



Independent Third-Party Cleaning Performance Summary for Orbio® Multi-Surface Cleaner

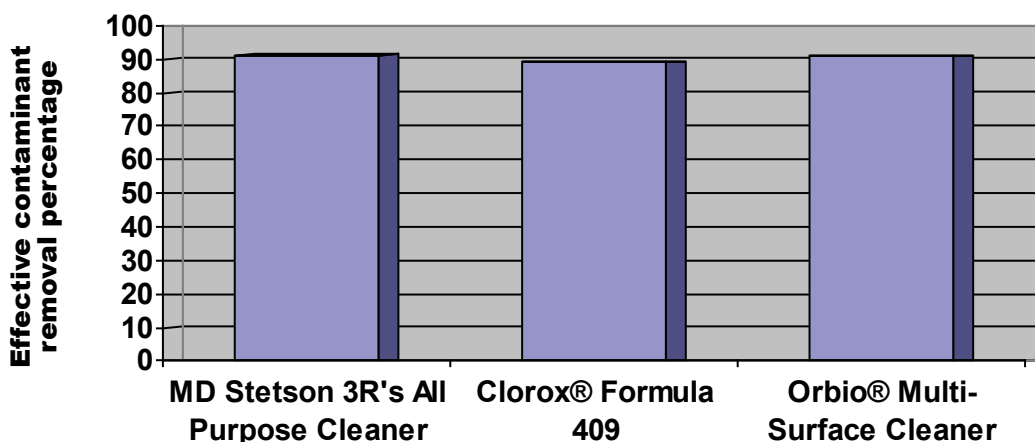


Performed by:
Toxic Use Reduction Institute (TURI),
University of Massachusetts - Lowell
www.cleansolutions.org



All-Purpose Cleaning Performance Summary*

Date Run:	4/27/2011				
Purpose:	To evaluate Orbio® Multi-Surface Cleaner (“supplied product”) for all purpose cleaning				
Experimental Procedure:	<p>Pre-weighed ceramic, polycarbonate and painted steel tiles were coated with Hucker’s Soil Formulation (Jiffy creamy peanut butter, salted butter, Arrowhead Mills stone ground wheat flour, egg yolk, evaporated milk, distilled water, printer’s ink with boiled linseed oil, Shaw’s saline solution)</p> <p>Three tiles were placed into a Gardner Straight Line Washability unit. A Kimberly-Clark Wypal reinforced paper towel was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. The cleaning unit was run for 20 cycles (~33 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded, efficiencies based on spectrophotometry readings were calculated and recorded.</p>				
Results:	The supplied product worked as well as the two comparative products using manual cleaning for all purpose soils.				
Summary:	<i>Company Name</i>	<i>Product Name</i>	<i>Concentration</i>	<i>Efficiency</i>	<i>Effective</i>
	MD Stetson	3R’s All Purpose Cleaner	3%	91.16%	Yes
	Clorox®	Formula 409 APC	100% (RTU)	89.25%	Yes
	Orbio Technologies	Orbio® Multi-Surface Cleaner	100% (RTU)	90.83%	Yes

