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A STUDY OF THE EFFICACY

OF

AEROSOL VERSUS NONAEROSOL LAUNDRY PRODUCTS

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ABSTRACT

The California Air Resources Board estimates that 6.6 tons of photochemically reactive organic compounds (PROC) are released into the environment in California every day because of the use of aerosol laundry products.

This project studied the efficacy, ease of product use, and PROC content for three major brands of pre-wash stain remover in available product forms and for five starch products in their available product forms.

Generally, the efficacy of the pre-wash stain removers was uneven, there being no one best product or product form. The efficacy also depended very much on the nature of the stain and the nature of the fabric. For many, the efficacy of the pre-wash stain remover was no better than standard laundering. Exceptions to this were ball point pen ink and oil stains on a variety of fabrics. Results regarding product form efficacy with respect to ball point ink stains indicate a 61% superiority for aerosols over nonaerosols in cases where product superiority existed.

For oil stains, the aerosols of all three products were most efficacious. This was probably due to the hydrocarbon solvent system of the aerosols. An aerosol index and a nonaerosol index were calculated which describe the incidence of aerosol and nonaerosol product superiority on all of the stains and on all of the fabrics. The indices are weighted to take into consideration the efficacy of pre-wash products generally for the particular kind of stain in question. That for aerosols is 198.7 and that for nonaerosols is 159.5. The higher value for aerosols is largely due to their superior performance for the removal of oil.

The aerosol pre-wash stain removers were found to be slightly easier to use by the laboratory investigator. Consumer satisfaction may differ. The aerosols contained from 16-76% PROC while the pump and direct forms contained no PROC.

Regarding the starches, the relationship between starch type and efficacy depends on the fabric treated. Faultless aerosol outperformed all of the nonaerosol products on the synthetics. On the natural fiber fabrics the results were mixed.

In the comparison of nonaerosols with Niagra aerosol, of the thirteen product form superiorities demonstrated, seven were in favor of aerosols and six in favor of nonaerosols.

The efficacy per unit cost is very high for the bulk starches like Vano and Argo whereas those of the others are very much lower.

The PROC content of Faultless aerosol was 5.8% and that for Niagra aerosol was 8.5%. None was detected in the nonaerosol products.

The aerosols were the easiest to use and the pump was second. Vano required some product preparation, and Argo was very much more difficult to use because of extensive product preparation.

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SUMMARY

The California Air Resources Board estimates that 6.6 tons of photochemically reactive organic compounds (PROC) are released into the environment in California every day because of the use of aerosol laundry products. Because nonaerosol laundry products contain little or no PROC solvent, emissions from nonaerosol products are much lower. Therefore, a potential method for reducing emissions from laundry product usage would be to switch from aerosol to nonaerosol product forms.

In this current study, efficacy comparisons were carried out, and PROC content was determined on aerosol and nonaerosol product forms found to be available in the southern California area. Both pre-wash stain removers and starches were so evaluated. Ease of product use was also considered.

Eight fabrics, three of which were delicates, were stained with thirteen materials including a variety of foods, blood, ink, and oil. Whiteness was measured by determining reflectance before and after laundering with detergent and pre-wash products. The method outlined in ASTM D3050 was followed. All fabrics and stains were run in triplicate. In addition, stains were run fresh and oven set.

The PROC content of aerosol pre-wash stain removers was determined by using a Shimadzu GC-9A Gas Chromatograph equipped with a flame ionization detector. Propellant was sampled using an Alltech Associates self-sealing can piercing apparatus and a Precision Sampling Pressure Lok Series A 100 ul gas-tight syringe. The same methodology was used for PROC determination of aerosol starches.

Analysis for PROC on nonaerosol pre-wash stain removers and starches was carried out using flame ionization gas chromatography on the distillate of each product.

Starch efficacy was determined using Federal Test Method 191, Method 5206. Five starch products and four fabrics were used. Fabric stiffness before and after starch application was measured. The amount of starch deposited was also measured. The starch efficacy index was calculated, which was the increase in stiffness divided by the weight of starch applied. Finally, the cost effectiveness of

each product was determined by dividing the starch efficacy index by the cost of the product per unit weight of solid starch. In essence, the latter is determining the stiffness increase per unit cost.

RESULTS

Regarding pre-wash stain remover efficacy, the relationship between pre-wash delivery form and cleaning efficiency was found to be dependent on the stain and on the fabric. The efficacy of a pre-wash product on many stains and fabrics was limited. Of notable exception were two stains: ball point pen ink and oil. Use of a pre-wash product had a substantial effect on the removal of these stains.

A two-sample t test was run on the pre-wash data to determine the significance of cleaning efficiency of the pre-wash versus the control. The same test was run to compare the cleaning efficiency of those product forms whose cleaning efficiencies were significantly better than the control.

For oil stains, the aerosols of all three products were most efficacious. This was probably due to the hydrocarbon solvent system of the aerosols.

In addition, an aerosol index and a nonaerosol index were calculated which describe the incidence of aerosol and nonaerosol product superiority on all of the stains and on all of the fabrics. The indices are weighted to take into consideration the efficacy of pre-wash products generally for the particular kind of stain in question. That for aerosols is 198.7 and that for nonaerosols is 159.5. The higher value for aerosols is largely due to their superior performance for the removal of oil.

Regarding ease of product use, comments included below reflect the subjective critical evaluation of the laboratory investigator. They may or may not be shared by the average consumer. Consumer evaluation for ease of use would have to be made separately.

The aerosol stain removers were easy to use. The spray was easy to direct and not messy. The Shout and Spray 'n Wash aerosols were quite alkaline, but didn't seem to dry the skin during use. The Clorox aerosol contains a hydrocarbon solvent and was very drying to the skin during use. The "foaming" feature of Spray 'n Wash was attractive in that one

had the sense of the product staying in one place after application.

The direct products were easy to use, but were messy. The pump products were somewhat easier to use than the direct products. Some pumps were easier to use than others. The only drawback was the fact that not all of the product was easy to dispense, although product remaining in a used dispenser could be transferred to a new one.

No pumps or direct forms were found to contain PROC. The PROC content of the pre-wash stain remover aerosols was as follows:

Product	Propellant(%)	Solvent(%)	Total PROC(%)
Shout	8	8	16
Spray 'n Wash	6	10	16
Clorox	9	67	76

Regarding the starches, the relationship between starch type and efficacy depends on the fabric treated. On the basis of a 2-sample t test comparing each nonaerosol to each aerosol, Faultless aerosol outperformed all of the nonaerosol products on the synthetics. On the natural fiber fabrics the results were mixed.

In the comparison of nonaerosols with Niagra aerosol, of the thirteen product form superiorities demonstrated, seven were in favor of aerosols and six in favor of nonaerosols.

The efficacy per unit cost is very high for the bulk starches like Vano and Argo whereas those of the others are very much lower.

The aerosols were the easiest to use and the pump was second. Vano required some product preparation, and Argo was very much more difficult to use because of extensive product preparation.

Starch aerosol forms contained PROC as follows:

Faultless	5.8%
Niagara	8.5

Of the PROC listed above, approximately 99% is propellant, isobutane. No volatile PROC was found in the nonaerosol starches.

CONCLUSIONS

1. Pre-Wash Stain Removers

There is no PROC content in either pump or direct forms. PROC content of the aerosols varies from 16-76%.

The efficacy of pre-wash stain removers, at least for the stains tested, is limited. They are particularly useful for the removal of oil and ball point ink. For ball point ink, product form efficacy is in favor of aerosols.

Aerosol stain removers are particularly effective in removing oil stains. Oil or grease is probably a major source of staining on clothes.

A calculation of an aerosol index and nonaerosol index which compare the performance of one form to the other, shows overall that the aerosols are superior. However, one should notice that the aerosol index is particularly high because of the superior performance of aerosols on oil stains.

2. Starch Products

The PROC content of Faultless aerosol was 5.8% and that for Niagra aerosol was 8.5%. None was detected in the nonaerosol products.

Faultless aerosol outperformed all of the nonaerosol products on the synthetics. On the natural fiber fabrics the results were mixed.

In the comparison of Niagra aerosol with nonaerosol product forms, results were mixed.

Although bulk and dry products are very cost effective, their consumer acceptance is limited probably because of the difficulty involved in use of the products.

BACKGROUND

The California Air Resources Board has been designated the responsible agency within the state for developing a suggested control measure for reducing emissions of photochemically reactive organic compounds (PROC) from the use of laundry products. PROC is defined as any compound containing at least one atom of carbon that is a gas or liquid at 70°F and 760 mm Hg, except methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, dichloromethane, trichlorofluoromethane, trifluoromethane, 1,1,1-trichloroethane, tetrachloroethene, trichlorotrifluoroethane, dichlorotetrafluoroethane, and chloropentafluoroethane.

PROC emissions from aerosol laundry products in California are estimated to be approximately 6.6 tons/day. These emissions arise from the use of PROC propellants and solvents. Because nonaerosol laundry products contain no propellants and generally little or no PROC solvent, emissions from nonaerosol products are much lower. Therefore, the Air Resources Board is evaluating the feasibility, on the basis of product efficacy and consumer satisfaction, of switching from aerosol to nonaerosol laundry products.

This study experimentally determines the efficacy of alternate forms (aerosol/pump/direct) of three pre-wash stain removers and of five starch products as available. For each form, ease of product use was considered and PROC content was determined.

Method:

1. Pre-Wash Stain Removers

   a. Efficacy

The following products were tested for their efficacy:

1. Shout
2. Clorox
3. Spray 'n Wash

Products 2 and 3 were tested in aerosol, pump, and direct delivery forms. Shout was tested only as an aerosol and as direct since it is not available as a pump. In the direct form, the product is directly dispensed by squeezing the bottle rather than by pump or aerosol action. Dishwashing liquid is frequently dispensed through this method.

Fabrics which were tested for stain removal were

unbleached, undyed specimens of the following, obtained from Testfabrics, Inc.:

1. Cotton momie (tablecloth fabric)
2. Dacron/cotton 65/35
3. Polyester/cotton 50/50 with durapress finish
4. Textured polyester interlock knit
5. Texturized dacron double knit
6. Silk crepe
7. Worsted gabardine
8. Dacron/wool 55/45

Fabrics 6-8 are identified as "delicates" in the data which follow. Four inch fabric squares were used for the test.

Stains which were applied and subsequently treated for removal were:

1. Red wine
2. Blue ink
3. Ballpoint ink
4. Black ink
5. Coffee
6. Blood
7. Oil
8. Chocolate
9. Mustard
10. Tea
11. Lipstick
12. Jelly
13. Grass

All stains were treated for removal after being freshly applied and after the stain had set (oven heating at 130°F for one hour). All fabrics were laundered three times before use in testing. All tests were run in triplicate.

Staining procedures were developed so that a uniform stain was obtained throughout the test fabric square. Exceptions were made for lipstick and blood, where uniform staining was achieved in only a limited area, and for grass, where uniform staining could not be achieved.

The following techniques were developed in order to establish reproducible stains so that a valid assessment of the efficacies of the various stain removers and their delivery systems could be made:

Chocolate: A solution of Hershey's Syrup and water, 1/3

syrup by volume, is made. The fabric is dipped in the solution, removed, and drained on paper towels.

Mustard: French's Mustard is spread on one side of the fabric. The excess mustard is wiped off with paper towels.

Jelly: The method employed for jelly is the same as that for mustard except that Welch's Grape Jelly is used.

Oil: Five milliliters of Fletcher Oil Company crude oil and one-hundred milliters of methylene chloride are combined. The fabric is dipped in the solution, drained, and the solvent is flashed off by placing in an oven at 50°C for three to five minutes.

Tea: One gram of Tetley Iced Tea Crystals is dissolved in fifty milliliters of water. The fabric is soaked in the solution for five minutes, then drained on paper towels.

Coffee: Nine grams of Taster's Choice decaffeinated, freeze dried coffee are dissolved in a liter of boiling water. The fabric is dipped in the solution, then drained on paper towels.

Red Wine: The fabric is dipped in Christian Brothers Ruby Port Wine, then drained on paper towels.

Blue Ink: A solution of Sheaffer Skip blue ink, twenty volume percent, and water is prepared. The fabric is dipped in the solution, then drained on paper towels.

Black Ink: The method used for black ink is the same as that used for blue except that Sheaffer Skip Jet Black Ink is used.

Ball Point Ink: 0.815 grams of black Donni Ball Point Pen Ink are combined with fifty milliliters of acetone. The fabric is dipped in the resulting solution, drained on paper towels, and the acetone is allowed to evaporate in ambient air.

Lipstick: Hazel Bishop #211 Lipstick is applied directly to the fabric. The excess is wiped off with paper towels.

Grass: Cut grass is rubbed across the fabric until a deep green stain is achieved over most of the fabric.

Blood: Three milliliters of whole human blood purchased from the American Red Cross were applied to the middle

of the fabric. The blood was allowed to soak into the fabric and drained on paper towels.

Efficacy of stain removal was determined by measuring the reflectance (or whiteness) of fabrics before staining, after staining, and after laundering, following the method outlined in ASTM D3050. A Photovolt Model 670 Reflection Meter was used to measure reflectance. To evaluate lightness of color irrespective of hue, a green tristimulus filter was used in all cases except for tea, for which a blue tristimulus filter was used. This method of measuring stain removal was used on all stains except grass. Grass stains were evaluated visually by two separate observers. The grass stain was rated on a subjective scale from one to five, one representing complete stain removal and five no removal.

The reflectance methods were validated with respect to the following concepts before further use:

1. Reproducibility of the reflectance reading on a fabric specimen as a function of where on the specimen the reading is made. Do you have to make sure the reflectance reading is taken on the same exact location each time or is the reflectance reading the same throughout the surface?

2. Does the function of simply washing a fabric in the presence of detergent alter the reflectance?

3. The change in reflectance due to washing or due to pre-wash application and washing should numerically match the visual change in the fabric. In cases where stains had low color, eg. tea, appropriate filters were used on the reflectance meter.

4. There are eight fabrics, each run in triplicate, thirteen stains, two or three dispensing systems per product, and stains run freshly applied and after setting. To determine the possibility of running multiple specimens simultaneously, stained fabrics of a particular type were simultaneously washed after treatment with a particular pre-wash in its three dispensing systems. This is to say that nine fabric specimens, all treated with the same pre-wash, were simultaneously washed. Unstained specimens of fabric were included in the wash with reflectance readings taken before and after to determine the carryover of stain if any occurred. These results were compared with those where only three specimens were run at a time.

Data on all of the above experiments are summarized in the results section and included in the Appendix. On the basis of the results of those experiments, three fabric specimens were actually used for each test. The composition of a each load was as follows:

[3 specimens stained (fresh) + 3 specimens stained (set) + 1 unstained (control)] x 5 fabrics x 1 product x 1 delivery form.

The five fabrics indicated in the load composition are the washables in the fabric list.

The composition of a delicates laundry load is as follows:

[3 specimens stained (fresh) + 3 specimens stained (set) + 1 unstained specimen (control)] x 3 delicate fabrics x 1 product x 1 delivery form.

Since three laundry pre-wash products were tested, two of the three in three delivery forms, the other in two delivery forms, 208 laundry loads were run and 5,824 swatches were measured for reflectance before and after laundering.

Three reflectance readings were determined on each fabric: unstained- not laundered (C_o), stained-not laundered (B), and stained-laundered (A). The value of C_o for each fabric was an average reflectance of unstained fabric squares before laundering. Cleaning efficiency as a percent has been calculated as $(A-B)/(C_o-B) \times 100$. The reflectance of the control piece (unstained) was also read before and after laundering. This was done to measure if any transference of stain was inadvertently being carried out during laundering. The parameter "redepo" is the quotient of $A1/C_o \times 100$ as determined on the control piece. In this case A1 is the reflectance of the control piece after laundering. If there is no transference during laundering, the "redepo" will approximate 100%. If it is significantly below 100%, there is significant transference. A correction for transference has been applied to two sets of data. The details as to how the correction has been applied is given in the appropriate section. The reflectance unit was calibrated with magnesium carbonate (100% reflectance) before measurement of each fabric swatch.

Subsequent to the fabric staining, the test square was either laundered fresh or oven set first as described above. Laundering was carried out in a General Electric Heavy-Duty Washer and General Electric Dryer. Tide powdered detergent was used for all runs. Delicate

fabrics were laundered with Woolite on a gentle cycle, and were dried flat at ambient temperature. White sheeting fabric was added as ballast to simulate a full laundry load. One stain (fresh and oven set) treated with one pre-wash (brand/dispenser) was laundered at a time.

b. Chemical Analysis

Aerosols:

The propellant was sampled from each aerosol by means of an Alltech Associates self-sealing can piercing apparatus (catalog # 8013) and a Precision Sampling Pressure-Lok Series A 100 ul gas tight syringe. The propellant sample was analyzed by flame-ionization gas chromatography using a Shimadzu GC-9A Gas Chromatograph under the following conditions:

Oven: 30°C, 5 minutes isothermal
ramp to 60°C, 2.5°C/minute, hold 20 min
Column: Gas Chrom C8, 13' SS, 1/8" ID
Injection Port and Detector: 100°C
Carrier: Nitrogen @ 2.75psi (~ 10 ml/min)

The resulting chromatograms were processed with a Shimadzu Chromatopac C-R3A Integrating Recorder, and were compared to those of standard C_2-C_6 hydrocarbons for identification.

After propellant sampling, the gas was released from the can through the sampling valve. The can was emptied. The contents were distilled and the distillate was analyzed for PROC. Infrared analysis was conducted on the nonaqueous phase of the distillate as the capillary film between NaCl disks, using a Perkin-Elmer Model 467 Grating Infrared Spectrophotometer. The infrared spectrum was compared to those of reference solvents (specifically, hydrocarbon solvents). Gas chromatography was conducted on the aqueous phase of the distillate, using a Shimadzu GC-9A Gas Chromatograph under the following conditions:

Oven: 100-200°C, ramped at 6°C/minute
Column: Tenax GC, 6'SS, 1/8" ID
Injection Port and Detector: 225°C
Carrier: Nitrogen @ 50 ml/min

The resulting chromatograms were processed with a Shimadzu Chromatopac C-R3A Integrating Recorder, and were compared to those of standard solvents (e.g., isopropanol, methoxyethanol, butoxyethanol) for identification.

The propellant and solvent content were quantified by calculating weight differences between full can, empty can, total nonvolatiles, and separated distillate phases.

Nonaerosols:

Each nonaerosol product was distilled. Each distillate was analyzed by flame ionization gas chromatography for organic solvents typically found in liquid cleaning formulations (e.g., cellosolves, alcohols, alkanolamines), as described above for the aerosol products.

2. Starch Products

a. Efficacy

The efficacies of aerosol and nonaerosol starch products were compared by determining the ratio of change in flex-stiffness to amount of applied product for each product and product form.

Four types of fabric were used: 50/50 cotton/polyester, 65/35 polyester/cotton, cotton momie, and linen. Five starch products were used: Faultless (aerosol), Niagara (aerosol), Vano (concentrated liquid, diluted 1:2 with water and applied with a pump), Spray 'n Starch (pump), and Argo (bulk powder, prepared according to instructions for medium starching).

The method and apparatus described in Federal Test Method Standard 191/ Method 5206 were used to determine fabric stiffness before and after starch application. In this method, the sample is slid parallel to its long dimension so that its end projects over the edge of the horizontal surface of the test apparatus. When the sample end can no longer support its weight and touches the sloped edge of the test apparatus, the length of overhang is measured. Flexural rigidity (or flex stiffness), G, is calculated by the equation: $G = W \times (O/2)^3$, where W = specimen weight per unit area, and O = length of overhang.

Each starch was applied to specimens of each type of fabric, according to product label instructions. The amount of starch deposited was also determined. Increase in weight and flex stiffness were calculated. The ratio of change of flex stiffness to change in fabric weight was used to rate starch efficacy, hereafter referred to as starch efficacy index. The tests were performed in the warp and fill directions of each fabric, in quintuplicate.

The starch products were also subjectively evaluated for ease of use.

b. Chemical Analysis

Aerosols:

The propellant was sampled from each aerosol by means of a self-sealing can piercing apparatus and a gas tight syringe. The propellant sample was analyzed by flame-ionization gas chromatography using the same conditions described above for analysis of the laundry pre-wash propellants. The resulting chromatograms were compared to those of standard C_2-C_6 hydrocarbons for identification. The propellant was quantified by calculating weight differences between full can, empty can, and total non-volatiles.

Nonaerosols:

Each nonaerosol product was distilled. Each distillate was analyzed by flame ionization gas chromatography for organic solvents (e.g., cellosolves, alcohols) as described above for the aerosol products.

RESULTS

1. Pre-Wash Stain Removers

a. Efficacy

Data reported in summary Tables 1 to 4 are all part of the validation experiments preceeding the actual data collection.

The data indicating the consistency of the reflectance measurements in four different areas on three specimens of the same fabric, both before and after washing, are given in Table 13 (Appendix) along with the standard deviations. These data are summarized in Table 1. No staining was carried out. In all of the tables which follow, if a number is given in parentheses following a parameter, that number in parentheses is the standard deviation. For fabrics which were identified as delicates, only data for unwashed fabrics are given. The reflectance reported in Table 1 is an average of the 12 reflectance readings measured (4 readings x 3 specimens). Generally, the consistency throughout is very good with correspondingly small standard deviations. The implication is that the reflectance is the same regardless of where the reading is taken on

the fabric. This eliminates the need to very carefully take readings at exactly the same place each time on the fabric.

Table 14 (Appendix) also contains data from validation experiments. Again these data are summarized in Table 2. One fabric was stained with each of the materials mentioned at the start of the report. The stain was washed with detergent, but was not treated with pre-wash stain remover. The reflectance was measured before and after laundering. These data were generated to determine that the method was sufficiently sensitive to the kinds of changes in color likely to be encountered in these experiments. The data bear out the application of this method to this type of experiment.

The limited data reported in Table 15 (Appendix) and summarized in Table 3 were generated using Clorox PreWash in the three dispensing forms on one fabric with blue ink and grass stains. The data are part of the validation experiments and were carried out to be sure that application of the pre-wash could be standardized and appropriate reflectance readings taken. For example, if fabric was stained with blue ink, treated with a pre-wash, and washed, would the before and after differences in reflectance be as sensitive as the differences observed visually before and after? And secondly, would the reflectances so measured on triplicate swatches retain their small standard deviations? Swatches run in triplicate were each laundered individually, not together. No problems were encountered.

The data reported in Table 16 (Appendix) and summarized in Table 4 were generated to test the validity of washing multiple specimens of the same stain together using three dispensing forms of one pre-wash, Clorox in this case. Nine specimens of blue ink stains were washed together. In addition, two unstained, untreated specimens were included to assess the degree of carryover.

TABLE 1
REFLECTANCE VALUES(%)
Validation Experiments
Washed and Unwashed Fabrics
No Stains/No Pre-wash
Detergent Only

Fabric	Reflectance(%) Unwashed	Washed
Momie Cloth	86.7(Ø.5)*	87.Ø(Ø.Ø)
65/35 Dacron/Cotton	86.9(Ø.3)	85.8(Ø.4)
5Ø/5Ø Poly/Cotton	87.Ø(Ø.Ø)	86.5(Ø.5)
Silk Crepe	86.2(Ø.4)	
Poly Interlock Knit	86.2(Ø.4)	85.4(Ø.5)
Poly Double Knit	85.Ø(Ø.Ø)	84.2(Ø.7)
Worsted Gabardine	77.2(Ø.4)	
55/45 Dacron/Wool	79.8(Ø.4)	

* Numbers in parentheses are the standard deviations of the parameters measured.

TABLE 2
Validation Experiments
Reflectance Measurements(%)
One Fabric - Variety of Stains
Detergent Used Only (no pre-wash)

Stain	Reflectance(%) Unwashed	Washed
Chocolate	40(1)*	77.7(0.5)
Mustard	71(1)	80.3(0.5)
Jelly	50.2(0.8)	75(1)
Oil	35(2)	37(1)
Tea	47(1)	48(1)
Coffee	70.2(0.4)	77.5(0.5)
Red Wine	66.1(0.8)	72(2)
Blue Ink	39(3)	77.0(0.7)
Black Ink	12(1)	33(3)
Ball Point Ink	12.1(0.6)	15.9(0.8)
Lipstick	36.9(0.3)	55(1)
Grass **	5.0(0.0)	4.0(0.0)

* Numbers in parentheses are the standard deviations of the parameters measured.

** Visual rating

Table 3
Validation Experiments
Reflectance Values(%)
Blue Ink/Grass - One Fabric - Detergent - Clorox PreWash

Stain	Reflectance(%) Unwashed	Washed
Blue Ink, Pump	39(1)*	81(1)
Grass, Pump**	5(Ø)	3(Ø)
Grass, Direct**	5(Ø)	3(Ø)
Grass, Aerosol**	5(Ø)	3(Ø)

* Numbers in parentheses are the standard deviations of the parameters measured.

** Visual rating

Table 4
Validation Experiments
Reflectance Values(%)

Multiple specimens/Blue Ink/Clorox/3 dispensers/Detergent
Reflectance(%)

Stain	Unwashed	Washed
Blue Ink, Pump	37(2)*	82(1)
Blue Ink, Direct	37(2)	82.8(Ø.4)
Blue Ink, Aerosol	38(2)	81.3(Ø.9)
Unstained	85(Ø.Ø)	85.8(Ø.7)

* Numbers in parentheses are the standard deviations of the parameters measured.

All reflectance readings (%), which is to say all the actual data points, are given in Table 17 (Appendix). For each stain/stain remover/product form there are three numbers given: (1) reflectance of stained fabric before laundering (B); (2) reflectance of stained fabric after laundering (A); and (3) cleaning efficiency as defined in the Table. In addition, each has data for the fresh stain and the oven set stain. Finally what is called "redepo" which is a measure of stain transference is given. The three numbers given for this parameter are (1) initial reflectance of control fabric (C_o); (2) reflectance of control fabric after laundering (A1) and (3) redepo as defined in the Table.

In order to more quickly compare aerosols, pumps, and direct delivery systems, Table 18 (Appendix) only contains cleaning efficiency with the redepo values. Data are ordered by stain. On each stain page the data are further ordered by product form versus fabric. Table 19 (Appendix) contains the same data for delicate fabrics. Table 2Ø (Appendix) contains analogous data for grass stains, which were evaluated visually.

With the exception of Sheaffer Black Ink and ball point ink, the redeposition values were above 90% indicating that there was very little stain transference. For the Sheaffer Black Ink, stain removal was generally poor as well. Cleaning efficiency data for Sheaffer Black Ink and ball point pen ink have been corrected for stain transference (low redepo); A (stain reflectance after washing) has been divided by the appropriate redepo percent before insertion into the cleaning efficiency formula. Corrected data have been flagged within Tables 17, 18, and 19. These are the only stains for which transference corrections have been applied.

The two-sample t test was run on each cleaning efficiency versus the control. The test is generally designed to measure the significance between two means. The test was run to determine whether differences in the cleaning efficiency values were significant. In running the test, it is assumed that the populations are normally distributed. In our case, n for each sampling is three. Therefore, the form of the two-sample t calculation is:

$$t = \frac{1.732\ (\bar{x}_1 - \bar{x}_2)}{(s_1^2 + s_2^2)^{1/2}}$$

where $\bar{x}$=average cleaning efficiency
and s=std. deviation of x

Assuming an alpha value of Ø.Ø5 with four degrees of freedom, the critical value of t is 2.776. This means

that the t value for any stain which is greater than 2.776 is significant. The cleaning of that fabric using a particular pre-wash was then significant with respect to the corresponding control. All the t calculations for stains versus the control are given in Table 21 (Appendix). Using this as the criterion, conclusions regarding efficacy from Table 21 are given in Table 5.

It is conceivable that a negative value of t could be significant implying that the control was better than use of a pre-wash. This is rare, but it does occur in the data. Since we are looking for pre-wash efficacy, these values have been ignored when considering the pre-wash versus the control.

All of the experiments have been run on both set and fresh stains. One has to be cautious in making conclusions where the pre-wash appears to be effective on one and not on the other. In some cases, for example, it will appear that the pre-wash is only effective on set stains. However, what is frequently the case is that for fresh stains use of a detergent alone is sufficient. There are situations within the data where removal of a set stain appears to be easier than removal of a fresh stain. This is contrary to what is generally considered to be the case. No explanations are given for this phenomenon. Further work would have to be carried out to address this situation.

Within Table 21 (Appendix), there are some values for t listed as "n/a". Occasionally within the data, both the control and the pre-wash cleaning efficacies have standard deviations of zero. This will negate the possibility of calculating the value of t, since it would require division by zero. If this is the case and if the value of the parameter in question is same for both pre-wash and control, the table lists simply n/a. If the standard deviations are both zero and if the cleaning efficiency of the pre-wash exceeds that of the control, the pre-wash is considered superior and that is indicated by n/a* on the table.

In Tables 5 and 21, product form superiority is not considered. This is addressed later in the report.

Grass stains, the data for which have been given in Table 20, do not have standard deviations calculated since evaluation was visual. Any evaluation different than the control was considered significant. Product form superiority was considered similarly.

TABLE 5
EFFICACY OF PRE-WASH PRODUCTS VERSUS CONTROL

Mustard

1. Sixteen percent of the mustard stains were at least partially removed from the fabrics tested by use of a pre-wash.

2. Detergent alone was 100% effective on polyester doubleknit so no pre-wash values are significant for this fabric. (indicated at n/a).

3. On wool garbardine, 50/50 cotton/polyester, and on silk no pre-wash was effective.

4. Only freshly applied stains were removed from polyester interlock.

5. Only set stains were removed from dacron/wool.

6. Six of the eight products tested were effective on polyester interlock.

7. Five of the eight products tested were effective on dacron/wool.

Tea

1. Thirty four percent of the stains were at least partially removed with the pre-wash products.

2. All of the products were effective on polyester interlock, seven on polyester doubleknit and on dacron/wool, and six on cotton momie.

3. Only one product was effective on 50/50 cotton/polyester and two on 35/65 cotton/polyester. These were not the same products in each case.

4. Stains were not removed from silk.

5. Only set stains were removed from 35/65 cotton/polyester, polyester doubleknit, wool gabardine and dacron/wool.

Wine

1. Forty nine percent of the stains were at least partially removed with the pre-wash products.

2. All of the products were effective on cotton momie and on polyester interlock. For the latter, only fresh

TABLE 5 (Continued)
EFFICACY OF PRE-WASH PRODUCTS VERSUS CONTROL

Wine (Continued)

stains were removed.

3. Only fresh stains were removed from polyester doubleknit. However, the cleaning efficiency of the control on set stain using only a detergent and no pre-wash was 97.5(0.1), so the significance of the removal of fresh stains is limited.

Sheaffer Black Ink

1. Two percent of the stains were at least partially removed through use of a pre-wash.

2. Use of a detergent alone was 100% percent effective on polyester interlock and polyester doubleknit.

3. With the exception of Spray 'n Wash direct on freshly stained silk and Spray 'n Wash pump on dacron/wool, no product was effective.

