

SPECTROPHOTOMETRIC EVALUATION OF MIXTEK[®] SYSTEM CO-MIXING

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6-25-02

I. OBJECTIVE:

To determine the accuracy with which the MixTek[®] System dispenses fluid materials with viscosity of approximately 1200 cps.

II. METHOD:

The MixTek System was fitted with two Lechner barrier pack cans containing a simple formulation of viscosity 1,200 cps. As a component of the simple formulation, the contents of one can was colored Blue with FD&C Blue 1, and the other colored Yellow with FD&C Yellow 5. The contents of each can was then compared to the material dispensed via the MixTek System by visible spectrophotometric analysis (absorbance measurements) to determine the accuracy with which they were co-dispensed and co-mixed. The following materials were employed:

0.5% & 1.0% Blue: Blue formulation was dispensed from the Lechner can prior to insertion into the MixTek System and then diluted with water to 0.5% and 1.0% (w/w) concentration.

0.5% & 1.0% Yellow: Yellow formulation was dispensed from the Lechner can prior to insertion into the MixTek System and then diluted with water to 0.5% and 1.0% (w/w) concentration.

1.0% Dispensed Green: Co-mixed Blue and Yellow formulations (45 g. total) as dispensed from the MixTek System was diluted with water to 1.0% (w/w) concentration.

III. RESULTS AND DISCUSSION:

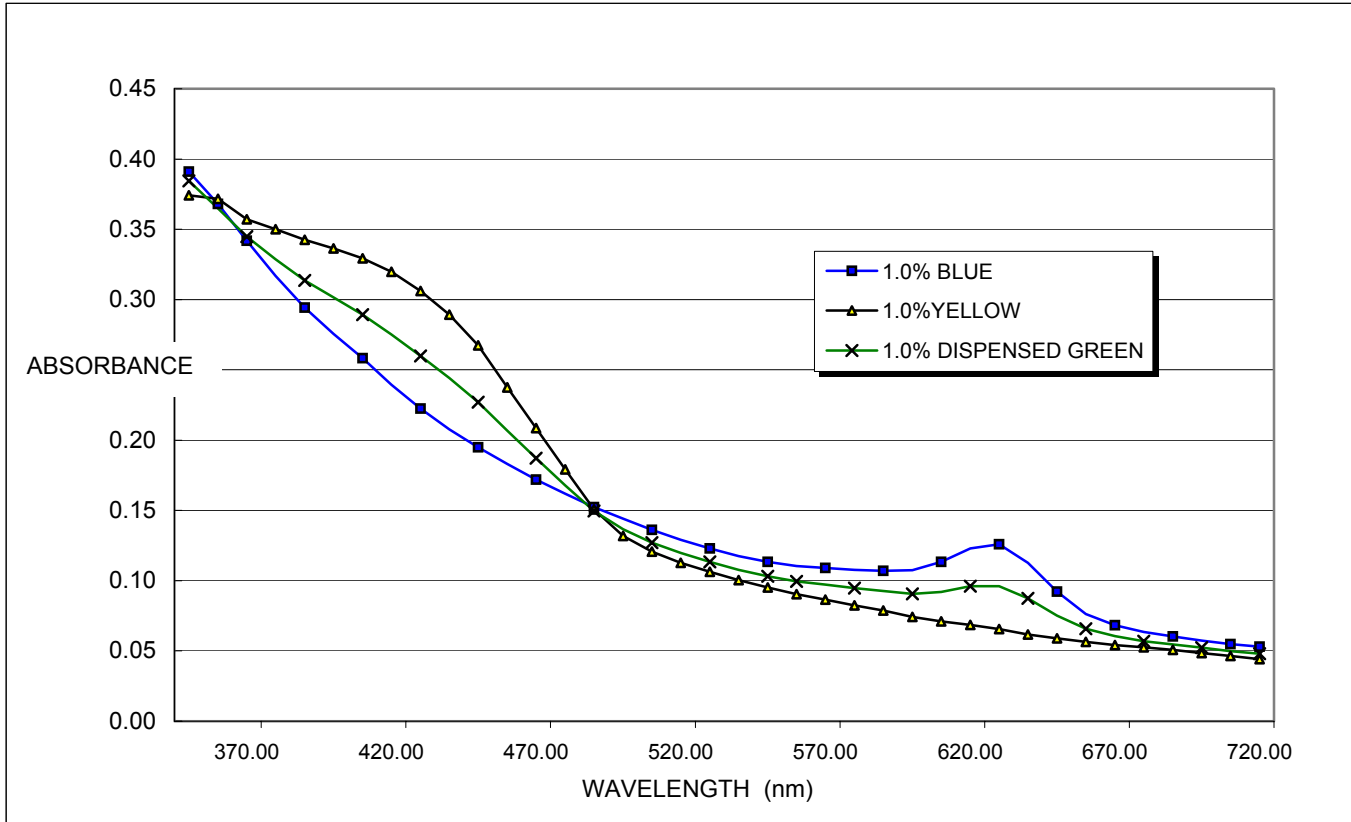
STUDY 1: Visible Spectrophotometric Comparison of 1.0% Dispensed Green with 1.0% Blue and 1.0% Yellow.

