

THIS REPORT IS CONFIDENTIAL TO THE BUSINESS OF THE COMPANY: IT SHOULD BE CAREFULLY HANDLED, IS NOT TRANSFERABLE TO ANOTHER INDIVIDUAL, AND IS NOT TO BE PHOTOCOPIED.

If the report has served its purpose and is no longer needed, please return it immediately to the Central File at the Research Center for record keeping purposes and destruction.

Accession Number: 83-228

Copy Number: 6

Issued To: J. Ardene

PHILIP MORRIS U.S.A.
RESEARCH CENTER
RICHMOND, VIRGINIA

CHARGE NO. & TITLE: 4010 Brand Modifications

TYPE REPORT: ANNUAL SEMIANNUAL COMPLETION SPECIAL

DATE: November 22, 1983 PERIOD COVERED: May, 1983-November, 1983

REPORT TITLE: Brand Modifications Semiannual Report

BY

H. A. Geiszler

W. A. Geiszler

APPROVED BY

P. N. Gauvin

P. N. Gauvin

DISTRIBUTION:

M. Hausermann
R. B. Seligman
F. Resnik
W. A. Farone
L. F. Meyer
T. S. Osdene
R. N. Thomson
L. R. Turano
D. A. Lowitz
K. S. Burns
J. L. Charles
F. L. Daylor
P. N. Gauvin
A. J. Kassman
D. B. Knudson
B. J. Kosakowski
W. F. Kuhn
W. F. Mutter

E. B. Sanders
F. M. Watson
R. M. Waugh
J. F. Whidby
J. E. Wickham
W. L. Dunn
R. Fagan
R. M. Ikeka
A. C. Lilly
H. B. Merritt
R. D. Carpenter
W. E. Clafin
R. W. Jenkins
A. G. Kallianos
M. A. Manzelli
H. L. Spielberg
A. I. Palmer
T. T. Goodale (NY)

H. Gaisch (INT)
S. A. Hutcheson
M. C. Bourlas
G. C. Keritsis
F. Will
W. F. Gannon
K. Assar
E. B. Fischer
L. L. Stewart
B. L. Goodman
C. M. Moogalian
W. A. Nichols
L. R. Brown
W. G. Houck
K. W. Gunst
F. M. Sprinkel
A. E. Stagg

0000134314

KEYWORDS: Tar Reduction, Nicotine Reduction, Flavor Granules, Saudi Arabia Marlboro, Filter Flare-Up, Laser Perforation, Mouthpiece Paper, Cigarette Wrapper, Tipping Paper, Charcoal Filters

TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT	i
I. SUMMARY	1
II. INTRODUCTION	3
A. OBJECTIVES	3
B. PROJECT PERSONNEL	3
III. RESULTS AND DISCUSSION	4
A. DOMESTIC PRODUCTS	4
1. Marlboro Menthol	4
2. Parliament Lights 100's	4
3. Marlboro Lights	4
4. English Ovals	5
5. Other Brands	5
B. EXPORT PRODUCTS	6
1. Marlboro for Saudi Arabia	6
2. Lark Deluxe for Japan	7
3. Lark Menthol for Japan	7
C. CIGARETTE COMPONENTS	8
1. White Tippings and Filter Flare-Up	9
2. 8-Second Cigarette Wrapper	10
3. Laser Perforated Tippings for PM Europe	10
4. Parliament Mouthpiece Paper	11
5. Flavor Carrier Studies	11
IV. PLANS	13
V. REFERENCES	15

0000134315

ABSTRACT

A summary of the development programs conducted in the Brand Modifications Project for the past six months is presented. Efforts to improve the subjective response of Marlboro Menthol, Parliament Lights 100's, Merit Ultra Lights, and a 9mg version of Marlboro Lights are described. The development of new cigarette specifications for Marlboro products exported to Saudi Arabia, and specifications for new Lark products for export to Japan, are reported. A program to develop white tipping papers that do not permit filter flare-up is also reported. Initial qualification testing for a Parliament mouthpiece paper and a high porosity cigarette wrapper were completed. Evaluation of silica gels as flavor carriers is also included.

φ0000134316

I. SUMMARY

During the past six months, the Brand Modifications Project has been conducting programs to modify the smoke deliveries of current domestic products; to develop cigarette specifications for new or modified export products; and to evaluate new or modified cigarette components. The three major programs for the project were (1) modified Marlboro products for Saudi Arabia; (2) new Lark products for Japan; and (3) elimination of filter flare-up.

Cigarette designs were developed for Marlboro LS, KS, and 100mm products to meet the new Saudi Arabia delivery requirements of <15mg tar and <1mg nicotine. Production of the new products began in October.

Cigarette design specifications have been developed for Lark Deluxe and Lark Milds Deluxe products for Japan, both being 24.0mm circumference 100mm cigarettes to be packaged in a Deluxe box. Initial design work has begun on a Lark Menthol 100mm cigarette.