Sheaffer Blue Ink

1. Twenty four percent of the stains were at least partially removed through use of pre-wash products.

2. Use of a detergent alone was 100% effective on polyester doubleknit (set stains). The cleaning efficiencies with a detergent alone were also very high on 35/65 cotton/polyester(set) and on polyester interlock.

3. All of the products were effective on polyester interlock when applied to fresh stains. On set stains use of a detergent alone was very effective.

4. Six products were effective on 35/65 cotton/polyester.

Coffee

1. Only nine percent of the stains were at least partially removed through use of a pre-wash.

2. Only set stains were removed from 35/65 cotton/polyester and only fresh stains were removed from polyester doubleknit. On the polyester doubleknit, the cleaning efficiency on set stains was very high with a detergent alone.

TABLE 5 (Continued)
EFFICACY OF PRE-WASH PRODUCTS VERSUS CONTROL

Coffee

3. No products were effective on 50/50 cotton/polyester, silk, wool gabardine or dacron/wool.

Ball Point Ink

1. Seventy seven percent of the stains were at least partially removed through the use of pre-wash products.

2. Most pre-wash products were effective for ball point ink removal from all fabrics except cotton momie. Only two products were effective on this fabric.

Jelly

1. Thirty one percent of the stains were at least partially removed through the use of pre-wash products.

2. No products were effective on cotton momie or polyester doubleknit. However, the cleaning efficiency for polyester doubleknit with a detergent alone is 99.9% so the significance of the latter is limited.

3. Only one product was effective on 35/65 cotton/polyester and on polyester doubleknit. Two were effective on 50/50 cotton/polyester.

Oil

1. Sixty three percent of the stains were at least partially removed through the use of pre-wash products.

2. With the exception of one product on one fabric, all of the aerosols were effective on all of the fabrics.

3. All of the products were effective on cotton momie and on wool gabardine.

Chocolate

1. Twenty three percent of the stains were at least partially removed through the use of pre-wash products.

2. Only set stains were removed from polyester doubleknit and only fresh stains were removed from wool gabardine.

3. Only one product was effective on cotton momie and only one product was effective on dacron/wool. It was

TABLE 5 (Continued)
EFFICACY OF PRE-WASH PRODUCTS VERSUS CONTROL

Chocolate (Continued)

not the same product in both cases.

4. For four of the eight fabrics, use of a detergent alone produced a cleaning efficiency of over 90% (set or fresh).

Blood

1. For every fabric, for either fresh or set, there was a cleaning efficiency of over 90% with a detergent alone.

2. Six percent of the stains were at least partially removed through the use of pre-wash products.

3. Blood was effectively removed from only three of the eight fabrics through use of a pre-wash.

4. Pre-wash products were effective only on set stains for wool gabardine. However, use of a detergent alone produced a high cleaning efficiency.

Lipstick

1. Thirteen percent of the stains were at least partially removed from the fabrics through the use of a pre-wash.

2. No pre-wash was effective on 50/50 cotton/polyester or on polyester doubleknit.

3. Only fresh stains were removed from silk.

Grass

1. Thirty five percent of the stains were at least partially removed from the fabrics through the use of a pre-wash.

2. Results are mixed.

Further two-sample t tests were run on each nonaerosol product against its brand aerosol product to determine if either had superiority. The value of t for significance is as before. These data are given as Table 22 (Appendix). The data are given for all stains except grass.

A dash in a column indicates that neither the t value for the aerosol nor the t value for the nonaerosol was significant in relation to the control. This is one way of saying that neither product form is superior.

If either an A or an N is listed alone in the Table, this indicates that this product form (A for aerosol or N for nonaerosol) was found to be significant. In point of fact either the aerosol or the nonaerosol was found not to be significant in relation to the control, and, therefore, the other product form was considered superior.

Finally, in some cases the actual value of t is given. This means that both product forms were significant in relation to the control. In addition, for those t values which exceeded the critical value of t, indicating significance, the product form showing superiority is indicated again by either an A or an N. If there is a t value less than the critical value, and, therefore, not significant, no letter is given. This is to say that even though both products showed significance in relation to the control, they were not significantly different from each other.

Table 6 quantitatively summarizes the data presented in Tables 20 and 22(Appendix). Given the number of aerosol/nonaerosol comparisons made and the number of fabrics on which the comparison is made, there are a total of 80 comparisons where a product form superiority could have presented itself for each stain. In Table 6 the column called "Total*(%)" is the number of product form superiorities shown for that stain expressed as a percent of the total product form superiorities which could have existed. The columns identified as "A**(%)" and "N***(%)" show the distribution of product form superiorities (A for aerosol and N for nonaerosol) for a particular stain. For example, for mustard only 8% of the 80 possible superiorities actually showed product form superiority. Of these, 67% were for aerosols and 33% were for nonaerosols.

In addition an "A Index" and an "N Index" are calculated. What this does is to weight the A's and the N's by multiplying each by the total percentage for that stain. The aerosols then have a total index which is

higher than that for the nonaerosols. Notice that the performance of aerosols on oil stains largely determines the value of the A index. To validly evaluate efficacy of these products, one should then have an idea of the frequency with which the consumer uses these products for each kind of stain. The present project does not address this issue. It is then important to consider the actual product form superiorities which were demonstrated when considering the distribution between aerosol and nonaerosol.

Table 7 is a qualitative summary of the occurrence of product form superiority.

TABLE 6
PRODUCT FORM SUPERIORITY

Stain	Total*(%)	A**(%)	A Index	N***(%)	N Index
Mustard	8	67	5.4	33	2.6
Tea	33	27	8.9	73	24.1
Wine	35	21	7.4	79	27.7
Sheaffer Black Ink	3	--	--	1ØØ	3
Sheaffer Blue Ink	19	73	13.9	27	5.1
Coffee	13	7Ø	9.1	3Ø	3.9
Ball point ink	55	61	33.6	39	21.5
Jelly	22	11	2.4	89	19.6
Oil	85	99	84.2	1	.8
Chocolate	31	36	11.2	64	19.8
Blood	14	82	11.5	18	2.5
Lipstick	16	23	3.7	77	12.3
Grass	24	31	7.4	69	16.6
	Index Total:		198.7		159.5

* Percent of product form superiorities
** Of comparisons showing superiority, percent showing aerosol superiority
*** Of comparisons showing superiority, percent showing nonaerosol superiority

TABLE 7
QUALITATIVE COMPARISON OF AEROSOLS VERSUS NONAEROSOLS REGARDING EFFICACY

Mustard

Very little product form superiority existed (see Table 6). No clear patterns were observed.

Tea

Nonaerosols were particularly superior on cotton momie and somewhat superior on 35/65 cotton polyester, wool gabardine, and wool/dacron.

Wine

Nonaerosols were particularly effective on cotton momie, 50/50 cotton/polyester, and on wool gabardine.

Sheaffer Black Ink

There was product form superiority in only two of the eighty comparisons, both in favor of nonaerosols on wool/dacron.

Sheaffer Blue Ink

Nonaerosols were superior on cotton/momie and aerosols were superior on 35/65 cotton/polyester, polyester interlock, and wool/dacron.

Coffee

With a product form superiority in only 13% of the comparisons, the aerosol was more often superior on cotton momie.

Ball Point Ink

Ball point ink showed the second highest product form superiority. With the exception of 35/65 cotton/polyester and wool/dacron, all other fabrics showed a product form superiority in favor of aerosols.

Jelly

With a limited overall product form superiority (22%), the nonaerosol form was superior on 50/50 cotton/polyester, 35/65 cotton polyester, wool gabardine and wool/dacron. The aerosol form was superior on polyester interlock.

TABLE 7 (Continued)
QUALITATIVE COMPARISON OF AEROSOLS VERSUS NONAEROSOLS REGARDING EFFICACY

Oil

The highest product form superiority was shown for this stain. Ninety nine percent of the product form superiority was in favor of the aerosol. This was distributed over all of the fabrics.

Chocolate

Although there is product form superiority in roughly one third of the comparisons, the distribution is somewhat mixed with the exception of silk where the nonaerosols were superior and wool/dacron where the aerosols were superior.

Blood

The aerosols were superior on cotton momie. Results were mixed in the remaining product form superiorities.

Lipstick

Nonaerosols were superior for 35/65 cotton/polyester, polyester interlock, silk, and wool/dacron. Aerosols were superior for cotton momie and wool gabardine.

Grass

Nonaerosols were superior for cotton. Results for the remaining fabrics were mixed.

EASE OF PRODUCT USE:

The following subjective observations are those of the laboratory investigator. Those of the consumer may differ.

The aerosol products were easy to use. The spray was easy to direct and not messy. The Shout and Spray 'n Wash aerosols were quite alkaline but didn't seem to dry the skin too much during use. The Clorox aerosol contains a hydrocarbon solvent (and no water) and was very drying to the skin. The "foaming" feature of Spray 'n Wash was attractive in that one had the sense of the product staying in one place after application.

The direct products were easy to use, but were messy and seemed wasteful during use. If they were not applied over a drain area or over the open washing machine, there was considerable liquid to clean up after use.

The Spray 'n Wash pump was somewhat easy to use. The pump plunger is operated with a trigger action. The Clorox pump product was difficult to use because the pump is operated with a push-down plunger. The plunger design is such that it can be operated only through a sharp plastic slot with one finger. For both products, the dip tube angle doesn't allow product use to complete emptiness. On the other hand, since the pumps are easily disassembled, the leftover product can be transferred to new replacement product.

b. Chemical Analysis

Table 8 summarizes PROC analysis results for the pre-wash spot removers.

The aerosol pre-wash products contained 16-76% volatile PROC. The volatile PROC consisted of 6-10% hydrocarbon propellant (combinations of propane, isobutane, and butane) and 8-67% aliphatic hydrocarbon solvent. PROC other than the hydrocarbons was not detected.

The nonaerosol products did not contain any volatile PROC components.

TABLE 8
LAUNDRY PRE-WASH PROC ANALYSIS

PRODUCT/FORM	PROC Content
Shout/aerosol	Total: 16% 8% propellant (33% propane, 13% isobutane, 54% butane) 8% solvent (aliphatic hydrocarbon, b.r. 82-84C)
Shout/direct	none detected
Spray n wash/ aerosol	Total: 16% 6% propellant (100% propane) 10% solvent (aliphatic hydrocarbon, b.p. 88C)
Spray n wash/ direct and pump	none detected
Clorox/aerosol	Total: 73% 9% propellant (34% propane, 11% isobutane, 55% butane) 67% solvent (aliphatic hydrocarbon, b.r. 158-168C)
Clorox/ direct and pump	none detected

2. Starch Products

a. Efficacy

Table 9 summarizes the results. In Table 10 the two-sample t test is applied to each nonaerosol versus each aerosol to determine significance. The critical value of t is 2.306 where alpha is 0.05. In essence each nonaerosol is compared to two aerosols. A positive value of t greater than 2.306 is in favor of nonaerosols. If t is less than -2.306, it is significant in favor of aerosols.

For Vano there is one aerosol which is superior and one nonaerosol which is superior for 50/50 cotton/polyester and 35/65 cotton/polyester. For Vano the nonaerosol is superior on cotton and one aerosol is superior on linen.

On Spray 'n Starch one aerosol is superior on synthetics. On both natural fabrics the nonaerosol is superior.

For Argo, with the exception of one direction on cotton, the aerosols are both superior.

The fibers which are 100% vegetable were the most affected by starching.

Table 11 summarizes cost effectiveness of each product. Cost effectiveness was calculated, in stiffness units per dollar, as $SU/W_g \times W_a/C$, where SU = stiffness units increase, W_g = weight starch gained by fabric, W_a = nonvolatile weight available in starch product, and C = unit cost of starch product. Argo bulk powder (diluted for medium starching) was more cost effective for cotton, linen, and 35/65 cotton/polyester. Vano (diluted 1:2 with water) was more cost effective for 50/50 cotton/polyester.

The aerosol products were easy to use, and produced a fine even mist over the fabrics.

Pump products were easy to use, but required slightly more effort to repeatedly operate the pump trigger. The pumps also did not produce as fine a spray as the aerosol products. Vano, marketed for use as a dip-in concentrated liquid, was diluted and dispensed from a pump as per the product labeling suggestion. It was easy to use in this form.

Argo, a powdered starch, was the most difficult product to use. It required extensive preparation: large liquid measure, small dry measure, boiling, fabric dipping, drying and sprinkling.

TABLE 9
SUMMARY OF STARCH EFFICACY RESULTS

	POLY/COTTON 50/50	POLY/COTTON 65/35	COTTON	LINEN
VANO (1 part Vano: 2 parts water, dispensed from a pump)				
Warp Direction				
stiffness change*	5.6 (1.2)**	5.9 (1.1)	38.9 (4.2)	75.0 (8.4)
wt. gain*	25.2 (4.3)	19.8 (1.4)	91.0 (8.9)	96.6 (6.8)
ratio*	251 (49)	296 (37)	425 (18)	778 (90)
Fill Direction				
stiffness change	3.3 (0.4)	2.2 (0.4)	20.1 (2.2)	56.0 (11.1)
wt. gain	25.3 (0.7)	19.9 (0.9)	92.9 (6.7)	97.8 (5.5)
ratio	129 (14)	112 (17)	217 (23)	572 (102)
SPRAY N STARCH (pump)				
Warp Direction				
stiffness change	1.0 (0.4)	1.5 (0.1)	16.9 (2.7)	41.4 (4.5)
wt. gain	7.6 (0.5)	7.8 (0.4)	40.9 (2.3)	48.3 (4.0)
ratio	135 (43)	188 (15)	411 (76)	857 (60)
Fill Direction				
stiffness change	0.9 (0.8)	1.0 (0.2)	6.9 (0.5)	31.2 (6.9)
wt. gain	10.3 (2.7)	9.8 (1.5)	33.3 (1.1)	48.6 (3.5)
ratio	82 (51)	104 (23)	206 (12)	640 (120)
FAULTLESS (aerosol)				
Warp Direction				
stiffness change	5.1 (0.6)	5.3 (1.4)	14.2 (1.6)	44.7 (4.3)
wt. gain	13.2 (1.4)	11.9 (3.6)	41.0 (3.1)	63.3 (2.4)
ratio	394 (27)	448 (87)	351 (67)	708 (86)
Fill Direction				
stiffness change	1.9 (0.4)	1.7 (0.2)	7.3 (1.3)	34.3 (7.2)
wt. gain	12.2 (0.7)	10.2 (0.9)	45.8 (2.9)	54.0 (1.8)
ratio	172 (21)	141 (18)	160 (24)	635 (130)
NIAGARA (aerosol)				
Warp Direction				
stiffness change	2.2 (0.9)	1.9 (0.2)	20.9 (2.3)	38.1 (4.2)
wt. gain	13.2 (3.1)	10.3 (0.8)	51.5 (3.7)	56.1 (1.5)
ratio	160 (36)	188 (28)	410 (52)	680 (79)
Fill Direction				
stiffness change	1.8 (0.6)	0.9 (0.3)	7.4 (1.5)	24.9 (0.6)
wt. gain	17.1 (2.1)	11.6 (1.3)	42.4 (3.5)	63.5 (5.2)
ratio	106 (25)	77 (21)	172 (23)	459 (150)
ARGO (powdered starch, prepared for "medium starching")				
Warp Direction				
stiffness change	0.3 (0.4)	1.1 (0.2)	8.2 (2.1)	26.6 (5.3)
wt. gain	11.6 (1.4)	10.2 (0.9)	35.1 (1.6)	53.4 (2.9)
ratio	22 (31)	103 (17)	237 (66)	501 (102)
Fill Direction				
stiffness change	0.2 (0.1)	0.2 (0.1)	7.8 (1.9)	21.9 (4.9)
wt. gain	10.3 (0.8)	9.7 (0.8)	38.1 (4.8)	56.1 (6.3)
ratio	20 (10)	21 (5)	211 (69)	392 (84)

* wt.gain (mg); stiffness change (SU) (10^{-4} in·lb); ratio (SU/g)
"RATIO" is the starch efficacy index

** Numbers in parentheses are the standard deviations of the parameters measured.

TABLE 10

STARCH EFFICACY 2-sample t-values COMPARING NON-AEROSOL TO AEROSOL

	POLY/COTTON 50/50	POLY/COTTON 65/35	COTTON	LINEN
COMPARED TO FAULTLESS AEROSOL:				
VANO (1 part Vano: 2 parts water, dispensed from a pump)				
Warp Direction	-5.542(A)	-3.595(A)	2.385(N)	-2.443(A)
Fill Direction	-3.810(A)	-2.619(A)	3.834(N)	-0.852
SPRAY N STARCH (pump)				
Warp Direction	-11.406(A)	-6.585(A)	1.325	3.178(N)
Fill Direction	-3.649(A)	-2.832(A)	3.833(N)	0.063
ARGO (powdered starch, prepared for "medium starching")				
Warp Direction	-20.234(A)	-8.703(A)	-2.710(A)	-3.469(A)
Fill Direction	-14.613(A)	-14.362(A)	1.561	-3.510(A)
COMPARED TO NIAGRA AEROSOL:				
VANO (1 part Vano: 2 parts water, dispensed from a pump)				
Warp Direction	3.346(N)	5.204(N)	0.610	1.830
Fill Direction	1.795	2.896(N)	3.093(N)	1.393
SPRAY N STARCH (pump)				
Warp Direction	-0.997	0.000	0.024	3.984(N)
Fill Direction	-0.994	1.938	2.930(N)	2.104
ARGO (powdered starch, prepared for "medium starching")				
Warp Direction	-6.495(A)	-5.802(A)	-4.603(A)	-3.102(A)
Fill Direction	-7.502(A)	-5.800(A)	1.199	-3.511(A)

KEY: critical t ratio is 2.306. t-values > 2.306 show that the non-aerosol form is significantly superior. t-values < -2.306 show that the aerosol form is significantly superior. t-values between -2.306 and 2.306 show that there is no significant difference between the efficacy of the aerosol and non-aerosol products.

TABLE 11
Efficacy of Starches per Unit Cost

	(10^{-1} in·lbs/dollar)			
	1*	2*	3*	4*
Niagara (aerosol) w**	1.6	1.9	4.2	7.0
f**	1.1	0.8	1.8	4.7
Faultless (aerosol)	5.7	6.6	5.2	10.5
	2.5	2.1	2.4	9.4
Spray 'n Starch (pump)	0.9	1.2	2.6	5.5
	0.5	0.7	1.3	4.1
Vano	45.2	53.3	76.5	140.0
	23.2	20.2	39.1	103.0
Argo	18.1	84.9	195.5	413.2
	16.5	17.3	174.0	323.3

1* 50/50 polyester/cotton
2* 65/35 polyester/cotton
3* cotton momie
4* linen

w** warp direction
f** fill direction

b. Chemical Analysis

The results are summarized in Table 12. The aerosol starch products contained 6-9 weight % hydrocarbon propellant, chiefly isobutane. No PROC was detected (<.1%) in the liquid non-aerosol starches.

TABLE 12

PROC CONTENT OF SPRAY STARCHES

	%PROC	COMPOSITION
FAULTLESS	5.8	99.9 isobutane Ø.1 propane
NIAGRA	8.5	98.7 isobutane 1.3 propane
VANO	none detected	
SPRAY N STARCH	none detected	

CONCLUSIONS

1. Pre-Wash Stain Removers

Even though pumps and direct forms are less convenient to use, the difference in ease of product use is not all that dramatic. The fact that there is no PROC content in either pumps or direct forms would suggest that a switch in product form be considered.

The general efficacy of pre-wash stain removers is limited. Their usefulness appears to be particularly for the removal of oil and ball point ink.

Aerosols are particularly effective in removing oil stains. Oil or grease is probably a major source of staining on clothes. One should know the frequency with which consumers use these products on these stains to validly evaluate efficacy.

No efficacy per unit cost has been determined for pre-wash products. In making this determination for starches, the assumption was made that stiffness, and, therefore, efficacy was directly related to the amount of solid deposited on the fabric. The amount of solid deposited was determined. The cost per unit solid could also be calculated. For pre-wash products, there is no necessary relationship between amount of product applied and efficacy. The latter depends more on the solubility of what is applied.

2. Starch Products

The nonaerosol starch products were not found to contain any volatile PROC.

Starch products are in a unique position. Consumers seem unwilling to deal with difficulty of product use even though bulk and dry forms are more cost effective.

For Vano there is one aerosol which is superior and one nonaerosol which is superior for 50/50 cotton/polyester and 35/65 cotton/polyester. For Vano the nonaerosol is superior on cotton and one aerosol is superior on linen.

On Spray 'n Starch one aerosol is superior on synthetics. On both natural fabrics the nonaerosol is superior.

For Argo, with the exception of one direction on cotton, the aerosols are both superior.

The fibers which are 100% vegetable were the most affected by starching.

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GLOSSARY

A	Reflectance of stained fabric after laundering
A1	Reflectance of control fabric after laundering with detergent and pre-wash
B	Reflectance of stained fabric before laundering
C_o	Average reflectance of unstained fabric before laundering
Cleaning Efficiency	$(A-B)/C_o-B) \times 100$
Efficacy Index (Starch Efficacy)	Ratio of change of flex stiffness to change in fabric weight on addition of starch
Flexural Rigidity (G)	Fabric flex stiffness as defined by $G=W \times (O/2)^3$ where W=fabric weight per unit area and O=length of fabric overhang
Momie Cloth	Cotton fabric generally used for tablecloths and napkins
PROC	Photochemically reactive organic compound
Redepo (Redeposition)	Stain transference which is defined as $A1/C_o \times 100$ as measured on unstained control swatch laundered with stained swatches
Two-sample t test	Test for the difference between two means. Populations are assumed to be normally distributed.

APPENDIX

TABLE 13
REFLECTANCE VALUES(%)
Validation Experiments
Washed and Unwashed Fabrics
No Stains/No Prewash
Detergent Only

Fabric	Reflectance(%) Unwashed	Washed
Momie Cloth	87 86 86 87	87 87 87 87
	86 87 87 87	87 87 87 87
	87 87 87 86	87 87 87 87
Mean	86.7	87.Ø
Stnd dev	Ø.5	Ø.Ø
65/35 Dacron/Cotton	87 87 87 86	85 86 85 86
	87 87 87 87	85 86 86 86
	87 87 87 87	86 86 86 86
Mean	86.9	85.8
Stnd Dev	Ø.3	Ø.4
5Ø/5Ø Poly/Cotton	87 87 87 87	86 87 87 86
	87 87 87 87	87 86 87 87
	87 87 87 87	87 86 86 86
Mean	87.Ø	86.5
Stnd Dev	Ø.Ø	Ø.5
Silk Crepe	86 86 86 86	
	86 87 86 86	
	86 87 86 86	
Mean	86.2	
Stnd Dev	Ø.4	
Poly Interlock Knit	86 86 86 86	85 85 85 86
	87 86 86 86	85 86 85 85
	86 86 87 86	85 86 86 86
Mean	86.2	85.4
Stnd Dev	Ø.4	Ø.5
Poly Double Knit	85 85 85 85	84 83 84 83
	85 85 85 85	85 85 84 84
	85 85 85 85	84 84 85 85
Mean	85.Ø	84.2
Stnd Dev	Ø.Ø	Ø.7
Worsted Gabardine	77 77 78 78	
	77 77 78 77	

TABLE 13 (continued)
REFLECTANCE VALUES(%)
Validation Experiments
Washed and Unwashed Fabrics
No Stains/ No Pre-wash
Detergent Only

Fabric	Reflectance(%) Unwashed	Washed
	77 77 77 77	
Mean	77.2	
Stnd Dev	0.4	
55/45 Dacron/Wool	80 80 80 80	
	80 80 79 80	
	80 80 79 80	
Mean	79.8	
Stnd Dev	0.4	

TABLE 14
Validation Experiments
Reflectance Measurements(%)
One Fabric - Variety of Stains
Detergent Used Only (no pre-wash)

Stain	Reflectance(%) Unwashed			Washed		
Chocolate	41	40	40	78	77	78
	39	40	41	78	78	78
	41	38	40	77	77	78
Mean	40			77.7		
Stnd Dev	1			0.5		
Mustard	70	71	70	80	81	80
	73	72	72	80	81	80
	70	70	71	80	81	80
Mean	71			80.3		
Stnd Dev	1			0.5		
Jelly	51	51	51	75	77	76
	49	49	50	75	76	73
	50	50	51	75	75	75
Mean	50.2			75		
Stnd Dev	0.8			1		
Oil	34	34	36	35	38	38
	33	35	36	36	37	37
	33	38	38	37	37	37
Mean	35			37		
Stnd Dev	2			1		
Tea	47	47	49	48	48	49
	46	47	49	47	47	47
	47	46	48	49	48	48
Mean	47			48		
Stnd Dev	1			1		
Coffee	70	70	70	78	77	77
	70	70	71	77	78	78
	70	70	71	77	78	78
Mean	70.2			77.5		
Stnd Dev	0.4			0.5		
Red Wine	67	67	67	73	76	76
	66	65	65	70	70	70
	66	66	66	72	72	72
Mean	66.1			72		
Stnd Dev	0.8			2		

TABLE 14(Continued)
Validation Experiments
Reflectance Measurements(%)
One Fabric - Variety of Stains
Detergent Used Only (no pre-wash)

Stain	Reflectance(%) Unwashed			Washed		
Blue Ink	37	37	44	78	77	77
	38	40	44	77	76	78
	37	38	37	77	76	77
Mean	39			77.0		
Stnd Dev	3			0.7		
Black Ink	11	11	12	37	36	32
	12	12	14	35	34	29
	11	11	15	30	30	33
Mean	12			33		
Stnd Dev	1			3		
Ball Point Ink	12	12	12	17	17	16
	11	12	13	16	15	16
	12	12	13	15	15	16
Mean	12.1			15.9		
Stnd Dev	0.6			0.8		
Lipstick	37	36	37	54	54	53
	37	37	37	57	56	57
	37	37	37	55	55	55
Mean	36.9			55		
Stnd Dev	0.3			1		
Grass *	5	5	5	4	4	4
	5	5	5	4	4	4
	5	5	5	4	4	4
Mean	5.0			4.0		
Stnd Dev	0.0			0.0		

* visual rating

Table 15
Validation Experiments
Reflectance Values(%)
Blue Ink/Grass - One Fabric - Detergent - Clorox PreWash

Stain	Reflectance(%) Unwashed				Washed			
Blue Ink, Pump	38	36	39	40	81	79	81	80
	38	38	39	40	82	83	82	82
	38	39	38	40	82	82	82	82
Mean	39				81			
Stnd Dev	1				1			
Grass, Pump*	5	5	5		3	3	3	
	5	5	5		3	3	3	
	5	5	5		3	3	3	
Mean	5				3			
Stnd Dev	0				0			
Grass, Direct*	5	5	5	5	3	3	3	
	5	5	5	5	3	3	3	
	5	5	5	5	3	3	3	
Mean	5				3			
Stnd Dev	0				0			
Grass, Aerosol*	5	5	5		3	3	3	
	5	5	5		3	3	3	
	5	5	5		3	3	3	
Mean	5				3			
Stnd Dev	0				0			

* visual rating

Table 16
Validation Experiments
Reflectance Values(%)

Multiple specimens/Blue Ink/Clorox/3 Dispensers/Detergent
Reflectance(%)

Stain	Unwashed			Washed		
Blue Ink, Pump	37	36	38	82	83	83
	37	36	37	81	81	81
	34	35	41	83	83	82
Mean	37			82		
Stnd Dev	2			1		
Blue Ink, Direct	37	37	37	82	83	83
	37	37	39	83	83	82
	34	33	40	83	83	83
Mean	37			82.8		
Stnd Dev	2			0.4		
Blue Ink, Aerosol	36	37	37	81	80	81
	37	37	38	82	82	80
	38	39	42	82	82	82
Mean	38			81.3		
Stnd Dev	2			0.9		
Unstained	85	85	85	86	86	87
	85	85	85	85	85	86
	85	85	85	86	85	86
Mean	85			85.8		
Stnd Dev	0.0			0.7		

TABLE 17
REFLECTANCE READINGS (%)

	1*			2			3			4			5		
mustard/shout/aerosol															
s	69.1	78.7	49.4**	75.1	84.8	87.9	74.0	86.0	98.6	63.3	87.8	99.0	67.7	87.2	66.7
f	68.9	79.7	54.9	74.5	84.8	88.4	74.0	86.2	97.2	64.0	87.0	99.4	59.1	83.2	96.4
r	88.5	87.5	98.9#	86.2	87.5	101.5	86.0	88.5	102.9	86.7	87.0	100.3	83.6	86.5	103.5
mustard/shout/direct															
s	68.3	81.7	66.1	73.7	84.3	85.4	72.1	85.8	98.9	61.3	86.2	96.9	56.9	83.3	93.1
f	66.5	82.0	70.5	73.2	85.0	90.7	73.7	85.3	94.6	63.9	85.5	94.8	58.3	86.8	100.0
r	88.5	89.0	100.6	86.2	87.0	100.9	86.0	87.0	101.2	86.7	87.0	100.3	83.6	87.0	104.1
mustard/control															
s	71.3	79.8	49.5	75.8	86.2	92.3	74.6	85.2	92.6	63.9	85.3	94.1	58.6	86.7	100.0
f	71.3	79.0	44.6	76.0	85.0	88.2	74.5	85.2	92.7	64.5	85.0	92.4	59.0	86.0	100.0
r	88.5	87.5	98.9	86.2	88.5	102.7	86.0	87.0	101.2	86.7	85.0	98.0	83.6	87.5	104.7
mustard/clorox/direct															
s	67.7	77.3	46.3	74.8	85.0	91.1	74.1	84.9	89.2	63.8	86.0	96.9	58.4	84.8	100.0
f	67.7	78.1	50.0	74.9	85.1	91.9	74.1	84.7	87.3	61.9	85.7	95.9	59.3	84.3	100.0
r	88.5	87.0	98.3	86.0	87.0	101.2	86.2	87.0	100.9	86.7	87.0	100.3	83.6	86.0	102.9
mustard/clorox/pump															
s	68.4	75.8	36.4	74.5	84.3	85.3	74.2	84.3	84.6	64.6	85.7	95.4	59.4	85.1	100.0
f	68.4	75.5	35.3	74.7	84.2	84.2	74.2	84.1	82.4	62.5	85.5	94.9	59.1	84.9	100.0
r	88.5	88.0	99.4	86.0	87.0	101.2	86.2	87.0	100.9	86.7	87.0	100.3	83.6	85.0	101.7

*1. Cotton Momie
2. Polyester/Cotton 50/50 with durapress finish
3. Dacron/Cotton 65/35
4. Textured Polyester Interlock Knit
5. Texturized Dacron Double-Knit

** Third number in every set is cleaning efficiency which is defined as $(A-B)/(C_o-B) \times 100$.

Third number in redepo is a measure of stain transference which is defined as $A1/C_o \times 100$.

