	
14)	160	167	149	158	
15)	168	154	156	156	

17)	161	163	160	161	157
2)	161	162	158	155	162
3)	160	153	159	163	153
4)	158	163	155	155	160
5)	157	157	163	162	158
6)	157	157	162	153	159
7)	154	157	155	159	159
8)	156	153	155	156	154
9)	153	163	158	163	156
10)	158	155	163	157	157
11)	153	153	160	163	157
12)	157	162	163	160	160
13)	162	158	157	162	158
14)	155	153	161	162	153
15)	156	163	154	163	153

158-156

156-153

~~Titanium~~
Titanium mentholate

SIGNATURE AND DATE Donald 1/3/80

Alan B. Norman
1-11-80

READ AND UNDERSTOOD (Signature and Date)



Subject *Cigarette Variability*

Project No. 1246

Date 12-5-79

319124

Menthol Transfer

Take 10

Re weigh samples

paper wt. 0.5804

1) .0502

2) .0492

3) .0479

4) .0488

5) .0474

6) .0482

7) .0474

8) .0465

9) .0455

10) .0481

0.479 ± .0013

*47.9 mg
± 1.3*

SIGNATURE AND DATE

Journal 1/3/80

*Alan B. Noman
1-11-80*

READ AND UNDERSTOOD (Signature and Date)



Subject *Cigarette Variability*

Project No. 1246

Date 12-5-79

319125

Menthol transfer

(?)

<i>John's Lab</i>		<i>E. Bal.</i>	<i>EIT</i>
<i>Q19</i>	<i>7-1.0124</i>	<i>1.0164</i>	<i>.0040</i>
<i>* 13-</i>	<i>110500</i>	<i>1.0475</i>	<i>.0025</i>
	<i>19-1.0067</i>	<i>1.0069</i>	<i>.0002</i>
	<i>48-0.9950</i>	<i>1.0015</i>	<i>.0065</i>

** only one that wedges more on John's ball*

SIGNATURE AND DATE

D. Journal 1/3/80

Alan B. Norman
1-11-80

READ AND UNDERSTOOD (Signature and Date)

Subject Cigarette Variability
Menthol TransferMenthol
2, wts.

Menthol transfer

11-20-79
D.E.T.

17	1.0170 ✓	1.0195	1.0197	1.0316	1.0229
27	1.0141 ✓	1.0323	1.0311	1.0190	0.9857
37	0.9913 ✓	1.0375	0.9963	1.0015	1.0553
47	1.0200 ✓	1.0009	0.9900	0.9959	1.0500
57	0.9979 ✓	1.0152	1.0200	1.0157	1.0418
67	1.0313 ✓	0.9577	1.0174	1.0300	1.0200
77	1.0261 ✓	1.0257	0.9900	1.0211	1.0300
87	1.0059 ✓	1.0202	1.0200	1.0307	1.0500
97	0.9914 ✓	0.9901	0.9900	1.0200	1.0000
107	1.0346 ✓	1.0005	1.0200	1.0205	1.0000
117	1.0125 ✓	1.0214	0.9900	1.0112	1.0185
127	1.0042 ✓	1.0200	0.9900	1.0200	0.9800
137	1.0006 ✓	1.0181	1.0200	1.0200	1.0000
147	1.0000 ✓	1.0200	0.9900	0.9900	1.0200
157	0.9714 ✓	0.9900	1.0200	1.0199	1.0500



