



Toxics Use Reduction Institute

Connecticut Hospital Environmental Roundtable
*Creating a clean, "green" and healthy hospital
with environmentally preferable and
biobased products*
Hospital of St. Raphael, New Haven, CT
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Alternatives Assessment of Biobased Cleaners for a Massachusetts VA Hospital

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Focus Areas

- All-Purpose Cleaning
 - Glass Cleaning
 - Bathroom Cleaning
 - Toilet Cleaning
 - Odor Elimination
 - Disinfecting
 - Metal Shining
 - Floor Stripping
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All-Purpose Process

- Substrates
 - Ceramics, Fiberglass, Chrome
 - Contaminants
 - Lab Soil No. 3 (Hucker's Soil): Distilled water 45.8%, Evaporated milk 13.8%, Creamy peanut butter 9.2%, Salted butter 9.2%, Stone ground wheat flour 9.2%, Egg yolk 9.2%, Printer's ink with boiled linseed oil 0.9% and saline solution 2.7%
 - Cleaning Method
 - Manual Wipe
 - Analytical Method
 - Gravimetric
-



All-Purpose

- Current Product vs. Requested Alternative
 - H₂Orange₂ vs. Grout Safe
- Current Product with Lab-selected Products
 - Bi-O-Kleen AP
 - VPW SC 1000
 - Eco All Purpose
 - Ecogent GP
 - Super H₂O₂ Citrus Concentrate



All-Purpose

• Products	Percent (%) Efficiency
– Bi-O-Kleen AP	98.61
– VPW SC 1000	99.05
– Eco All Purpose	99.13
– H ₂ Orange ₂	92.00
– Grout Safe	95.00
– Ecogent GP	86.16
– Super H ₂ O ₂	88.74



Glass & Bathroom Process

- Substrates
 - Glass
 - Glass, Chrome
 - Bathroom
 - Ceramics, Fiberglass, Chrome
 - Contaminants
 - Glass
 - Lab Soil No. 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%.
 - Bathroom
 - Lab Soil No. 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%
 - Cleaning Method
 - Manual Wipe
 - Analytical Method
 - Gravimetric
-



Glass & Bathroom

- H₂Orange₂ vs. Grout Safe
- **Bathroom / Lab Soil** **Overall % Efficiency**
 - H₂Orange₂ **92.25**
 - Grout Safe **100.06**
- **Glass**
 - H₂Orange₂ **97.64**
 - Grout Safe **87.14**





Toilet Bowl Process

- Substrates
 - Ceramics, Plastic
 - Contaminants
 - Hucker's Soil
 - Cleaning Method
 - Manual Wipe
 - Analytical Method
 - Gravimetric
-



Toilet Bowl Cleaning

Company	Product	% Efficiency
*Mishua	Husky Toilet Bowl Cleaner	84.28
EnvirOx LLC	H ₂ Orange ₂	67.15
EnvirOx LLC	GroutSafe	90.79
Gemtek Products	SC Toilet Bowl Cleaner	88.23
Cleanline Products	Super H ₂ O ₂ Citrus Conc.	83.61
Bi-O-Kleen Ind.	Soy Cream Cleaner	86.89
Cogent Env. Solutions	Ecogent All Purpose	88.83

*Current Product



Odor Elimination Process

- Substrate
 - Fiberglass
 - Contaminants
 - Odor
 - A – Lab Soil No. 3 (Hucker's soil)
 - B – Lab Soil No. 4 (Kitchen soil)
 - C – Castrol Moly Dee cutting fluid
 - Cleaning Methods
 - None
 - Analytical Methods
 - Smell
 - Initial, 5 minutes, 60 minutes
 - Two observers
-



Odor Elimination

Company	Product	Effective	Rank
*IAC Inc	Eats It	No	4
Gemtek Products	ODOR-EX	Yes	2
Orison Marketing	Heavy Duty Odor Neutralizer	Yes	1
EnvirOx LLC	H ₂ Orange ₂	No	5
Cleanline Products	Super H ₂ O ₂ Citrus Concentrate	Yes	3

*Current Product



Metal Shining Process

- Substrates
 - Brass, Copper, Zinc
 - Contaminant
 - Oxidation
 - Cleaning Method
 - Wipe
 - Analytical Methods
 - Visual
 - Light Meter
-



Metal Shining Light Meter

- Average Percent Brightness Improvement

Substrates	Products		
	*Flush It	Quick Shine	Soy Cream
Brass	15.81	14.82	14.00
Copper	-2.57	-5.48	5.29
Zinc	-21.44	-13.07	23.88

*Current Product



Metal Shining Visual

- Brass



Copper



Zinc



Soy Cream Results



Floor Stripping Process

- Substrates
 - Plastic, Ceramic, Vinyl Tile
- Contaminants
 - Coatings
- Cleaning Methods
 - Manual Wipe
 - Mechanical Wipe
 - Pilot Rotary Scrub
 - Rotary Scrub
- Analytical Methods
 - Gravimetric
 - Visual



Floor Stripping

- Products Evaluated
 - Johnson Pro Strip
 - *Current Product
 - Orison Marketing Eco Natural Floor Stripper
 - Gemtek Products SC Supersolve
 - Gemtek Products EZ Solv
 - Gemtek Products SC Actisolv
 - Bio Chem Systems Solsafe 245
 - Bio Chem Systems Bio T Max
 - PureTech International Botanical Gold
 - Soysolv Industrial Products Cornsolv
 - Soysolv Industrial Products Soysolv II Plus
 - Soysolv Industrial Products Soysolv
 - DuPont DBE 5
 - DuPont DBE 6
 - Pioneer Eclipse EnviroStar Green Floor Stripper
 - *Non-bio-based alternative



Future Floor Stripping Piloting

- PureTech International Botanic Gold
- Solsafe 245
- Bio T Max
- Gemtek Products SC Actisolv
- Soysolv Industrial SoySolv II Plus
- Soysolv Industrial CornSolv
 - Odor issues



Conclusions Thus Far

- Disinfecting Issues Still Need to Be Addressed
 - Biobased Cleaners Performed as Satisfactorily as Any Other Chemical Group
 - Total Cost Accounting (TCA) Will Be Essential for True Product Comparison (not just purchase price)
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 - See also: www.mass.gov/epp/products/cleaning.htm

THANK YOU FOR YOUR ATTENTION!