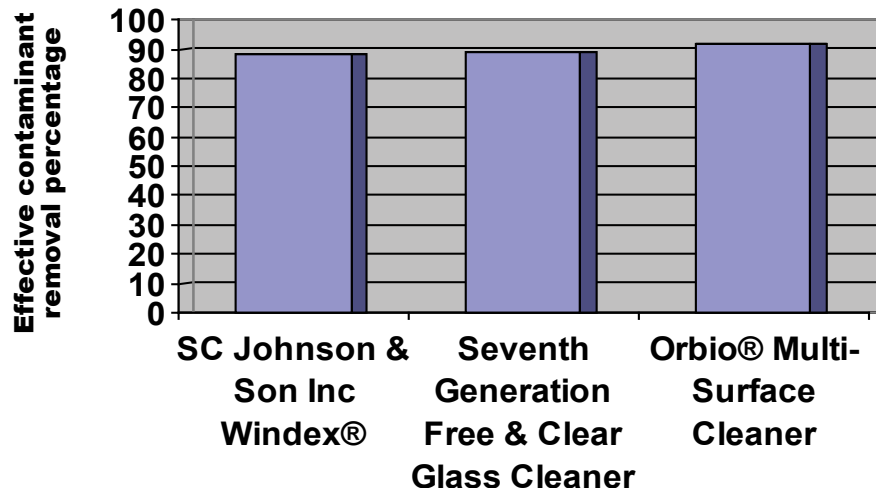


*Full report available for download at www.orbio.com



Glass Cleaning Performance Summary*

Date Run:	4/25/2011				
Substrates:	Glass and Chrome Tiles				
Purpose:	To evaluate Orbio® Multi-Surface Cleaner (“supplied product”) for glass cleaning using manual cleaning				
Experimental Procedure:	<p>Pre-weighed chrome and glass tiles were coated with SSL Soil 2 Glass Soap Scum (SSL Soil 2 (Glass soap scum: Water 51.5%, hair gel 25.6%, toothpaste 10.4%, shaving cream 5.3%, hair spray 3.7% and spray deodorant 3.5%).</p> <p>Three tiles were placed into a Gardner Straight Line Washability unit. A Wypall X60 reinforced wipe was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. The solution was allowed to penetrate for 30 seconds followed by cleaning in the SLW unit for 5 cycles (~10 seconds). Final weights were recorded and efficiencies based on spectrophotometry readings were calculated and recorded.</p>				
Results:	The three products were all successful in removing the glass soap scum from the two surfaces using manual cleaning. The supplied product was the most consistent cleaner (lowest standard deviation) and had the highest average soil removal of the three products. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.				
Summary:	<i>Company Name</i>	<i>Product Name</i>	<i>Concentration</i>	<i>Efficiency</i>	<i>Effective</i>
	SC Johnson & Son Inc	Windex®	100% (RTU)	88.16%	Yes
	Seventh Generation	Free & Clear Glass Cleaner	100% (RTU)	88.80%	Yes
	Orbio Technologies	Orbio® Multi-Surface Cleaner	100% (RTU)	91.58%	Yes
Conclusion:	The supplied product worked as well as the two comparative products for glass soil removal using manual wiping.				



*Full report available for download at www.orbio.com



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Date: May 18, 2011

Reid Rabon
ORBIO™ Technologies,
A Tennant Company Group

Dear Mr Rabon,

The Toxics Use Reduction Institute (TURI) Laboratory is located at the University of Massachusetts Lowell. TURI was established in 1989 by the Massachusetts legislature as a multi-disciplinary research, education and technical support center to promote reduction in the use of toxic chemicals and the generation of toxic by-products.

The TURI Lab's mission is to test and evaluate the effectiveness of greener chemical cleaners and related equipment on a variety of substrates and soils. The Lab's goal is to identify, develop and promote safer alternatives to hazardous solvents.

To that end, the TURI Lab has conducted a product performance review for the product (s) you submitted. As part of our standard testing procedures, the Lab selects comparative products to further enhance the evaluation process of submitted products. Selection of comparative products will vary based on the type of cleaning requested and industry recognized products within that class of cleaning. The following form summarizes the testing conducted. In addition to the forms provided, the resulting data has been entered into the lab's on-line database, www.cleanersolutions.org.

Thank you for your interest in TURI's Lab.

A handwritten signature in blue ink, appearing to read 'Jason Marshall', is written over a light blue horizontal line.

Jason Marshall, ScD
Laboratory Director

Products Tested: Orbio Multi-Surface Cleaner for all purpose and glass cleaning

TURI SURFACE SOLUTIONS LABORATORY EVALUATION SUMMARY

SCL #: 2011-18-338-5-4-
 DateRun: 4/25/2011
 Experimenters: Le; Weil;
 ClientType: Chemical Mfr;
 ProjectNumber: 1
 Substrates: Glass/Quartz; Chrome;
 PartType: Coupons;
 Contaminants: Films; Soaps;
 CleaningMethods: Manual Wipe;
 AnalyticalMethods: Gravimetric;
 Purpose: To evaluate supplied products for glass cleaning using manual cleaning
 ExperimentalProcedure: Preweighed chrome and glass coupons were coated with SSL Soil 2 Glass Soap Scum (SSL Soil 2 (Glass soap scum: Water 51.5%, hair gel 25.6%, toothpaste 10.4%, shaving cream 5.3%, hair spray 3.7% and spray deodorant 3.5%) using a hand held swab and allowed to dry for 24 hours at room temperature. The contaminated coupons were weighed again to determine the amount of soil added.

Three coupons were placed into a Gardner Straight Line Washability unit. A Wypall X60 reinforced wipe was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. Each coupon was sprayed 7-10 times with the same cleaning solution. The solution was allowed to penetrate for 30 seconds followed by cleaning in the SLW unit for 5 cycles (~10 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded and efficiencies recorded.

ChemistriesEvaluated: Windex; Free & Clear Natural Glass and Surface Cleaner;

Results: The three products were all successful in removing the glass soap scum from the two surfaces using manual cleaning. The supplied product was the most consistent cleaner (lowest standard deviation) and had the highest average soil removal of the three products. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