50478 1025

SIGNATURE AND DATE

D. Journal 1/3/80Alan B. Roman1-11-80
READ AND UNDERSTOOD (Signature and Date)

#3 Menthol transfer

$\frac{109669}{10500}$
 $\frac{1016910160}{10491}$

$\frac{109929}{105}$
 $\frac{10429}{10429}$

$\frac{110330}{105}$
 $\frac{110830-10848}{530}$

~~109929~~
~~10429~~

$\frac{110300}{105}$
 $\frac{110800-10800}{105}$

$\frac{109531}{105}$
 $\frac{110331-10331}{105}$

$\frac{110773}{105}$
 $\frac{110773-10762}{105}$

$\frac{110012}{105}$
 $\frac{110512-10562}{105}$

$\frac{100500}{105}$
 $\frac{459}{105}$

$\frac{109651}{105}$
 $\frac{110151-10500}{105}$

$\frac{110010}{105}$
 $\frac{110570-10571}{105}$

$\frac{109878}{105}$
 $\frac{110378-10500}{105}$

$\frac{110210}{105}$
 $\frac{110710-10700}{105}$

$\frac{110068}{105}$
 $\frac{110568-10560}{105}$

$\frac{110084}{105}$
 $\frac{110934-10532}{105}$

$\frac{109561}{105}$
 $\frac{110361-10500}{105}$

10498

$\frac{109974}{105}$
 $\frac{104}{105}$

$\frac{11043}{105}$
 $\frac{104}{105}$



SIGNATURE AND DATE

Drummond 1/3/80

Alan B. Norman
1-11-80

READ AND UNDERSTOOD (Signature and Date)



Subject Mental Transfer

319130

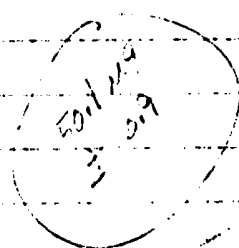
(Mental)

11-19-79
D.E.T.

Wt. of Xk.

17	0.0520	0.0490	0.0490	0.0510	0.0491
27	0.0510	0.0510	0.0499	0.0500	0.0518
37	0.0491	0.0491	0.0492	0.0491	0.0500
47	0.0500	0.0496	0.0500	0.0510	0.0489
57	0.0518	0.0489	0.0500	0.0500	0.0501
67	0.0500	0.0502	0.0511	0.0506	0.0490
77	0.0498	0.0500	0.0507	0.0506	0.0498
87	0.0510	0.0490	0.0496	0.0505	0.0493
97	0.0500	0.0500	0.0518	0.0502	0.0500
107	0.0500	0.0510	0.0508	0.0501	0.0490
117	0.0494	0.0502	0.0516	0.0497	0.0500
127	0.0505	0.0502	0.0502	0.0492	0.0500
137	0.0530	0.0497	0.0500	0.0499	0.0492
147	0.0509	0.0488	0.0502	0.0529	0.0500
157	0.0517	0.0492	0.0499	0.0507	0.0511

0.0501
x 0.0009



50418 1029

SIGNATURE AND DATE

[Signature] 1/3/80

Alan B. Norman
1-11-80

READ AND UNDERSTOOD (Signature and Date)



Q.D. additive 5mm

TiO₂

11-26-79

TiO₂ Additive

1. 128	30. 129	59. 133
2. 130	31. 132	60. 130
3. 140	32. 137	61. 125
4. 130	33. 129	62. 134
5. 129	34. 125	63. 129
6. 133	35. 130	64. 125
7. 135	36. 134	65. 123
8. 135	37. 124	66. 125
9. 142	38. 135	67. 127
10. 120	39. 133	68. 128
11. 120	40. 124	69. 134
12. 121	41. 140	70. 137
13. 133	42. 126	71. 136
14. 128	43. 122	72. 128
15. 123	44. 133	73. 131
16. 137	45. 128	74. 137
17. 124	46. 133	75. 138
18. 130	47. 123	76. 138
19. 135	48. 125	77. 139
20. 120	49. 133	78. 131
21. 124	50. 139	79. 128
22. 120	51. 133	
23. 134	52. 132	
24. 128	53. 130	
25. 134	54. 131	
26. 124	55. 131	
27. 137	56. 123	
28. 125	57. 128	
29. 124	58. 135	

5.0
1300
45.6
124-135

50418 1030

SIGNATURE AND DATE

D. Journal 1/3/80

Alvin B. Norman
11-80

READ AND UNDERSTOOD (Signature and Date)