***Corrected for low redeposistion values; cleaning efficiency defined as $(A \times C_o/A1 - B)/(C_o-B) \times 100$

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
mustard/clorox/aerosol															
s	69.2	77.2	41.6	75.3	85.2	92.9	74.4	84.8	87.8	64.0	86.2	97.9	59.4	85.0	100.0
f	69.0	78.1	46.8	75.1	84.9	89.8	74.1	84.7	87.6	61.8	86.1	97.6	59.6	85.0	100.0
r	88.5	88.0	99.4	86.0	87.0	101.2	86.2	87.0	100.9	86.7	87.0	100.3	83.6	85.0	101.7
mustard/s&w/pump															
s	68.4	80.9	62.2	74.9	84.7	87.9	75.2	84.8	87.1	64.4	86.0	96.9	62.6	85.0	100.0
f	68.2	78.6	50.9	75.0	85.0	90.9	75.1	85.0	89.2	64.0	86.0	96.9	59.6	85.0	100.0
r	88.5	88.0	99.4	86.0	87.0	101.2	86.2	86.0	99.8	86.7	86.0	99.2	83.6	85.0	101.7
mustard/spraynwash/direct															
s	67.9	80.6	61.5	75.0	84.4	85.6	75.0	84.5	85.2	64.5	85.9	96.4	62.9	85.0	100.0
f	67.7	78.2	50.5	75.3	84.9	89.7	74.8	84.4	84.6	64.7	86.0	96.8	61.3	84.8	100.0
r	88.5	88.0	99.4	86.0	87.0	101.2	86.2	87.0	100.9	86.7	86.0	99.2	83.6	85.0	101.7
mustard/spraynwash/aerosol															
s	67.6	81.5	66.4	75.0	84.0	81.8	75.1	84.2	82.0	63.9	85.8	96.1	61.7	85.0	100.0
f	67.1	79.2	56.7	75.2	83.8	79.5	74.3	84.5	85.9	64.3	86.0	96.9	59.8	84.4	100.0
r	88.5	88.0	99.4	86.0	87.0	101.2	86.2	87.0	100.9	86.7	87.0	100.3	83.6	85.0	101.7
tea/spraynwash/aerosol															
s	33.7	42.9	18.1	58.0	57.9	2.3	50.3	54.9	14.7	33.3	75.6	88.4	32.5	78.7	96.3
f	33.1	47.4	27.5	57.2	58.0	4.8	49.7	52.3	8.2	31.8	75.5	88.6	31.5	79.0	96.9
r	84.7	84.3	99.5	82.1	82.0	99.9	81.4	81.0	99.5	81.1	81.0	99.9	80.5	80.5	100.0
tea/spraynwash/pump															
s	32.9	53.3	39.4	57.2	64.3	28.7	49.3	60.2	33.9	35.6	72.5	81.1	29.6	79.3	97.7
f	29.9	53.8	43.7	53.6	65.3	39.3	50.3	60.0	31.4	32.3	71.8	80.9	30.0	78.8	96.7
r	84.7	83.5	98.6	82.1	82.0	99.9	81.4	82.5	101.4	81.1	82.0	101.1	80.5	81.0	100.6
tea/spraynwash/direct															
s	35.5	54.2	37.4	56.2	63.5	27.8	52.8	60.8	27.9	38.3	78.5	93.9	33.6	75.8	90.0
f	35.1	55.0	40.1	56.5	65.8	35.9	52.3	62.5	35.1	35.4	78.8	95.0	35.3	73.5	84.5
r	84.7	85.5	100.9	82.1	83.5	101.7	81.4	82.5	101.4	81.1	81.0	99.9	80.5	81.5	101.2
tea/shout/aerosol															
s	39.6	53.2	30.0	57.5	63.0	22.5	52.7	58.5	20.3	35.4	71.2	78.2	37.3	80.2	99.2
f	34.2	52.7	36.5	56.7	62.3	21.8	51.8	58.0	20.9	32.3	72.7	82.7	39.0	81.0	99.6
r	84.7	85.0	100.4	82.1	84.0	102.3	81.4	83.5	102.6	81.1	82.0	101.1	80.5	82.0	101.9
tea/shout/direct															
s	33.6	55.5	42.8	56.7	68.0	44.3	51.9	63.3	38.5	35.7	80.5	98.7	38.3	78.5	95.2
f	36.3	58.5	45.8	55.4	67.5	45.4	52.3	63.7	38.9	34.5	79.7	96.9	35.5	76.3	90.8
r	84.7	85.0	100.4	82.1	82.5	100.5	81.4	81.5	100.1	81.1	81.0	99.9	80.5	81.0	100.6

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
tea/clorox/aerosol															
s	39.7	52.7	27.8	58.7	62.8	17.7	51.8	57.5	19.3	33.9	78.3	94.1	38.6	80.7	99.6
f	35.7	49.5	28.0	56.4	61.0	18.0	51.2	58.2	23.3	33.6	78.5	94.5	33.6	81.0	99.7
r	84.7	85.0	100.4	82.1	82.0	99.9	81.4	83.0	102.0	81.1	83.5	103.0	80.5	82.5	102.5
tea/clorox/pump															
s	38.9	49.8	23.9	52.6	63.5	35.6	51.4	61.3	33.1	41.2	76.0	87.2	29.1	80.0	98.7
f	35.2	49.7	29.2	56.1	62.5	24.8	50.5	59.5	29.1	33.9	73.8	84.5	35.4	79.7	97.5
r	84.7	85.0	100.4	82.1	84.5	102.9	81.4	84.5	103.8	81.1	83.5	103.0	80.5	82.0	101.9
tea/clorox/direct															
s	38.0	53.3	32.7	56.1	62.5	23.8	52.9	61.8	30.4	41.2	75.8	86.7	35.0	78.7	95.6
f	38.4	49.3	23.5	55.5	61.3	21.9	51.2	59.8	28.5	34.2	75.3	87.5	41.9	79.3	96.9
r	84.7	85.0	100.4	82.1	83.5	101.7	81.4	84.5	103.8	81.1	82.0	101.1	80.5	81.0	100.6
tea/control															
s	41.2	53.2	27.5	57.3	64.0	26.4	52.7	58.8	21.4	41.3	70.7	73.7	33.4	71.5	80.9
f	40.5	47.7	16.1	54.9	60.5	19.6	51.6	57.3	19.3	37.7	68.0	69.8	39.2	75.6	88.0
r	84.7	84.5	99.8	82.1	82.5	100.5	81.4	82.5	101.4	81.1	82.0	101.1	80.5	81.0	100.6
wine/spraynwash/aerosol															
s	67.1	78.0	50.7	73.0	82.0	67.8	74.0	81.7	63.9	63.5	84.0	88.4	61.6	82.7	95.7
f	65.9	72.3	28.5	75.1	81.3	56.3	74.9	82.0	63.9	64.5	83.3	84.8	63.1	83.0	97.1
r	88.5	86.0	97.2	86.2	86.0	99.8	86.0	84.0	97.7	86.7	84.0	96.9	83.6	84.0	100.5
wine/spraynwash/pump															
s	67.8	81.3	65.5	75.5	84.0	79.2	74.1	82.3	69.3	63.7	82.7	82.5	57.5	82.3	95.0
f	68.3	77.3	45.0	74.2	81.7	62.4	72.3	81.8	68.4	61.9	80.0	72.9	63.3	82.0	92.1
r	88.5	82.0	92.7	86.2	86.0	99.8	86.0	86.0	100.0	86.7	84.0	96.9	83.6	82.0	98.1
wine/spraynwash/direct															
s	66.8	81.3	66.8	73.8	84.0	82.1	73.9	84.0	83.5	63.3	83.3	85.7	58.3	82.7	96.4
f	67.8	79.8	58.0	74.9	82.7	68.8	74.6	81.7	62.0	63.8	81.3	76.6	58.7	79.7	84.4
r	88.5	85.0	96.0	86.2	84.0	97.4	86.0	85.0	98.8	86.7	84.0	96.9	83.6	84.0	100.5
wine/control															
s	66.4	75.0	39.0	73.6	80.0	50.5	71.6	82.0	72.3	63.1	82.0	80.1	59.9	83.0	97.5
f	60.2	72.3	42.8	73.4	79.3	46.3	73.5	79.3	46.5	63.3	76.0	54.0	60.4	78.3	77.3
r	88.5	85.0	96.0	86.2	87.0	100.9	86.0	85.0	98.8	86.7	84.0	96.9	83.6	84.0	100.5
wine/clorox/aerosol															
s	68.2	78.7	51.5	73.6	82.0	66.5	71.7	82.0	71.7	62.7	84.7	91.6	60.2	82.3	93.8
f	68.2	74.7	31.9	75.7	80.2	42.7	73.5	80.3	54.8	63.5	81.0	75.4	63.6	82.3	93.5
r	88.5	87.0	98.3	86.2	84.0	97.4	86.0	85.0	98.8	86.7	83.0	95.7	83.6	84.0	100.5

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
wine/clorox/pump															
s	65.7	81.0	66.9	74.7	82.0	63.2	72.9	83.2	78.3	65.4	82.3	79.5	61.7	84.0	98.1
f	68.0	78.3	51.2	76.4	81.7	53.5	73.3	81.3	63.4	62.8	82.3	81.8	64.1	81.3	88.4
r	88.5	86.0	97.2	86.2	86.0	99.8	86.0	83.0	96.5	86.7	85.0	98.0	83.6	86.0	102.9
wine/clorox/direct															
s	68.4	81.7	65.9	75.1	82.3	65.0	72.5	84.7	87.8	64.5	85.7	93.1	61.8	82.7	95.6
f	68.6	77.0	42.3	75.9	81.7	56.1	72.3	81.0	63.4	63.1	82.2	80.7	63.3	82.0	92.1
r	88.5	86.0	97.2	86.2	85.0	98.6	86.0	89.0	103.5	86.7	84.0	96.9	83.6	84.0	100.5
wine/shout/aerosol															
s	68.1	80.3	60.1	74.3	82.3	67.3	74.2	82.3	68.6	63.2	82.3	81.4	61.5	83.2	97.4
f	67.2	77.7	49.0	75.2	84.5	79.1	71.8	81.7	69.4	64.4	83.0	83.4	62.8	81.7	90.6
r	88.5	86.0	97.2	86.2	83.0	96.3	86.0	83.0	96.5	86.7	84.0	96.9	83.6	85.0	101.7
wine/shout/direct															
s	68.1	83.5	75.6	74.8	84.3	83.6	71.6	84.7	90.3	63.6	84.3	89.7	60.0	85.0	100.0
f	68.4	82.0	67.8	75.1	83.5	75.4	73.3	82.3	71.0	64.5	85.0	92.4	63.6	84.0	99.1
r	88.5	88.0	99.4	86.2	88.0	102.1	86.0	85.0	98.8	86.7	86.0	99.2	83.6	86.0	102.9
sheaffer black ink/control/ ***															
s	12.7	29.3	35.2	23.2	44.2	47.1	31.5	52.2	50.4	28.5	84.7	100.0	22.5	84.0	100.0
f	10.3	23.0	26.2	22.7	30.3	21.4	25.7	29.0	11.7	14.0	83.5	100.0	17.0	80.5	100.0
r	88.5	66.0	74.6	86.2	72.0	83.5	86.0	76.0	88.4	86.7	83.0	95.7	83.6	80.0	95.7
sheaffer black ink/spraynwash/aerosol***															
s	12.7	26.0	28.6	24.0	38.7	34.8	28.7	47.8	44.1	27.8	85.2	100.0	22.0	83.3	100.0
f	9.2	19.3	20.6	18.2	27.7	21.3	29.5	27.7	3.1	15.0	82.8	98.3	17.8	83.5	100.0
r	88.5	67.0	75.7	86.2	73.0	84.7	86.0	76.0	88.4	86.7	84.0	96.9	83.6	81.0	96.9
sheaffer black ink/spraynwash/pump***															
s	13.8	25.8	27.9	25.7	40.8	38.3	21.2	49.2	51.1	29.5	83.8	97.9	23.7	83.2	100.0
f	9.0	22.5	26.6	18.5	26.3	19.1	22.8	27.8	12.4	14.5	83.2	97.4	16.7	82.0	100.0
r	88.5	66.0	74.6	86.2	72.0	83.5	86.0	77.0	89.5	86.7	85.0	98.0	83.6	81.0	96.9
sheaffer black ink/spraynwash/direct***															
s	14.7	26.3	27.9	23.7	41.2	39.8	29.2	50.3	47.7	26.2	84.5	100.0	36.0	83.0	100.0
f	8.8	19.0	20.9	18.2	23.5	14.1	25.2	26.3	7.7	14.7	84.7	99.5	14.5	81.5	100.0
r	88.5	66.0	74.6	86.2	73.0	84.7	86.0	77.0	89.5	86.7	84.0	96.9	83.6	80.0	95.7
sheaffer black ink/clorox/aerosol***															
s	14.7	30.7	35.0	23.7	36.3	30.7	29.5	41.0	29.4	26.7	84.0	99.4	21.7	83.0	100.0
f	9.2	21.5	24.2	21.0	28.0	18.5	20.2	27.8	16.8	14.8	84.0	100.0	14.5	81.3	100.0
r	88.5	67.0	75.7	86.2	73.0	84.7	86.0	76.0	88.4	86.7	83.0	95.7	83.6	81.0	96.9

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
sheaffer black ink/clorox/pump***															
s	14.0	27.7	31.0	25.7	40.7	37.9	29.2	49.0	45.0	32.7	85.0	100.0	25.8	84.3	100.0
f	8.8	21.3	24.8	18.3	25.8	18.5	24.5	27.8	10.7	15.2	83.7	100.0	14.5	82.8	100.0
r	88.5	66.0	74.6	86.2	72.0	83.5	86.0	77.0	89.5	86.7	83.0	95.7	83.6	80.0	95.7
sheaffer black ink/clorox/direct***															
s	11.8	26.3	29.9	26.7	46.7	47.8	28.3	50.3	49.6	27.8	84.2	99.1	21.3	83.5	100.0
f	9.0	20.8	23.3	20.0	26.7	17.4	20.5	28.0	17.0	15.8	83.0	98.5	15.0	81.3	100.0
r	88.5	67.0	75.7	86.2	73.0	84.7	86.0	76.0	88.4	86.7	84.0	96.9	83.6	81.0	96.9
sheaffer black ink/shout/aerosol***															
s	13.7	26.3	28.2	28.7	40.3	32.9	34.2	48.8	39.3	32.9	83.3	98.9	21.3	83.3	100.0
f	9.2	21.0	23.4	24.3	29.3	16.6	18.7	27.7	18.1	16.3	82.8	98.3	15.2	81.7	100.0
r	88.5	67.0	75.7	86.2	73.0	84.7	86.0	77.0	89.5	86.7	84.0	96.9	83.6	81.0	96.9
sheaffer black ink/shout/direct***															
s	16.0	23.7	21.6	28.3	47.3	47.6	29.3	49.5	47.1	21.2	86.0	100.0	25.3	82.2	99.7
f	9.0	21.7	25.2	27.0	26.0	6.2	15.0	28.7	24.2	17.3	84.3	100.0	14.7	83.7	100.0
r	88.5	66.0	74.6	86.2	73.0	84.7	86.0	76.0	88.4	86.7	83.0	95.7	83.6	80.0	95.7
sheaffer/blue/spraynwash/aerosol															
s	19.2	78.7	85.8	30.3	82.7	93.6	31.3	84.0	96.3	30.8	84.7	96.1	27.0	85.0	100.0
f	36.5	76.7	77.2	57.8	81.7	84.1	60.0	83.0	88.4	17.8	85.8	98.8	13.2	84.7	100.0
r	88.5	86.0	97.2	86.2	84.0	97.4	86.0	86.0	100.0	86.7	87.0	100.3	83.6	81.0	96.9
sheaffer/blue/spraynwash/pump															
s	19.5	73.0	77.5	27.0	81.2	91.5	30.2	82.0	92.8	30.5	86.3	98.0	26.5	84.8	100.0
f	36.3	74.3	72.8	57.3	79.3	76.1	55.2	81.0	83.8	14.5	85.7	98.6	17.2	84.3	100.0
r	88.5	85.0	96.0	86.2	84.0	97.4	86.0	85.0	98.8	86.7	86.0	99.2	83.6	81.0	96.9
sheaffer/blue/spraynwash/direct															
s	18.3	72.2	76.7	28.7	80.7	90.4	29.2	82.3	93.6	28.5	85.7	98.2	18.8	84.5	99.7
f	30.8	84.2	92.5	48.5	81.0	85.5	58.3	81.7	84.5	15.5	86.0	98.9	24.8	84.7	100.0
r	88.5	86.0	97.2	86.2	84.0	97.4	86.0	85.0	98.8	86.7	85.0	98.0	83.6	82.0	98.1
sheaffer/blue/clorox/aerosol															
s	19.2	71.0	74.8	28.7	81.7	92.1	28.7	82.2	93.3	31.0	86.0	98.7	25.2	86.0	100.0
f	37.7	71.0	65.6	58.7	81.0	81.1	60.5	83.2	88.9	14.3	85.3	98.1	16.3	84.2	100.0
r	88.5	86.0	97.2	86.2	84.0	97.4	86.0	86.0	100.0	86.7	86.0	99.2	83.6	82.0	98.1
sheaffer/blue/clorox/pump															
s	18.0	75.5	81.6	29.0	81.3	91.5	29.0	83.2	95.0	29.5	85.8	98.5	27.3	84.7	100.0
f	36.3	75.8	75.6	55.8	81.7	85.1	60.5	83.3	89.6	14.2	85.0	97.7	13.2	84.0	99.7
r	88.5	86.0	97.2	86.2	85.0	98.6	86.0	86.0	100.0	86.7	87.0	100.3	83.6	81.0	96.9

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
sheaffer/blue/clorox/direct															
s	17.2	76.3	82.9	28.2	82.7	93.9	31.3	83.0	94.5	28.2	86.0	98.8	28.7	85.0	100.0
f	35.7	76.7	77.6	52.9	81.8	86.9	60.7	83.3	89.5	14.3	85.3	98.1	14.2	85.0	100.0
r	88.5	85.0	96.0	86.2	84.0	97.4	86.0	85.0	98.8	86.7	86.0	99.2	83.6	80.0	95.7
sheaffer/blue/shout/aerosol															
s	19.3	75.7	81.4	28.0	81.0	91.1	31.5	83.3	95.1	25.8	87.0	100.0	28.5	84.7	100.0
f	31.3	76.0	78.0	56.5	82.0	85.8	60.8	82.5	86.1	14.7	86.3	99.4	14.5	83.8	100.0
r	88.5	86.0	97.2	86.2	84.0	97.4	86.0	86.0	100.0	86.7	86.0	99.2	83.6	80.0	95.7
sheaffer/blue/shout/direct															
s	18.2	76.0	82.2	27.3	81.0	91.2	27.8	83.0	94.8	25.5	85.3	97.8	25.5	84.5	100.0
f	39.0	77.2	77.1	57.2	81.3	83.2	60.0	84.0	91.8	15.2	84.8	97.4	13.2	84.3	100.0
r	88.5	86.0	97.2	86.2	84.0	97.4	86.0	86.0	100.0	86.7	87.0	100.3	83.6	81.0	96.9
sheaffer/blue/control															
s	19.5	77.7	84.3	27.5	81.3	91.7	27.0	82.2	93.5	27.0	86.5	99.5	22.3	84.7	100.0
f	34.5	74.5	74.1	52.0	82.0	87.8	60.2	81.2	81.2	14.2	83.8	96.0	11.7	83.0	99.2
r	88.5	86.0	97.2	86.2	84.0	97.4	86.0	86.0	100.0	86.7	87.0	100.3	83.6	81.0	96.9
coffee/spraynwash/aerosol															
s	62.8	81.7	73.4	75.0	84.8	87.8	72.7	85.0	92.5	61.5	86.3	97.8	56.2	85.2	100.0
f	50.0	77.7	71.9	67.3	80.7	70.7	60.2	80.7	79.4	50.3	83.7	91.5	39.7	84.5	100.0
r	88.5	88.0	99.4	86.2	87.0	100.9	86.0	88.0	102.3	86.7	87.0	100.3	83.6	85.0	101.7
coffee/spraynwash/pump															
s	62.7	81.7	72.6	74.3	83.8	79.4	73.0	83.7	82.1	59.8	85.5	95.5	55.7	84.3	100.0
f	50.8	76.3	67.8	66.7	80.3	70.0	62.3	80.7	77.5	49.3	84.7	94.6	39.3	84.0	99.6
r	88.5	88.0	99.4	86.2	88.0	102.1	86.0	87.0	101.2	86.7	87.0	100.3	83.6	85.0	101.7
coffee/spraynwash/direct															
s	66.0	80.7	64.8	73.2	83.5	79.2	73.2	84.0	84.4	61.5	85.3	94.5	53.5	84.0	100.0
f	50.3	75.7	66.3	67.5	80.3	68.6	61.2	80.8	79.2	49.5	83.7	91.8	39.2	83.3	98.8
r	88.5	87.5	98.9	86.2	87.0	100.9	86.0	87.0	101.2	86.7	87.0	100.3	83.6	85.0	101.7
coffee/clorox/aerosol															
s	67.0	80.7	63.3	74.2	82.3	68.7	74.3	83.7	79.9	61.3	85.2	94.0	55.8	84.2	100.0
f	48.7	74.3	64.4	66.8	79.3	64.5	61.7	79.0	71.2	49.5	84.0	92.7	39.8	83.0	98.3
r	88.5	87.0	98.3	86.2	87.0	100.9	86.0	87.0	101.2	86.7	87.0	100.3	83.6	85.0	101.7
coffee/clorox/pump															
s	65.5	82.0	71.8	75.3	84.5	84.2	72.8	86.0	100.0	62.7	85.8	96.3	56.2	84.3	100.0
f	50.0	76.8	69.7	67.0	80.7	71.2	60.5	80.5	78.5	49.2	84.0	92.8	38.7	84.0	99.6
r	88.5	88.0	99.4	86.2	87.0	100.9	86.0	88.0	102.3	86.7	87.0	100.3	83.6	85.0	101.7

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
coffee/clorox/direct															
s	64.5	81.3	70.1	73.2	84.7	87.4	74.2	84.7	88.8	62.5	85.3	94.6	60.2	84.3	100.0
f	48.7	76.5	69.9	68.7	79.3	60.8	61.2	80.7	78.5	48.3	85.0	95.5	38.5	82.7	97.6
r	88.5	88.0	99.4	86.2	87.0	100.9	86.0	87.5	101.7	86.7	88.0	101.5	83.6	85.0	101.7
coffee/shout/aerosol															
s	66.0	79.3	59.2	73.7	82.0	66.3	71.0	83.0	79.8	63.3	87.7	100.0	53.8	85.0	100.0
f	50.5	75.3	65.3	68.0	81.0	71.4	62.2	81.0	79.0	48.2	84.5	94.3	38.8	82.8	98.3
r	88.5	87.0	98.3	86.2	87.0	100.9	86.0	87.0	101.2	86.7	87.0	100.3	83.6	85.5	102.3
coffee/shout/direct															
s	64.8	81.7	71.2	73.2	84.0	82.9	69.7	84.8	93.1	63.0	87.0	98.9	54.8	84.7	100.0
f	48.8	77.0	71.0	67.8	81.0	71.6	60.3	82.3	85.5	47.0	85.3	95.5	38.5	83.7	99.5
r	88.5	87.0	98.3	86.2	87.0	100.9	86.0	88.0	102.3	86.7	86.5	99.8	83.6	85.5	102.3
coffee/control															
s	61.3	79.3	66.1	74.3	83.3	75.1	65.7	83.0	85.2	56.3	85.7	96.8	54.5	84.0	99.3
f	49.2	74.7	64.8	64.5	79.0	66.6	60.3	80.3	77.9	47.0	83.2	91.1	36.8	81.0	94.4
r	88.5	87.0	98.3	86.2	86.0	99.8	86.0	87.0	101.2	86.7	86.5	99.8	83.6	85.0	101.7
ball point ink/spraynwash/aerosol***															
s	14.0	49.2	58.1	15.0	39.2	45.7	16.5	48.3	56.0	22.7	73.2	89.2	20.5	70.0	86.4
f	12.5	51.3	62.3	14.5	48.2	61.8	18.2	54.8	65.9	17.2	71.8	88.0	18.3	71.3	89.3
r	88.5	76.0	85.9	86.2	71.0	82.4	86.0	75.0	87.2	86.7	79.5	91.7	83.6	78.0	93.3
ball point ink/spraynwash/pump***															
s	12.5	46.0	51.4	12.5	46.3	59.4	18.2	52.7	62.2	23.5	69.0	78.3	21.5	59.0	67.2
f	13.2	45.0	49.5	12.8	42.7	53.1	20.3	55.2	65.3	16.0	57.3	63.2	21.0	65.7	79.0
r	88.5	79.0	89.3	86.2	71.0	82.4	86.0	75.0	87.2	86.7	82.0	94.6	83.6	78.0	93.3
ball point ink/spraynwash/direct***															
s	13.7	44.3	51.6	16.8	39.7	45.3	17.7	46.3	57.4	23.7	64.0	72.5	20.2	60.0	69.9
f	13.7	43.8	50.8	12.8	37.0	43.7	20.5	52.8	67.8	14.2	48.5	53.0	24.7	66.3	78.8
r	88.5	75.0	84.7	86.2	71.0	82.4	86.0	70.0	81.4	86.7	80.0	92.3	83.6	78.0	93.3
ball point ink/clorox/aerosol***															
s	12.7	43.7	50.4	18.7	45.8	68.4	18.7	50.0	63.7	22.7	68.0	81.2	22.5	68.0	91.4
f	15.5	46.3	52.8	13.2	39.3	58.1	19.3	50.5	64.1	16.7	71.7	88.5	23.2	73.0	91.3
r	88.5	76.0	85.9	86.2	61.0	70.8	86.0	70.0	81.4	86.7	79.0	91.1	83.6	78.0	93.3
ball point ink/clorox/pump***															
s	15.0	44.7	66.4	19.3	38.0	44.7	16.5	38.0	58.7	20.3	55.3	64.5	21.7	57.3	69.5
f	15.8	44.3	65.6	13.3	31.7	43.1	21.0	50.3	84.5	14.3	42.7	47.5	23.0	55.8	66.3
r	88.5	62.0	70.1	86.2	61.0	70.8	86.0	57.0	66.3	86.7	76.0	87.7	83.6	74.0	88.5

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
ball point ink/clorox/direct***															
s	11.8	38.7	49.2	17.0	36.7	48.0	17.5	40.2	55.8	22.0	59.7	72.6	21.3	56.2	67.6
f	11.0	38.5	49.6	13.2	30.3	38.8	21.7	49.3	72.7	14.2	37.0	39.5	18.8	44.7	48.7
r	88.5	69.0	78.0	86.2	63.0	73.1	86.0	62.0	72.1	86.7	75.0	86.5	83.6	74.0	88.5
ball point ink/shout/aerosol***															
s	13.8	26.0	31.2	15.8	24.7	30.5	15.8	28.3	27.8	23.7	43.3	42.2	20.3	42.7	48.6
f	15.8	31.0	39.2	13.2	19.3	22.0	22.2	35.7	34.9	13.8	27.3	24.5	20.2	40.8	45.0
r	88.5	62.0	70.1	86.2	57.0	66.1	86.0	69.0	80.2	86.7	75.0	86.5	83.6	70.0	83.7
ball point ink/shout/direct***															
s	15.5	40.0	43.4	16.3	37.8	43.4	17.7	47.7	57.6	22.5	68.0	82.7	20.8	60.7	74.6
f	14.2	42.0	47.6	13.2	36.3	43.2	17.7	41.7	47.0	14.8	52.0	59.8	33.8	60.0	51.6
r	88.5	75.0	84.7	86.2	70.0	81.2	86.0	72.0	83.7	86.7	78.0	90.0	83.6	75.0	89.7
ball point ink/control/ ***															
s	14.5	31.0	43.2	15.7	23.0	15.8	18.8	31.5	23.7	23.8	42.3	38.0	22.0	34.0	26.7
f	14.7	33.0	47.2	13.5	25.7	22.6	22.0	36.7	28.8	16.8	27.0	19.5	19.5	29.7	21.8
r	88.5	59.0	66.7	86.2	74.0	85.8	86.0	78.0	90.7	86.7	77.0	88.8	83.6	74.0	88.5
jelly/control															
s	42.0	83.8	89.7	56.0	84.5	94.5	53.0	85.0	97.0	36.3	85.3	97.3	29.3	83.7	99.9
f	41.5	84.3	91.1	56.7	83.2	89.6	54.2	84.7	94.8	40.0	82.8	91.8	32.3	82.7	97.9
r	88.5	86.0	97.2	86.2	86.0	99.8	86.0	87.0	101.2	86.7	87.0	100.3	83.6	85.0	101.7
jelly/spraynwash/aerosol															
s	32.2	85.8	95.2	53.0	85.0	96.4	53.5	82.8	90.3	32.5	85.2	97.2	26.8	85.2	100.0
f	41.8	81.7	85.4	57.5	83.5	90.6	53.0	84.0	94.0	35.2	86.2	98.8	35.5	85.8	100.0
r	88.5	88.0	99.4	86.2	87.5	101.5	86.0	87.0	101.2	86.7	87.0	100.3	83.6	85.0	101.7
jelly/spraynwash/pump															
s	42.0	81.5	84.8	55.7	86.0	99.3	52.2	84.5	95.2	36.3	84.0	94.6	32.3	85.3	100.0
f	41.3	84.7	91.9	57.8	84.7	94.5	51.8	86.0	100.0	37.3	84.5	95.6	34.7	84.5	99.9
r	88.5	88.0	99.4	86.2	87.0	100.9	86.0	87.0	101.2	86.7	87.0	100.3	83.6	85.0	101.7
jelly/spraynwash/direct															
s	41.8	87.3	97.5	55.3	85.2	96.7	52.5	86.5	100.0	34.5	83.8	94.5	32.2	84.8	100.0
f	47.2	84.8	91.1	59.0	84.7	94.4	53.8	86.0	100.0	38.2	83.3	93.1	32.7	84.5	100.0
r	88.5	88.0	99.4	86.2	87.0	100.9	86.0	87.0	101.2	86.7	87.0	100.3	83.6	85.0	101.7
jelly/clorox/aerosol															
s	36.2	85.0	93.4	56.8	84.3	93.6	53.7	85.8	98.4	32.0	83.5	94.1	29.7	83.5	99.0
f	46.7	82.5	85.7	52.0	82.2	88.2	52.5	85.3	98.0	41.5	84.0	93.9	35.0	84.2	100.0
r	88.5	88.0	99.4	86.2	87.5	101.5	86.0	87.0	101.2	86.7	87.0	100.3	83.6	85.0	101.7

