The TURI Laboratory / Umass Lowell

Performance Testing & MORE

How We Fit Into the Industry

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Healthy Schools Campaign Green Cleaning Conf. Seattle, WA 7/30 – 31/2015
A Little About Me....

• Life long New Englander
• I will Pahk your Cah
• Red Sox are Bad
• Patriots.....😊
• I love Seattle & Pete Carroll
• I will gladly talk to you about all the ways and reasons you hate the Pats, Brady and the rest one on one..

• Now lets talk Testing
TURI Laboratory Mission & Goal

• Assist facilities in finding safer cleaning chemicals & processes that:
  – *Perform as well or better*
  – *Improve EH&S*
  – *Economically feasible*

• Evaluate /compare performance of cleaners & equipment, R&D, consulting, formulation & more

• Aid companies in selecting processes & systems to facilitate better, safer cleaning
  – Share information on effective cleaning methods and processes to help move industries forward
TURI LAB FACTS....

• Working in less toxic alternatives for 22 yrs
  – Located at UMASS Lowell

• Janitorial work about 15 years
  – Performance testing for third party certifications
  – Working with manufacturers on products
  – Help promote good process & systems
  – Learn from the end users, work in REALITY

• Data does the talking, field work supports it

• Helping to supply data to industry
<table>
<thead>
<tr>
<th>Standard sub category</th>
<th>Performance code</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Purpose</td>
<td>APH</td>
<td>GS 37</td>
</tr>
<tr>
<td>All purpose – light duty</td>
<td>APL</td>
<td>N/A</td>
</tr>
<tr>
<td>Glass Cleaning</td>
<td>GLC</td>
<td>GS 37</td>
</tr>
<tr>
<td>Bathroom general</td>
<td>BRG</td>
<td>GS 37</td>
</tr>
<tr>
<td>Bathroom toilet bowl (must be selected with BRG)</td>
<td>BTB</td>
<td>GS 37</td>
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<tr>
<td>Grease removal from hard surfaces</td>
<td>GRH</td>
<td>DCC17</td>
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<td>Automatic Dishwashing</td>
<td>DWA</td>
<td>DCC05A</td>
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<td>Foam Stability of Hand Dishwashing Detergents</td>
<td>DWM</td>
<td>DCC10</td>
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<tr>
<td>Screening the Efficacy of Oven Cleaners</td>
<td>OVC</td>
<td>DCC12</td>
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<td>Hand Washing</td>
<td>HWC</td>
<td>GS41</td>
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<td>Cleaning Performance-Resilient Flooring and Washable Walls</td>
<td>FWW</td>
<td>ASTM D4488 A5 *</td>
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<td>Evaluating Cleaning Performance of Ceramic Tile Cleaners</td>
<td>FWW</td>
<td>ASTM D5343</td>
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<td>Odor Elimination</td>
<td>ODE</td>
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<tr>
<td>Floor stripping</td>
<td>FLS</td>
<td>GS 40</td>
</tr>
<tr>
<td>Oil cleaning - heavy</td>
<td>OCH</td>
<td>GS 34</td>
</tr>
<tr>
<td>Oil cleaning – heavy (motor)</td>
<td>OCH</td>
<td>ASTM G122</td>
</tr>
<tr>
<td>Oil cleaning – light (cooking)</td>
<td>OCL</td>
<td>ASTM G122</td>
</tr>
<tr>
<td>Whiteboard cleaning</td>
<td>WBC</td>
<td></td>
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<tr>
<td>Stainless Steel cleaning/polishing</td>
<td>SSC</td>
<td></td>
</tr>
<tr>
<td>Wood Polish</td>
<td>WPC</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>MSC</td>
<td></td>
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<td>Carpet cleaning-standard</td>
<td>CCS</td>
<td>GS 37</td>
</tr>
<tr>
<td>Carpet stain removal</td>
<td>CSR</td>
<td>CM T110</td>
</tr>
<tr>
<td>Miscellaneous G122</td>
<td>MSC G122</td>
<td>ASTM G122</td>
</tr>
</tbody>
</table>

*Standard dropped by ASTM- Currently working on new standard
Why a University Laboratory