Control 5-nm

TiO₂

11-26-79

TiO₂ Additive

1. 128	30. 126	59. 132
2. 134	31. 128	60. 129
3. 137	32. 132	61. 134
4. 130	33. 127	62. 126
5. 130	34. 133	63. 124
6. 135	35. 133	64. 128
7. 127	36. 134	65. 126
8. 129	37. 132	66. 125
9. 125	38. 135	67. 129
10. 130	39. 128	68. 135
11. 133	40. 136	69. 127
12. 130	41. 128	70. 131
13. 128	42. 127	71. 127
14. 139	43. 130	72. 135
15. 128	44. 130	73. 127
16. 126	45. 130	74. 131
17. 136	46. 136	75. 135
18. 134	47. 127	76. 138
19. 127	48. 125	77. 127
20. 125	49. 136	
21. 132	50. 127	
22. 134	51. 132	
23. 127	52. 124	
24. 138	53. 124	
25. 132	54. 124	
26. 134	55. 125	
27. 131	56. 126	
28. 124	57. 137	
29. 132	58. 131	

S.D. 130.3
4.0
126-134

50418 1031

SIGNATURE AND DATE

D. Journal 1/3/80

Albert B. Thomas

READ AND UNDERSTOOD (Signature and Date)



Subject TiO₂

Date 12-5-79

319133

wt paper . 2092
4092

TiO₂ Additive

TiO₂

11-26-79

1. .4096	1004	29. .4090	0002
2. .4095	1003	30. .4100	1008
3. .4098	1006	31. .4098	1006
4. .4095	1003	32. .4099	1007
5. .4092	1003	33. .4096	1004
6. .4100	1008	34. .4094	1002
7. .4101	1009	35. .4098	1001
8. .4100	1008	36. .4098	0002
9. .4095	1003	37. .4092	1002
10. .4095	1003	38. .4090	0002
11. .4096	1004	39.	
12. .4098	1001	40.	
13. .4097	1005		
14. .4100	1008		
15. .4094	1002		
16. .4096	1004		
17. .4100	1008		
18. .4098	1006		
19. .4095	1003		
20. .4094	1002		
21. .4095	1003		
22. .4100	1008		
23. .4094	1002		
24. .4096	1004		
25. .4096	1004		
26. .4096	1004		
27. .4095	1003		
28. .4092	1002		

50418 1032

SIGNATURE AND DATE

[Signature] 1/3/80

[Signature]

READ AND UNDERSTOOD (Signature and Date)

1-11-80

P.D. Silica Gel
TEST5-8 mm
PlusPlus
10² Control

[172-182]

11-28-79
L.C.T.

12) 173	178	182	182	178	181	173	172	172	172
22) 173	182	180	176	177	172	172	172	173	180
32) 184	182	180	170	174	180	177	172	173	180
42) 179	175	173	175	185	177	182	174	177	177
52) 187	175	177	177	172	172	173	177	172	177
62) 178	182	185	170	170	175	182	180	176	172
72) 172	180	183	175	172	177	175	173	172	170
82) 180	173	182	177	177	182	173	177	172	180
92) 185	177	185	175	172	177	172	174	181	173
102) 173	183	179	170	170	173	181	180	174	177
112) 175	172	175	182	180	179	177	172	182	172
122) 170	183	176	172	176	182	178	181	182	172
132) 172	185	172	177	170	176	182	175	176	174
142) 182	178	184	181	177	181	174	174	173	175
152) 170	176	178	175	177	180	172	173	172	172

177
x 5

176 x 4

SILICA GEL ADDITIVE (100mg)



50418 1033

SIGNATURE AND DATE

D. Journal 1/3/80Alan B. Norman
1-11-80

READ AND UNDERSTOOD (Signature and Date)



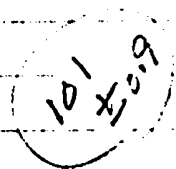
Subject Silica Gel Additive

11-27-79
S.E.T.