To eliminate filter flare-up on our domestic products, new white tipping papers are being developed with Ecusta and with Kimberly-Clark. Both suppliers have developed promising candidates and small scale factory trials are planned.

For domestic products, consumer panel tests have been or are being conducted for Marlboro Menthol, Parliament Lights 100's, Marlboro Lights, and Merit Ultra Lights. Marlboro Menthol was tested against Newport and was significantly

0000134317

preferred by Salem and Marlboro Menthol smokers in a POL test. Models of Parliament 100's with reduced charcoal levels are being tested against the current product. Modified versions of Marlboro Lights and Merit Ultra Lights are scheduled for POL testing.

An 8-second cigarette wrapper from DeMauduit passed initial qualification testing. Since the DeMauduit wrapper has a better appearance than other 8-second wrappers, it would be the preferred material if we return to 8-second wrappers. A Parliament mouthpiece paper from Colonial Heights Packaging also passed initial qualification testing and could be developed as a second source of the material. Evaluation of silica gels as possible flavor carriers for incorporation into cigarette filters is in progress.

0000134318

I. INTRODUCTION

A. Objectives

The objectives of the Brand Modifications Project for the past six months have been:

1. Modify the smoke delivery of current products to improve subjective response or adjust delivery level without harming subjective response.
2. Develop specifications for new or modified export products manufactured in domestic factories.
3. Evaluate new or modified cigarette components.

Project personnel time has been distributed among the objectives as follows:

Brand Modifications	25%
Export Products	25%
Cigarette Components	50%

Three programs in particular have accounted for about 40% of the project effort; Marlboro for Saudi Arabia; Lark products for Japan; and tippings to reduce filter flare-up.

B. Project Personnel

Project Leader	W. A. Geiszler
Professionals	L. R. Brown (½ time)
	K. W. Gunst (½ time)
	J. G. Nepomuceno (thru 8/83)
	F. M. Sprinkel (effective 11/83)
	A. E. Stagg
Technicians	L. L. Stewart (on loan thru 8/83)
	S. C. Stone (on loan thru 7/31)
	J. E. Hall (8/83-9/83)
	M. J. Mullins (effective 9/83)
	M. L. Peters

0000134319

III. RESULTS AND DISCUSSION

A. Domestic Products

1. Marlboro Menthol

As a follow-up to the FTC tar increases of Marlboro Menthol from 14mg to 16mg late last year, a POL test of the current Marlboro Menthol product against Newport KS was conducted. Both cigarettes were ring-tipped to conceal brand identity. Marlboro Menthol was preferred by Salem and Marlboro Menthol smokers while Newport and Kool smokers indicated no significant preference for either product.¹ Since the current product performs well with consumers in blind testing, no further product improvement work is planned at this time.

2. Parliament Lights 100's

The objective of the Parliament program is to improve the taste of the 100mm product at the current 11mg FTC tar delivery level. A POL test is being conducted for models with 30 and 0 mg of charcoal in the filter versus the production control cigarette with 56mg of charcoal.² The test will be completed by the end of the year.

3. Marlboro Lights

The objective of the Marlboro Lights program is to develop a 9mg FTC tar version of the KS product which performs equally with the 11mg current product among Marlboro and Marlboro Lights

0000134320

smokers. A 9mg model with a modified flavor formulation performed well versus the production control in internal panel testing and a POL test is scheduled for the modified product.³

4. English Ovals

The objective of the English Ovals testing is to reduce the FTC tar delivery of the unfiltered 85mm product from 28mg to 18-19mg, moving it farther from the top of the FTC tar list. Blends with 25% expanded bright tobacco have yielded 22-23mg deliveries; faster burning cigarette wrappers and a smaller circumference are being tested to achieve still further reductions in delivery.⁴

5. Other Brands

Programs are in progress to improve the subjective attributes of Merit KS, Merit Ultra Lights KS, and Cambridge 100 products. For these programs, blend and/or flavor modifications are being tested.

For the Merit program, several modified blend formulations were tested against the production control by internal panels. Two blends were judged to be significantly different for the control: a blend with bodied bright and burley components, and a blend with expanded oriental tobacco. These two blends are scheduled for testing with two different casing and aftercut flavor formulations to develop candidates for consumer panel testing.

0000134321

For the MUL product, a model with a modified blend gave improved subjective response in internal panel testing, so a POL test has been scheduled for the modified prototype. The modified blend contains expanded oriental tobacco as a replacement for some of the expanded bright fraction.

For the Cambridge 100 program, two blends containing dark air cured tobaccos as partial replacements for burley have tested well in initial panel screening. Another round of internal panel testing is scheduled to select the better candidate for POL testing.