• Non Biased – work to generate data not money$
  – Research and standard testing is the driver

• Interested in data & what works
  – If there is not non biased, 3rd party data how do you trust a product????
  – All data on testing claims of a product should be readily available to the public

• Want to inform janitorial sector end users & help generate the data they need & want
  – Standardized

• Resources – students, other scientists
Product Testing in the Lab

- Glass Cleaner
- All Purpose Cleaners
- Bathroom Cleaners
- Dish Detergents
- Graffiti removers
- Floor Strippers, cleaners, maintainers, finishes

EVERYTHING & ANYTHING
Equipment Testing in the Lab

• Floor Scrubber
  – Small & Large

• Engineered water
  – Mineral based
  – ozone

• Battery back pack vac.
  – Efficacy, time, cord mgmt

• Steam
  – Large & small units

• Hands Free Restroom Cleaners
Innovative Cleaners & Technology Tested

• We do a lot of R&D, field & lab testing
• Organic cleaners with probiotics,
• Onsite generators of cleaners, sanitizers & disinfectants
  – Mineral based
• More water based solutions
  – Steam
  – Hands free restroom
  – Floor machines & pads that do not require cleaner
• Microfiber, bucketless mops, waterless urinal retrofits & door handle protectors
What is Reality Based Testing

• Customers products are tested against industry std products – *green & not*

• Specific substrates used

• Specific **real world soils** based on ASTM, GS & other standard soils used
  – Work with certifiers on our soils
Reality Based Substrates & Soils

**Substrates**
- Ceramic
- Porcelain
- Stainless steel
- Painted Steel
- Chrome
- Fiberglass
- Glass

**Soils**
- Bathroom
- All purpose
- Hard floor
- Glass
- Vacuuming soils
  - Carpet & Hard Floor
BYK-Gardner Abrasion Tester

http://glossmeters.com/abrasion-tester.html
Straight-line Washability

• BYK-Gardner Abrasion Tester
  – Device enables a real-world repeatable rubbing or scrubbing action to compare cleaning performance cleaners
    • Such as All purpose, bathroom glass and more
    • Test the durability and efficacy of scrub brushes or scouring pads
  – Precisely matches pressure & rate of cleaning from surface to surface & from product to product
    • Enables apples-to-apples comparisons between cleaning methodologies
Who Does the Testing

- University of Massachusetts Lowell’s TURI Lab
  - A globally-recognized test lab
  - specializing in performance testing of green products
  - TURI understands “green cleaning” product performance
TURI Lab People
How Do You Know Something Works

• Testing using industry standards to produce data, paid for, third party testing
• Testing is reproducible & not a fluke
• Analytical methods are used
  – ATP meters – trend tool to show cleaning efficacy in field and lab. **LIMITATIONS**
  – Gloss meters, contact angle
  – Black light, white glove, plate growth
• Field work & antidotal info & data in field in addition to 3rd party, no biased testing
Analytical Methods & Equip Used

- Gravimetric (abrasion tester)
- Color-gloss readings
- ATP testing where applicable
  – Trend tool, not absolute
- Visual evaluation by panel
- Time & effort – time cleaning activities for comparisons
Cleaner Solutions Database

• Check it out on-line to start your search for a new cleaning method
  www.cleanersolutions.org

• Remember....
  – The products you find should be tested on your specific soils in your current cleaning process
  – Every situation is different so PILOT.
TURI SURFACE SOLUTIONS LABORATORY
EVALUATION SUMMARY

SCL #: 2010-17-275-20-4-
Date Run: 3/16/2010
Experimeyers: Marshall, Cho;
Client Type: Chemical Mfr.
Project Number: 1
Substrates: Ceramics, Fiberglass, Chrome;
Part Type: Coupons;
Contaminants: Films, Soaps;
Cleaning Methods: Manual Wipe;
Analytical Methods: Gravimetric;
Purpose: To evaluate the supplied products for bathroom cleaning using manual cleaning
Experimental Procedure: The supplied cleaning products were used at the recommended concentration (2%, 2% and 1.5%). Preweighed coupons, ceramic and fiberglass, were coated with 5SL Sol 1 (bathroom soap scum: All-in-one shampoo and conditioner 28.6%, Dry skin lotion 21.4%, Liquid hand soap 21.4%, Liquid body wash 14.3%, Deodorant bar soap 7.2% and water 7.1%) 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 sted 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 30 cycles (~33 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded and efficiencies were calculated and recorded.