Silica Gel
Samplest

17	0.1021	0.1000	0.1001	0.0997	0.0997
27	0.1039	0.1000	0.1001	0.1002	0.1016
37	0.1000	0.1003	0.1001	0.1011	0.1000
47	0.1048	0.1001	0.1011	0.1005	0.1001
57	0.1017	0.1006	0.1012	0.1002	0.1005
67	0.1000	0.1002	0.1001	0.1000	0.1017
77	0.1004	0.1013	0.1004	0.1002	0.1016
87	0.1006	0.1000	0.1001	0.1000	0.1004
97	0.0997	0.1001	0.1000	0.0997	0.1001
107	0.1006	0.1000	0.1000	0.1000	0.1010
117	0.1011	0.1000	0.1000	0.0998	0.1001
127	0.0998	0.1000	0.1001	0.1000	0.0997
137	0.1009	0.1012	0.1003	0.1003	0.1002
147	0.1000	0.1001	0.1011	0.1003	0.1000
157	0.1003	0.1000	0.1000	0.1000	0.1010

1006.76
x 7.700



SILICA GEL ADDITIVE



50478 1034

SIGNATURE AND DATE

D. Johnson 1/3/80

Albert B. Norman
1-11-80

READ AND UNDERSTOOD (Signature and Date)

WA paper 3125
100mg 4125

SnO₂ additive

1. 4128	1003	29 4113	0.1
2. 4134	1009	30. 4123	0002
3. 4126	1001	31. 4130	1005
4. 4118	0007	32. 4131	1006
5. 4130	1005	33. 4133	1007
6. 4128	1003	34. 4124	1001
7. 4120	1005	35. 4121	1005
8. 4120	1005	36. 4120	0005
9. 4118	0007	37. 4130	1005
10. 4125	100	38. 4125	1000
11. 4121	1003	39. 4124	1001
12. 4125	100	40. 4124	1001
13. 4133	1008	41. 4126	1001
14. 4120	0005	42. 4125	100
15. 4124	1001	43. 4127	1002
16. 4121	1004	44. 4120	1005
17. 4132	1007	45. 4127	1003
18. 4132	1007	46. 4135	1010
19. 4130	1005	47.	
20. 4120	1003	48.	05
21. 4122	4103	49.	284
22. 4127	1007	50.	
23. 4130	1005		
24. 4121	0004		
25. 4131	1005		
26. 4133	1008		
27. 4121	0004		
28. 4131	1006		



50418 1035

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7 containers
3.3/29,000 1.9% C-18F

SnO₂ additive

11-21-79

1. 137	28. 134	55. 131
2. 135	29. 137	56. 125
3. 138	30. 135	57. 132
4. 126	31. 141	58. 127
5. 136	32. 141	59. 125
6. 136	33. 130	60. 125
7. 143	34. 141	61. 131
8. 131	35. 139	62. 133
9. 137	36. 136	63. 139
10. 131	37. 136	64. 136
11. 145	38. 130	65. 124
12. 140	39. 132	66. 134
13. 140	40. 139	67. 131
14. 141	41. 136	68. 131
15. 144	42. 139	69. 128
16. 141	43. 141	70. 139
17. 142	44. 123	71. 145
18. 131	45. 138	72. 134
19. 132	46. 132	73. 141
20. 133	47. 132	74. 143
21. 130	48. 138	75. 139
22. 142	49. 143	76. 131
23. 140	50. 138	77. 126
24. 131	51. 138	78. 129
25. 136	52. 125	
26. 128	53. 128	
27. 141	54. 131	

5.0 134.0
1/6.6

127-140

50478 1036

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Alan B. Kover
1-11-80

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Control
From Test

SnO₂ addition

11-21-79

1. 140	29. 141	57. 146
2. 139	30. 127	58. 134
3. 127	31. 131	59. 136
4. 135	32. 139	60. 133
5. 143	33. 128	61. 136
6. 135	34. 131	62. 135
7. 136	35. 134	63. 131/127
8. 131	36. 128	64. 133
9. 130	37. 135	65. 134
10. 131	38. 131	66. 136
11. 128	39. 135	67. 137
12. 128	40. 139	68. 136
13. 128	41. 127	69. 134
14. 128	42. 139	70. 140
15. 140	43. 128	71. 140
16. 127	44. 140	72. 137
17. 133	45. 138	73. 138
18. 137	46. 132	74. 136
19. 133	47. 135	75. 133
20. 142	48. 146	76. 132
21. 135	49. 138	77. 130
22. 143	50. 137	
23. 140	51. 134	
24. 125	52. 136	
25. 136	53. 137	
26. 136	54. 130	
27. 144	55. 132	
28. 137	56. 146	