Orbio Multi-Surface Cleaner Glass						
	0.0311	0.0009	97.11	92.58	91.58	3.9
	0.0369	0.0044	88.08			
	0.0363	0.0027	92.56			
Orbio Multi-Surface Cleaner Chrome						
	0.0578	0.0032	94.46	90.58		
	0.0300	0.0039	87.00			
	0.0494	0.0048	90.28			
Windex Glass						
	0.0340	0.0040	88.24	80.77	88.16	9.6
	0.0375	0.0068	81.87			
	0.0457	0.0127	72.21			
Windex Chrome						
	0.0743	0.0026	96.50	95.54		
	0.0459	0.0021	95.42			
	0.0622	0.0033	94.69			
7th Gen-glass cleaner Glass						
	0.0714	0.0118	83.47	89.03	88.80	4.1
	0.0805	0.0060	92.55			
	0.0729	0.0065	91.08			
7th Gen-glass cleaner Chrome						
	0.1263	0.0142	88.76	88.57		
	0.0380	0.0060	84.21			
	0.0414	0.0030	92.75			

Summary	Substrates:	Glass/Quartz; Chrome;			
	Contaminants:	Films; Soaps;			
	CompanyName:	Product Name	Conc.	Efficiency	Effective
	SC Johnson & Son Inc	Windex	100	88.16	Yes
	Seventh Generation	Free & Clear Natural Glass Cleaner	100	88.80	Yes
	Orbio	Orbio Multi-Surface Cleaner	100	91.58	Yes

Conclusion: The supplied product worked as well as the two comparative products for glass soil removal using manual wiping.

TURI SURFACE SOLUTIONS LABORATORY EVALUATION SUMMARY

SCL #: 2011-18-338-4-4-
 DateRun: 4/27/2011
 Experimenters: Le;
 ClientType: Chemical Mfr;
 ProjectNumber: 1
 Substrates: Ceramics; Rubber; Steel;
 PartType: Coupons;
 Contaminants: Hucker's Soil;
 CleaningMethods: Manual Wipe;
 AnalyticalMethods: Gravimetric;
 Purpose: To evaluate three supplied products for all purpose cleaning
 ExperimentalProcedure: Preweighed ceramic, polycarbonate and painted steel coupons were coated with Hucker's Soil Formulation (Jiffy creamy peanut butter, salted butter, Arrowhead Mills stone ground wheat flour, egg yolk, evaporated milk, distilled water, printer's ink with boiled linseed oil, Shaws saline solution) using a hand held swab and allowed to dry for 24 hours at room temperature. The contaminated coupons were weighed again to determine the amount of soil added.

Three coupons were placed into a Gardner Straight Line Washability unit. A Kimberly-Clark Wypal reinforced paper towel was attached to the cleaning sled and soaked with 5-7 sprays of cleaning solutions. Each coupon was sprayed 7-10 times with the same cleaning solution. The cleaning unit was run for 20 cycles (~33 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded, efficiencies were calculated and recorded.

ChemistriesEvaluated: 3R All Purpose Cleaner; Formula 409 All Purpose Cleaner; Orbio Multi-Surface Cleaner

Results: The supplied product worked as well as the two comparative products using manual cleaning for all purpose soils. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed
Orbio Multi-Surface Cleaner ceramic	0.1142	0.0042	96.32
	0.1820	0.0035	98.08
	0.1349	0.0075	94.44
Orbio Multi-Surface Cleaner polycarb	0.0720	0.0262	63.61
	0.0904	0.0146	83.85
	0.1542	0.0173	88.78
Orbio Multi-Surface Cleaner Stainless Steel	0.0324	-0.0003	100.92
	0.1092	0.0068	93.77
	0.0615	0.0014	97.72
3R's Ceramic	0.1656	-0.0017	101.02
	0.1197	-0.0034	102.84
	0.1804	0.0097	94.62
3R's Polycrab	0.0719	0.0162	77.47
	0.1056	0.0128	87.88
	0.0685	0.0148	78.39
3R's Stainless Steel	0.0359	0.0042	88.30
	0.0893	0.0050	94.40
	0.0626	0.0028	95.52
Formula 409 Ceramic	0.1186	0.0064	94.60
	0.1013	0.0067	93.39
	0.1181	0.0069	94.15
Formula 409 Polycarb	0.0422	0.0083	80.33
	0.0617	0.0120	80.55
	0.0786	0.0108	86.26
Formula 409 Stainless Steel	0.0459	0.0048	89.54
	0.0337	0.0018	94.66
	0.0343	0.0035	89.80

Summary

Substrates: Ceramics; Rubber; Steel;

Contaminants: Hucker's Soil;

CompanyName:	Product Name	Conc.	Efficiency	Effective
MD Stetson	3R All Purpose Cleaner	3	91.16	Yes
Clorox	Formula 409 All Purpose Cleaner	100	89.25	Yes
Orbio	Orbio Multi-Surface Cleaner	100	90.83	Yes

Conclusion:

While the efficiency of the Orbio product (90.83% +/- 11.4) showed slightly lower performance on polycarbonate substrate, its overall efficiency when combining its effectiveness for all three substrates was above 90%. The performance was statistically the same as Formula 409 (89.25% +/-5.7) and 3R's product (91.16% +/-9.0).