



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



## 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
  - H<sub>2</sub>Orange<sub>2</sub> vs. Grout Safe
- Current Product with Lab-selected Products
  - Bi-O-Kleen AP
  - VPW SC 1000
  - Eco All Purpose
  - Ecogent GP
  - Super H<sub>2</sub>O<sub>2</sub> Citrus Concentrate



## All-Purpose

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

- H<sub>2</sub>Orange<sub>2</sub> vs. Grout Safe
- **Bathroom / Lab Soil Overall % Efficiency**
  - H<sub>2</sub>Orange<sub>2</sub> **92.25**
  - Grout Safe **100.06**
- **Glass**
  - H<sub>2</sub>Orange<sub>2</sub> **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 <sub>2</sub> Orange <sub>2</sub>	67.15
EnvirOx LLC	GroutSafe	90.79
Gemtek Products	SC Toilet Bowl Cleaner	88.23
Cleanline Products	Super H <sub>2</sub> O <sub>2</sub> 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 <sub>2</sub> Orange <sub>2</sub>	No	5
Cleanline Products	Super H <sub>2</sub> O <sub>2</sub> 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

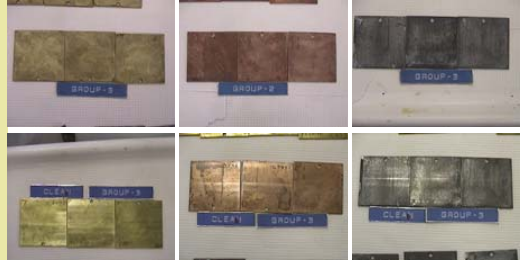
Substrates	Products		
	*Flush It	Quick Shine	Soy Cream
Brass	15.81	14.82	14.00
Copper	-2.57	-5.48	5.29
Zinc	-21.44	-13.07	23.88

\*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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**THANK YOU FOR YOUR ATTENTION!**