134.6
x
4.5

130-139 (47)

50418 1037

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Winston - Lights
(glued)

Cigarette Variability

11-15-79

	<u>HO</u>	<u>HC</u>	<u>AP</u>		<u>HO</u>	<u>HC</u>	<u>AP</u>
1.	103	116	13	21.	113	130	17
2.	114	128	14	22.	113	130	17
3.	111	128	17	23.	112	125	13
4.	114	128	14	24.	114	128	14
5.	110	127	17	25.	104	123	19
6.	107	121	14	26.	112	129	17
7.	108	120	12	27.	105	123	18
8.	107	121	14	28.	104	124	24
9.	109	123	14	29.	104	121	17
10.	112	129	17	30.	113	125	12
11.	110	124	14	31.	112	131	19
12.	110	124	14	32.	114	130	16
13.	115	126	11	33.	104	118	14
14.	108	119	11	34.	115	122	7
15.	113	128	15	35.	104	124	20
16.	112	124	16	36.	104	120	16
17.	106	121	15	37.	107	124	17
18.	109	131	22	38.	106	124	18
19.	114	130	14	39.	104	120	16
20.	111	125	14	40.	114	124	14
	109.5 ± 3.8	125.0 ± 4.0	15.4 ± 3.0				

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Subject Cigarette Variability

Date 12-5-79

319140

11-13-79

Winston Lights

	HO	HC	AP		HO	HC	AP
1.	100✓	122	22✓	29.	117	134✓	17
2.	110	125	15	30.	125✓	140✓	15
3.	105	133	28✓	31.	117	136	19
4.	111	125	14	32.	107	121	14
5.	111	122	11	33.	120✓	131	11
6.	111	126	15	34.	111	125	14
7.	112	128	16	35.	107	118	11
8.	112	123	11	36.	119	136✓	17
9.	111	127	16	37.	114	127	13
10.	107	125	18	38.	116	129	13
11.	113	128	15	39.	118✓	130	12
12.	111	132	21✓	40.	119	130	11
13.	107	128	21✓	41.	94	120	26
14.	106	125	19	42.	107	129	22✓
15.	121✓	143✓	22✓	43.	109	131	22
16.	100✓	123	23✓	44.	110	128	18
17.	106	123	17	45.	112	129	17
18.	105	121✓	16	46.	108	125	17
19.	104	121✓	17	47.	112	129	17
20.	97✓	119	22✓	48.	107	122	15
21.	111	125	14	49.	110	129	19
22.	113	127	14	50.	111	125	14
23.	97	125	28✓	51.	104	123	19
24.	113	124	11	52.	107	125	18
25.	108	126	18	53.	110	125	15
26.	124✓	136✓	12	54.	107	125	21
27.	114	134✓	20	55.	110	128	18
28.	114	133	19	56.	107	122	15

50418 1039

SIGNATURE AND DATE

Donald 1/3/80

Alvin B. Hanna
1-11-80

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Subject Cigarette Variability

Project No. 1246

Date 12-5-71

319141

11-18-79

Winston Lights con.

	<u>HD</u>	<u>HC</u>	<u>AP</u>
57.	120✓	135✓	15
58.	110	129	17
59.	116	136✓	20
60.	101✓	126	25✓
61.	109	126	17
62.	107	127	20
63.	119✓	132	13
64.	119✓	136✓	17
65.	116	128	12
66.	116	130	14
67.	121✓	136	15
68.	120✓	129	9✓
69.	122✓	136✓	14
70.	114	124	12
71.	112	130	18
72.	110	122	12
73.	112	126	14
74.	121✓	136	15
75.	104✓	124	20
76.	114	124	14
77.	105	119	14
78.	123✓	140✓	17
79.	114	124	14
80.	114	128	14

ungraded

<u>HD</u>	111.3	± 6.4	105-117
<u>HC</u>	128.0	± 5.2	122-133
<u>AP</u>	140.0	± 4.0	144
<u>AP</u>	16.5	± 4.0	12-20