Chemistries Evaluated: Product 1; Product 2; Product 3 – comparative product

Results: The two supplied products both removed over 85% of the bathroom soap scum soil from the surfaces using manual cleaning. The conventional product removed 75%. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

<table>
<thead>
<tr>
<th>Cleaner</th>
<th>Initial wt</th>
<th>Final wt</th>
<th>% Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 1 (1148) Ceramic</td>
<td>0.2057</td>
<td>0.0155</td>
<td>94.93</td>
</tr>
<tr>
<td>Product 1 (1148) Chrome</td>
<td>0.1234</td>
<td>0.0079</td>
<td>93.60</td>
</tr>
<tr>
<td>Product 1 (1148) Nickel</td>
<td>0.0260</td>
<td>0.0025</td>
<td>90.38</td>
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<tr>
<td>Product 1 (1148) Fiberglass</td>
<td>0.0115</td>
<td>0.0019</td>
<td>83.48</td>
</tr>
<tr>
<td>Product 1 (1148) Glass</td>
<td>0.0073</td>
<td>0.0024</td>
<td>91.21</td>
</tr>
<tr>
<td>Product 1 (1148) Glass</td>
<td>0.0117</td>
<td>0.0038</td>
<td>67.52</td>
</tr>
<tr>
<td>Product 1 (1148) Fiberglass</td>
<td>0.0216</td>
<td>0.0029</td>
<td>90.26</td>
</tr>
<tr>
<td>Product 1 (1148) Glass</td>
<td>0.0054</td>
<td>0.0015</td>
<td>90.26</td>
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<tr>
<td>Product 2 (11128) Ceramic</td>
<td>0.2546</td>
<td>0.0458</td>
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<tr>
<td>Product 2 (11128) Chrome</td>
<td>0.5427</td>
<td>0.1034</td>
<td>80.95</td>
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<tr>
<td>Product 2 (11128) Nickel</td>
<td>0.2379</td>
<td>0.0441</td>
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<tr>
<td>Product 2 (11128) Fiberglass</td>
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<td>0.0441</td>
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<td>Product 2 (11128) Glass</td>
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<tr>
<td>Product 3 (11128) Ceramic</td>
<td>0.2163</td>
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<td>Product 3 (11128) Chrome</td>
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<td>Product 3 (11128) Glass</td>
<td>0.4309</td>
<td>0.0661</td>
<td>80.15</td>
</tr>
</tbody>
</table>

Summary: Substrates: Ceramics, Fiberglass, Chrome;
Contaminants: Films, Soaps;
Product Name: Concentration: Efficiency: Effective
Product 1: 2.1 Yes
Product 2: 0.78 Yes
Product 3: 0.76 No

Conclusion: The two products had an overall average efficiency over 85% and performed better than the conventional cleaning product.
Why Test???

**Green Washing**

- False Claims, what is true
- Need to do your homework
- Third party certified? Check MSDS
- Many terms are used but aren't policed by the Federal Trade Commission
  - Environmentally friendly / safe
  - Natural, Eco Safe
  - Earth Friendly

*Testing Help prove claims*

- Clients should ask for Testing **before** they buy & have someone technical explain
Testing & Field Work

• TURI lab known as a lab who tests for performance of cleaners & equipment

• **Unique ability to do lab & field work**

• Can take our reality testing further into the field
  – Help end users solve problems - implementation
  – Help manufacturers back up claims – 3rd party testing
  – Help public & clients see proof of claims – help inform and make purchasing decisions

• Work with facility management & workers to verify performance in the field
Thank You!!

Heidi Wilcox, M.Sc.
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TURI Lab Field Specialist

Phone 978 934 3249
Website: www.turi.org/laboratory
Testing Database: www.cleanersolutions.org