Special Test
University of Kentucky Textile Lab

Company:	CSC Network
Contact Person:	Jessica Hunter
Product:	Napkins
Date Received:	8/4/2011
Date Due:	10/10/2011
Technician:	Meredith, Erin

Sample Description:
Black Napkins- 100% Polyester, 20"x20" (9 Suppliers)
Ivory Napkins- 100% Polyester, 20"x20" (7 Suppliers)

Tests Performed:
ASTM D 5034-95 (2001): Standard Method for Breaking Strength (Grab Test)
AATCC 96-2009: Dimensional Changes in Commercial Laundering of Woven and Knitted Fabrics Except Wool (Dimensional Stability)
ASTM D 3776-96: Standard Test Method for Mass per Unit Area (Fabric Weight)
AATCC Test Method 130-2000: Soil Release: Oily Stain Release Method – Modified
AATCC Test Method 110-2005: Whiteness of Textiles – Modified for Color
ASTM D 4966-98: Standard Test Method for Abrasion Resistance of Textiles Fabrics- Modified Abrasion

Procedures:

ASTM D 5034-95 (2001): Standard Method for Breaking Strength (Grab Test)
This test was used to determine the amount of force required to break the napkins. Three specimens were cut in both the filling and warp directions from one napkin from each supplier. The six samples from each supplier were evaluated at new and after 100 IL. Breaking strength was performed by the Grab Test, a tensile test, in which the central part of the width of a specimen is gripped in clamps. Breaking force is the maximum force applied to a material carried to rupture. Results are given in pound of force (lbf).

ASTM D 3776-96 – Standard Test Method for Mass per Unit Area (Fabric Weight)
One 5.94 square-inch circle was cut from three napkins from each supplier using the Universal Sample Cutter. Each sample was conditioned for twenty-four hours and weighed in grams to the nearest one hundredth place. Samples were weighed new. The weight was converted in oz/yard^2 and an average and standard deviation was calculated for each specimen.

AATCC Test Method 130-2000: Soil Release: Oily Stain Release Method – Modified
The soil release test was used to evaluate the fabric's ability to release stains during laundering. Five stains (ketchup, mustard, coffee, bacon grease, and lipstick) were applied to one napkin from each supplier. Specimens were subjectively evaluated by two technicians and rated on a scale of 1 to 5 using the AATCC soil release scale; a rating of 1 indicated poor stain removal and

a rating of 5 indicated complete stain removal. Stains were applied after 49IL and 99IL and stain removal was evaluated after 50IL and 100IL.

AATCC Test Method 110-2005: Color Retention of Textiles
In order to determine the color retention of the napkins the new napkins were read against the Milliken qtx. Standard file after 1 IL, 50 IL and 100 IL. A subjective color evaluation was conducted under a light booth. Three napkins from each supplier were observed under daylight and fluorescent lighting with and without UV. Under UV, light optical brighteners turn bright blue and glow.

A Datacolor Spectrophotometer 600 Series was used to measure and compare the napkins after 1 IL, 50IL and 100 IL. 3 napkins from each supplier were evaluated after 1IL, 50IL and 100IL. Each supplier was measured against the Milliken standard to determine which supplier most closely matched the color of the Milliken brand napkin.

ASTM D 4966-98 Standard Test Method for Abrasion Resistance of Textiles Fabrics- Modified Abrasion
Abrasion was evaluated for the napkins from each supplier after 50IL and 100IL. Each napkin was compared to the ASTM standard and rated on a scale from 1 to 5 with 1 being very severe visual abrasion and 5 being no visual abrasion.

Results:

ASTM D 5034-95 (2001): Standard Method for Breaking Strength (Grab Test)
The following table depicts the average breaking strength after 100 IL for each napkin supplier. Please see the attached spreadsheets labeled "Breaking Strength" for more detailed results.

Supplier	Average Breaking Strength (lbf) after 100 IL	
	Black	Ivory
American Dawn	219.4	--
Baltic	176.2	--
Calderon Textiles	169.0	209.1
Milliken (Domestic)	194.6	177.7
Pinnacle	217.5	191.4
Riegel	204.5	218.4
Standard Textiles	118.3	173.5
Venus	209.6	187.8
Non Approved Supplier	210.3	212.7

AATCC 96-2009: Dimensional Changes in Commercial Laundering of Woven and Knitted Fabrics Except Wool (Dimensional Stability)
Dimensional Stability was measured after 100 IL. The table below depicts the average dimensional change after 100 IL for both the Black and Ivory napkin suppliers. Please see the attached spreadsheets labeled "Dimensional Change" for more detailed results.