50418 1040

SIGNATURE AND DATE D. J. ... 1/3/79

Albert B. ...
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Subject *Cigarette Variability*

Project No. 1246

Date 12-5-79

319142

Doral II (glued)

11-15-79

	<u>ND</u>	<u>HC</u>	<u>AP</u>		<u>ND</u>	<u>HC</u>	<u>AP</u>
1.	71	124	53	21.	81	129	48
2.	96	140	44	22.	86	129	43
3.	82	131	49	23.	83	141	58
4.	95	148	53	24.	89	136	47
5.	89	140	51	25.	92	138	46
6.	81	135	54	26.	90	142	52
7.	99	151	52	27.	86	141	65
8.	92	140	48	28.	73	136	63
9.	82	133	51	29.	94	151	57
10.	83	135	52	30.	78	128	50
11.	79	126	47	31.	86	134	48
12.	77	128	51	32.	91	148	52
13.	92	144	52	33.	94	137	43
14.	72	120	48	34.	81	135	54
15.	90	140	50	35.	86	137	51
16.	91	139	48	36.	90	148	58
17.	75	128	53	37.	78	131	53
18.	75	131	56	38.	87	129	42
19.	82	130	48	39.	81	128	47
20.	91	137	46	40.	94	141	47
	85.3	136.0	50.5				
	±	±	±				
	7.2	7.2	4.4				

50418 1041

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D. Journal 1/3/79

Alan B. Norman

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Subject Cigarette Variability

319143

Doral II.

11-14-79

	<u>HD</u>	<u>HC</u>	<u>AP</u>		<u>HD</u>	<u>HC</u>	<u>AP</u>
1.	70	125	55	29.	87	140	53
2.	106	154	48	30.	78	140	62✓
3.	85	138	53	31.	70	120	60
4.	82	138	51	32.	104	154✓	50
5.	84	138	54	33.	61	121✓	60
6.	65	111	46	34.	83	141	54
7.	106	134	48	35.	87	145	58
8.	72	128	56	36.	92	144	52
9.	101	155	54	37.	81	132	51
10.	110	159	49	38.	77	141	64✓
11.	70	128	58	39.	82	141	59
12.	84	141	57	40.	88	141	53
13.	79	134	55	41.	96	158✓	62
14.	92	153	61	42.	83	134	51
15.	84	132	48	43.	91	143	52
16.	89	142	53	44.	73	141	68
17.	97	157	60	45.	77	129	62✓
18.	97	145	48	46.	73	130	57
19.	100	144	44	47.	72	136	64✓
20.	82	144	62	48.	101	161✓	60
21.	67	122	55	49.	98	140	42✓
22.	85	135	56	50.	88	136	48
23.	90	141	51	51.	74	141	67
24.	77	135	58	52.	88	146	58
25.	89	150	61	53.	87	137	50
26.	72	130	58	54.	108	166 ¹	58
27.	99	147	48	55.	87	138	51
28.	69	125	57	56.	92	145	53

50418 1042

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Doral II.

11-14-79

	<u>HD</u>	<u>HC</u>	<u>AP</u>
57.	97 ✓	152 ✓	55
58.	100 ✓	142	42 ✓
59.	92	143	51
60.	64 ✓	124 ✓	60
61.	87	145	58
62.	82	135	53
63.	79	137	58
64.	66	124 ✓	58
65.	86	154 ✓	68
66.	99 ✓	150	52
67.	92	154 ✓	62
68.	74	127	53
69.	89	139	50
70.	69 ✓	123	54
71.	72	131	59
72.	89	143	54
73.	81	139	58
74.	93	145	52
75.	64 ✓	114 ✓	54
76.	71 ✓	144	73
77.	98	140	42 ✓
78.	73	125 ✓	52
79.	60 ✓	113 ✓	53
80.	77	128	51