B. Export Products

1. Marlboro for Saudi Arabia

Saudi Arabia now requires that no cigarette product exceed 15mg tar or 1mg nicotine in delivery by the International Standards Organization (ISO) smoking method. ISO tar is about 0.5mg higher than FTC tar for the Marlboro products, while ISO and FTC nicotine deliveries are the same. Meeting the nicotine standard of less than 1.00mg has posed the more demanding design requirement. A blend with 19% expanded bright tobacco together with 20-25% filter dilution and a fast-burning cigarette wrapper yields 13.5mg ISO tar and 0.9mg nicotine deliveries for the LS, KS and 100mm Marlboro products.

Based on successful internal testing of the 13.5mg products, production specifications were converted to the lower tar design in October. A POL test of the new and former Saudi Marlboro KS products is being conducted to see if parity can be achieved.⁵

0000134322

2. Lark Deluxe for Japan

Two Lark Deluxe products, a 14mg FTC tar Lark Deluxe 100's and a 10mg FTC tar Lark Milds Deluxe 100's are being developed for the Japanese market. Both cigarettes have a dual filter with a charcoal-on-tow inner plug, and both are 24.0mm in circumference for packaging in a Deluxe box. Cigarette design specifications have been developed for both products such that they can be produced on B&H Deluxe Ultra Lights makers and packers. Introduction of the products have been delayed until the second quarter of 1984 so packaging art work can be finalized.

3. Lark Menthol for Japan

The objective of this program is to develop a 100mm menthol cigarette for Japan with a charcoal filter. The same charcoal as used in B&H Multifilter Menthol (PA2C, 1% activated) is being used for the Lark product because of its low menthol absorption characteristics. Three different menthol blends are being screened to arrive at a preferred blend for the product.

φ000134323

C. Cigarette Components

1. White Tippings and Filter Flare-Up

A general product objective has been to eliminate filter flare-up complaints on all of our brands. The brands that suffer from such complaints are those with white or cork-on-white tipping papers. Three white tipping basesheets are used primarily on our brands: GSR-156 and WTA sheets from Kimberly-Clark, and 30134 sheet from Ecusta. Products using the WTA sheet are free of flare-up complaints, whereas products using the GSR-156 sheet have the highest complaint rates. The GSR-156 sheet has a higher opacity rating (88%) than WTA sheet (80%) and hence makes a more attractive tipping paper. The 30134 sheet has a lesser flare-up tendency than GSR-156, but also has a lower opacity (83%). The 30134 sheet is inferior to the other two sheets in machining performance on the tipping machine. Consequently we have been working with both paper suppliers toward two goals: (1) to develop an Ecusta product equivalent to WTA as a second source of supply for a 0% flare-up tipping, and (2) to develop white tippings with at least 88% opacity and 0% flare-up rate.

Fundamental to the flare-up rate of white tippings is the mineral content of the sheet. The WTA sheet contains 22-28% CaCO_3 and 1% TiO_2 , and gives 0% flare-up rate in machine smoking. The GSR-156 sheet contains 5-10% CaCO_3 and 10-15% TiO_2 , and gives a 5% flare-up rate. TiO_2 is a much better opacifier than CaCO_3 , thus the higher opacity of GSR-156 tipping. Experimental sheets submitted by both suppliers for the higher opacity product have 10-15% CaCO_3 and 10-15% TiO_2 concentrations in the sheets.

0000134324

Kimberly-Clark has submitted a series of tippings that has led to a promising candidate for 88% opacity/0% flare-up. A product identified as GSR-209 containing 13% CaCO₃ gave 0% flare-up but had only 84-85% opacity. A follow-up submission identified as GSR-222 contained 12% CaCO₃ and yielded 88% opacity, but gave a 2-3% flare-up rate. Further modification by K-C led to GSR-229 which has met both the opacity and flare-up targets in initial testing. Fully converted bobbins of GSR-229 have been ordered so small scale factory testing can be conducted on Marlboro Lights 100's.

The emphasis with Ecusta has been toward qualifying a sheet equivalent to WTA first, then developing a higher opacity sheet. Ecusta has made 3 submissions of 80% opacity candidates, the latter two yielding 0% flare-up rates. Ecusta's initial submissions were made with 2% mono-ammonium phosphate (MAP) added to the sheet to prevent static burn into the filter, but these sheets gave 1-3% flare-up rates. The most promising candidate, TOD 01247, is made with no MAP. Converted bobbins of TOD 01247 have been ordered for testing on B&H Lights.

In addition to the formulation of the tipping basesheet, several other cigarette parameters have been investigated for contribution to flare-up. The two inks used to produce a cork-on-white tipping, the buff underlayer and the brown top ink, were tested separately for contribution to flare-up. Neither ink appeared to be a culprit in causing flare-up, but the two layers of ink on a WTA sheet increase flare-up from 0% to 2% when no white band is used over the tobacco rod.