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
jelly/clorox/pump															
s	40.3	86.5	95.8	54.3	85.2	96.8	52.8	86.8	100.0	35.2	84.8	96.4	31.0	84.3	100.0
f	45.0	85.2	92.2	55.8	84.3	93.9	52.0	85.5	98.1	43.2	84.5	95.0	31.8	84.0	99.9
r	88.5	88.0	99.4	86.2	87.0	100.9	86.0	87.0	101.2	86.7	86.5	99.8	83.6	86.0	102.9
jelly/clorox/direct															
s	35.5	85.7	94.7	51.3	86.0	99.1	54.7	86.8	99.5	33.3	84.3	95.6	27.7	83.5	99.6
f	47.5	83.5	87.8	58.3	85.0	94.0	52.7	85.2	97.5	35.7	83.7	94.0	37.3	76.6	83.7
r	88.5	88.0	99.4	86.2	87.0	100.9	86.0	86.0	100.0	86.7	87.0	100.3	83.6	85.0	101.7
jelly/shout/aerosol															
s	42.8	84.2	90.5	53.5	84.7	95.3	53.8	84.5	95.3	39.0	82.5	91.2	30.5	84.3	100.0
f	47.8	79.8	78.6	57.0	81.7	84.4	53.8	84.7	95.3	42.2	82.5	90.7	33.0	82.5	97.8
r	88.5	87.0	98.3	86.2	87.0	100.9	86.0	87.0	101.2	86.7	86.5	99.8	83.6	85.0	101.7
jelly/shout/direct															
s	38.2	85.7	94.2	56.0	83.2	89.1	54.5	86.3	98.9	34.0	84.8	95.9	32.0	83.7	98.3
f	45.5	84.2	89.9	57.8	84.2	92.8	53.7	83.8	93.4	38.3	84.2	94.2	37.2	84.7	100.0
r	88.5	88.0	99.4	86.2	87.5	101.5	86.0	87.0	101.2	87.0	86.7	99.7	83.6	85.5	102.3
oil/spraynwash/aerosol															
s	28.7	58.8	50.4	47.2	62.8	40.1	48.3	62.5	37.7	37.7	56.5	58.7	31.7	39.7	15.4
f	30.2	59.3	50.0	34.5	53.8	37.6	37.5	54.5	35.1	32.7	50.3	32.7	28.3	40.5	21.6
r	88.5	86.0	97.2	86.2	86.0	99.8	86.0	86.0	100.0	86.7	86.0	99.2	83.6	82.0	98.1
oil/spraynwash/pump															
s	28.8	61.0	54.4	50.7	55.7	14.3	50.3	56.2	16.4	36.3	36.8	1.0	32.5	28.5	0.0
f	33.2	48.5	27.7	40.8	44.8	10.1	42.8	45.0	8.0	31.3	32.2	1.5	27.5	27.3	0.5
r	88.5	86.0	97.2	86.2	86.5	100.3	86.0	86.5	100.6	86.7	86.0	99.2	83.6	83.0	99.3
oil/spraynwash/direct															
s	29.5	45.0	26.3	48.8	54.3	15.6	48.0	54.8	17.9	35.8	37.8	3.9	31.7	33.5	4.0
f	33.3	48.7	27.8	40.2	54.3	30.7	41.3	46.2	10.9	29.5	29.5	0.3	33.5	33.3	0.7
r	88.5	86.0	97.2	86.2	85.5	99.2	86.0	86.5	100.6	86.7	86.0	99.2	83.6	83.0	99.3
oil/clorox/aerosol															
s	31.0	66.0	60.9	47.8	69.5	56.5	48.2	71.7	62.2	39.7	69.3	63.1	30.2	55.2	46.8
f	34.3	67.0	60.3	36.3	62.3	52.1	40.0	63.0	49.9	32.3	61.3	53.3	29.8	51.7	40.5
r	88.5	86.5	97.7	86.2	86.0	99.8	86.0	86.0	100.0	86.7	86.0	99.2	83.6	86.0	102.9
oil/clorox/pump															
s	30.2	45.7	26.6	44.5	54.5	23.4	48.8	54.8	16.2	36.8	37.7	2.0	32.5	29.3	0.0
f	34.8	47.7	23.6	39.7	47.0	15.9	36.5	43.2	13.5	31.8	33.0	2.6	31.8	29.7	0.0
r	88.5	86.0	97.2	86.2	86.0	99.8	86.0	86.0	100.0	86.7	86.0	99.2	85.0	84.0	98.8

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
oil/clorox/direct															
s	31.8	46.0	25.1	47.8	56.2	21.7	49.7	55.7	16.4	38.3	38.0	0.4	32.8	28.3	0.0
f	34.3	49.0	27.1	36.8	44.0	14.5	34.0	40.0	11.5	31.0	31.0	0.6	25.7	26.3	1.4
r	88.5	86.5	97.7	86.2	86.5	100.3	86.0	85.0	98.8	86.7	85.5	98.6	83.6	85.0	101.7
oil/shout/aerosol															
s	33.2	62.5	53.0	48.5	63.3	39.4	48.8	63.2	38.6	38.2	61.0	47.0	34.3	48.5	28.9
f	32.3	60.5	50.2	37.2	55.3	37.0	34.8	52.8	35.1	28.7	50.3	37.1	22.3	50.0	45.3
r	88.5	86.5	97.7	86.2	86.5	100.3	86.0	85.5	99.4	86.7	85.0	98.0	83.6	85.0	101.7
oil/shout/direct															
s	33.5	52.8	35.1	48.0	63.2	39.7	50.0	61.7	32.1	34.5	54.7	38.7	33.8	34.8	2.3
f	34.7	53.8	35.6	38.8	51.5	26.4	39.0	57.0	38.5	30.7	49.2	33.0	35.5	37.3	3.9
r	88.5	87.5	98.9	86.2	86.0	99.8	86.0	86.0	100.0	86.7	85.5	98.6	83.6	85.0	101.7
oil/control															
s	32.0	37.3	9.4	48.0	52.2	11.0	48.7	51.2	6.6	38.2	43.5	11.8	32.5	29.3	0.0
f	34.7	37.2	5.9	41.2	44.3	7.0	35.8	37.8	4.1	30.7	32.3	4.9	24.8	25.2	0.6
r	88.5	87.5	98.9	86.2	85.5	99.2	86.0	86.5	100.6	86.7	86.0	99.2	83.6	85.0	101.7
chocolate/control															
s	34.2	75.0	74.9	35.7	82.3	92.4	36.3	81.0	90.0	29.2	82.8	93.3	25.5	81.8	97.0
f	20.7	73.0	77.2	33.8	78.3	85.0	32.0	73.7	77.2	27.2	81.8	91.8	16.0	79.7	94.2
r	88.5	85.0	96.0	86.2	85.0	98.6	86.0	85.0	98.8	86.7	85.0	98.0	83.6	84.0	100.5
chocolate/spraynwash/aerosol															
s	34.0	72.8	71.2	34.3	80.8	89.7	32.2	83.5	95.6	28.0	84.2	95.7	22.3	84.3	100.0
f	22.8	68.8	70.1	32.8	79.2	86.8	32.5	77.3	83.8	23.3	83.8	95.5	20.2	77.0	89.6
r	88.5	87.0	98.3	86.2	87.0	100.9	86.0	85.0	98.8	86.7	86.0	99.2	83.6	83.5	99.9
chocolate/spraynwash/pump															
s	28.3	76.5	79.5	33.7	85.0	97.3	35.5	81.5	91.1	26.8	84.0	95.5	22.7	83.7	99.7
f	21.3	70.0	72.4	36.0	82.3	92.3	34.3	79.0	86.5	28.3	82.0	91.9	22.3	77.3	89.8
r	88.5	86.0	97.2	86.2	85.0	98.6	86.0	85.0	98.8	86.7	85.0	98.0	83.6	85.0	101.7
chocolate/spraynwash/direct															
s	34.7	73.7	72.5	31.3	82.2	92.6	35.2	82.7	93.4	26.0	83.7	95.0	25.5	84.0	99.3
f	21.3	68.7	70.5	35.5	81.0	89.8	26.7	75.0	81.5	26.5	83.0	93.9	23.0	78.0	90.7
r	88.5	84.0	94.9	86.2	85.0	98.6	86.0	88.0	102.3	86.7	85.0	98.0	83.6	82.0	98.1
chocolate/clorox/aerosol															
s	29.3	74.7	76.3	33.0	83.3	94.6	30.0	81.5	92.0	26.7	83.3	94.4	24.2	84.3	100.0
f	17.3	69.7	73.7	32.5	79.3	87.1	29.0	75.0	80.8	27.3	83.0	93.8	23.7	72.5	81.6
r	88.5	86.0	97.2	86.2	90.0	104.4	86.0	88.0	102.3	86.7	85.0	98.0	83.6	84.0	100.5

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
chocolate/clorox/pump															
s	27.0	74.3	77.0	32.0	82.0	92.3	30.0	82.3	93.4	28.0	84.5	96.3	26.8	83.3	98.7
f	20.2	67.7	69.5	31.2	78.8	86.6	31.0	71.3	73.3	25.5	81.3	91.2	22.3	68.5	74.8
r	88.5	85.0	96.0	86.2	86.0	99.8	86.0	84.0	97.7	86.7	85.0	98.0	83.6	86.0	102.9
chocolate/clorox/direct															
s	37.2	76.3	76.3	32.5	81.7	91.5	36.5	83.7	95.3	26.8	83.3	94.4	25.7	83.0	98.7
f	21.2	68.7	70.5	32.2	79.3	87.3	30.5	75.3	80.9	28.7	83.3	93.5	20.5	80.0	94.2
r	88.5	85.0	96.0	86.2	85.0	98.6	86.0	88.0	102.3	86.7	85.0	98.0	83.6	89.0	106.5
chocolate/shout/aerosol															
s	31.2	72.2	71.3	29.7	80.8	90.5	34.5	81.0	90.3	28.3	83.7	94.8	26.8	85.0	99.6
f	20.0	68.2	70.3	33.2	78.0	84.5	33.5	73.0	75.2	27.2	82.7	93.2	24.8	76.5	87.9
r	88.5	84.0	94.9	86.2	83.5	96.9	86.0	86.0	100.0	86.7	85.0	98.0	83.6	82.0	98.1
chocolate/shout/direct															
s	29.0	76.8	80.4	32.8	81.5	91.2	37.8	83.3	94.5	27.0	83.3	94.4	27.0	83.7	99.3
f	21.8	71.7	74.7	35.0	78.8	85.6	31.5	79.8	88.7	29.3	83.0	93.5	23.3	79.3	93.0
r	88.5	85.0	96.0	86.2	85.0	98.6	86.0	86.0	100.0	86.7	86.0	99.2	83.6	85.0	101.7
blood/control															
s	9.5	78.3	87.1	13.5	82.7	95.2	10.7	84.3	97.8	13.0	85.3	98.2	10.2	56.6	66.7
f	8.8	82.3	92.3	10.5	83.7	96.7	9.8	84.8	98.3	8.7	86.7	99.7	10.7	80.3	95.3
r	88.5	83.0	93.8	86.2	85.0	98.6	86.0	85.0	98.8	86.7	85.0	98.0	83.6	77.5	92.7
blood/spraynwash/aerosol															
s	8.5	79.3	88.5	13.0	83.7	96.5	11.0	85.0	98.7	12.0	85.7	98.6	10.2	84.7	100.0
f	7.3	82.7	92.8	10.2	82.7	95.4	9.8	84.3	97.8	9.8	86.3	99.4	9.3	84.2	100.0
r	88.5	81.0	91.5	86.2	85.0	98.6	86.0	85.0	98.8	86.7	85.0	98.0	83.6	84.0	100.5
blood/spraynwash/pump															
s	11.0	79.7	88.5	11.8	82.8	95.5	11.7	84.7	98.2	12.0	85.7	98.6	9.7	84.0	99.7
f	7.3	82.3	92.4	10.5	84.0	97.1	10.0	84.3	97.8	8.8	86.0	99.1	9.7	84.0	100.0
r	88.5	81.0	91.5	86.2	85.0	98.6	86.0	85.0	98.8	86.7	85.0	98.0	83.6	85.0	101.7
blood/spraynwash/direct															
s	9.5	78.7	87.5	12.8	82.3	94.7	10.7	85.0	98.7	11.5	85.0	97.7	10.2	84.7	100.0
f	7.7	82.3	92.4	7.7	83.0	95.9	8.5	84.0	97.4	8.0	86.0	99.0	17.7	84.0	100.0
r	88.5	84.0	94.9	86.2	85.0	98.6	86.0	84.0	97.7	86.7	85.0	98.0	83.6	85.0	101.7
blood/clorox/aerosol															
s	12.7	79.0	87.4	12.0	82.8	95.5	11.0	85.5	99.3	11.8	86.3	99.2	10.2	84.3	100.0
f	8.0	82.0	91.9	12.7	83.3	96.1	10.7	84.7	98.2	8.3	85.3	98.3	8.5	85.3	100.0
r	88.5	81.0	91.5	86.2	84.0	97.4	86.0	85.5	99.4	86.7	85.0	98.0	83.6	84.0	100.5

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
blood/clorox/pump															
s	9.3	77.7	86.3	13.2	82.0	94.3	11.8	84.3	97.8	11.2	85.3	98.2	9.7	83.3	99.5
f	8.7	82.0	91.9	10.7	83.7	96.6	10.8	84.7	98.2	11.3	85.7	98.6	8.7	84.0	100.0
r	88.5	83.0	93.8	86.2	85.0	98.6	86.0	88.0	102.3	86.7	85.0	98.0	83.6	84.0	100.5
blood/clorox/direct															
s	9.0	77.7	86.4	13.3	82.0	94.2	11.2	84.0	97.3	12.2	86.3	99.4	10.5	83.3	99.5
f	8.5	81.7	91.5	11.7	84.0	97.1	11.2	84.7	98.2	9.3	86.7	99.7	10.5	84.3	100.0
r	88.5	81.0	91.5	86.2	85.0	98.6	86.0	85.0	98.8	86.7	86.0	99.2	83.6	84.0	100.5
blood/shout/aerosol															
s	9.3	76.7	85.1	11.5	80.8	92.8	11.7	85.8	99.5	12.2	85.7	98.6	10.5	84.3	100.0
f	8.0	82.3	92.3	12.8	81.7	93.8	10.2	85.0	98.7	9.0	84.3	96.9	9.3	83.7	99.7
r	88.5	83.0	93.8	86.2	84.0	97.4	86.0	86.0	100.0	86.7	85.0	98.0	83.6	85.0	101.7
blood/shout/direct															
s	11.2	79.0	87.7	12.7	82.7	95.2	11.3	85.8	99.3	11.3	85.7	98.5	10.7	84.0	99.7
f	8.0	83.7	94.0	9.8	83.7	96.7	11.2	85.7	99.6	9.7	86.0	99.0	9.3	84.2	100.0
r	88.5	81.0	91.5	86.2	84.0	97.4	86.0	84.0	97.7	86.7	85.0	98.0	83.6	84.0	100.5
lipstick/control															
s	18.7	36.8	26.1	15.8	34.3	26.0	14.3	36.3	30.7	12.8	25.3	16.9	13.3	25.8	17.8
f	14.7	29.5	20.1	15.8	33.3	24.6	17.7	38.2	29.8	12.5	20.5	10.7	12.5	19.2	9.4
r	88.5	85.0	96.0	86.2	85.0	98.6	86.0	84.0	97.7	86.7	84.0	96.9	83.6	82.0	98.1
lipstick/spraynwash/aerosol															
s	19.8	37.0	24.9	14.8	32.3	24.5	17.3	33.5	23.3	15.5	34.7	26.9	12.3	17.3	7.0
f	13.0	27.8	19.6	17.5	33.7	23.5	15.3	35.7	28.8	14.5	23.5	12.5	11.7	14.3	3.7
r	88.5	85.0	96.0	86.2	85.0	98.6	86.0	85.0	98.8	86.7	83.0	95.7	83.6	77.0	92.1
lipstick/spraynwash/pump															
s	16.3	37.8	29.5	16.7	35.3	26.5	14.7	36.7	30.8	13.2	38.7	34.7	12.5	27.3	20.9
f	12.7	31.0	24.2	14.8	38.0	32.5	16.7	46.0	42.3	12.5	32.0	26.3	12.0	16.5	6.3
r	88.5	86.5	97.7	86.2	85.0	98.6	86.0	85.0	98.8	86.7	84.0	96.9	83.6	83.0	99.3
lipstick/spraynwash/direct															
s	17.7	40.8	32.6	18.2	36.5	26.6	15.3	39.7	34.4	13.0	30.2	23.3	12.7	26.3	19.3
f	16.7	31.3	20.7	18.0	33.8	22.6	16.8	44.0	39.3	14.3	22.3	11.0	12.5	20.7	11.5
r	88.5	87.0	98.3	86.2	85.0	98.6	86.0	85.0	98.8	86.7	84.0	96.9	83.6	83.0	99.3
lipstick/clorox/aerosol															
s	18.2	43.0	35.2	17.8	36.8	27.4	16.0	38.7	32.4	15.8	26.2	14.5	12.7	20.0	10.3
f	15.8	41.0	34.7	18.8	37.2	26.8	19.0	42.2	34.4	14.3	31.0	23.0	12.3	17.7	7.9
r	88.5	85.0	96.0	86.2	85.0	98.6	86.0	85.0	98.8	86.7	84.0	96.9	83.6	73.0	87.3

TABLE 17 (continued)
REFLECTANCE READINGS (%)

	1			2			3			4			5		
lipstick/clorox/pump															
s	17.5	37.8	28.1	20.8	33.0	18.3	16.0	37.0	30.0	18.2	37.7	28.3	13.3	25.7	17.6
f	16.7	29.5	17.7	18.8	37.0	26.6	17.7	45.0	39.9	14.5	23.0	11.8	12.3	18.7	8.9
r	88.5	86.0	97.2	86.2	85.0	98.6	86.0	84.0	97.7	86.7	86.0	99.2	83.6	83.0	99.3
lipstick/clorox/direct															
s	19.3	30.5	16.1	20.0	33.3	19.9	15.2	34.5	27.3	15.2	38.8	33.1	13.8	20.5	9.5
f	16.0	36.5	28.0	18.3	34.7	23.9	18.7	45.8	40.4	13.8	21.3	10.3	12.3	18.2	8.2
r	88.5	86.0	97.2	86.2	85.0	98.6	86.0	86.0	100.0	86.7	84.0	96.9	83.6	83.0	99.3
lipstick/shout/aerosol															
s	17.5	35.0	25.5	18.8	36.7	26.2	16.5	35.7	27.6	14.3	24.0	13.3	14.3	23.7	13.4
f	16.7	31.3	20.4	17.8	33.8	23.0	18.5	40.2	32.0	13.3	19.7	8.6	12.7	17.0	6.1
r	88.5	85.0	96.0	86.2	85.0	98.6	86.0	84.0	97.7	86.7	84.0	96.9	83.6	78.0	93.3
lipstick/shout/direct															
s	18.0	46.7	40.6	18.0	38.3	29.8	15.5	39.7	34.3	14.0	38.0	33.0	12.8	28.3	21.9
f	16.0	36.7	28.9	17.7	39.2	31.0	18.8	47.2	42.1	14.5	26.0	15.9	12.0	16.3	6.1
r	88.5	88.0	99.4	86.2	84.0	97.4	86.0	85.0	98.8	86.7	84.0	96.9	83.6	84.0	100.5

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
wine/spraynwash/aerosol									
oven set	68.7	75.2	34.9**	53.6	71.3	75.9	63.7	75.3	76.0
fresh	71.8	75.2	22.0	55.5	66.3	50.1	63.5	74.7	72.0
redepo	87.0	83.0	95.4#	77.0	79.0	102.6	79.0	79.0	100.0
wine/spraynwash/pump									
oven set	70.2	77.7	46.3	53.6	64.8	46.4	66.0	77.7	84.1
fresh	68.3	73.7	29.8	56.6	73.5	79.4	64.7	73.0	54.1
redepo	86.4	84.0	97.3	77.9	77.5	99.5	79.9	78.0	97.6
wine/spraynwash/direct									
oven set	67.9	77.8	53.7	53.8	73.0	79.8	65.1	77.0	80.5
fresh	70.5	65.7	0.0	52.7	65.7	51.4	65.0	74.2	61.2
redepo	86.4	84.0	97.3	77.9	76.0	97.6	79.9	78.5	98.3
wine/control									
oven set	69.9	70.5	4.1	54.3	64.2	41.8	64.3	74.0	62.2
fresh	69.9	68.3	0.0	50.0	56.8	24.5	62.6	70.8	47.7
redepo	86.4	88.5	102.5	77.9	76.0	97.6	79.9	80.0	100.2
wine/clorox/aerosol									
oven set	70.7	71.7	6.2	54.9	71.7	73.1	65.7	76.0	72.6
fresh	68.4	64.2	0.0	51.7	64.0	46.9	65.0	71.8	45.7
redepo	86.4	85.0	98.4	77.9	78.0	100.2	79.9	79.0	98.9
wine/clorox/pump									
oven set	70.5	74.8	27.4	55.0	64.8	43.2	65.4	77.3	82.5
fresh	69.9	70.7	13.7	53.4	71.2	72.5	64.4	72.3	51.1
redepo	86.4	84.0	97.3	77.9	77.0	98.9	79.9	82.0	102.7
wine/clorox/direct									
oven set	70.0	71.0	17.4	53.4	72.5	78.1	66.7	77.5	82.0
fresh	67.8	73.3	34.2	53.1	63.3	41.2	65.4	74.0	58.1
redepo	86.4	85.0	98.4	77.9	77.0	98.9	79.9	8.0	10.0
wine/shout/aerosol									
oven set	68.7	71.2	13.6	54.7	71.8	73.9	65.5	77.0	79.9
fresh	69.3	74.0	28.6	54.0	62.7	36.3	65.0	71.2	40.8
redepo	86.4	86.0	99.6	77.9	77.5	99.5	79.9	81.0	101.4

*1. Silk Crepe 2. Worsted Gabardine 3. Dacron/Wool 55/45

** Third number in every set is cleaning efficiency which is defined as $(A-B)/(C_o-B) \times 100$.

Third number in redepo is a measure of stain transference which is defined as A1/B x 100.

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

wine/shout/direct

	1*			2			3		
oven set	70.3	70.5	5.5	55.1	68.3	52.1	66.8	77.0	77.7
fresh	71.4	66.0	0.0	55.0	67.3	48.2	66.7	73.7	52.6
redepo	86.4	84.0	97.3	80.5	79.0	98.1	79.9	79.0	98.9

sheaffer black ink/control/ ***

oven set	38.7	57.2	42.5	24.3	48.7	48.7	39.5	69.0	77.1
fresh	65.0	65.0	12.6	25.5	25.5	1.9	43.0	44.5	7.2
redepo	86.4	83.0	96.1	77.9	75.0	96.3	79.9	78.0	97.6

sheaffer black ink/spraynwash/aerosol***

oven set	32.7	56.0	46.4	25.5	50.3	47.0	39.0	68.5	75.7
fresh	63.3	63.8	16.3	26.0	26.7	0.9	44.3	45.8	8.4
redepot	86.4	83.0	96.1	77.0	78.0	101.3	78.0	78.0	100.0

sheaffer black ink/spraynwash/pump***

oven set	30.5	58.0	52.1	23.7	54.7	57.1	36.8	72.0	85.7
fresh	60.0	73.5	40.8	30.8	31.5	2.0	47.5	53.2	21.5
redepo	86.4	84.0	97.3	77.9	78.0	100.2	79.9	78.0	97.6

sheaffer black ink/spraynwash/direct***

oven set	31.0	57.3	50.4	24.5	55.3	57.9	35.8	69.5	78.1
fresh	36.3	51.8	34.0	26.5	27.3	6.2	43.2	46.5	10.5
redepo	86.4	84.0	97.3	77.9	78.0	100.2	79.9	79.0	98.9

sheaffer black ink/clorox/aerosol***

oven set	33.5	52.7	38.9	25.3	48.0	45.3	33.2	67.2	75.7
fresh	49.5	55.0	20.3	23.0	23.0	1.1	41.0	43.0	8.2
redepo	86.4	84.0	97.3	77.9	76.0	97.6	79.9	78.0	97.6

sheaffer black ink/clorox/pump***

oven set	32.5	53.3	42.7	24.7	46.2	40.9	43.2	70.0	75.1
fresh	54.8	60.3	24.5	25.7	27.0	3.2	50.3	53.0	12.0
redepo	86.4	83.0	96.1	77.9	77.0	98.9	79.9	79.0	98.9

sheaffer black ink/clorox/direct***

oven set	36.2	53.3	38.6	27.3	47.0	40.0	31.7	57.2	55.8
fresh	50.0	55.0	19.1	21.3	23.0	3.4	43.2	47.0	13.8
redepo	86.4	83.0	96.1	77.9	77.0	98.9	79.9	78.0	97.6

sheaffer black ink/shout/aerosol***

oven set	31.5	51.2	39.6	22.8	51.7	54.7	32.8	58.2	56.8
fresh	42.0	48.2	18.3	29.8	30.7	3.4	44.0	45.0	6.1
redepo	86.4	83.0	96.1	77.9	76.0	97.6	79.9	78.0	97.6

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
sheaffer black ink/shout/direct***									
oven set	33.0	52.2	40.0	22.7	46.3	45.4	32.5	58.5	57.9
fresh	50.3	47.7	3.6	25.2	25.8	3.1	52.5	54.5	12.8
redepo	86.4	83.0	96.1	77.9	75.0	96.3	79.9	78.0	97.6
sheaffer/blue/control									
oven set	48.0	66.3	51.7	24.7	64.0	74.0	33.0	71.3	81.8
fresh	57.3	60.7	11.9	55.5	56.5	6.2	45.0	59.7	42.0
redepo	83.4	85.0	102.0	77.9	77.0	98.9	79.9	79.0	98.9
sheaffer/blue/spraynwash/aerosol									
oven set	49.3	70.3	56.7	23.2	69.5	84.7	37.5	73.7	85.4
fresh	58.5	62.0	11.6	55.5	60.0	24.5	47.2	63.8	51.0
redepo	86.4	85.0	98.4	77.9	76.0	97.6	79.9	79.0	98.9
sheaffer/blue/spraynwash/pump									
oven set	47.3	68.7	54.6	24.8	69.0	83.3	34.2	72.3	83.5
fresh	61.8	62.3	3.2	51.0	56.0	18.6	46.3	60.7	42.7
redepo	86.4	84.0	97.3	77.9	77.0	98.9	79.9	79.0	98.9
sheaffer/blue/spraynwash/direct									
oven set	50.3	67.0	45.7	20.7	65.3	78.1	38.7	69.5	74.8
fresh	62.3	62.0	1.3	51.7	59.7	31.4	45.8	60.3	42.5
redepo	86.4	85.0	98.4	77.9	77.0	98.9	79.9	79.0	98.9
sheaffer/blue/clorox/aerosol									
oven set	55.5	63.3	24.8	24.7	56.3	59.5	35.3	66.3	69.5
fresh	59.3	62.8	12.4	48.5	54.2	19.2	45.0	58.8	39.6
redepo	86.4	84.5	97.9	77.9	76.5	98.3	79.9	78.0	97.6
sheaffer/blue/clorox/pump									
oven set	45.3	65.7	49.2	23.2	63.3	73.4	37.2	64.3	63.6
fresh	56.8	60.3	11.7	51.0	53.7	9.8	49.7	60.3	35.1
redepo	86.4	85.0	98.4	77.9	76.0	97.6	79.9	79.0	98.9
sheaffer/blue/clorox/direct									
oven set	50.2	67.0	46.5	29.3	61.0	65.3	35.7	63.0	61.9
fresh	62.2	64.3	9.2	52.2	52.8	4.7	46.8	60.7	41.8
redepo	86.4	84.0	97.3	77.9	77.0	98.9	79.9	79.0	98.9
sheaffer/blue/shout/aerosol									
oven set	45.5	62.7	42.0	27.5	59.8	63.5	43.3	65.2	59.8
fresh	59.0	60.7	5.6	49.2	55.5	22.0	47.8	61.5	42.7
redepo	86.4	84.0	97.3	77.9	77.0	98.9	79.9	79.0	98.9

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
sheaffer/blue/shout/direct									
oven set	47.3	62.5	38.7	25.8	58.2	62.2	39.2	63.2	59.Ø
fresh	59.3	59.7	4.4	51.7	55.2	13.4	45.7	58.7	38.1
redepo	86.4	84.Ø	97.3	77.9	77.Ø	98.9	79.9	79.Ø	98.9
coffee/control									
oven set	67.3	7Ø.5	16.6	51.2	57.2	22.3	58.Ø	67.8	44.5
fresh	7Ø.7	75.Ø	27.2	47.2	62.Ø	48.3	6Ø.5	7Ø.3	5Ø.7
redepo	86.4	85.Ø	98.4	77.9	77.Ø	98.9	79.9	79.Ø	98.9
coffee/spraynwash/aerosol									
oven set	7Ø.2	73.Ø	17.3	57.3	62.Ø	22.7	58.8	69.5	5Ø.Ø
fresh	71.5	75.Ø	23.1	5Ø.Ø	61.Ø	39.3	61.2	7Ø.7	5Ø.6
redepo	86.4	85.Ø	98.4	77.9	77.Ø	98.9	79.9	79.Ø	98.9
coffee/spraynwash/pump									
oven set	68.8	74.5	27.4	51.8	56.5	17.3	6Ø.Ø	68.5	42.3
fresh	72.3	75.3	2Ø.5	5Ø.2	61.8	42.2	61.5	72.3	59.Ø
redepo	86.4	85.Ø	98.4	77.9	77.Ø	98.9	79.9	79.Ø	98.9
coffee/spraynwash/direct									
oven set	71.2	73.3	14.9	53.2	55.7	11.4	55.Ø	68.7	52.7
fresh	72.7	74.Ø	9.3	5Ø.7	61.3	39.1	61.7	7Ø.2	46.7
redepo	86.4	85.Ø	98.4	77.9	77.Ø	98.9	79.9	79.Ø	98.9
coffee/clorox/aerosol									
oven set	69.5	71.Ø	8.9	56.Ø	59.7	16.9	57.5	67.3	44.Ø
fresh	72.3	73.3	8.7	51.3	62.2	4Ø.8	61.7	7Ø.7	49.1
redepo	86.4	84.Ø	97.3	77.9	77.Ø	98.9	79.9	79.Ø	98.9
coffee/clorox/pump									
oven set	7Ø.3	73.7	17.5	52.Ø	6Ø.2	31.3	58.7	68.7	47.1
fresh	72.7	74.Ø	9.Ø	5Ø.5	61.2	39.Ø	61.2	71.Ø	52.3
redepo	86.4	84.Ø	97.3	77.9	76.Ø	97.6	79.9	79.Ø	98.9
coffee/clorox/direct									
oven set	7Ø.3	72.7	14.7	5Ø.5	57.8	26.5	59.Ø	68.7	45.6
fresh	73.Ø	74.8	13.2	5Ø.7	62.3	42.9	61.7	7Ø.Ø	45.8
redepo	86.4	84.Ø	97.3	77.9	76.Ø	97.6	79.9	79.Ø	98.9
coffee/shout/aerosol									
oven set	69.Ø	68.3	Ø.Ø	51.8	58.3	25.4	58.5	68.2	44.4
fresh	72.2	71.5	3.1	49.3	6Ø.7	39.7	6Ø.8	7Ø.3	49.8
redepo	86.4	85.Ø	98.4	77.9	77.Ø	98.9	79.9	79.Ø	98.9