When accurately mixed in a 1.0:1.0 ratio, the Absorbance of 1.0% Dispensed Green at any wavelength should equal the sum of the Absorbance for the 1.0% Blue and 1.0% Yellow divided by two. (The sum is divided by two since, when properly mixed, the 1.0% Dispensed Green is comprised of half the concentration of the blue and yellow dyes contained in the separate aerosol cans.) As evident from the following Graph and Table, the Absorbance of the material dispensed by the MixTek System is equally comprised of the blue and yellow component formulations.

Graph: The curve representing the dispensed material (1.0% Dispensed Green) is observed to be apparently equidistant from that of the 1.0% Blue and 1.0% Yellow at all wavelengths.

Table: The Absorbance of 1.0% Dispensed Green at any wavelength equals, or very closely approximates, the sum of the Absorbance for the 1.0% Blue and 1.0% Yellow divided by two. (e.g., at 610nm: (Blue) 0.11 + (Yellow) 0.07 = 0.18 ; and absorbance for 1.0% Dispensed Green is 0.09 (or 0.18/2).

STUDY 1: Visible Spectrophotometric Comparison of 1.0% Dispensed Green with 1.0% Blue and 1.0% Yellow.



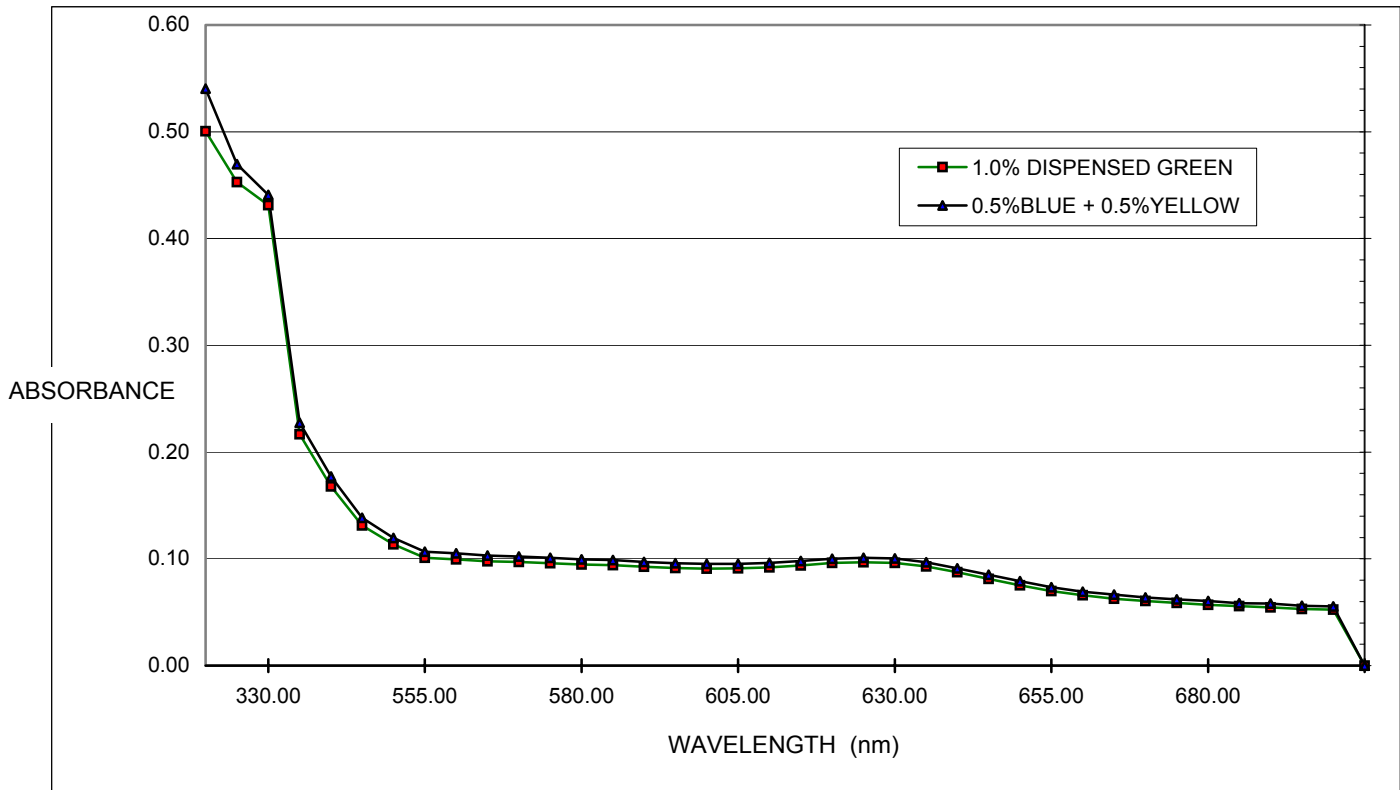
WAVE-LENGTH (nm)	ABSORBANCE		
	1.0% BLUE	1.0% YELLOW	1.0% DISPENSED GREEN
720.00	0.05	0.04	0.05
710.00	0.05	0.05	0.05
700.00	0.06	0.05	0.05
690.00	0.06	0.05	0.05
680.00	0.06	0.05	0.06
670.00	0.07	0.05	0.06
660.00	0.08	0.06	0.07
650.00	0.09	0.06	0.08
640.00	0.11	0.06	0.09
630.00	0.13	0.07	0.10
620.00	0.12	0.07	0.10
610.00	0.11	0.07	0.09
600.00	0.11	0.07	0.09
590.00	0.11	0.08	0.09
580.00	0.11	0.08	0.09
570.00	0.11	0.09	0.10
560.00	0.11	0.09	0.10
550.00	0.11	0.10	0.10
540.00	0.12	0.10	0.11