HD 94.1 ± 12.0 72-96
HC 139.0 ± 11.2 127-150
AP 54.9 ± 6.0 49-61
 55.0 ± 6.0

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D. J. ... 1/3/80

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Allen B. ...
1-11-80

50418 1043



Subject Cigarette Variability

319145

	HD	HC	AP		HD	HC	AP
1.	113	126	13	21.	113	127	14
2.	112	131	19	22.	109	128	19
3.	107	125	18	23.	118	109	14
4.	116	133	17	24.	108	122	14
5.	112	126	14	25.	119	122	13
6.	114	129	15	26.	106	105	19
7.	112	131	19	27.	116	132	116
8.	115	127	12	28.	117	130	13
9.	111	127	16	29.	115	131	16
10.	112	128	16	30.	105	125	20
11.	117	131	14	31.	113	126	13
12.	116	130	14	32.	115	132	17
13.	111	124	13	33.	115	130	15
14.	114	¹³² 128	18	34.	117	131	14
15.	111	126	15	35.	115	135	20
16.	111	123	12	36.	106	125	19
17.	107	124	17	37.	111	128	17
18.	115	129	14	38.	110	127	17
19.	114	128	14	39.	111	128	17
20.	107	126	19	40.	109	128	19

HD 100.5 ± 16.1
 HC 128.0 ± 3.0
 AP 15.9 ± 2.3

Winston Lights

Range
 HD 105-117
 HC 122-133
 AP 12-20

11-16-79

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Alan B. ...
1-11-80

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50418 1044



	HO	HC	AP		HO	HC	AP
1	124	149	25	21	117	144	27
2	114	139	25	22	127	152	30
3	121	146	25	23	116	143	27
4	119	141	24	24	120	147	27
5	124	150	26	25	126	149	28
6	117	140	23	26	123	146	28
7	125	148	23	27	119	147	28
8	117	141	24	28	119	141	28
9	121	146	25	29	119	149	30
10	117	147	30	30	115	138	28
11	119	146	27	31	117	140	28
12	123	149	26	32	124	149	25
13	115	143	26	33	119	143	24
14	117	140	23	34	121	143	22
15	119	141	22	35	117	146	29
16	114	141	27	36	123	147	24
17	124	146	22	37	122	147	25
18	118	145	27	38	114	140	26
19	122	149	26	39	119	143	24
20	119	141	22	40	117	141	24

HO 119.4 ± 3.2

HC 144.5 ± 3.6

AP 25.1 ± 2.3

Carroll Lights unglued

HO - 114-126

HC - 140-152

AP - 22-30

11-16-79

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Subject *Cigarette Variability*

Project No. 1246

Date 12-5-79

319147

	<u>HD</u>	<u>HC</u>	<u>AP</u>		<u>HD</u>	<u>HC</u>	<u>AP</u>
1.	77	126	49	21.	86	145	59
2.	90	139	49	22.	86	135	49
3.	71	127	56	23.	86	136	50
4.	80	140	60	24.	75	135	60
5.	79	136	57	25.	72	131	59
6.	93	146	53	26.	89	138	49
7.	89	141	52	27.	76	132	56
8.	79	139	60	28.	82	141	59
9.	86	144	58	29.	80	131	51
10.	93	147	51	30.	94	144	50
11.	86	138	52	31.	84	139	55
12.	87	146	59	32.	92	144	52
13.	78	134	56	33.	83	143	60
14.	86	134	48	34.	78	130	52
15.	74	126	52	35.	89	142	53
16.	81	134	53	36.	77	128	51
17.	86	141	55	37.	82	139	57
18.	93	135	52	38.	84	140	56
19.	90	141	57	39.	93	146	53
20.	82	121	49	40.	83	139	56