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
coffee/shout/direct									
oven set	68.5	72.7	23.0	53.5	59.7	23.9	60.2	68.3	41.4
fresh	72.8	75.0	15.7	50.0	62.7	45.4	60.7	72.0	58.9
redepo	86.4	84.0	97.3	77.9	77.0	98.9	79.9	79.0	98.9
blood/control									
oven set	8.2	78.0	89.3	10.3	60.3	74.0	12.7	69.7	84.8
fresh	8.0	81.7	94.0	10.0	75.3	96.3	20.7	78.5	97.6
redepo	86.4	83.0	96.1	77.9	76.0	97.6	79.9	79.0	98.9
blood/spraynwash/aerosol									
oven set	8.7	80.3	92.7	11.8	69.0	87.7	12.3	75.0	94.0
fresh	8.0	82.0	94.9	14.3	75.7	98.0	12.8	78.3	99.0
redepo	86.0	85.0	98.8	77.0	75.0	97.4	79.0	78.0	98.7
blood/spraynwash/pump									
oven set	8.3	79.0	90.6	10.8	54.5	66.0	10.0	74.3	90.0
fresh	8.5	82.3	94.8	16.0	74.0	95.1	13.7	78.5	99.2
redepo	86.4	85.0	98.4	77.0	75.0	97.4	79.0	78.0	98.7
blood/spraynwash/direct									
oven set	8.2	80.2	92.1	10.7	58.0	70.5	12.0	66.7	80.6
fresh	8.8	81.3	93.5	14.0	77.0	98.6	15.3	77.8	96.8
redepo	86.4	82.0	95.0	77.9	76.0	97.6	79.9	78.0	97.6
blood/clorox/aerosol									
oven set	8.2	78.3	89.7	10.8	58.5	71.1	12.7	68.3	82.8
fresh	9.5	81.8	94.1	15.5	75.7	96.5	13.8	78.3	97.7
redepo	86.4	81.0	93.8	77.9	78.0	100.2	79.9	80.0	100.2
blood/clorox/pump									
oven set	8.7	77.3	88.4	10.0	66.7	83.5	12.0	72.0	88.4
fresh	9.2	82.7	95.2	11.3	75.0	95.7	13.2	78.3	97.7
redepo	86.4	83.0	96.1	77.9	77.0	98.9	79.9	79.0	98.9
blood/clorox/direct									
oven set	8.7	79.5	91.2	11.2	61.3	75.2	13.2	70.0	85.2
fresh	9.7	83.0	95.6	16.0	75.2	95.6	15.3	77.7	96.6
redepo	86.4	81.5	94.4	77.9	76.5	98.3	79.9	79.0	98.9
blood/shout/aerosol									
oven set	8.5	78.3	89.0	9.2	70.0	89.7	10.7	69.8	86.5
fresh	8.8	81.8	93.4	19.5	76.0	98.3	16.5	78.0	98.4
redepo	87.0	83.0	95.4	77.0	76.0	98.7	79.0	78.0	98.7

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
blood/shout/direct									
oven set	8.5	79.7	91.4	9.2	66.3	83.2	12.2	70.7	86.4
fresh	10.3	82.0	94.3	16.5	76.3	97.5	16.0	78.5	97.8
redepo	86.4	81.5	94.4	77.9	77.0	98.9	79.9	78.0	97.6
oil/control									
oven set	33.2	44.2	20.5	37.8	42.7	11.9	42.8	43.8	4.0
fresh	29.7	39.0	16.4	32.7	37.3	10.3	33.2	34.2	2.1
redepo	86.4	84.0	97.3	77.9	76.0	97.6	79.9	78.0	97.6
oil/spraynwash/aerosol									
oven set	48.2	79.0	80.8	32.7	60.3	61.0	44.8	54.7	28.1
fresh	34.3	71.3	71.2	35.8	63.7	66.3	36.0	42.3	14.5
redepo	86.4	85.0	98.4	77.9	77.0	98.9	79.9	79.0	98.9
oil/spraynwash/pump									
oven set	43.3	62.2	44.7	38.7	49.7	28.4	41.5	43.0	4.0
fresh	53.3	62.7	20.6	36.3	43.0	16.1	37.3	41.7	10.4
redepo	86.5	84.0	97.1	77.5	77.0	99.4	79.0	79.0	100.0
oil/spraynwash/direct									
oven set	43.2	64.3	49.4	35.2	46.0	25.3	43.7	46.0	6.4
fresh	36.3	51.5	31.0	34.0	42.0	17.3	36.7	37.7	2.3
redepo	86.4	85.0	98.4	77.9	77.0	98.9	79.9	78.0	97.6
oil/clorox/aerosol									
oven set	46.5	81.5	87.8	36.0	69.0	78.8	43.7	60.5	46.4
fresh	40.2	79.3	84.9	33.3	64.0	68.8	38.0	63.0	59.8
redepo	86.4	85.0	98.4	77.9	78.0	100.2	79.9	79.0	98.9
oil/clorox/pump									
oven set	45.2	64.3	46.8	36.7	46.7	24.2	42.5	44.0	4.1
fresh	36.5	53.7	34.4	33.7	44.0	23.3	37.5	38.7	2.8
redepo	86.4	85.0	98.4	77.9	77.0	98.9	79.9	78.0	97.6
oil/clorox/direct									
oven set	46.8	65.3	46.4	36.5	44.0	18.1	44.5	45.7	3.4
fresh	34.8	50.0	29.4	33.7	40.3	15.1	38.5	39.3	2.0
redepo	86.4	85.0	98.4	77.9	76.0	97.6	79.9	78.0	97.6
oil/shout/aerosol									
oven set	43.7	59.0	37.6	38.3	55.0	42.6	44.3	55.3	30.9
fresh	36.5	48.3	23.7	34.3	54.3	46.0	34.5	37.7	7.0
redepo	86.4	85.0	98.4	77.9	77.0	98.9	79.9	79.0	98.9

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
oil/shout/direct									
oven set	35.Ø	6Ø.5	5Ø.6	36.Ø	49.8	33.6	43.2	48.Ø	13.2
fresh	35.7	59.Ø	46.3	33.5	45.8	27.8	36.5	38.7	5.Ø
redepo	86.4	84.Ø	97.3	77.9	78.Ø	1ØØ.2	79.9	79.Ø	98.9
chocolate/control									
oven set	34.8	71.5	7Ø.3	3Ø.3	65.7	75.7	27.3	75.Ø	92.3
fresh	24.8	59.7	56.Ø	19.2	6Ø.7	71.8	22.2	68.5	81.5
redepo	87.Ø	85.Ø	97.7	77.Ø	77.Ø	1ØØ.Ø	79.Ø	78.5	99.4
chocolate/spraynwash/aerosol									
oven set	36.3	74.Ø	74.3	26.8	66.7	79.2	24.8	71.Ø	86.9
fresh	21.8	59.7	58.2	14.2	61.3	75.1	23.2	69.3	84.2
redepo	87.Ø	84.Ø	96.6	77.Ø	77.Ø	1ØØ.Ø	78.Ø	78.Ø	1ØØ.Ø
chocolate/spraynwash/pump									
oven set	34.5	77.7	83.2	25.5	69.Ø	83.2	25.8	74.8	9Ø.7
fresh	28.5	61.7	57.Ø	21.Ø	65.3	78.Ø	19.3	7Ø.Ø	83.7
redepo	86.4	84.Ø	97.3	77.9	77.Ø	98.9	79.9	79.Ø	98.9
chocolate/spraynwash/direct									
oven set	39.3	72.Ø	69.3	29.8	67.8	78.8	26.7	75.7	92.Ø
fresh	24.8	61.Ø	58.8	17.3	63.7	76.6	24.Ø	69.7	81.7
redepo	86.4	83.Ø	96.1	77.9	75.Ø	96.3	79.9	78.Ø	97.6
chocolate/clorox/aerosol									
oven set	31.Ø	72.7	74.5	31.Ø	69.7	84.1	26.7	72.3	89.Ø
fresh	23.5	61.7	6Ø.3	16.3	64.3	79.2	25.2	7Ø.Ø	84.9
redepo	87.Ø	85.Ø	97.7	77.Ø	77.Ø	1ØØ.Ø	78.Ø	78.Ø	1ØØ.Ø
chocolate/clorox/pump									
oven set	29.2	76.7	83.1	27.7	66.Ø	76.2	3Ø.8	74.Ø	88.Ø
fresh	19.7	6Ø.7	61.5	19.Ø	62.3	73.6	25.Ø	69.7	81.4
redepo	86.4	85.Ø	98.4	77.9	77.Ø	98.9	79.9	78.Ø	97.6
chocolate/clorox/direct									
oven set	34.7	74.7	77.3	27.7	68.7	81.8	27.Ø	75.3	91.4
fresh	23.2	58.Ø	55.1	15.5	66.Ø	81.Ø	25.2	71.7	84.9
redepo	86.4	85.Ø	98.4	77.9	77.Ø	98.9	79.9	79.Ø	98.9
chocolate/shout/aerosol									
oven set	3Ø.8	67.5	66.Ø	29.3	66.3	76.3	28.8	73.7	91.4
fresh	26.5	6Ø.Ø	56.Ø	16.Ø	58.8	69.2	21.7	67.3	81.Ø
redepo	86.4	84.Ø	97.3	77.9	77.Ø	98.9	78.Ø	78.Ø	1ØØ.Ø

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
chocolate/shout/direct									
oven set	33.7	76.3	81.0	23.5	67.7	81.3	24.8	73.2	87.7
fresh	22.7	65.0	66.5	14.8	61.7	74.3	25.8	70.7	82.9
redepo	86.4	85.0	98.4	77.9	76.0	97.6	79.9	78.0	97.6
mustard/control									
oven set	70.3	79.2	55.2	61.2	72.8	73.3	65.2	73.8	62.6
fresh	73.7	78.3	37.0	62.2	69.5	49.3	70.6	74.7	69.0
redepo	86.4	84.0	97.3	77.0	75.0	97.4	79.0	78.0	98.7
mustard/spraynwash/aerosol									
oven set	71.5	79.0	50.5	63.0	74.7	78.6	66.3	75.3	66.0
fresh	74.8	78.0	27.0	62.3	69.7	47.0	66.5	74.3	58.3
redepo	86.4	85.0	98.4	77.9	77.0	98.9	79.9	80.0	100.2
mustard/spraynwash/pump									
oven set	73.2	80.3	54.0	46.8	75.2	84.5	64.8	77.3	86.9
fresh	74.2	78.0	29.8	62.8	71.7	58.2	66.0	74.5	65.4
redepo	86.4	84.0	97.3	77.9	77.0	98.9	79.0	78.0	98.7
mustard/spraynwash/direct									
oven set	72.2	78.8	44.7	62.8	74.5	83.3	64.9	76.3	81.2
fresh	73.0	77.3	30.2	62.5	70.8	57.0	64.5	74.7	69.6
redepo	87.0	84.0	96.6	77.0	77.0	100.0	79.0	78.0	98.7
mustard/clorox/aerosol									
oven set	68.0	77.7	50.6	64.3	74.7	76.5	65.8	76.3	80.4
fresh	74.0	76.3	17.8	64.2	71.0	49.8	66.5	75.2	70.0
redepo	86.4	84.0	97.3	77.9	77.0	98.9	78.9	80.0	101.4
mustard/clorox/pump									
oven set	73.2	77.8	34.4	62.5	72.7	65.6	64.2	74.7	66.5
fresh	73.0	76.2	21.8	63.3	70.3	48.4	67.0	75.0	61.9
redepo	86.4	84.0	97.3	77.9	77.0	98.9	79.9	78.0	97.6
mustard/clorox/direct									
oven set	70.3	76.5	38.4	61.2	71.7	62.6	65.8	75.2	66.1
fresh	75.0	76.5	12.9	61.0	70.3	55.4	67.5	73.8	50.8
redepo	86.4	84.0	97.3	77.9	77.0	98.9	79.9	79.0	98.9
mustard/shout/aerosol									
oven set	71.5	78.7	47.6	61.3	72.3	66.2	63.2	74.7	68.7
fresh	74.7	75.2	11.6	62.2	68.2	37.9	67.2	73.3	48.3
redepo	86.4	85.0	98.4	77.9	77.0	98.9	79.9	79.0	98.9

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
mustard/shout/direct									
oven set	73.2	77.7	34.3	62.8	72.0	60.9	64.0	74.7	67.2
fresh	75.3	76.0	5.9	62.0	70.7	55.0	66.3	72.8	47.8
redepo	86.4	84.0	97.3	77.9	77.0	98.9	79.9	79.0	98.9
tea/control									
oven set	42.3	43.3	5.1	26.7	35.8	25.7	43.0	57.3	53.4
fresh	37.7	42.7	11.6	17.2	37.7	45.6	37.3	52.0	43.9
redepo	81.0	80.0	98.8	62.1	62.0	99.8	69.8	68.0	97.4
tea/spraynwash/aerosol									
oven set	44.3	41.3	4.5	28.0	40.0	35.0	39.3	58.7	63.0
fresh	41.7	44.2	6.0	18.5	34.7	37.1	35.0	47.7	36.4
redepo	81.0	80.0	98.8	62.1	62.0	99.8	69.8	68.0	97.4
tea/spraynwash/pump									
oven set	43.5	41.7	0.0	21.5	41.3	48.8	34.2	59.3	70.6
fresh	36.5	41.7	11.7	20.0	37.2	40.7	33.8	49.7	44.0
redepo	81.0	81.0	100.0	62.1	62.0	99.8	69.8	67.0	96.0
tea/spraynwash/direct									
oven set	41.0	44.7	8.2	25.2	40.3	41.0	38.3	59.3	66.9
fresh	37.8	42.7	11.2	18.3	37.0	42.5	34.2	51.0	47.2
redepo	81.0	80.0	98.8	62.1	62.0	99.8	69.8	68.0	97.4
tea/clorox/aerosol									
oven set	46.2	43.2	0.0	22.5	41.0	46.7	32.8	56.3	63.4
fresh	38.7	38.7	1.5	22.0	36.3	35.7	36.0	51.3	45.4
redepo	81.0	80.0	98.8	62.1	61.0	98.2	69.8	67.5	96.7
tea/clorox/pump									
oven set	38.0	38.7	4.5	28.3	42.7	42.9	37.3	58.0	63.6
fresh	39.5	40.3	2.8	19.8	37.5	41.8	34.8	51.8	48.6
redepo	81.0	81.0	100.0	62.1	63.0	101.4	69.8	68.0	97.4
tea/clorox/direct									
oven set	38.2	37.3	1.1	25.3	40.7	41.7	31.3	55.3	62.1
fresh	40.2	41.3	2.8	20.5	37.7	41.3	35.0	51.3	46.9
redepo	81.0	81.0	100.0	62.1	62.0	99.8	69.8	68.0	97.4
tea/shout/aerosol									
oven set	43.3	39.7	0.0	26.7	40.0	37.0	36.0	58.0	65.1
fresh	41.3	41.0	2.0	20.8	37.7	40.7	36.8	51.3	44.0
redepo	81.0	81.0	100.0	62.1	62.0	99.8	69.8	68.0	97.4

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
tea/shout/direct									
oven set	42.3	46.2	9.3	22.3	42.3	50.1	32.3	58.3	68.8
fresh	42.0	44.3	5.9	19.2	38.3	44.6	34.5	52.0	49.6
redepo	81.0	80.0	98.8	62.1	63.0	101.4	69.8	68.0	97.4
lipstick/control									
oven set	15.7	21.2	7.8	14.8	17.3	4.0	16.2	21.3	8.1
fresh	16.7	26.3	13.9	15.5	16.8	2.9	16.8	22.3	8.7
redepo	86.4	84.0	97.3	77.9	74.0	95.0	79.9	78.0	97.6
lipstick/spraynwash/aerosol									
oven set	15.7	22.0	8.9	14.8	14.3	0.0	15.5	20.3	7.5
fresh	16.7	26.0	13.4	14.8	17.0	4.0	17.2	20.3	5.0
redepo	86.4	83.0	96.1	77.9	73.0	93.8	79.9	78.0	97.6
lipstick/spraynwash/pump									
oven set	16.0	24.0	11.4	14.7	19.8	8.2	16.7	22.8	9.8
fresh	16.8	33.7	24.2	15.0	19.2	6.6	17.0	26.0	14.3
redepo	86.4	84.0	97.3	77.9	73.0	93.8	79.9	78.0	97.6
lipstick/spraynwash/direct									
oven set	15.3	28.0	17.8	14.3	18.0	5.8	15.2	26.3	17.3
fresh	15.3	26.7	16.0	14.2	16.7	3.9	15.3	22.0	10.3
redepo	86.4	83.0	96.1	77.9	73.0	93.8	79.9	78.5	98.3
lipstick/clorox/aerosol									
oven set	15.7	28.0	17.4	14.0	17.0	4.7	15.0	20.3	8.2
fresh	15.8	33.7	25.3	14.3	17.7	5.2	15.2	20.0	7.5
redepo	86.4	85.0	98.4	77.9	75.0	96.3	79.9	78.0	97.6
lipstick/clorox/pump									
oven set	15.5	27.7	17.2	14.5	19.3	7.6	15.0	26.0	17.0
fresh	16.0	29.3	19.0	14.3	19.0	7.3	16.0	24.2	12.8
redepo	86.4	83.5	96.7	77.9	75.0	96.3	79.9	78.0	97.7
lipstick/clorox/direct									
oven set	15.2	26.7	16.1	14.7	21.2	10.2	15.0	22.7	11.8
fresh	15.8	28.2	17.5	14.2	17.2	4.7	15.2	21.0	9.0
redepo	86.4	83.0	96.1	77.9	75.0	96.3	79.9	78.0	97.6
lipstick/shout/aerosol									
oven set	15.3	25.7	14.6	14.0	23.7	15.1	15.0	25.5	16.2
fresh	15.5	29.2	19.3	14.2	17.3	5.0	15.5	19.7	6.5
redepo	86.4	84.0	97.3	77.9	75.0	96.3	79.9	78.0	97.6

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
lipstick/shout/direct									
oven set	15.2	25.5	14.5	14.0	20.2	9.7	15.2	27.0	18.3
fresh	16.0	29.2	18.7	14.0	17.3	5.2	16.0	23.7	12.0
redepo	86.4	83.0	96.1	77.9	75.0	96.3	79.9	78.0	97.6
jelly/control									
oven set	57.7	78.3	71.9	45.0	71.2	82.0	49.0	74.5	85.0
fresh	63.5	77.8	62.6	48.5	71.2	79.3	57.0	73.7	75.3
redepo	86.4	84.0	97.2	77.0	77.0	100.0	79.0	79.0	100.0
jelly/s&w/aerosol									
oven set	59.2	82.5	85.7	45.7	74.5	92.1	46.3	76.3	91.9
fresh	63.0	83.0	85.5	51.2	74.3	89.7	55.8	77.0	91.6
redepo	86.4	84.0	97.2	77.0	77.0	100.0	79.0	79.0	100.0
jelly/s&w/pump									
oven set	57.7	83.0	88.2	42.2	76.2	97.5	48.3	77.7	95.6
fresh	62.5	83.0	85.8	49.8	76.0	96.3	54.8	78.0	95.9
redepo	86.4	85.0	98.4	77.0	77.0	100.0	79.0	79.0	100.0
jelly/s&w/direct									
oven set	58.2	83.7	90.3	50.0	77.3	99.0	49.0	78.0	100.0
fresh	63.0	82.7	84.1	45.8	76.0	96.8	55.5	78.0	100.0
redepo	86.4	85.0	98.4	77.0	77.0	100.0	70.0	79.0	112.9
jelly/clorox/aerosol									
oven set	59.7	83.0	87.4	43.8	72.0	85.0	49.7	75.3	87.7
fresh	61.7	82.0	82.2	51.2	74.0	88.2	51.3	76.3	90.6
redepo	86.4	84.0	97.2	77.0	76.0	98.7	79.0	78.0	98.7
jelly/clorox/pump									
oven set	58.7	82.2	84.7	43.5	75.0	94.1	50.3	78.0	96.5
fresh	63.3	82.3	82.4	49.3	75.5	94.3	54.8	77.3	93.0
redepo	86.4	84.0	97.2	77.0	77.0	100.0	79.0	79.0	100.0
jelly/clorox/direct									
oven set	58.5	82.3	85.3	43.2	75.3	95.0	45.0	77.7	96.1
fresh	61.5	82.3	83.6	45.7	76.0	96.8	57.0	78.0	95.4
redepo	86.4	85.0	98.4	77.0	77.0	100.0	79.0	79.0	100.0
jelly/shout/aerosol									
oven set	58.3	78.3	71.2	46.2	70.7	79.3	50.2	74.3	83.9
fresh	63.0	78.8	67.7	49.2	73.0	85.7	55.2	76.0	87.7
redepo	86.4	86.0	99.5	77.0	78.0	101.3	79.0	79.0	100.0

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
jelly/shout/direct									
oven set	58.8	79.3	74.3	43.8	72.7	87.3	46.3	74.3	85.7
fresh	62.7	79.7	71.7	49.2	70.3	76.0	54.5	76.3	89.4
redepo	86.4	85.0	98.4	77.0	78.0	101.3	79.0	79.0	100.0
ballpoint pen ink/control/ ***									
set	18.8	21.2	15.7	23.2	31.3	25.9	22.3	24.8	10.8
fresh	25.7	26.8	19.3	26.2	33.5	26.6	16.3	23.2	16.2
redep	86.4	62.0	71.8	77.0	65.0	84.4	79.0	69.0	87.3
ballpoint pen ink/spraynwash/aerosol***									
set	21.5	28.0	34.6	21.0	42.8	44.2	19.5	40.3	39.7
fresh	24.2	30.0	36.9	27.3	51.2	55.2	17.2	32.0	27.5
redep	86.4	55.0	63.7	77.0	72.0	93.5	79.0	74.0	93.7
ballpoint pen ink/spraynwash/pump***									
set	19.0	27.0	45.5	18.0	36.5	42.7	25.5	52.7	63.5
fresh	26.7	34.0	60.0	16.0	31.0	34.0	16.7	33.7	34.2
redep	86.4	47.0	54.4	77.0	65.0	84.4	79.0	70.0	88.6
ballpoint pen ink/spraynwash/direct***									
set	19.7	29.5	41.4	21.8	41.8	45.6	23.8	51.8	58.7
fresh	24.2	35.5	52.4	20.8	38.7	41.0	16.0	42.5	47.7
redep	86.4	54.0	62.5	77.0	68.5	89.0	79.0	73.0	92.4
ballpoint pen ink/clorox/aerosol***									
set	20.2	26.7	28.9	22.5	44.3	49.6	20.0	30.7	21.5
fresh	25.0	32.3	37.1	25.7	51.2	61.2	17.5	46.7	52.5
redep	86.4	58.5	67.7	77.0	69.0	89.6	79.0	74.0	93.7
ballpoint pen ink/clorox/pump***									
set	20.3	25.3	26.3	22.5	38.7	39.2	24.9	47.0	46.8
fresh	22.8	31.7	38.3	25.3	44.2	47.7	17.2	25.3	16.0
redep	86.4	58.0	67.1	77.0	68.0	88.3	79.0	74.0	93.7
ballpoint pen ink/clorox/direct***									
set	19.5	26.7	30.2	22.3	41.7	45.3	23.8	43.7	42.3
fresh	23.5	32.3	39.2	26.7	46.2	50.9	20.5	28.0	16.0
redep	86.4	58.0	67.1	77.0	68.0	88.3	79.0	73.0	92.4
ballpoint pen ink/shout/aerosol***									
set	18.5	25.2	22.4	22.2	38.2	36.1	27.0	49.2	48.4
fresh	23.7	31.7	29.9	24.5	47.3	52.4	16.2	25.0	16.5
redep	86.4	64.5	74.7	77.0	70.0	90.9	79.0	74.5	94.3

TABLE 17 (continued)
REFLECTANCE READINGS (%)
DELICATES

	1*			2			3		
ballpoint pen ink/shout/direct***									
set	19.3	25.3	33.4	21.3	36.8	34.5	25.0	43.8	39.7
fresh	24.7	32.2	45.8	26.2	46.2	48.3	15.2	26.8	20.6
redep	86.4	52.5	60.8	77.0	70.0	90.9	79.0	75.0	94.9

TABLE 18.
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
mustard/control/					
set	49.5 (1.4)	92.3 (6.6)	92.6 (2.7)	94.1 (5.5)	100.0 (0.0)
fresh	44.6 (3.3)	88.2 (5.0)	92.7 (5.2)	92.4 (1.8)	100.0 (0.0)
redep	98.9	102.7	101.2	98.0	104.7
mustard/spraynwash/aerosol					
set	66.4 (2.2)	81.8 (0.0)	82.0 (1.9)	96.1 (0.7)	100.0 (0.0)
fresh	56.7 (2.1)	79.5 (2.1)	85.9 (3.5)	96.9 (0.1)	100.0 (0.0)
redep	99.4	101.2	100.9	100.3	101.7
mustard/spraynwash/pump					
set	62.2 (3.8)	87.9 (3.6)	87.1 (2.7)	96.9 (0.1)	100.0 (0.0)
fresh	50.9 (2.6)	90.9 (0.0)	89.2 (0.2)	96.9 (0.0)	100.0 (0.0)
redep	99.4	101.2	99.8	99.2	101.7
mustard/spraynwash/direct					
set	61.5 (2.7)	85.6 (3.1)	85.2 (3.3)	96.4 (0.9)	100.0 (0.0)
fresh	50.5 (1.2)	89.7 (1.4)	84.6 (4.5)	96.8 (0.1)	100.0 (0.0)
redep	99.4	101.2	100.9	99.2	101.7
,tard/clorox/aerosol					
set	41.6 (2.6)	92.9 (3.5)	87.8 (3.3)	97.9 (1.8)	100.0 (0.0)
fresh	46.8 (4.4)	89.8 (2.4)	87.6 (0.5)	97.6 (0.7)	100.0 (0.0)
redep	99.4	101.2	100.9	100.3	101.7
mustard/clorox/pump					
set	36.4 (7.4)	85.3 (5.7)	84.6 (4.1)	95.4 (1.5)	100.0 (0.0)
fresh	35.3 (4.5)	84.2 (6.6)	82.4 (0.8)	94.9 (1.6)	100.0 (0.0)
redep	99.4	101.2	100.9	100.3	101.7
mustard/clorox/direct					
set	46.3 (4.2)	91.1 (0.5)	89.2 (1.8)	96.9 (0.1)	100.0 (0.0)
fresh	50.0 (2.9)	91.9 (1.7)	87.3 (5.0)	95.9 (1.2)	100.0 (0.0)
redep	98.3	101.2	100.9	100.3	102.9
mustard/shout/aerosol					
set	49.4 (0.1)	87.9 (4.5)	98.6 (2.5)	99.0 (1.7)	100.0 (0.0)
fresh	54.9 (7.5)	88.4 (4.7)	97.2 (2.4)	99.4 (0.5)	96.4 (6.3)
redep	98.9	101.5	102.9	100.3	103.5
mustard/shout/direct					
set	66.1 (7.5)	85.4 (8.3)	98.9 (2.0)	96.9 (3.3)	100.0 (0.0)
fresh	70.5 (9.6)	90.7 (0.7)	94.6 (6.2)	94.8 (2.2)	100.0 (0.0)
redep	100.6	100.9	101.2	100.3	104.1

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
tea/control/					
set	27.5 (0.6)	26.4 (9.2)	21.4 (3.9)	73.7 (6.7)	80.9 (3.8)
fresh	16.1 (3.8)	19.6 (13.9)	19.3 (11.5)	69.8 (1.5)	88.0 (7.6)
redep	99.8	100.5	101.4	101.1	100.6
tea/spraynwash/aerosol					
set	18.1 (0.2)	2.3 (3.9)	14.7 (3.9)	88.4 (0.9)	96.3 (0.6)
fresh	27.5 (6.3)	4.8 (8.2)	8.2 (4.3)	88.6 (0.6)	96.9 (0.5)
redep	99.5	99.9	99.5	99.9	100.0
tea/spraynwash/pump					
set	39.4 (3.2)	28.7 (3.8)	33.9 (5.5)	81.1 (1.1)	97.7 (0.6)
fresh	43.7 (1.7)	39.3 (12.5)	31.4 (10.3)	80.9 (4.7)	96.7 (2.4)
redep	98.6	99.9	101.4	101.1	100.6
tea/spraynwash/direct					
set	37.4 (7.5)	27.8 (6.3)	27.9 (11.0)	93.9 (1.2)	90.0 (4.8)
fresh	40.1 (1.2)	35.9 (8.3)	35.1 (12.0)	95.0 (2.7)	84.5 (4.2)
redep	100.9	101.7	101.4	99.9	101.2
t /clorox/aerosol					
s	27.8 (11.5)	17.7 (4.7)	19.3 (6.5)	94.1 (1.2)	99.6 (0.7)
fresh	28.0 (10.1)	18.0 (0.3)	23.3 (5.7)	94.5 (2.8)	99.7 (0.6)
redep	100.4	99.9	102.0	103.0	102.5
tea/clorox/pump					
set	23.9 (3.1)	35.6 (14.2)	33.1 (5.1)	87.2 (1.4)	98.7 (1.1)
fresh	29.2 (4.2)	24.8 (1.6)	29.1 (3.8)	84.5 (6.3)	97.5 (2.6)
redep	100.4	102.9	103.8	103.0	101.9
tea/clorox/direct					
set	32.7 (6.7)	23.8 (12.2)	30.4 (12.8)	86.7 (4.2)	95.6 (4.2)
fresh	23.5 (2.6)	21.9 (5.1)	28.5 (2.9)	87.5 (3.0)	96.9 (2.3)
redep	100.4	101.7	103.8	101.1	100.6
tea/shout/aerosol					
set	30.0 (3.1)	22.5 (2.5)	20.3 (1.6)	78.2 (1.1)	99.2 (0.7)
fresh	36.5 (3.9)	21.8 (7.8)	20.9 (2.6)	82.7 (1.3)	99.6 (0.7)
redep	100.4	102.3	102.6	101.1	101.9
tea/shout/direct					
set	42.8 (4.7)	44.3 (10.8)	38.5 (12.9)	98.7 (1.1)	95.2 (0.4)
fresh	45.8 (5.7)	45.4 (2.3)	38.9 (5.0)	96.9 (2.2)	90.8 (8.2)
redep	100.4	100.5	100.1	99.9	100.6