WAVE-LENGTH (nm)	ABSORBANCE		
	1.0% BLUE	1.0% YELLOW	1.0% DISPENSED GREEN
530.00	0.12	0.11	0.11
520.00	0.13	0.11	0.12
510.00	0.14	0.12	0.13
500.00	0.14	0.13	0.14
490.00	0.15	0.15	0.15
480.00	0.16	0.18	0.17
470.00	0.17	0.21	0.19
460.00	0.18	0.24	0.21
450.00	0.20	0.27	0.23
440.00	0.21	0.29	0.24
430.00	0.22	0.31	0.26
420.00	0.24	0.32	0.28
410.00	0.26	0.33	0.29
400.00	0.28	0.34	0.30
390.00	0.29	0.34	0.31
380.00	0.32	0.35	0.33
370.00	0.34	0.36	0.34
360.00	0.37	0.37	0.36
350.00	0.39	0.37	0.38

STUDY 2: Compare the visible spectrum and absorbance values of 1.0% Dispensed Green with that of the mixture of 0.5% Blue and 0.5% Yellow.

Ideally, the Absorbance curve for 1.0% Dispensed Green should be identical with, and overlay that of the mixture of 0.5% Blue and 0.5% Yellow, since it is comprised of 50% of each. Referral to the following graph, demonstrates this to be the case, indicating the dispensed material to be comprised of equal proportion of the two component materials.

STUDY 2: Visible Spectrophotometric Comparison of 1.0% Dispensed Green with mixture of 0.5% Blue and 0.5% Yellow.



STUDY 2: *continued***Visible Spectrophotometric Comparison of 1.0% Dispensed Green with mixture of 0.5% Blue and 0.5% Yellow.**

WAVE-LENGTH (nm)	ABSORBANCE	
	1.0% DISPENSED GREEN	0.5%BLUE + 0.5%YELLOW
700.00	0.05	0.06
695.00	0.05	0.06
690.00	0.05	0.06
685.00	0.06	0.06
680.00	0.06	0.06
675.00	0.06	0.06
670.00	0.06	0.06
665.00	0.06	0.07
660.00	0.07	0.07
655.00	0.07	0.07
650.00	0.08	0.08
645.00	0.08	0.09
640.00	0.09	0.09
635.00	0.09	0.10
630.00	0.10	0.10
625.00	0.10	0.10
620.00	0.10	0.10
615.00	0.09	0.10

WAVE-LENGTH (nm)	ABSORBANCE	
	1.0% DISPENSED GREEN	0.5%BLUE + 0.5%YELLOW
610.00	0.09	0.10
605.00	0.09	0.10
600.00	0.09	0.10
595.00	0.09	0.10
590.00	0.09	0.10
585.00	0.09	0.10
580.00	0.09	0.10
575.00	0.10	0.10
570.00	0.10	0.10
565.00	0.10	0.10
560.00	0.10	0.11
555.00	0.10	0.11
530.00	0.11	0.12
505.00	0.13	0.14
480.00	0.17	0.18
455.00	0.22	0.23
330.00	0.43	0.44
325.00	0.45	0.47
320.00	0.50	0.54

IV. CONCLUSION:

Under the described conditions, the MixTek System was determined to accurately dispense and co-mix component materials in a 1:1 ratio.