HD 83.5 ± 6.0

HC 137.5 ± 5.7

AP 54.0 ± 3.7

Doral II. unglued

HD 84.1 ± 12.0

72-96

HC 139.0 ± 11.2

127-150

AP 54.9 ± 6.0

49-61

11-16-79

SIGNATURE AND DATE

D. Brown 1/3/80

Alan B. Hanna
1-11-80

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50418 1046



Subject Cigarette Variability

319148

Camel Lights
glue

11-15-79

	<u>HD</u>	<u>HC</u>	<u>AP</u>		<u>HD</u>	<u>HC</u>	<u>AP</u>
1.	114	143	29	21.	126	150	24
2.	119	143	24	22.	119	145	26
3.	121	149	28	23.	132	155	23
4.	120	148	28	24.	119	144	25
5.	119	139	28	25.	120	145	25
6.	125	146	21	26.	117	145	28
7.	118	141	23	27.	117	145	28
8.	117	139	22	28.	116	138	22
9.	122	151	29	29.	124	150	26
10.	123	147	24	30.	128	152	29
11.	111	134	23	31.	122	145	23
12.	115	143	28	32.	122	146	21
13.	122	144	22	33.	119	142	23
14.	126	152	26	34.	116	143	27
15.	121	150	29	35.	121	152	21
16.	122	151	29	36.	114	136	24-22
17.	115	141	26	37.	125	149	24
18.	125	148	23	38.	122	154	22
19.	123	146	23	39.	125	149	24
20.	118	140	22	40.	127	150	23
	120.6	145.7	25.0				
	±	±	±				
	4.3	5.0	4.8				

50418 1047

SIGNATURE AND DATE

D. Johnson 1/3/80

Alan B. Roman
1-11-80

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Camel Lights

R
a
n
g
e

{ HD- 114-126 130 ± 6
HC- 140-152 146 ± 6
AP- 22-30 26 ± 4

11-14-79

	<u>HD</u>	<u>HC</u>	<u>AP</u>		<u>HD</u>	<u>HC</u>	<u>AP</u>
1.	100	130	30	29.	117	145	28
2.	107	140	33	30.	110	134	24
3.	110	136	26	31.	112	146	34
4.	106	137	31	32.	123 ✓	155 ✓	32
5.	117	123 ✓	16 ✓	33.	115	145	30
6.	105	135	30	34.	133 ✓	156 ✓	23
7.	96 ✓	128	32	35.	115	145	30
8.	107	140	33	36.	112	142	30
9.	109	127	18	37.	124 ✓	165 ✓	41 ✓
10.	97 ✓	131	34	38.	128 ✓	150 ✓	22
11.	88 ✓	119	31	39.	117	147	30
12.	100	127	27	40.	119 ✓	152 ✓	33
13.	101	128	27	41.	102	127	25
14.	105	134	29	42.	100	119	19 ✓
15.	110	147	37	43.	95 ✓	132	37
16.	105	139	34	44.	86 ✓	125 ✓	39 ✓
17.	115	137	32	45.	99	128	29 ✓
18.	106	136	30	46.	126 ✓	146	20
19.	120 ✓	149 ✓	29	47.	106	121	25
20.	106	133	27	48.	103	130	27
21.	119	153 ✓	34	49.	97 ✓	128	31
22.	124 ✓	163 ✓	39 ✓	50.	109	138	29
23.	110	140	30	51.	105	134	29
24.	119	156 ✓	37	52.	106	128	32
25.	130 ✓	154 ✓	34	53.	103	124	21 ✓
26.	115	149 ✓	34	54.	108	128	30 ✓
27.	116	147	31	55.	104	124	20 ✓
28.	117	145	28	56.	103	131	28

50418 1048

SIGNATURE AND DATE

D. Journal 1/3/80

Alan B. Nawa
1-11-80

READ AND UNDERSTOOD (Signature and Date)



Subject

Index

Date

319150

* Cigarette Variability

319102

319104

319113-319125

319139-319149

* Effects of Air Dilution on Smoke Deliveries

319110-319112

* Filter Additives

- Ti(O Menthol)₄

319103

319105

319126-319130

- TiO₂

319131-319133

- SiO₂

319134-319135

- SnO₂

319136-319138

* Parameter Study

319101

319106-319109

50478 1049

Alan B. ...
1-11-80

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[Signature]

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