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
wine/control/					
set	39.0 (5.2)	50.5 (14.2)	72.3 (6.0)	80.1 (8.2)	97.5 (0.1)
fresh	42.8 (5.0)	46.3 (2.9)	46.5 (5.2)	54.0 (3.8)	77.3 (8.9)
redep	96.0	100.9	98.8	96.9	100.5
wine/spraynwash/aerosol					
set	50.7 (2.8)	67.8 (4.6)	63.9 (3.2)	88.4 (0.2)	95.7 (2.8)
fresh	28.5 (3.1)	56.3 (7.7)	63.9 (8.9)	84.8 (3.0)	97.1 (0.3)
redep	97.2	99.8	97.7	96.9	100.5
wine/spraynwash/pump					
set	65.5 (6.2)	79.2 (10.5)	69.3 (5.0)	82.5 (2.5)	95.0 (2.5)
fresh	45.0 (17.1)	62.4 (2.4)	68.4 (14.2)	72.9 (4.8)	92.1 (2.2)
redep	92.7	99.8	100.0	96.9	98.1
wine/spraynwash/direct					
set	66.8 (4.0)	82.1 (8.5)	83.5 (0.2)	85.7 (2.0)	96.4 (2.0)
fresh	58.0 (2.5)	68.8 (4.9)	62.0 (4.2)	76.6 (2.6)	84.4 (4.9)
redep	96.0	97.4	98.8	96.9	100.5
e/clorox/aerosol					
	51.5 (2.5)	66.5 (9.6)	71.7 (8.4)	91.6 (2.2)	93.8 (6.1)
fresh	31.9 (8.0)	42.7 (3.3)	54.8 (4.0)	75.4 (0.7)	93.5 (3.2)
redep	98.3	97.4	98.8	95.7	100.5
wine/clorox/pump					
set	66.9 (10.0)	63.2 (4.5)	78.3 (9.7)	79.5 (2.4)	98.1 (1.7)
fresh	51.2 (19.1)	53.5 (22.0)	63.4 (8.0)	81.8 (5.9)	88.4 (2.5)
redep	97.2	99.8	96.5	98.0	102.9
wine/clorox/direct					
set	65.9 (3.0)	65.0 (5.3)	87.8 (11.2)	93.1 (9.3)	95.6 (3.0)
fresh	42.3 (5.0)	56.1 (2.6)	63.4 (1.8)	80.7 (10.7)	92.1 (0.6)
redep	97.2	98.6	103.5	96.9	100.5
wine/shout/aerosol					
set	60.1 (4.2)	67.3 (5.7)	68.6 (7.3)	81.4 (2.6)	97.4 (4.1)
fresh	49.0 (7.0)	79.1 (24.1)	69.4 (14.5)	83.4 (0.6)	90.6 (3.0)
redep	97.2	96.3	96.5	96.9	101.7
wine/shout/direct					
set	75.6 (3.4)	83.6 (4.9)	90.3 (8.4)	89.7 (5.3)	100.0 (0.0)
fresh	67.8 (4.3)	75.4 (14.4)	71.0 (5.8)	92.4 (4.3)	99.1 (1.6)
redep	99.4	102.1	98.8	99.2	102.9

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
sheaffer black ink/control/***					
set	35.2 (2.3)	47.1 (5.5)	50.4 (11.6)	100.0 (0.0)	100.0 (0.0)
fresh	26.2 (0.7)	21.4 (3.4)	11.7 (9.1)	100.0 (0.0)	100.0 (0.0)
redep	74.6	83.5	88.4	95.7	95.7
sheaffer black ink/spraynwash/aerosol***					
set	28.6 (0.8)	34.8 (1.5)	44.1 (8.1)	100.0 (0.0)	100.0 (0.0)
fresh	20.6 (1.8)	21.3 (4.9)	3.1 (4.2)	98.3 (1.1)	100.0 (0.0)
redep	75.7	84.7	88.4	96.9	96.9
sheaffer black ink/spraynwash/pump***					
set	27.9 (1.1)	38.3 (4.6)	51.1 (10.1)	97.9 (0.6)	100.0 (0.0)
fresh	26.6 (0.8)	19.1 (11.4)	12.4 (10.1)	97.4 (0.4)	100.0 (0.0)
redep	74.6	83.5	89.5	98.0	96.9
sheaffer black ink/spraynwash/direct***					
set	27.9 (2.6)	39.8 (3.9)	47.7 (4.7)	100.0 (0.0)	100.0 (0.0)
fresh	20.9 (3.1)	14.1 (3.6)	7.7 (6.8)	99.5 (0.8)	100.0 (0.0)
redep	74.6	84.7	89.5	96.9	95.7
`affer black ink/clorox/aerosol***					
	35.0 (1.9)	30.7 (12.6)	29.4 (22.6)	99.4 (1.0)	100.0 (0.0)
fresh	24.2 (1.1)	18.5 (2.6)	16.8 (7.1)	100.0 (0.0)	100.0 (0.0)
redep	75.7	84.7	88.4	95.7	96.9
sheaffer black ink/clorox/pump***					
set	31.0 (1.0)	37.9 (7.7)	45.0 (2.8)	100.0 (0.0)	100.0 (0.0)
fresh	24.8 (1.6)	18.5 (4.7)	10.7 (3.8)	100.0 (0.0)	100.0 (0.0)
redep	74.6	83.5	89.5	95.7	95.7
sheaffer black ink/clorox/direct***					
set	29.9 (2.1)	47.8 (7.0)	49.6 (6.8)	99.1 (1.5)	100.0 (0.0)
fresh	23.3 (1.7)	17.4 (3.0)	17.0 (3.3)	98.5 (1.4)	100.0 (0.0)
redep	75.7	84.7	88.4	96.9	96.9
sheaffer black ink/shout/aerosol***					
set	28.2 (3.8)	32.9 (4.4)	39.3 (2.3)	98.9 (1.8)	100.0 (0.0)
fresh	23.4 (0.3)	16.6 (2.1)	18.1 (3.9)	98.3 (3.0)	100.0 (0.0)
redep	75.7	84.7	89.5	96.9	96.9
sheaffer black ink/shout/direct***					
set	21.6 (9.5)	47.6 (1.0)	47.1 (5.2)	100.0 (0.0)	99.7 (0.5)
fresh	25.2 (1.0)	6.2 (4.8)	24.2 (5.8)	100.0 (0.0)	100.0 (0.0)
redep	74.6	84.7	88.4	95.7	95.7

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
sheaffer blue ink/control/					
set	84.3 (0.9)	91.7 (0.5)	93.5 (1.1)	99.5 (0.6)	100.0 (0.0)
fresh	74.1 (1.0)	87.8 (2.3)	81.2 (1.9)	96.0 (0.4)	99.2 (0.0)
redep	97.2	97.4	100.0	100.3	96.9
sheaffer blue ink/spraynwash/aerosol					
set	85.8 (0.4)	93.6 (1.2)	96.3 (0.0)	96.1 (4.8)	100.0 (0.0)
fresh	77.2 (2.1)	84.1 (1.1)	88.4 (0.7)	98.8 (0.4)	100.0 (0.0)
redep	97.2	97.4	100.0	100.3	96.9
sheaffer blue ink/spraynwash/pump					
set	77.5 (2.4)	91.5 (2.4)	92.8 (1.9)	98.0 (2.5)	100.0 (0.0)
fresh	72.8 (1.0)	76.1 (2.7)	83.8 (0.2)	98.6 (0.8)	100.0 (0.0)
redep	96.0	97.4	98.8	99.2	96.9
sheaffer blue ink/spraynwash/direct					
set	76.7 (0.5)	90.4 (2.0)	93.6 (1.0)	98.2 (1.0)	99.7 (0.6)
fresh	92.5 (0.8)	85.5 (4.9)	84.5 (3.1)	98.9 (1.2)	100.0 (0.0)
redep	97.2	97.4	98.8	98.0	98.1
affer blue ink/chlorox/aerosol					
s	74.8 (0.4)	92.1 (0.9)	93.3 (0.8)	98.7 (0.0)	100.0 (0.0)
fresh	65.6 (0.8)	81.1 (3.7)	88.9 (0.4)	98.1 (0.8)	100.0 (0.0)
redep	97.2	97.4	100.0	99.2	98.1
sheaffer blue ink/chlorox/pump					
set	81.6 (1.1)	91.5 (0.3)	95.0 (0.5)	98.5 (0.5)	100.0 (0.0)
fresh	75.6 (2.8)	85.1 (1.5)	89.6 (2.1)	97.7 (0.0)	99.7 (0.5)
redep	97.2	98.6	100.0	100.3	96.9
sheaffer blue ink/chlorox/direct					
set	82.9 (1.1)	93.9 (2.0)	94.5 (0.1)	98.8 (0.0)	100.0 (0.0)
fresh	77.6 (0.8)	86.9 (1.3)	89.5 (2.4)	98.1 (0.8)	100.0 (0.0)
redep	96.0	97.4	98.8	99.2	95.7
sheaffer blue ink/shout/aerosol					
set	81.4 (1.7)	91.1 (0.0)	95.1 (1.2)	100.0 (0.0)	100.0 (0.0)
fresh	78.0 (2.0)	85.8 (0.6)	86.1 (1.3)	99.4 (0.6)	100.0 (0.1)
redep	97.2	97.4	100.0	99.2	95.7
sheaffer blue ink/shout/direct					
set	82.2 (0.2)	91.2 (0.0)	94.8 (0.2)	97.8 (1.0)	100.0 (0.0)
fresh	77.1 (1.9)	83.2 (2.1)	91.8 (4.9)	97.4 (0.4)	100.0 (0.0)
redep	97.2	97.4	100.0	100.3	96.9

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
coffee/control/					
set	66.1 (4.0)	75.1 (7.9)	85.2 (2.2)	96.8 (0.9)	99.3 (1.3)
fresh	64.8 (1.8)	66.6 (3.2)	77.9 (4.3)	91.1 (2.9)	94.4 (2.1)
redep	98.3	99.8	101.2	99.8	101.7
coffee/spraynwash/aerosol					
set	73.4 (1.4)	87.8 (2.6)	92.5 (0.3)	97.8 (3.7)	100.0 (0.0)
fresh	71.9 (0.9)	70.7 (3.3)	79.4 (1.0)	91.5 (6.8)	100.0 (0.0)
redep	99.4	100.9	102.3	100.3	101.7
coffee/spraynwash/pump					
set	72.6 (6.4)	79.4 (10.2)	82.1 (4.4)	95.5 (1.8)	100.0 (0.0)
fresh	67.8 (3.2)	70.0 (2.2)	77.5 (1.7)	94.6 (1.4)	99.6 (0.8)
redep	99.4	102.1	101.2	100.3	101.7
coffee/spraynwash/direct					
set	64.8 (5.8)	79.2 (3.6)	84.4 (0.4)	94.5 (2.5)	100.0 (0.0)
fresh	66.3 (4.9)	68.6 (8.6)	79.2 (1.5)	91.8 (1.8)	98.8 (2.1)
redep	98.9	100.9	101.2	100.3	101.7
coffee/clorox/aerosol					
set	63.3 (4.8)	68.7 (14.1)	79.9 (4.8)	94.0 (1.1)	100.0 (0.0)
fresh	64.4 (1.9)	64.5 (3.6)	71.2 (0.9)	92.7 (0.1)	98.3 (1.9)
redep	98.3	100.9	101.2	100.3	101.7
coffee/clorox/pump					
set	71.8 (2.3)	84.2 (5.1)	100.0 (0.0)	96.3 (1.6)	100.0 (0.0)
fresh	69.7 (2.3)	71.2 (3.1)	78.5 (1.4)	92.8 (2.6)	99.6 (0.8)
redep	99.4	100.9	102.3	100.3	101.7
coffee/clorox/direct					
set	70.1 (0.7)	87.4 (7.0)	88.8 (4.2)	94.6 (4.1)	100.0 (0.0)
fresh	69.9 (3.2)	60.8 (3.4)	78.5 (2.7)	95.5 (2.7)	97.6 (3.0)
redep	99.4	100.9	101.7	101.5	101.7
coffee/shout/aerosol					
set	59.2 (7.1)	66.3 (2.7)	79.8 (7.3)	100.0 (0.0)	100.0 (0.0)
fresh	65.3 (3.5)	71.4 (0.8)	79.0 (4.2)	94.3 (1.2)	98.3 (0.7)
redep	98.3	100.9	101.2	100.3	102.3
coffee/shout/direct					
set	71.2 (5.5)	82.9 (2.3)	93.1 (3.9)	98.9 (2.0)	100.0 (0.0)
fresh	71.0 (4.3)	71.6 (2.4)	85.5 (3.4)	95.5 (3.9)	99.5 (0.8)
redep	98.3	100.9	102.3	99.8	102.3

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
ball point ink/control/***					
set	43.2 (6.4)	15.8 (3.1)	23.7 (6.2)	38.0 (7.7)	26.7 (4.6)
fresh	47.2 (4.2)	22.6 (8.4)	28.8 (6.0)	19.5 (5.0)	21.8 (5.6)
redep	66.7	85.8	90.7	88.8	88.5
ball point ink/spraynwash/aerosol***					
set	58.1 (1.2)	45.7 (0.3)	56.0 (2.8)	89.2 (3.2)	86.4 (2.8)
fresh	62.3 (8.6)	61.8 (17.2)	65.9 (1.2)	88.0 (4.3)	89.3 (6.0)
redep	85.9	82.4	87.2	91.7	93.3
ball point ink/spraynwash/pump***					
set	51.4 (2.1)	59.4 (2.5)	62.2 (0.3)	78.3 (1.4)	67.2 (2.9)
fresh	49.5 (2.6)	53.1 (2.7)	65.3 (4.9)	63.2 (5.3)	79.0 (3.7)
redep	89.3	82.4	87.2	94.6	93.3
ball point ink/spraynwash/direct***					
set	51.6 (1.4)	45.3 (5.5)	57.4 (1.4)	72.5 (5.2)	69.9 (8.3)
fresh	50.8 (3.1)	43.7 (0.7)	67.8 (5.2)	53.0 (3.3)	78.8 (3.6)
redep	84.7	82.4	81.4	92.3	93.3
ball point ink/clorox/aerosol***					
set	50.4 (1.0)	68.4 (4.8)	63.7 (9.4)	81.2 (7.7)	94.2 (5.4)
fresh	52.8 (5.9)	58.1 (3.8)	64.1 (5.8)	88.5 (2.1)	91.3 (5.9)
redep	85.9	70.8	81.4	91.1	93.3
ball point ink/clorox/pump***					
set	66.4 (3.2)	44.7 (9.6)	58.7 (2.4)	64.5 (2.5)	69.5 (9.3)
fresh	65.6 (8.6)	43.1 (1.9)	84.5 (3.8)	47.5 (2.5)	66.3 (9.1)
redep	70.1	70.8	66.3	87.7	88.5
ball point ink/clorox/direct***					
set	49.2 (6.2)	48.0 (4.2)	55.8 (3.9)	72.6 (6.3)	67.6 (3.9)
fresh	49.6 (6.8)	38.8 (2.1)	72.7 (0.8)	39.5 (5.9)	48.7 (5.8)
redep	78.0	73.1	72.1	86.5	88.5
ball point ink/shout/aerosol***					
set	31.2 (7.0)	30.5 (8.4)	27.8 (3.2)	42.2 (8.1)	48.6 (16.3)
fresh	39.2 (7.1)	22.0 (2.4)	34.9 (12.6)	24.5 (14.1)	45.0 (17.8)
redep	70.1	66.1	80.2	86.5	83.7
ball point ink/shout/direct***					
set	43.4 (2.2)	43.4 (6.4)	57.6 (7.3)	82.7 (1.1)	74.6 (6.9)
fresh	47.6 (8.1)	43.2 (4.3)	47.0 (4.1)	59.8 (4.9)	51.6 (45.6)
redep	84.7	81.2	83.7	90.0	89.7

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
jelly/control/					
set	89.7 (7.9)	94.5 (1.4)	97.0 (0.0)	97.3 (1.5)	99.9 (0.1)
fresh	91.1 (2.5)	89.6 (5.6)	94.8 (4.8)	91.8 (2.8)	97.9 (1.8)
redep	97.2	99.8	101.2	100.3	101.7
jelly/spraynwash/aerosol					
set	95.2 (1.4)	96.4 (0.2)	90.3 (8.4)	97.2 (0.5)	100.0 (0.0)
fresh	85.4 (1.2)	90.6 (1.3)	94.0 (6.5)	98.8 (1.8)	100.0 (0.0)
redep	99.4	101.5	101.2	100.3	101.7
jelly/spraynwash/pump					
set	84.8 (2.0)	99.3 (0.0)	95.2 (8.4)	94.6 (1.2)	100.0 (0.0)
fresh	91.9 (0.8)	94.5 (1.3)	100.0 (0.0)	95.6 (1.6)	99.9 (0.1)
redep	99.4	100.9	101.2	100.3	101.7
jelly/spraynwash/direct					
set	97.5 (1.2)	96.7 (0.9)	100.0 (0.0)	94.5 (1.2)	100.0 (0.0)
fresh	91.1 (0.8)	94.4 (2.8)	100.0 (0.0)	93.1 (0.5)	100.0 (0.0)
redep	99.4	100.9	101.2	100.3	101.7
[illegible]ly/clorox/aerosol					
[illegible]	93.4 (1.4)	93.6 (1.6)	98.4 (1.7)	94.1 (1.8)	99.0 (1.0)
fresh	85.7 (0.8)	88.2 (1.1)	98.0 (2.3)	93.9 (5.8)	100.0 (0.0)
redep	99.4	101.5	101.2	100.3	101.7
jelly/clorox/pump					
set	95.8 (1.1)	96.8 (0.7)	100.0 (0.0)	96.4 (2.5)	100.0 (0.0)
fresh	92.2 (4.8)	93.9 (2.1)	98.1 (2.2)	95.0 (1.9)	99.9 (0.1)
redep	99.4	100.9	101.2	99.8	102.9
jelly/clorox/direct					
set	94.7 (3.9)	99.1 (1.0)	99.5 (0.9)	95.6 (2.0)	99.6 (0.6)
fresh	87.8 (1.6)	94.0 (5.3)	97.5 (0.9)	94.0 (0.7)	83.7 (28.3)
redep	99.4	100.9	100.0	100.3	101.7
jelly/shout/aerosol					
set	90.5 (1.1)	95.3 (1.9)	95.3 (0.1)	91.2 (0.7)	100.0 (0.0)
fresh	78.6 (2.4)	84.4 (1.6)	95.3 (4.1)	90.7 (3.6)	97.8 (1.7)
redep	98.3	100.9	101.2	99.8	101.7
jelly/shout/direct					
set	94.2 (2.3)	89.1 (9.5)	98.9 (1.9)	95.9 (0.5)	98.3 (3.0)
fresh	89.9 (1.8)	92.8 (2.6)	93.4 (7.4)	94.2 (2.5)	100.0 (0.0)
redep	99.4	101.5	101.2	99.7	102.3

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
oil/control/					
set	9.4 (3.5)	11.0 (4.1)	6.6 (3.3)	11.8 (19.5)	0.0 (0.0)
fresh	5.9 (5.1)	7.0 (0.9)	4.1 (3.5)	4.9 (4.3)	0.6 (0.5)
redep	98.9	99.2	100.6	99.2	101.7
oil/spraynwash/aerosol					
set	50.4 (2.9)	40.1 (4.8)	37.7 (1.3)	58.7 (35.8)	15.4 (0.9)
fresh	50.0 (0.9)	37.6 (4.0)	35.1 (3.7)	32.7 (4.3)	21.6 (5.9)
redep	97.2	99.8	100.0	99.2	98.1
oil/spraynwash/pump					
set	54.4 (33.6)	14.3 (6.7)	16.4 (1.5)	1.0 (0.0)	0.0 (0.0)
fresh	27.7 (1.9)	10.1 (8.9)	8.0 (7.0)	1.5 (1.4)	0.5 (0.9)
redep	97.2	100.3	100.6	99.2	99.3
oil/spraynwash/direct					
set	26.3 (3.3)	15.6 (13.6)	17.9 (6.8)	3.9 (1.7)	4.0 (7.0)
fresh	27.8 (1.5)	30.7 (23.3)	10.9 (7.5)	0.3 (0.5)	0.7 (1.2)
redep	97.2	99.2	100.6	99.2	99.3
[illegible]/clorox/aerosol					
[illegible]	60.9 (3.1)	56.5 (1.8)	62.2 (4.5)	63.1 (4.4)	46.8 (5.9)
fresh	60.3 (3.1)	52.1 (2.4)	49.9 (13.8)	53.3 (4.5)	40.5 (2.9)
redep	97.7	99.8	100.0	99.2	102.9
oil/clorox/pump					
set	26.6 (2.3)	23.4 (8.7)	16.2 (4.3)	2.0 (2.0)	0.0 (0.0)
fresh	23.6 (6.6)	15.9 (5.0)	13.5 (2.4)	2.6 (3.1)	0.0 (0.0)
redep	97.2	99.8	100.0	99.2	98.8
oil/clorox/direct					
set	25.1 (4.0)	21.7 (1.7)	16.4 (5.5)	0.4 (0.6)	0.0 (0.0)
fresh	27.1 (2.0)	14.5 (3.4)	11.5 (0.2)	0.6 (1.1)	1.4 (1.8)
redep	97.7	100.3	98.8	98.6	101.7
oil/shout/aerosol					
set	53.0 (2.5)	39.4 (3.3)	38.6 (0.1)	47.0 (2.9)	28.9 (4.7)
fresh	50.2 (1.0)	37.0 (0.6)	35.1 (2.2)	37.1 (10.6)	45.3 (22.9)
redep	97.7	100.3	99.4	98.0	101.7
oil/shout/direct					
set	35.1 (2.9)	39.7 (6.9)	32.1 (7.7)	38.7 (6.8)	2.3 (2.1)
fresh	35.6 (3.8)	26.4 (10.6)	38.5 (14.1)	33.0 (1.0)	3.9 (2.5)
redep	98.9	99.8	100.0	98.6	101.7

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
chocolate/control/					
set	73.4 (3.5)	92.0 (0.2)	89.3 (2.6)	93.2 (0.4)	96.9 (0.2)
fresh	77.2 (7.3)	85.0 (1.0)	77.2 (1.3)	91.8 (1.3)	94.2 (0.8)
redep	96.0	98.6	98.8	98.0	100.5
chocolate/spraynwash/aerosol					
set	71.2 (1.5)	89.7 (2.6)	95.6 (4.3)	95.7 (1.8)	100.0 (0.0)
fresh	70.1 (1.3)	86.8 (0.9)	83.8 (1.3)	95.5 (1.6)	89.6 (1.5)
redep	98.3	100.9	98.8	99.2	99.9
chocolate/spraynwash/pump					
set	79.5 (6.7)	97.3 (3.0)	91.1 (3.5)	95.5 (0.0)	99.7 (0.6)
fresh	72.4 (1.9)	92.3 (4.2)	86.5 (1.7)	91.9 (1.9)	89.8 (5.7)
redep	97.2	98.6	98.8	98.0	101.7
chocolate/spraynwash/direct					
set	72.5 (7.8)	92.6 (1.6)	93.4 (1.3)	95.0 (3.8)	99.3 (0.6)
fresh	70.5 (5.9)	89.8 (3.4)	81.5 (7.8)	93.9 (3.3)	90.7 (1.7)
redep	94.9	98.6	102.3	98.0	98.1
chocolate/clorox/aerosol					
set	76.3 (4.3)	94.6 (1.2)	92.0 (3.7)	94.4 (1.0)	100.0 (0.0)
fresh	73.7 (5.3)	87.1 (3.5)	80.8 (6.5)	93.8 (1.7)	81.6 (13.3)
redep	97.2	104.4	102.3	98.0	100.5
chocolate/clorox/pump					
set	77.0 (5.1)	92.3 (1.8)	93.4 (1.4)	96.3 (0.8)	98.7 (1.4)
fresh	69.5 (5.4)	86.6 (2.2)	73.3 (6.3)	91.2 (1.8)	74.8 (24.8)
redep	96.0	99.8	97.7	98.0	102.9
choclate/clorox/direct					
set	76.3 (1.5)	91.5 (1.4)	95.3 (2.3)	94.4 (1.0)	98.7 (1.4)
fresh	70.5 (7.0)	87.3 (1.3)	80.9 (5.7)	93.5 (5.7)	94.2 (3.4)
redep	96.0	98.6	102.3	98.0	106.5
chocolate/shout/aerosol					
set	71.3 (3.9)	90.5 (0.6)	90.3 (0.5)	94.8 (0.9)	99.6 (0.6)
fresh	70.3 (2.0)	84.5 (2.1)	75.2 (1.9)	93.2 (1.0)	87.9 (1.9)
redep	94.9	96.9	100.0	98.0	98.1
chocolate/shout/direct					
set	80.4 (0.5)	91.2 (1.2)	94.5 (2.4)	94.4 (0.9)	99.3 (0.6)
fresh	74.7 (1.4)	85.6 (3.5)	88.7 (0.5)	93.5 (4.7)	93.0 (1.2)
redep	96.0	98.6	100.0	99.2	101.7

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
blood/control/					
set	87.1 (0.5)	95.2 (1.5)	97.8 (0.8)	98.2 (0.7)	66.7 (57.7)
fresh	92.3 (0.8)	96.7 (1.5)	98.3 (1.5)	99.7 (0.5)	95.3 (4.1)
redep	93.8	98.6	98.8	98.0	92.7
blood/spraynwash/aerosol					
set	88.5 (0.7)	96.5 (0.8)	98.7 (1.3)	98.6 (0.8)	100.0 (0.0)
fresh	92.8 (1.4)	95.4 (0.8)	97.8 (0.8)	99.4 (0.5)	100.0 (0.0)
redep	91.5	98.6	98.8	98.0	100.5
blood/spraynwash/pump					
set	88.5 (1.4)	95.5 (0.4)	98.2 (0.8)	98.6 (0.8)	99.7 (0.5)
fresh	92.4 (0.7)	97.1 (0.0)	97.8 (0.8)	99.1 (0.0)	100.0 (0.0)
redep	91.5	98.6	98.8	98.0	101.7
blood/spraynwash/direct					
set	87.5 (2.0)	94.7 (0.8)	98.7 (0.0)	97.7 (0.0)	100.0 (0.0)
fresh	92.4 (1.9)	95.9 (1.3)	97.4 (1.3)	99.0 (1.1)	100.0 (0.0)
redep	94.9	98.6	97.7	98.0	101.7
blood/clorox/aerosol					
set	87.4 (0.9)	95.5 (1.0)	99.3 (1.2)	99.2 (1.3)	100.0 (0.0)
fresh	91.9 (0.0)	96.1 (0.6)	98.2 (1.5)	98.3 (0.7)	100.0 (0.0)
redep	91.5	97.4	99.4	98.0	100.5
blood/clorox/pump					
set	86.3 (2.9)	94.3 (1.4)	97.8 (0.8)	98.2 (0.8)	99.5 (0.5)
fresh	91.9 (0.1)	96.6 (0.8)	98.2 (0.8)	98.6 (0.7)	100.0 (0.0)
redep	93.8	98.6	102.3	98.0	100.5
blood/clorox/direct					
set	86.4 (0.7)	94.2 (1.4)	97.3 (0.0)	99.4 (0.5)	99.5 (0.5)
fresh	91.5 (4.0)	97.1 (1.3)	98.2 (0.8)	99.7 (0.5)	100.0 (0.0)
redep	91.5	98.6	98.8	99.2	100.5
blood/shout/aerosol					
set	85.1 (4.0)	92.8 (0.5)	99.5 (0.8)	98.6 (0.8)	100.0 (0.0)
fresh	92.3 (1.9)	93.8 (1.7)	98.7 (1.3)	96.9 (1.5)	99.7 (0.5)
redep	93.8	97.4	100.0	98.0	101.7
blood/shout/direct					
set	87.7 (0.5)	95.2 (0.7)	99.3 (0.7)	98.5 (1.9)	99.7 (0.5)
fresh	94.0 (0.7)	96.7 (0.8)	99.6 (0.8)	99.0 (1.1)	100.0 (0.1)
redep	91.5	97.4	97.7	98.0	100.5

TABLE 18 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock polyester	polyester doubleknit polyester
lipstick/control/					
set	26.1 (7.7)	26.0 (6.6)	30.7 (0.2)	16.9 (4.4)	17.8 (3.4)
fresh	20.1 (5.5)	24.6 (6.7)	29.8 (6.6)	10.7 (4.4)	9.4 (2.9)
redep	96.0	98.6	97.7	96.9	98.1
lipstick/spraynwash/aerosol					
set	24.9 (10.8)	24.5 (3.1)	23.3 (5.9)	26.9 (6.5)	7.0 (2.1)
fresh	19.6 (2.3)	23.5 (1.6)	28.8 (1.0)	12.5 (4.4)	3.7 (2.2)
redep	96.0	98.6	98.8	95.7	92.1
lipstick/spraynwash/pump					
set	29.5 (8.6)	26.5 (9.0)	30.8 (1.9)	34.7 (3.7)	20.9 (4.0)
fresh	24.2 (6.1)	32.5 (2.8)	42.3 (2.8)	26.3 (6.4)	6.3 (3.7)
redep	97.7	98.6	98.8	96.9	99.3
lipstick/spraynwash/direct					
set	32.6 (6.5)	26.6 (6.7)	34.4 (4.3)	23.3 (4.8)	19.3 (0.8)
fresh	20.7 (10.0)	22.6 (12.8)	39.3 (2.9)	11.0 (4.0)	11.5 (7.1)
redep	98.3	98.6	98.8	96.9	99.3
lipstick/clorox/aerosol					
set	35.2 (5.5)	27.4 (9.6)	32.4 (2.5)	14.5 (6.5)	10.3 (2.1)
fresh	34.7 (2.0)	26.8 (11.5)	34.4 (7.0)	23.0 (17.7)	7.5 (4.2)
redep	96.0	98.6	98.8	96.9	87.3
lipstick/clorox/pump					
set	28.1 (13.3)	18.3 (6.7)	30.0 (3.8)	28.3 (7.1)	17.6 (3.7)
fresh	17.7 (4.7)	26.6 (8.6)	39.9 (5.0)	11.8 (1.3)	8.9 (1.4)
redep	97.2	98.6	97.7	99.2	99.3
lipstick/clorox/direct					
set	16.1 (8.3)	19.9 (4.6)	27.3 (0.8)	33.1 (5.4)	9.5 (3.9)
fresh	28.0 (8.6)	23.9 (5.9)	40.4 (3.9)	10.3 (0.1)	8.2 (2.0)
redep	97.2	98.6	100.0	96.9	99.3
lipstick/shout/aerosol					
set	25.5 (22.5)	26.2 (6.1)	27.6 (0.5)	13.3 (4.3)	13.4 (2.7)
fresh	20.4 (3.6)	23.0 (8.4)	32.0 (7.4)	8.6 (1.6)	6.1 (2.9)
redep	96.0	98.6	97.7	96.9	93.3
lipstick/shout/direct					
set	40.6 (3.1)	29.8 (1.5)	34.3 (1.8)	33.0 (6.2)	21.9 (1.3)
fresh	28.9 (9.3)	31.0 (9.8)	42.1 (4.5)	15.9 (1.4)	6.1 (1.6)
redep	99.4	97.4	98.8	96.9	100.5