Supplier	Dimensional Change 100IL (%)	
	Black	Ivory
American Dawn	-1.06	--
Baltic	-1.76	--
Calderon Textiles	-1.69	-2.73
Milliken (Domestic)	-1.43	-2.47
Pinnacle	-1.26	-1.91
Riegel	-1.19	-2.11
Standard Textiles	-0.93	-1.78
Venus	-2.21	-2.45
Non Approved Supplier	-2.17	-3.06

ASTM D 3776-96 – Standard Test Method for Mass per Unit Area (Fabric Weight)
Fabric weight was measured at new. The table below depicts the fabric weight (oz/yd^2) of the new napkins. The attached spreadsheet labeled "Fabric Weight" shows detailed information.

Supplier	Fabric Weight NEW (oz/yd^2)	
	Black	Ivory
American Dawn	26.1	--
Baltic	29.1	--
Calderon Textiles	29.0	31.0
Milliken (Domestic)	29.0	27.3
Pinnacle	27.7	26.7
Riegel	32.1	30.2
Standard Textiles	24.3	25.6
Venus	28.6	25.4
Non Approved Supplier	29.9	28.8

AATCC Test Method 130-2000: Soil Release: Oily Stain Release Method – Modified
The table below reports the score given to each supplier after 100IL. The napkins were stained with ketchup, mustard, coffee, bacon grease, and lipstick. For more detailed results, please see the attached spreadsheets labeled "Soil Release". A rating of 1 indicates poor stain removal and a rating of 5 indicates complete stain removal.

Supplier (BLACK)	Ketchup	Mustard	Lipstick	Bacon Grease	Coffee
American Dawn	5	5	2	5	5
Baltic	5	5	1.5	5	5
Calderon Textiles	5	5	1	5	5
Milliken (Domestic)	4.5	5	2	5	5
Pinnacle	5	5	1.5	5	5
Riegel	5	5	1.5	5	5
Standard Textiles	5	5	2	5	5
Venus	5	5	2	5	5
Non Approved Supplier	5	5	1	5	5

Supplier (IVORY)	Ketchup	Mustard	Lipstick	Bacon Grease	Coffee
Calderon Textiles	4.5	3	1	5	4.25
Milliken (Domestic)	4.5	3	1	4.25	5
Pinnacle	4.75	2.5	1	4	4.25
Riegel	4.5	2.75	1	4.5	3.75
Standard Textiles	4.25	2.5	1	4.25	4.5
Venus	4.75	3.25	1	4	4
Non Approved Supplier	4.5	3.5	1	5	4.5

AATCC Test Method 110-2005: Whiteness of Textiles – Modified for Color
The objective color evaluation was completed to determine which napkins retained color after 100 IL. Please see the attached spreadsheets labeled "Color Retention" for more detailed results.

Supplier	Color Retention after 100 IL – CMC_DE	
	Black	Ivory
American Dawn	Fail	--
Baltic	Fail	--
Calderon Textiles	Fail	Fail
Milliken (Domestic)	Pass	Fail
Pinnacle	Fail	Pass
Riegel	Fail	Fail
Standard Textiles	Fail	Fail
Venus	Fail	Fail
Non Approved Supplier	Fail	Fail

The subjective color evaluation was completed under a Spectralight Lightbox after 50 and 100 IL. Please see the attached spreadsheet labeled "Subjective Evaluation of Color Retention" for more detailed results.

Supplier	Color Retention after 100 IL – Subjective	
	Black	Ivory
American Dawn	No Change	--
Baltic	Slightly Darker	--
Calderon Textiles	Slightly Darker	Slightly Darker
Milliken (Domestic)	Slightly Gray	Darker Yellow
Pinnacle	Darker	Lighter Yellow
Riegel	No Change	Slightly Gray
Standard Textiles	No Change	Slightly Yellow
Venus	No Change	Slightly Lighter
Non Approved Supplier	No Change	Slightly Yellow

ASTM D 4966-98 Standard Test Method for Abrasion Resistance of Textiles Fabrics- Modified Abrasion

Abrasion was evaluated for each supplier after 50IL and 100IL. Each napkin from each supplier was compared to the ASTM standard and rated on a scale from 1 to 5 with 1 being very severe visual abrasion and 5 being no visual abrasion. The table below charts the average rating given to the supplier's napkins after 100 IL. The attached spreadsheets labeled "Abrasion Evaluation" detail individual results.

Supplier	Abrasion Rating after 100 IL	
	Black	Ivory
American Dawn	2.75	--
Baltic	3	--
Calderon Textiles	4.25	2.5
Milliken (Domestic)	4.25	2.75
Pinnacle	3	3.5
Riegel	2.5	2.75
Standard Textiles	3.5	1.5
Venus	4	4.75
Non Approved Supplier	3	2.75