0000134325

With the white band on the tipping, the flare-up rate is generally 0%. Blend components were tested as single component fillers. Expanded bright tobacco and expanded stems appeared to give the lowest flare-up rates, but the results are not consistent enough at this time to allow drawing firm conclusions.

2. 8-Second Cigarette Wrapper

An 8-second cigarette wrapper produced by DeMauduit coded 590C passed initial qualification tests for use on our cigarette products.⁶ The paper contains flax fiber and performs equal to Ecusta 708 wrapper in analytical and subjective smoking. The DeMauduit product has a better overall appearance than the Ecusta product. At the present time, we are not using 8-second wrapper in production, so no further qualification testing of 590C is planned.

3. Laser Perforated Tippings for PM Europe

PM Europe is considering the purchase of laser perforated tipping papers for some brands from PM USA. The products under consideration are Philip Morris Super Lights and Muratti Ambassador; both involve 4 rows of perforations per cigarette. Initial bobbins of PM Super Lights tipping have been perforated and shipped to FTR for testing on cigarettes.⁷

PME is also considering the acquisition of a laser perforator system. Toward this end, we have perforated 12 bobbins of Benkert cork tipping supplied by FTR and shipped the perforated tipping back to FTR for cigarette evaluation.

0000134326

4. Parliament Mouthpiece Paper

The mouthpiece paper used on Parliament products is currently supplied by only Milprint. We have been working with Purchasing and Operations Services toward qualification of Colonial Heights Packaging as a second supplier of the product. The primary converting operation by Milprint or Colonial Heights is the addition of a heat seal coating to the sheet to impart moisture resistance and firmness during smoking. The extraction technique used by the Incoming Materials QA Lab to determine coating weight has yielded values much lower than either suppliers' figures, so we have undertaken an investigation of the extraction method. Our analyses of samples supplied by Milprint have correlated well with Milprint's reported values. We are now trying to correlate results with the QA Lab and establish a meaningful inspection procedure.

The first two trials submitted by Colonial Heights tested low in coating weight, but the third trial achieved an acceptable 4.4 pounds per ream coating level. Subjective testing by in-house panels showed no differences between the Milprint and Colonial Heights products.⁸ Further qualification testing of the Colonial Heights material is being delayed until sufficient machining trials can be conducted at Stockton Street.

5. Flavor Carrier Studies

A program is being conducted in conjunction with the Filtration Physics Project to evaluate silica gels as granular flavor carriers for use in cigarette filters. It was found that gels with pore sizes of 40^oÅ and below did not release flavors during smoking, and gels with pore sizes of 80^oÅ and above

0000134327

released the flavor to the filter during storage. Gels with 60Å pore sizes are under investigation.

φ000134328

IV. PLANS

The program objectives for the Brand Modifications Project for the next six months are:

A. Domestic Products

1. Develop versions of Merit, Merit Ultra Lights, Merit Menthol, Parliament Lights 100's, and Cambridge 100's that are preferred to the current products in consumer panel testing.
2. Develop a 9mg FTC tar version of Marlboro Lights that achieves parity with the current product.
3. Determine the product feasibility of increasing the filter lengths of B&H 100's, Marlboro 100's, and Virginia Slims from 27mm to 31.5mm.

B. Export Products

1. Develop specifications for Lark Menthol 100's and Merit KS products with charcoal filters for export to Japan.
2. Investigate techniques for improving the manufacturing efficiency of Lark plug-space-plug filters.

C. Cigarette Components

1. Qualify white tippings with 0% filter flare-up rates for use in production.
2. Evaluate and/or qualify new plugwraps and cigarette wrappers.
3. Develop tipping papers precoated with heat sensitive adhesives for use in manufacturing.

0000134329

4. Evaluate silica gels and other granular materials as flavor carriers for use in cigarette filters.

D. Technical Investigations

1. Develop a method for determining coating weight on Parliament mouthpiece paper for use in incoming materials inspection.
2. Determine the capabilities of Hauni-laser perforation at manufacturing speeds of 5000 cigarettes per minute.

0000134330

V. REFERENCES

1. Virginia Graff-Muse, National POL Test 5037,
(report being written).
2. National POL Test 7101 (in progress).
3. National POL Test 4310 (test scheduled).
4. National POL Test 4316 (test scheduled).
5. National POL Test 3273 (in progress).
6. L. R. Brown, memo to D. P. Ward, DeMauduit 8 Sec.
Cigarette Paper, September 19, 1963.
7. W. A. Geiszler, memo to Mr. E. L. Erkohen, October
17, 1983.
8. S. C. Stone, memo to J. H. Griffin, Milprint vs. Colonial
Heights Parliament Mouthpiece Papers, September 20, 1983.

0000134331

φ000134332

T. S. OSDENE

DEC 5 1983