TABLE 19
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
wine/control/			
set	4.1 (7.1)	41.8 (3.7)	62.2 (6.6)
fresh	0.0 (0.0)	24.5 (2.9)	47.7 (1.3)
redep	102.5	97.6	100.2
wine/spraynwash/aerosol			
set	34.9 (6.1)	75.9 (1.2)	76.0 (3.4)
fresh	22.0 (13.4)	50.1 (3.4)	72.0 (7.8)
redep	95.4	102.6	100.0
wine/spraynwash/pump			
set	46.3 (2.3)	46.4 (1.5)	84.1 (5.2)
fresh	29.8 (11.1)	79.4 (2.6)	54.1 (13.7)
redep	97.3	99.5	97.6
wine/spraynwash/direct			
set	53.7 (1.2)	79.8 (0.8)	80.5 (7.0)
fresh	0.0 (0.0)	51.4 (2.7)	61.2 (25.9)
redep	97.3	97.6	98.3
wine/clorox/aerosol			
set	6.2 (4.3)	73.1 (1.4)	72.6 (2.2)
fresh	0.0 (0.0)	46.9 (1.5)	45.7 (5.3)
redep	98.4	100.2	98.9
wine/clorox/pump			
set	27.4 (2.5)	43.2 (6.3)	82.5 (4.1)
fresh	13.7 (23.7)	72.5 (10.2)	51.1 (9.9)
redep	97.3	98.9	102.7
wine/clorox/direct			
set	17.4 (15.4)	78.1 (5.4)	82.0 (3.0)
fresh	34.2 (51.0)	41.2 (4.5)	58.1 (25.9)
redep	98.4	98.9	10.0
wine/shout/aerosol			
set	13.6 (11.4)	73.9 (3.7)	79.9 (4.0)
fresh	28.6 (25.5)	36.3 (1.8)	40.8 (8.0)
redep	99.6	99.5	101.4
wine/shout/direct			
set	5.5 (5.3)	52.1 (18.4)	77.7 (8.8)
fresh	0.0 (0.0)	48.2 (33.2)	52.6 (10.7)
redep	97.3	98.1	98.9

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
sheaffer black ink/control/***			
set	42.5 (10.3)	48.7 (9.0)	77.1 (2.4)
fresh	12.6 (4.3)	1.9 (1.8)	7.2 (1.7)
redep	96.1	96.3	97.6
sheaffer black ink/spraynwash/aerosol***			
set	46.4 (12.7)	47.0 (1.6)	75.7 (6.4)
fresh	16.3 (14.9)	0.9 (0.7)	8.4 (10.9)
redep	96.1	101.3	100.0
sheaffer black ink/spraynwash/pump***			
set	52.1 (1.9)	57.1 (3.3)	85.7 (2.3)
fresh	40.8 (40.2)	2.0 (1.7)	21.5 (2.0)
redep	97.3	100.2	97.6
sheaffer black ink/spraynwash/direct***			
set	50.4 (3.5)	57.9 (7.0)	78.1 (3.9)
fresh	34.0 (1.9)	6.2 (7.9)	10.5 (6.3)
redep	97.3	100.2	98.9
sheaffer black ink/clorox/aerosol***			
set	38.9 (3.9)	45.3 (3.1)	75.7 (5.9)
fresh	20.3 (17.0)	1.1 (1.0)	8.2 (2.5)
redep	97.3	97.6	97.6
sheaffer black ink/clorox/pump***			
set	42.7 (2.0)	40.9 (11.7)	75.1 (3.6)
fresh	24.5 (20.3)	3.2 (2.0)	12.0 (6.7)
redep	96.1	98.9	98.9
sheaffer black ink/clorox/direct***			
set	38.6 (3.4)	40.0 (10.0)	55.8 (1.7)
fresh	19.1 (4.4)	3.4 (1.0)	13.8 (11.1)
redep	96.1	98.9	97.6
sheaffer black ink/shout/aerosol***			
set	39.6 (2.4)	54.7 (0.3)	56.8 (7.1)
fresh	18.3 (7.9)	3.4 (1.0)	6.1 (2.0)
redep	96.1	97.6	97.6
sheaffer black ink/shout/direct***			
set	40.0 (6.5)	45.4 (14.6)	57.9 (0.9)
fresh	3.6 (6.3)	3.1 (0.4)	12.8 (6.3)
redep	96.1	96.3	97.6

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
sheaffer blue ink/control/			
set	51.7 (7.0)	74.0 (3.1)	81.8 (1.0)
fresh	11.9 (5.6)	6.2 (6.0)	42.0 (2.1)
redep	102.0	98.9	98.9
sheaffer blue ink/spraynwash/aerosol			
set	56.7 (1.5)	84.7 (0.9)	85.4 (1.3)
fresh	11.6 (9.0)	24.5 (27.9)	51.0 (1.3)
redep	98.4	97.6	98.9
sheaffer blue ink/spraynwash/pump			
set	54.6 (3.3)	83.3 (4.8)	83.5 (1.6)
fresh	3.2 (5.6)	18.6 (3.5)	42.7 (1.1)
redep	97.3	98.9	98.9
sheaffer blue ink/spraynwash/direct			
set	45.7 (7.7)	78.1 (4.2)	74.8 (0.7)
fresh	1.3 (2.3)	31.4 (24.7)	42.5 (3.6)
redep	98.4	98.9	98.9
sheaffer blue ink/clorox/aerosol			
set	24.8 (21.6)	59.5 (5.6)	69.5 (3.7)
fresh	12.4 (10.0)	19.2 (5.7)	39.6 (2.2)
redep	97.9	98.3	97.6
sheaffer blue ink/clorox/pump			
set	49.2 (6.9)	73.4 (7.0)	63.6 (1.8)
fresh	11.7 (3.6)	9.8 (3.9)	35.1 (5.0)
redep	98.4	97.6	98.9
sheaffer blue ink/clorox/direct			
set	46.5 (3.7)	65.3 (9.0)	61.9 (5.1)
fresh	9.2 (6.1)	4.7 (5.2)	41.8 (3.6)
redep	97.3	98.9	98.9
sheaffer blue ink/shout/aerosol			
set	42.0 (0.8)	63.5 (16.9)	59.8 (2.3)
fresh	5.6 (4.5)	22.0 (2.4)	42.7 (2.7)
redep	97.3	98.9	98.9
sheaffer blue ink/shout/direct			
set	38.7 (4.4)	62.2 (0.7)	59.0 (1.1)
fresh	4.4 (4.1)	13.4 (0.6)	38.1 (2.5)
redep	97.3	98.9	98.9

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
coffee/control/			
set	16.6 (0.3)	22.3 (12.6)	44.5 (11.1)
fresh	27.2 (6.5)	48.3 (1.7)	50.7 (5.6)
redep	98.4	98.9	98.9
coffee/spraynwash/aerosol			
set	17.3 (3.4)	22.7 (2.2)	50.0 (12.7)
fresh	23.1 (5.0)	39.3 (5.8)	50.6 (2.9)
redep	98.4	98.9	98.9
coffee/spraynwash/pump			
set	27.4 (26.3)	17.3 (14.4)	42.3 (9.7)
fresh	20.5 (16.5)	42.2 (1.3)	59.0 (7.0)
redep	98.4	98.9	98.9
coffee/spraynwash/direct			
set	14.9 (13.2)	11.4 (16.2)	52.7 (15.0)
fresh	9.3 (10.6)	39.1 (3.7)	46.7 (1.7)
redep	98.4	98.9	98.9
coffee/clorox/aerosol			
set	8.9 (5.1)	16.9 (10.0)	44.0 (1.6)
fresh	8.7 (10.0)	40.8 (2.9)	49.1 (4.3)
redep	97.3	98.9	98.9
coffee/clorox/pump			
set	17.5 (17.3)	31.3 (11.9)	47.1 (3.0)
fresh	9.0 (7.8)	39.0 (3.6)	52.3 (3.8)
redep	97.3	97.6	98.9
coffee/clorox/direct			
set	14.7 (4.3)	26.5 (16.3)	45.6 (8.9)
fresh	13.2 (5.6)	42.9 (2.9)	45.8 (3.0)
redep	97.3	97.6	98.9
coffee/shout/aerosol			
set	0.0 (0.0)	25.4 (9.7)	44.4 (18.4)
fresh	3.1 (5.3)	39.7 (1.7)	49.8 (6.5)
redep	98.4	98.9	98.9
coffee/shout/direct			
set	23.0 (8.1)	23.9 (22.5)	41.4 (1.1)
fresh	15.7 (3.5)	45.4 (2.4)	58.9 (5.2)
redep	97.3	98.9	98.9

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
blood/control/			
set	89.3 (1.3)	74.0 (2.8)	84.8 (1.0)
fresh	94.0 (0.4)	96.3 (1.0)	97.6 (1.1)
redep	96.1	97.6	98.9
blood/spraynwash/aerosol			
set	92.7 (1.5)	87.7 (5.6)	94.0 (3.8)
fresh	94.9 (0.0)	98.0 (2.3)	99.0 (1.2)
redep	98.8	97.4	98.7
blood/spraynwash/pump			
set	90.6 (1.3)	66.0 (6.2)	90.0 (9.0)
fresh	94.8 (0.7)	95.1 (4.1)	99.2 (0.8)
redep	98.4	97.4	98.7
blood/spraynwash/direct			
set	92.1 (0.3)	70.5 (1.2)	80.6 (6.8)
fresh	93.5 (1.5)	98.6 (1.5)	96.8 (0.4)
redep	95.0	97.6	97.6
blood/clorox/aerosol			
set	89.7 (0.8)	71.1 (0.4)	82.8 (1.7)
fresh	94.1 (0.5)	96.5 (0.9)	97.7 (0.9)
redep	93.8	100.2	100.2
blood/clorox/pump			
set	88.4 (0.8)	83.5 (1.1)	88.4 (2.4)
fresh	95.2 (0.7)	95.7 (1.4)	97.7 (0.9)
redep	96.1	98.9	98.9
blood/clorox/direct			
set	91.2 (0.6)	75.2 (2.0)	85.2 (3.9)
fresh	95.6 (0.0)	95.6 (0.4)	96.6 (2.3)
redep	94.4	98.3	98.9
blood/shout/aerosol			
set	89.0 (0.7)	89.7 (0.0)	86.5 (6.0)
fresh	93.4 (1.0)	98.3 (1.5)	98.4 (0.0)
redep	95.4	98.7	98.7
blood/shout/direct			
set	91.4 (0.7)	83.2 (5.9)	86.4 (2.8)
fresh	94.3 (0.1)	97.5 (0.9)	97.8 (1.4)
redep	94.4	98.9	97.6

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
oil/control/			
set	20.5 (10.4)	11.9 (3.5)	4.0 (4.0)
fresh	16.4 (6.4)	10.3 (0.7)	2.1 (2.8)
redep	97.3	97.6	97.6
oil/spraynwash/aerosol			
set	80.8 (3.3)	61.0 (4.8)	28.1 (3.1)
fresh	71.2 (4.9)	66.3 (2.2)	14.5 (1.4)
redep	98.4	98.9	98.9
oil/spraynwash/pump			
set	44.7 (10.8)	28.4 (7.1)	4.0 (1.6)
fresh	20.6 (18.3)	16.1 (8.5)	10.4 (13.2)
redep	97.1	99.4	100.0
oil/spraynwash/direct			
set	49.4 (7.4)	25.3 (7.1)	6.4 (0.7)
fresh	31.0 (7.8)	17.3 (15.4)	2.3 (1.1)
redep	98.4	98.9	97.6
oil/clorox/aerosol			
set	87.8 (4.1)	78.8 (0.7)	46.4 (1.8)
fresh	84.9 (2.3)	68.8 (10.5)	59.8 (18.1)
redep	98.4	100.2	98.9
oil/clorox/pump			
set	46.8 (5.4)	24.2 (4.8)	4.1 (1.7)
fresh	34.4 (2.7)	23.3 (5.0)	2.8 (3.0)
redep	98.4	98.9	97.6
oil/clorox/direct			
set	46.4 (10.8)	18.1 (4.2)	3.4 (2.4)
fresh	29.4 (1.7)	15.1 (1.2)	2.0 (0.7)
redep	98.4	97.6	97.6
oil/shout/aerosol			
set	37.6 (23.2)	42.6 (15.5)	30.9 (15.7)
fresh	23.7 (2.6)	46.0 (4.7)	7.0 (2.2)
redep	98.4	98.9	98.9
oil/shout/direct			
set	50.6 (14.6)	33.6 (9.6)	13.2 (1.6)
fresh	46.3 (6.1)	27.8 (7.4)	5.0 (2.4)
redep	97.3	100.2	98.9

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
chocolate/control/			
set	70.3 (1.6)	75.7 (5.1)	92.3 (0.1)
fresh	56.0 (3.8)	71.8 (1.5)	81.5 (1.1)
redep	97.7	100.0	99.4
chocolate/spraynwash/aerosol			
set	74.3 (8.4)	79.2 (4.9)	86.9 (1.6)
fresh	58.2 (4.4)	75.1 (0.4)	84.2 (1.4)
redep	96.6	100.0	100.0
chocolate/spraynwash/pump			
set	83.2 (4.9)	83.2 (1.8)	90.7 (0.5)
fresh	57.0 (6.4)	78.0 (0.3)	83.7 (1.8)
redep	97.3	98.9	98.9
chocolate/spraynwash/direct			
set	69.3 (11.2)	78.8 (5.2)	92.0 (1.4)
fresh	58.8 (5.3)	76.6 (0.7)	81.7 (1.4)
redep	96.1	96.3	97.6
chocolate/clorox/aerosol			
set	74.5 (5.0)	84.1 (2.5)	89.0 (1.1)
fresh	60.3 (7.2)	79.2 (3.7)	84.9 (1.8)
redep	97.7	100.0	100.0
chocolate/clorox/pump			
set	83.1 (0.1)	76.2 (5.8)	88.0 (0.9)
fresh	61.5 (2.4)	73.6 (0.7)	81.4 (2.2)
redep	98.4	98.9	97.6
chocolate/clorox/direct			
set	77.3 (3.1)	81.8 (5.3)	91.4 (2.0)
fresh	55.1 (2.8)	81.0 (2.4)	84.9 (3.1)
redep	98.4	98.9	98.9
chocolate/shout/aerosol			
set	66.0 (3.7)	76.3 (6.1)	91.4 (1.8)
fresh	56.0 (3.1)	69.2 (5.4)	81.0 (2.8)
redep	97.3	98.9	100.0
chocolate/shout/direct			
set	81.0 (2.9)	81.3 (1.9)	87.7 (2.8)
fresh	66.5 (0.9)	74.3 (2.5)	82.9 (1.1)
redep	98.4	97.6	97.6

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
mustard/control/			
set	55.2 (5.5)	73.3 (8.8)	62.6 (1.7)
fresh	37.0 (17.2)	49.3 (5.6)	69.0 (27.0)
redep	97.3	97.4	98.7
mustard/spraynwash/aerosol			
set	50.5 (1.7)	78.6 (3.2)	66.0 (7.0)
fresh	27.0 (6.2)	47.0 (6.5)	58.3 (6.2)
redep	98.4	98.9	100.2
mustard/spraynwash/pump			
set	54.0 (12.7)	84.5 (12.7)	86.9 (7.2)
fresh	29.8 (13.5)	58.2 (20.6)	65.4 (6.7)
redep	97.3	98.9	98.7
mustard/spraynwash/direct			
set	44.7 (4.6)	83.3 (10.9)	81.2 (3.1)
fresh	30.2 (8.5)	57.0 (5.7)	69.6 (5.4)
redep	96.6	100.0	98.7
mustard/clorox/aerosol			
set	50.6 (10.2)	76.5 (2.9)	80.4 (4.8)
fresh	17.8 (11.3)	49.8 (5.2)	70.0 (5.9)
redep	97.3	98.9	101.4
mustard/clorox/pump			
set	34.4 (10.3)	65.6 (10.2)	66.5 (6.5)
fresh	21.8 (17.2)	48.4 (8.2)	61.9 (1.1)
redep	97.3	98.9	97.6
mustard/clorox/direct			
set	38.4 (2.3)	62.6 (3.9)	66.1 (4.8)
fresh	12.9 (6.4)	55.4 (5.9)	50.8 (5.1)
redep	97.3	98.9	98.9
mustard/shout/aerosol			
set	47.6 (15.8)	66.2 (7.5)	68.7 (2.8)
fresh	11.6 (10.7)	37.9 (9.8)	48.3 (2.2)
redep	98.4	98.9	98.9
mustard/shout/direct			
set	34.3 (7.9)	60.9 (7.5)	67.2 (2.1)
fresh	5.9 (5.1)	55.0 (5.8)	47.8 (5.4)
redep	97.3	98.9	98.9

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
tea/control/			
set	5.1 (4.4)	25.7 (5.2)	53.4 (0.9)
fresh	11.6 (2.1)	45.6 (1.6)	43.9 (11.1)
redep	98.8	99.8	97.4
tea/spraynwash/aerosol			
set	4.5 (7.9)	35.0 (3.4)	63.0 (6.1)
fresh	6.0 (5.8)	37.1 (0.8)	36.4 (4.4)
redep	98.8	99.8	97.4
tea/spraynwash/pump			
set	0.0 (0.0)	48.8 (2.7)	70.6 (3.1)
fresh	11.7 (4.6)	40.7 (3.7)	44.0 (0.9)
redep	100.0	99.8	96.0
tea/spraynwash/direct			
set	8.2 (13.3)	41.0 (2.0)	66.9 (2.3)
fresh	11.2 (1.0)	42.5 (3.4)	47.2 (2.9)
redep	98.8	99.8	97.4
tea/clorox/aerosol			
set	0.0 (0.0)	46.7 (4.9)	63.4 (4.7)
fresh	1.5 (1.3)	35.7 (1.4)	45.4 (1.7)
redep	98.8	98.2	96.7
tea/clorox/pump			
set	4.5 (5.7)	42.9 (9.5)	63.6 (2.9)
fresh	2.8 (2.6)	41.8 (1.5)	48.6 (2.7)
redep	100.0	101.4	97.4
tea/clorox/direct			
set	1.1 (1.8)	41.7 (1.4)	62.1 (3.4)
fresh	2.8 (3.8)	41.3 (0.6)	46.9 (1.8)
redep	100.0	99.8	97.4
twa/shout/aerosol			
set	0.0 (0.0)	37.0 (8.1)	65.1 (5.3)
fresh	2.0 (3.5)	40.7 (5.7)	44.0 (2.7)
redep	100.0	99.8	97.4
tea/shout/direct			
set	9.3 (5.9)	50.1 (3.9)	68.8 (4.3)
fresh	5.9 (6.3)	44.6 (1.1)	49.6 (2.5)
redep	98.8	101.4	97.4

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
lipstick/control/			
set	7.8 (6.3)	4.Ø (3.2)	8.1 (5.2)
fresh	13.9 (1.5)	2.9 (2.8)	8.7 (Ø.8)
redep	97.3	95.Ø	97.6
lipstick/spraynwash/aerosol			
set	8.9 (2.9)	Ø.Ø (Ø.Ø)	7.5 (3.7)
fresh	13.4 (1.1)	4.Ø (3.6)	5.Ø (2.3)
redep	96.1	93.8	97.6
lipstick/spraynwash/pump			
set	11.4 (2.4)	8.2 (1.8)	9.8 (5.7)
fresh	24.2 (5.Ø)	6.6 (Ø.9)	14.3 (Ø.7)
redep	97.3	93.8	97.6
lipstick/spraynwash/direct			
set	17.8 (5.2)	5.8 (4.6)	17.3 (3.1)
fresh	16.Ø (2.1)	3.9 (Ø.8)	1Ø.3 (2.4)
redep	96.1	93.8	98.3
lipstick/clorox/aerosol			
set	17.4 (Ø.7)	4.7 (1.6)	8.2 (2.4)
fresh	25.3 (5.5)	5.2 (1.6)	7.5 (Ø.4)
redep	98.4	96.3	97.6
lipstick/clorox/pump			
set	17.2 (2.Ø)	7.6 (3.5)	17.Ø (1.5)
fresh	19.Ø (2.2)	7.3 (1.9)	12.8 (2.7)
redep	96.7	96.3	97.7
lipstick/clorox/direct			
set	16.1 (3.2)	1Ø.2 (4.3)	11.8 (1.8)
fresh	17.5 (1.Ø)	4.7 (3.4)	9.Ø (Ø.4)
redep	96.1	96.3	97.6
lipstick/shout/aerosol			
set	14.6 (Ø.5)	15.1 (5.9)	16.2 (1.3)
fresh	19.3 (4.8)	5.Ø (1.2)	6.5 (2.9)
redep	97.3	96.3	97.6
lipstick/shout/direct			
set	14.5 (2.1)	9.7 (2.Ø)	18.3 (Ø.4)
fresh	18.7 (3.5)	5.2 (2.4)	12.Ø (2.4)
redep	96.1	96.3	97.6

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
jelly/control/			
set	71.9 (2.5)	82.0 (3.6)	85.0 (1.0)
fresh	62.6 (2.4)	79.3 (3.9)	75.3 (3.4)
redep	97.2	100.0	100.0
jelly/spraynwash/aerosol			
set	85.7 (3.4)	92.1 (4.6)	91.9 (1.6)
fresh	85.5 (4.1)	89.7 (1.7)	91.6 (3.5)
redep	97.2	100.0	100.0
jelly/spraynwash/pump			
set	88.2 (0.1)	97.5 (1.0)	95.6 (1.8)
fresh	85.8 (0.3)	96.3 (0.4)	95.9 (0.3)
redep	98.4	100.0	100.0
jelly/spraynwash/direct			
set	90.3 (2.0)	99.0 (1.8)	100.0 (0.0)
fresh	84.1 (2.2)	96.8 (0.1)	100.0 (0.0)
redep	98.4	100.0	112.9
jelly/clorox/aerosol			
set	87.4 (3.2)	85.0 (4.8)	87.7 (4.5)
fresh	82.2 (0.2)	88.2 (4.5)	90.6 (2.8)
redep	97.2	98.7	98.7
jelly/clorox/pump			
set	84.7 (1.3)	94.1 (6.2)	96.5 (0.2)
fresh	82.4 (2.3)	94.3 (3.5)	93.0 (2.8)
redep	97.2	100.0	100.0
jelly/clorox/direct			
set	85.3 (2.7)	95.0 (1.9)	96.1 (1.8)
fresh	83.6 (2.6)	96.8 (3.0)	95.4 (0.2)
redep	98.4	100.0	100.0
jelly/shout/aerosol			
set	71.2 (2.4)	79.3 (6.1)	83.9 (2.1)
fresh	67.7 (6.9)	85.7 (1.9)	87.7 (6.3)
redep	99.5	101.3	100.0
jelly/shout/direct			
set	74.3 (6.1)	87.3 (5.3)	85.7 (0.6)
fresh	71.7 (4.6)	76.0 (1.3)	89.4 (5.5)
redep	98.4	101.3	100.0

TABLE 19 (continued)
AVERAGE CLEANING EFFICIENCY (AND STANDARD DEVIATION)

	silk	wool gabardine	dacron/ wool
ballpoint pen ink/control/***			
set	15.7 (4.9)	25.9 (1.1)	10.8 (4.8)
fresh	19.3 (2.8)	26.6 (1.9)	16.2 (10.4)
redep	71.8	84.4	87.3
ballpoint pen ink/spraynwash/aerosol***			
set	34.6 (2.5)	44.2 (9.1)	39.7 (10.6)
fresh	36.9 (2.6)	55.2 (5.2)	27.5 (2.7)
redep	63.7	93.5	93.7
ballpoint pen ink/spraynwash/pump***			
set	45.5 (6.6)	42.7 (7.1)	63.5 (2.8)
fresh	60.0 (2.9)	34.0 (5.3)	34.2 (1.4)
redep	54.4	84.4	88.6
ballpoint pen ink/spraynwash/direct***			
set	41.4 (8.5)	45.6 (4.3)	58.7 (4.7)
fresh	52.4 (2.3)	41.0 (10.8)	47.7 (12.6)
redep	62.5	89.0	92.4
ballpoint pen ink/clorox/aerosol***			
set	28.9 (6.0)	49.6 (9.4)	21.5 (2.9)
fresh	37.1 (2.4)	61.2 (2.7)	52.5 (10.7)
redep	67.7	89.6	93.7
ballpoint pen ink/clorox/pump***			
set	26.3 (2.3)	39.2 (8.1)	46.8 (4.8)
fresh	38.3 (4.2)	47.7 (5.2)	16.0 (6.0)
redep	67.1	88.3	93.7
ballpoint pen ink/clorox/direct***			
set	30.2 (2.6)	45.3 (6.8)	42.3 (13.2)
fresh	39.2 (5.6)	50.9 (4.7)	16.0 (10.2)
redep	67.1	88.3	92.4
ballpoint pen ink/shout/aerosol***			
set	22.4 (1.2)	36.1 (2.9)	48.4 (7.4)
fresh	29.9 (0.7)	52.4 (4.9)	16.5 (4.3)
redep	74.7	90.9	94.3
ballpoint pen ink/shout/direct***			
set	33.4 (6.9)	34.5 (4.4)	39.7 (13.8)
fresh	45.8 (1.8)	48.3 (2.4)	20.6 (3.1)
redep	60.8	90.9	94.9

TABLE 20
GRASS STAIN REMOVAL
Average Visual Ratings

Two values are reported for each fabric and condition. Each is an average of triplicate specimens evaluated by separate observers.

	Cotton Momie		50/50 Cotton/ Polyester		65/35 Polyester/ Cotton		Polyester Interlock		Polyester Doubleknit	
Control										
set	4	5	3	4	4	3	3	4	2	2
fresh	3	5	3	4	3	3	2	2	2	2
Spray 'n Wash/Aerosol										
set	3*	3*	3	3*	3*	3	3	3*	3	2
fresh	3	3*	3	2*	3*	2*	2	2	2	2
Spray 'n Wash/Pump										
set	3**	3**	3	4A	2*N	2*N	3	4A	2	2
fresh	3	3**	3	2**	2*N	2**	2	2	2	2
Spray 'n Wash/Direct										
set	3**	3**	3	4A	2*N	3	3	4A	2	3
fresh	3	3**	3	3*A	3	3A	2	2	2	2
Clorox/Aerosol										
set	4	5	4	5	3*	3	2*	4	2	2
fresh	3	4*	3	3*	2*	2*	2	2	2	2
Clorox/Pump										
set	3*N	4*N	4	4	3**	3	4	5	3	4
fresh	3	3*N	3	4A	2**	3A	2	3	2	2
Clorox/Direct										
set	4	4*N	4	4	3**	3	2*	4	2	2
fresh	3	3*N	3	3*N	2**	3A	2	2	2	2
Shout/Aerosol										
set	4	4*	4	4	4	4	2	3*	3	4
fresh	3	3*	3	3*	3	3	3	2	2	2
Shout/Direct										
set	4	4**	4	4	3*N	3	3	4A	3	3
fresh	3	3**	2*N	3**	2*N	2*N	2N	2	2	2

KEY TO VISUAL EVALUATION:
1 all of stain removed
2 light brown stain, no green
3 dark brown stain, no green
4 some green
5 no stain removal

*prewash was better than control
**better than control, but no difference between nonaerosol and aerosol
*A or A aerosol superior
*N or N nonaerosol superior

TABLE 20
GRASS STAIN REMOVAL
Average Visual Ratings
(continued)

	Silk		Wool Gabardine		55/45 Dacron/Wool	
Control						
set	5	4	4	5	5	4
fresh	4	4	3	3	3	4
Spray 'n Wash/Aerosol						
set	4*	4	4	4*	4*	4
fresh	3*	4	3	3	2*	3*
Spray 'n Wash/Pump						
set	4**	5	4	5A	4**	5
fresh	3**	5	3	4	3A	3**
Spray 'n Wash/Direct						
set	4**	5	4	4**	3*N	4
fresh	4A	4	3	3	3A	3**
Clorox/Aerosol						
set	4*	4	4	4*	4*	4
fresh	3*	4	3	3	3	4
Clorox/Pump						
set	4*	5	4	5A	4**	5
fresh	3**	3*N	3	3	3	3*N
Clorox/Direct						
set	3*N	4	3	3*N	3*N	3*N
fresh	3**	3*	3	3	2**	3**
Shout/Aerosol						
set	4*	5	4	5	4*	4
fresh	4	4	3	3	3	3*
Shout/Direct						
set	4**	4	4	4	4**	4
fresh	3*N	3*N	3	3	3	3**

TABLE 21. PREWASH EFFICACY 2-sample t-values COMPARING ALL FORMS TO CONTROL

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
mustard/spraynwash/aerosol								
set	11.225*	-2.755	-5.561	0.625	n/a	-1.414	0.980	0.817
fresh	5.358*	-2.779	-1.879	4.323*	n/a	-0.947	-0.464	-0.669
mustard/spraynwash/pump								
set	5.432*	-1.014	-2.495	0.882	n/a	-0.150	1.255	5.689*
fresh	2.597	0.935	-1.165	4.330*	n/a	-0.570	0.722	-0.224
mustard/spraynwash/direct								
set	6.834*	-1.591	-3.006	0.715	n/a	-2.536	1.236	9.112*
fresh	2.910*	0.500	-2.040	4.227*	n/a	-0.614	1.669	0.038
mustard/clorox/aerosol								
set	-4.634	0.139	-1.950	1.137	n/a	-0.688	0.598	6.054*
fresh	0.693	0.500	-1.691	4.663*	n/a	-1.616	0.113	0.063
mustard/clorox/pump								
set	-3.013	-1.390	-2.822	0.395	n/a	-3.085	-0.990	1.005
fresh	-2.887	-0.837	-3.391	1.798	n/a	-1.082	-0.157	-0.455
mustard/clorox/direct								
set	-1.252	-0.314	-1.815	0.882	n/a	-4.881	-1.925	1.190
fresh	2.129	1.213	-1.297	2.802*	n/a	-2.274	1.299	-1.147
mustard/shout/aerosol								
set	-0.123	-0.954	2.824*	1.474	n/a	-0.787	-1.064	3.225*
fresh	2.177	0.050	1.361	6.490*	-0.990	-2.172	-1.749	-1.323
mustard/shout/direct								
set	3.768*	-1.127	3.247*	0.756	n/a	-3.761	-1.857	2.949*
fresh	4.419*	0.858	0.407	1.462	n/a	-3.002	1.225	-1.334
tea/spraynwash/aerosol								
set	-25.742	-4.177	-2.104	3.766*	6.933*	-0.115	2.593	2.697
fresh	2.684	-1.588	-1.566	20.155*	2.024	-1.572	-8.230	-1.088
tea/spraynwash/pump								
set	6.331*	0.400	3.211*	1.888	7.564*	-2.008	6.828*	9.229*
fresh	11.483*	1.825	1.357	3.897*	1.891	0.034	-2.105	0.016
tea/spraynwash/direct								
set	2.279	0.217	0.965	5.140*	2.574	0.383	4.756*	9.467*
fresh	10.431*	1.744	1.646	14.131*	-0.698	-0.298	-1.429	0.498
tea/clorox/aerosol								
set	0.045	-1.459	-0.480	5.191*	8.382*	-2.008	5.091*	3.619*
fresh	1.910	-0.199	0.540	13.468*	2.658	-7.083	-8.065	0.231
tea/clorox/pump								
set	-1.975	0.942	3.156*	3.416*	7.793*	-0.144	2.751	5.818*
fresh	4.006*	0.644	1.401	3.931*	2.048	-4.560	-3.001	0.713
tea/clorox/direct								
set	1.339	-0.295	1.165	2.847*	4.495*	-1.457	5.146*	4.284*
fresh	2.784*	0.269	1.344	9.140*	1.941	-3.511	-4.358	0.462
tea/shout/aerosol								
set	1.371	-0.709	-0.452	1.148	8.203*	-2.008	2.033	3.770*
fresh	6.489*	0.239	0.235	11.256*	2.632	-4.074	-1.434	0.015
tea/shout/direct								
set	5.593*	2.185	2.198	6.377*	6.482*	0.988	6.502*	6.071*
fresh	7.509*	3.172*	2.707	17.628*	0.434	-1.487	-0.892	0.868

KEY: *=these values are significantly better than the control (no prewash) values
n/a=the standard deviations for the forms being compared were both 0.0, and the 2-sample t equation can not be used

TABLE 21. PREWASH EFFICACY 2-sample t-values COMPARING ALL FORMS TO CONTROL (continued)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
wine/spraynwash/aerosol								
set	3.431*	2.007	-2.140	1.753	-1.113	5.699*	15.184*	3.219*
fresh	-4.210	2.105	2.924*	11.018*	3.851*	2.844*	9.922*	5.322*
wine/spraynwash/pump								
set	5.672*	2.815*	-0.665	0.485	-1.731	9.793*	1.996	4.514*
fresh	0.214	7.408*	2.508	5.347*	2.796*	4.650*	24.413*	0.805
wine/spraynwash/direct								
set	7.339*	3.307*	3.231*	1.149	-0.951	11.930*	17.386*	3.294*
fresh	4.709*	6.844*	4.016*	8.501*	1.210	n/a	11.758*	0.902
wine/clorox/aerosol								
set	3.752*	1.617	-0.101	2.346	-1.050	0.438	13.704*	2.589
fresh	-2.001	-1.419	2.191	9.593*	2.967*	n/a	11.883*	-0.635
wine/clorox/pump								
set	4.287*	1.477	0.911	-0.122	0.610	5.361*	0.332	4.525*
fresh	0.737	0.562	3.068*	6.861*	2.080	1.001	7.840*	0.590
wine/clorox/direct								
set	7.761*	1.657	2.113	1.816	-1.096	1.358	9.605*	4.730*
fresh	-0.122	4.358*	5.319*	4.073*	2.874*	1.161	5.403*	0.695
wine/shout/aerosol								
set	5.467*	1.902	-0.678	0.262	-0.042	1.225	10.625*	3.972*
fresh	1.248	2.340	2.575	13.236*	2.453	1.943	5.988*	-1.475
wine/shout/direct								
set	10.203*	3.816*	3.020*	1.703	43.300*	0.274	0.951	2.441
fresh	6.566*	3.431*	5.447*	11.590*	4.175*	n/a	1.232	0.787
sheaffer black ink/spraynwash/aerosol***								
set	-4.694	-3.737	-0.771	n/a	n/a	0.413	-0.322	-0.355
fresh	-5.022	-0.029	-1.486	-2.677	n/a	0.413	-0.897	0.188
sheaffer black ink/spraynwash/pump***								
set	-4.959	-2.126	0.079	-6.062	n/a	1.588	1.518	4.481*
fresh	0.652	-0.335	0.089	-11.258	n/a	1.208	0.070	9.436*
sheaffer black ink/spraynwash/direct***								
set	-3.642	-1.875	-0.374	n/a	n/a	1.258	1.398	0.378
fresh	-2.888	-2.553	-0.610	-1.083	n/a	7.884*	0.919	0.876
sheaffer black ink/clorox/aerosol***								
set	-0.116	-2.066	-1.432	-1.039	n/a	-0.566	-0.619	-0.381
fresh	-2.657	-1.174	0.765	n/a	n/a	0.761	-0.673	0.573
sheaffer black ink/clorox/pump***								
set	-2.900	-1.684	-0.784	n/a	n/a	0.033	-0.915	-0.801
fresh	-1.388	-0.866	-0.176	n/a	n/a	0.993	0.837	1.203
sheaffer black ink/clorox/direct***								
set	-2.947	0.136	-0.103	-1.039	n/a	-0.623	-1.120	-12.544
fresh	-2.732	-1.528	0.948	-1.856	n/a	1.830	1.262	1.018
sheaffer black ink/shout/aerosol***								
set	-2.729	-3.492	-1.626	-1.058	n/a	-0.475	1.154	-4.691
fresh	-6.368	-2.080	1.120	-0.981	n/a	1.098	1.262	-0.726
sheaffer black ink/shout/direct***								
set	-2.410	0.155	-0.450	n/a	-1.039	-0.356	-0.333	-12.974
fresh	-1.419	-4.476	2.006	n/a	n/a	-2.044	1.127	1.486

TABLE 21. PREWASH EFFICACY 2-sample t-values COMPARING ALL FORMS TO CONTROL (continued)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
sheaffer blue ink/spraynwash/aerosol								
set	2.638	2.531	4.409*	-1.217	n/a	1.210	5.741*	3.802*
fresh	2.308	-2.514	6.159*	8.573*	n/a*	-0.049	1.111	6.311*
sheaffer blue ink/spraynwash/pump								
set	-4.595	-0.141	-0.552	-1.011	n/a	0.649	2.819*	1.561
fresh	-1.592	-5.713	2.357	5.035*	n/a*	-1.903	3.092*	0.511
sheaffer blue ink/spraynwash/direct								
set	-12.785	-1.092	0.117	-1.931	-0.866	-0.999	1.360	-9.932
fresh	24.885*	-0.736	1.572	3.971*	n/a*	-3.033	1.717	0.208
sheaffer blue ink/chlorox/aerosol								
set	-16.707	0.673	-0.255	-2.309	n/a	-2.052	-3.924	-5.558
fresh	-11.496	-2.664	6.869*	4.067*	n/a*	0.076	2.721	-1.367
sheaffer blue ink/chlorox/pump								
set	-3.290	-0.594	2.150	-2.218	n/a	-0.441	-0.136	-15.309
fresh	0.874	-1.703	5.137*	7.361*	1.732	-0.052	0.871	-2.204
sheaffer blue ink/chlorox/direct								
set	-1.706	1.848	1.568	-2.021	n/a	-1.138	-1.583	-6.632
fresh	4.734*	-0.590	4.696*	4.067*	n/a*	-0.565	-0.327	-0.083
sheaffer blue ink/shout/aerosol								
set	-2.611	-2.078	1.702	1.443	n/a	-2.385	-1.058	-15.193
fresh	3.021*	-1.457	3.686*	8.166*	13.856*	-1.519	4.235*	0.354
sheaffer blue ink/shout/direct								
set	-3.945	-1.732	2.014	-2.525	n/a	-2.723	-6.431	-26.564
fresh	2.420	-2.558	3.493*	4.286*	n/a*	-1.872	2.068	-2.069
coffee/spraynwash/aerosol								
set	2.983*	2.645	5.694*	0.455	0.933	0.355	0.054	0.565
fresh	6.111*	1.545	0.588	0.094	4.619*	-0.866	-2.579	-0.027
coffee/spraynwash/pump								
set	1.492	0.577	-1.091	-1.119	0.933	0.711	-0.453	-0.258
fresh	1.415	1.516	-0.150	1.882	4.008*	-0.654	-4.937	1.604
coffee/spraynwash/direct								
set	-0.320	0.818	-0.620	-1.499	0.933	-0.223	-0.920	0.761
fresh	0.498	0.378	0.494	0.355	2.566	-2.493	-3.913	-1.184
coffee/clorox/aerosol								
set	-0.776	-0.686	-1.739	-3.412	0.933	-2.610	-0.581	-0.077
fresh	-0.265	-0.755	-2.641	0.955	2.385	-2.687	-3.864	-0.392
coffee/clorox/pump								
set	2.140	1.676	11.652*	-0.472	0.933	0.090	0.899	0.392
fresh	2.906*	1.788	0.230	0.756	4.008*	-3.105	-4.046	0.409
coffee/clorox/direct								
set	1.706	2.018	1.315	-0.908	0.933	-0.763	0.353	0.134
fresh	2.406	-2.152	0.205	1.923	1.514	-2.826	-2.782	-1.336
coffee/shout/aerosol								
set	-1.466	-1.826	-1.227	6.158*	0.933	-95.837	0.338	-0.008
fresh	0.220	2.520	0.317	1.766	3.052*	-4.977	-6.196	-0.182
coffee/shout/direct								
set	1.299	1.642	3.056*	1.658	0.933	1.368	0.107	-0.481
fresh	2.304	2.165	2.401	1.568	3.931*	-2.698	-1.708	1.858

TABLE 21. PREWASH EFFICACY 2-sample t-values COMPARING ALL FORMS TO CONTROL (continued)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
ball point ink/spraynwash/aerosol***								
set	3.963*	16.628*	8.223*	10.635*	19.201*	5.951*	3.458*	4.302*
fresh	2.733	3.547*	10.502*	17.991*	14.245*	7.978*	8.947*	1.822
ball point ink/spraynwash/pump***								
set	2.109	18.962*	10.743*	8.919*	12.900*	6.279*	4.050*	16.426*
fresh	0.806	5.987*	8.161*	10.388*	14.760*	17.487*	2.276	2.971*
ball point ink/spraynwash/direct***								
set	2.221	8.093*	9.183*	6.431*	7.885*	4.537*	7.687*	12.350*
fresh	1.194	4.336*	8.508*	9.685*	14.829*	15.821*	2.274	3.339*
ball point ink/clorox/aerosol***								
set	1.925	15.944*	6.152*	6.871*	16.481*	2.951*	4.337*	3.305*
fresh	1.339	6.669*	7.326*	22.037*	14.798*	8.360*	18.151*	4.214*
ball point ink/clorox/pump***								
set	5.616*	4.962*	9.118*	5.669*	7.145*	3.392*	2.818*	9.185*
fresh	3.330*	4.123*	13.584*	8.675*	7.213*	6.519*	6.601*	-0.029
ball point ink/clorox/direct***								
set	1.166	10.684*	7.590*	6.024*	11.746*	4.527*	4.878*	3.884*
fresh	0.520	3.241*	12.561*	4.479*	5.779*	5.505*	8.302*	-0.024
ball point ink/shout/aerosol***								
set	-2.191	2.844*	1.018	0.651	2.240	2.300	5.696*	7.383*
fresh	-1.680	-0.119	0.757	0.579	2.153	6.361*	8.503*	0.046
ball point ink/shout/direct***								
set	0.051	6.722*	6.130*	9.954*	10.004*	3.622*	3.284*	3.426*
fresh	0.076	3.781*	4.338*	9.970*	1.123	13.789*	12.278*	0.702
jelly/spraynwash/aerosol								
set	1.187	2.327	-1.381	-0.110	1.732	5.664*	2.995*	6.334*
fresh	-3.560	0.301	-0.171	3.642*	2.021	8.349*	4.234*	5.786*
jelly/spraynwash/pump								
set	-1.041	5.938*	-0.371	-2.434	1.732	11.284*	7.185*	8.916*
fresh	0.528	1.476	1.876	2.041	1.921	16.613*	7.510*	10.453*
jelly/spraynwash/direct								
set	1.691	2.289	n/a*	-2.525	1.732	9.954*	7.315*	25.980*
fresh	0.000	1.328	1.876	0.792	2.021	11.438*	7.769*	12.582*
jelly/clorox/aerosol								
set	0.799	-0.733	1.426	-2.365	-1.551	6.611*	0.866	1.014
fresh	-3.563	-0.425	1.041	0.565	2.021	14.096*	2.589	6.016*
jelly/clorox/pump								
set	1.325	2.545	n/a	-0.535	1.732	7.868*	2.923*	19.531*
fresh	0.352	1.245	1.082	1.638	1.921	10.316*	4.958*	6.960*
jelly/clorox/direct								
set	0.983	4.631*	4.811*	-1.178	-0.854	6.307*	5.531*	9.337*
fresh	-1.926	0.988	0.958	1.320	-0.867	10.279*	6.160*	10.222*
jelly/shout/aerosol								
set	0.174	0.587	-29.444	-6.383	1.732	-0.350	-0.660	-0.819
fresh	-6.247	-1.546	0.137	-0.418	-0.070	1.209	2.555	3.000*
jelly/shout/direct								
set	0.947	-0.974	1.732	-1.534	-0.923	0.631	1.433	1.040
fresh	-0.675	0.898	-0.275	1.107	2.021	3.038*	-1.390	3.777*

TABLE 21. PREWASH EFFICACY 2-sample t-values COMPARING ALL FORMS TO CONTROL (continued)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
oil/spraynwash/aerosol								
set	15.623*	7.984*	15.187*	1.993	29.636*	9.572*	14.315*	8.248*
fresh	14.749*	12.927*	10.542*	7.918*	6.143*	11.775*	42.012*	6.861*
oil/spraynwash/pump								
set	2.307	0.728	4.682*	-0.959	n/a	2.796*	3.610*	0.000
fresh	6.938*	0.600	0.863	-1.302	-0.168	0.375	1.178	1.065
oil/spraynwash/direct								
set	6.085*	0.561	2.589	-0.699	0.990	3.922*	2.932*	1.024
fresh	7.135*	1.760	1.423	-1.840	0.133	2.506	0.786	0.115
oil/clorox/aerosol								
set	19.078*	17.600*	17.257*	4.445*	13.739*	10.427*	32.463*	16.742*
fresh	15.787*	30.475*	5.572*	13.468*	23.483*	17.445*	9.628*	5.456*
oil/clorox/pump								
set	7.113*	2.233	3.068*	-0.866	n/a	3.887*	3.586*	0.040
fresh	3.675*	3.034*	3.836*	-0.751	-2.078	4.488*	4.460*	0.295
oil/clorox/direct								
set	5.116*	4.175*	2.646	-1.012	n/a	2.992*	1.964	-0.223
fresh	6.703*	3.693*	3.656*	-1.678	0.742	3.400*	5.984*	-0.060
oil/shout/aerosol								
set	17.557*	9.346*	16.787*	3.092*	10.650*	1.165	3.346*	2.876*
fresh	14.764*	48.037*	12.988*	4.875*	3.380*	1.830	13.012*	2.383
oil/shout/direct								
set	9.793*	6.193*	5.272*	2.256	1.897	2.908*	3.678*	3.699*
fresh	8.088*	3.159*	4.101*	11.024*	2.242	5.857*	4.078*	1.362
chocolate/spraynwash/aerosol								
set	-1.001	-1.528	2.171	2.348	26.846*	0.810	0.857	-5.834
fresh	-1.658	2.317	6.218*	3.109*	-4.687	0.655	3.682*	2.627
chocolate/spraynwash/pump								
set	1.398	3.053*	0.715	9.959*	7.668*	4.335*	2.402	-5.435
fresh	-1.102	2.929*	7.527*	0.075	-1.324	0.233	7.020*	1.806
chocolate/spraynwash/direct								
set	-0.182	0.644	2.443	0.816	6.572*	-0.153	0.737	-0.370
fresh	-1.236	2.346	0.942	1.025	-3.226	0.744	5.022*	0.195
chocolate/clorox/aerosol								
set	0.906	3.702*	1.034	1.930	26.846*	1.386	2.562	-5.175
fresh	-0.672	0.999	0.941	1.619	-1.638	0.915	3.210*	2.792*
chocolate/clorox/pump								
set	1.008	0.287	2.405	6.003*	2.204	13.829*	0.112	-8.225
fresh	-1.469	1.147	-1.050	-0.468	-1.354	2.120	1.883	-0.070
choclate/clorox/direct								
set	1.319	-0.612	2.994*	1.930	2.204	3.475*	1.436	-0.778
fresh	-1.147	2.429	1.096	0.504	0.000	-0.330	5.630*	1.790
chocolate/shout/aerosol								
set	-0.694	-4.108	0.654	2.814*	7.394*	-1.848	0.131	-0.865
fresh	-1.579	-0.372	-1.505	1.478	-5.293	0.000	-0.804	-0.288
chocolate/shout/direct								
set	3.429*	-1.139	2.545	2.110	6.572*	5.595*	1.782	-2.844
fresh	-0.583	0.285	14.300*	0.604	-1.441	4.657*	1.485	1.559

TABLE 21. PREWASH EFFICACY 2-sample t-values COMPARING ALL FORMS TO CONTROL (continued)

	cotton momie	50/50 cotton/ polyester	35/65 cotton/ polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
blood/spraynwash/aerosol								
set	2.819*	1.324	1.021	0.652	1.000	2.967*	3.790*	4.055
fresh	0.537	-1.324	-0.509	-0.735	1.985	3.897*	1.174	1.490
blood/spraynwash/pump								
set	1.631	0.335	0.612	0.652	0.991	1.225	-2.037	0.995
fresh	0.163	0.462	-0.509	-2.078	1.985	1.719	-0.492	2.037
blood/spraynwash/direct								
set	0.336	-0.509	1.948	-1.237	1.000	3.635*	-1.990	-1.058
fresh	0.084	-0.698	-0.785	-1.003	1.985	-0.558	2.210	-1.184
blood/clorox/aerosol								
set	0.505	0.288	1.801	1.173	1.000	0.454	-1.776	-1.756
fresh	-0.866	-0.643	-0.082	-2.819	1.985	0.270	0.257	0.122
blood/clorox/pump								
set	-0.471	-0.760	0.000	0.000	0.985	-1.021	5.469*	2.398
fresh	-0.859	-0.102	-0.102	-2.215	1.985	2.578	-0.604	0.122
blood/clorox/direct								
set	-1.409	-0.844	-1.083	2.416	0.985	2.298	0.604	0.172
fresh	-0.340	0.349	-0.102	0.000	1.985	6.928*	-1.126	-0.679
blood/shout/aerosol								
set	-0.859	-2.629	2.603	0.652	1.000	-0.352	9.712*	0.484
fresh	0.000	-2.215	0.349	-3.067	1.845	-0.965	1.921	1.260
blood/shout/direct								
set	1.470	0.000	2.444	0.257	0.991	2.463	2.440	0.932
fresh	2.770	0.000	1.324	-1.003	1.985	1.260	1.545	0.195
lipstick/spraynwash/aerosol								
set	-0.157	-0.356	-2.171	2.207	-4.681	0.275	-2.165	-0.163
fresh	-0.145	-0.277	-0.259	0.501	-2.712	-0.466	0.418	-2.632
lipstick/spraynwash/pump								
set	0.510	0.078	0.091	5.363*	1.023	0.925	1.981	0.382
fresh	0.865	1.884	3.020*	3.479*	-1.142	3.417*	2.179	9.124*
lipstick/spraynwash/direct								
set	1.117	0.110	1.489	1.702	0.744	2.120	0.556	2.632
fresh	0.091	-0.240	2.282	0.087	0.474	1.409	0.595	1.095
lipstick/clorox/aerosol								
set	1.666	0.208	1.174	-0.530	-3.251	2.623	0.339	0.030
fresh	4.321*	0.286	0.828	1.168	-0.645	3.463*	1.235	-2.324
lipstick/clorox/pump								
set	0.225	-1.418	-0.319	2.364	-0.069	2.463	1.315	2.848*
fresh	-0.575	0.318	2.113	0.415	-0.269	3.317*	2.252	2.522
lipstick/clorox/direct								
set	-1.530	-1.313	-7.141	4.028*	-2.778	2.034	2.003	1.165
fresh	1.340	-0.136	2.395	-0.157	-0.590	3.459*	0.708	0.581
lipstick/shout/aerosol								
set	-0.044	0.039	-9.970	-1.013	-1.755	1.864	2.864*	2.617
fresh	0.079	-0.258	0.384	-0.777	-1.394	1.860	1.194	-1.267
lipstick/shout/direct								
set	3.026*	0.972	3.443*	3.668*	1.951	1.747	2.616	3.387*
fresh	1.411	0.934	2.667	1.951	-1.726	2.183	1.080	2.259

TABLE 22. PREWASH EFFICACY 2-sample t-values COMPARING NON-AEROSOL TO AEROSOL

	cotton momie	50/50 cotton/ polyester	35/65 cotton polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
mustard/spraynwash/pump								
set	1.660	-	-	-	-	-	-	-
fresh	A	-	-	0.000	-	-	-	-
mustard/spraynwash/direct								
set	-2.440	-	-	-	-	-	-	-
fresh	-0.093	-	-	-1.220	-	-	-	-
mustard/clorox/pump								
set	-	-	-	-	-	-	-	A
fresh	-	-	-	-	-	-	-	-
mustard/clorox/direct								
set	-	-	-	-	-	-	-	A
fresh	-	-	-	0.870	-	-	-	-
mustard/shout/direct								
set	N	-	0.46	-	-	-	-	-0.740
fresh	N	-	-	A	-	-	-	-
tea/spraynwash/pump								
set	N	-	N	A	2.858(N)	-	N	N
fresh	N	-	-	-2.815(A)	-	-	-	-
tea/spraynwash/direct								
set	-	-	-	6.351(N)	-	-	N	N
fresh	N	-	-	4.008(N)	-	-	-	-
tea/clorox/pump								
set	-	-	N	-6.481(A)	-1.196	-	A	0.063
fresh	N	-	-	-2.512	-	-	-	-
tea/clorox/direct								
set	-	-	-	-2.934(A)	-1.627	-	-1.699	-0.388
fresh	N	-	-	-2.954(A)	-	-	-	-
tea/shout/direct								
set	N	-	-	N	-8.593(A)	-	N	0.939
fresh	2.332	N	-	9.625(N)	-	-	-	-
wine/spraynwash/pump								
set	3.768(N)	N	-	-	-	3.029(N)	-	2.258
fresh	-	N	A	-3.641(A)	-3.900(A)	0.766	11.856(N)	-
wine/spraynwash/direct								
set	5.771(N)	N	N	-	-	5.238(N)	-	-
fresh	N	N	-0.334	-3.578(A)	-	-2.844(A)	0.519	-
wine/clorox/pump								
set	2.588	-	-	-	-	-	-	-
fresh	-	-	N	1.866	-	-	4.301(N)	-
wine/clorox/direct								
set	6.387(N)	-	-	-	-	-	1.552	-
fresh	-	N	N	0.856	-0.745	-	-2.081	-
wine/shout/direct								
set	4.968(N)	N	N	-	-	-	-	-
fresh	N	N	N	3.590(A)	-	-	-	-

KEY: A=aerosol form was significantly superior (from Table 17)
N=nonaerosol form was significantly superior (from Table 17)
-=neither aerosol nor nonaerosol were significantly better than using no prewash
alone=two-sided t results comparing nonaerosol to aerosol; neither significantly different from the other; both better than using no prewash
with (N) or (A)=two-sided t results comparing nonaerosol to aerosol; final outcome c (N) (nonaerosol) or (A) (aerosol) as significantly better

TABLE 22. PREWASH EFFICACY 2-sample t-values COMPARING NON-AEROSOL TO AEROSOL (continued)

	cotton momie	50/50 cotton/ polyester	35/65 cotton polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
sheaffer black ink/spraynwash/pump								
set	-	-	-	-	-	-	-	N
fresh	-	-	-	-	-	-	-	N
sheaffer black ink/spraynwash/direct								
set	-	-	-	-	-	-	-	-
fresh	-	-	-	-	-	-	-	-
sheaffer black ink/clorox/pump								
set	-	-	-	-	-	-	-	-
fresh	-	-	-	-	-	-	-	-
sheaffer black ink/clorox/direct								
set	-	-	-	-	-	-	-	-
fresh	-	-	-	-	-	-	-	-
sheaffer black ink/shout/direct								
set	-	-	-	-	-	-	-	-
fresh	-	-	-	-	-	-	-	-
sheaffer blue ink/spraynwash/pump								
set	-	-	A	-	-	-Ø.497	-	A
fresh	-	-	A	-Ø.387	-	N	-	A
sheaffer blue ink/spraynwash/direct								
set	-	-	A	-	-	-	-	A
fresh	N	-	A	Ø.137	-	-	-	A
sheaffer blue ink/clorox/pump								
set	-	-	-	-	-	-	-	-
fresh	N	-	Ø.567	-Ø.866	-	-	-	-
sheaffer blue ink/clorox/direct								
set	-	-	-	-	-	-	-	-
fresh	N	-	Ø.427	Ø.ØØØ	-	-	-	-
sheaffer blue ink/shout/direct								
set	-	-	-	A	-	-	-	-
fresh	-	-	1.947	-4.8Ø4(A)	-	A	-	-
coffee/spraynwash/pump								
set	A	-	A	-	-	-	-	-
fresh	A	-	-	-	-Ø.866	-	-	-
coffee/spraynwash/direct								
set	A	-	A	-	-	-	-	-
fresh	A	-	-	-		-	-	-
coffee/clorox/pump								
set	-	-	N	-	-	-	-	-
fresh	N	-	-	-	-	-	-	-
coffee/clorox/direct								
set	-	-	-	-	-	-	-	-
fresh	-	-	-	-	-	-	-	-
coffee/shout/direct								
set	-	-	N	A	-	-	-	-
fresh	-	-	-	-	1.955	-	-	-

TABLE 22. PREWASH EFFICACY 2-sample t-values COMPARING NON-AEROSOL TO AEROSOL (continued)

	cotton momie	50/50 cotton/ polyester	35/65 cotton polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
ball point ink/spraynwash/pump								
set	A	9.424(N)	3.813(N)	-5.405(A)	-8.249(A)	2.675	-0.225	3.759(N)
fresh	A	-0.865	-0.206	-6.294(A)	-2.531	10.272(N)	A	N
ball point ink/spraynwash/direct								
set	A	-0.126	-0.775	-3.979(A)	-3.262(A)	1.329	0.241	2.818(N)
fresh	A	-1.820	0.617	-11.184(A)	-2.599	7.734(A)	-2.052	N
ball point ink/clorox/pump								
set	N	-3.824(A)	-0.893	-3.573(A)	-3.978(A)	-0.700	-1.452	7.814(N)
fresh	N	-6.115(A)	5.096(N)	-21.750(A)	-3.993(A)	0.430	-3.991(A)	A
ball point ink/clorox/direct								
set	-	-5.540(A)	-1.344	-1.497	-6.916(A)	0.334	-0.642	-1.307
fresh	-	-7.699(A)	2.544(N)	-13.552(A)	-8.918(A)	0.597	-3.291(A)	A
ball point ink/shout/direct								
set	-	2.116	N	N	N	N	-0.526	-0.062
fresh	-	N	N	N	-	14.259(N)	-1.301	-
jelly/spraynwash/pump								
set	-	N	-	-	-	1.273	1.987	2.661
fresh	-	-	-	A	-	0.126	6.545(N)	2.120
jelly/spraynwash/direct								
set	-	-	-	-	-	2.020	2.419	8.768(N)
fresh	-	-	N	A	-	-0.521	7.220(N)	4.157(N)
jelly/clorox/pump								
set	-	-	N	-	-	-1.354	N	N
fresh	-	-	-	-	-	0.150	N	1.050
jelly/clorox/direct								
set	-	N	N	-	-	-0.869	N	3.000(N
fresh	-	-	-	-	-	0.930	N	2.962(N
jelly/shout/direct								
set	-	-	-	-	-	-	-	-
fresh	-	-	-	-	-	-	-	0.352
oil/spraynwash/pump								
set	A	A	-18.59(A)	-	A	-4.06(A)	-6.59(A)	A
fresh	-18.37(A)	A	A	A	A	A	A	A
oil/spraynwash/direct								
set	-9.50(A)	A	A	-	A	-6.71(A)	-0.63	A
fresh	-21.98(A)	A	A	A	A	A	A	A
oil/clorox/pump								
set	-15.39(A)	A	-12.80(A)	A	A	-6.05(A)	-19.49(A)	A
fresh	18.72(A)	-11.30(A)	-4.50(A)	A	A	-24.66(A)	-6.78(A)	A
oil/clorox/direct								
set	-12.25(A)	-24.34(A)	A	A	A	-6.21(A)	-24.69(A)	A
fresh	-15.59(A)	-15.65(A)	-4.82(A)	A	A	-33.61(A)	-8.80(A)	A
oil/shout/direct								
set	-8.10(A)	0.07	-1.46	A	A	0.83	-0.86	-1.94
fresh	-6.44(A)	-1.73	0.41	-0.67	A	5.90(N)	-3.60(A)	-

TABLE 22. PREWASH EFFICACY 2-sample t-values COMPARING NON-AEROSOL TO AEROSOL (continued)

	cotton momie	50/50 cotton/ polyester	35/65 cotton polyester	polyester interlock	polyester doubleknit	silk	wool gabardine	wool/ dacron
chocolate/spraynwash/pump								
set	-	N	-	N	-Ø.87	N	-	-
fresh	-	N	2.19	A	-	N	-	-
chocolate/spraynwash/direct								
set	-	-	-	-	Ø.84	-	-	-
fresh	-	-	-	A	-	-	3.22(N)	-
chocolate/clorox/pump								
set	-	-	-	N	A	N	-	-
fresh	-	-	-	-	-	-	-	A
chocolate/clorox/direct								
set	-	A	N	-	A	N	-	-
fresh	-	-	-	-	-	-	Ø.71	A
chocolate/shout/direct								
set	N	A	-	A	N	N	-	-
fresh	-	-	N	-	N	N	-	-
blood/spraynwash/pump								
set	A	-	-	-	-	A	A	-
fresh	-	-	-	-	-	A	-	-
blood/spraynwash/direct								
set	A	-	-	-	-	Ø.68	A	-
fresh	-	-	-	-	-	A	-	-
blood/clorox/pump								
set	A	-	-	-	-	-	N	-
fresh	-	-	-	-	-	-	-	-
blood/clorox/direct								
set	-	-	-	-	-	-	-	-
fresh	-	-	-	-	-	N	-	-
blood/shout/direct								
set	-	-	-	-	-	-	A	-
fresh	-	-	-	-	-	-	-	-
lipstick/spraynwash/pump								
set	-	-	-	N	-	-	-	-
fresh	-	-	N	N	-	N	-	N
lipstick/spraynwash/direct								
set	-	-	-	-	-	-	-	-
fresh	-	-	-	-	-	-	-	-
lipstick/clorox/pump								
set	-	-	-	-	-	-	-	N
fresh	A	-	-	-	-	-1.84	-	-
lipstick/clorox/direct								
set	-	-	-	N	-	-	-	-
fresh	A	-	-	-	-	-2.42	-	-
lipstick/shout/direct								
set	-	-	N	N	-	-	A	N
fresh	-	-	-	-	-	-	-	-