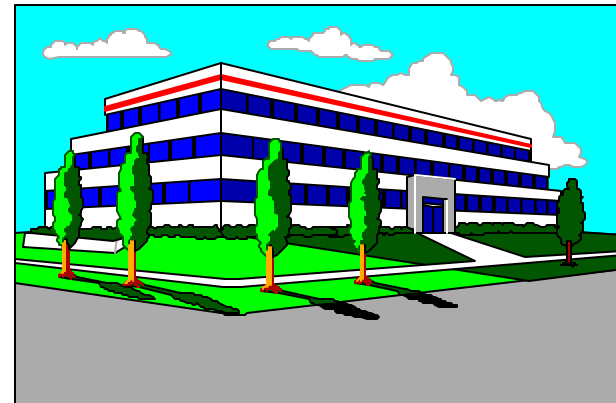


Greening the Cleaning Process



by
Roger McFadden
Vice President Product Research & Development
Coastwide Laboratories





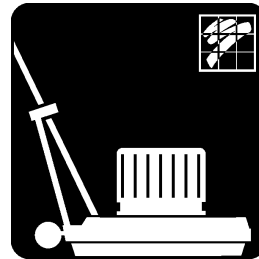
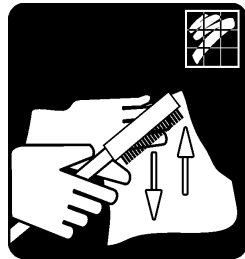
What is Cleaning?

Cleaning is the process of removing pollutants from the environment and putting them in their proper place.



Three Concepts of Cleaning

- Cleaning is an **Activity**
- Cleaning is a **Process**
- Cleaning is a Special Form of **Management**



How to Maximize the Cleaning Process

- **Identify the Specific Soil & Surface Characteristics**
- **Increase Contact Time**
- **Use Correct Dilution**
- **Increase Air and Water Flow**
- **Control Temperature**
- **Mechanical Action – More Elbow Grease**
- **Use Extraction When Possible**
- **Proper Disposal**

Cleaning Standards: How Clean is Clean?

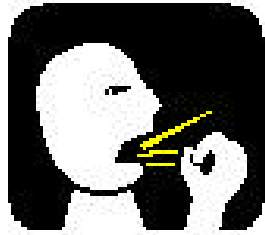
- **Typically NOT well defined**
- **Often Subjective and Ambiguous**
- **Specific to buildings and applications**
- **Confusing to workers**

Cleaning Process

- **Contaminated Surfaces**
- **Skilled and Properly Trained Workers**
- **Appropriate Cleaning Chemicals**
- **Proper Equipment and Tools**
- **Well-Defined Cleaning Standards**
- **Proper Planning**
- **Effective Cleaning & Environmental Management**



What are the **Problems** with
Traditional Commercial
Cleaning Products?



Many Traditional Cleaning Products Present
Human and Environmental Health Concerns

**They may contain chemicals associated
with eye, skin or respiratory irritation,
sensitivity or corrosivity!**



Many Traditional Cleaning Products Contribute To *Poor Indoor Air Quality*

Most people spend more than 90 percent of their time indoors; thus, exposure to indoor environmental hazards has led to many health concerns associated with cleaning products and processes.



Many Traditional Cleaning Products Are
Classified As Hazardous Waste

**Creates potential handling, storage,
and disposal issues for users**



Many Traditional Cleaning Products Are ***Environmental Pollutants***

Millions of tons of cleaning products are washed down drains every month. These products often contain toxic chemicals that can find their way into drinking water supplies or streams and lakes.



Many Traditional Cleaning Products Are *Toxic to Aquatic Plants and Animals*

Some of these chemicals such as phosphates can cause nutrient-loading in water bodies, leading to adverse effects on water quality flora, and fauna in the area.



Many Traditional Cleaning Products Contribute To *Increased VOC Emissions*

General purpose cleaning products have been shown to contribute approximately 8 percent of total nonvehicular volatile organic compound (VOC) emissions, which contribute to smog formation, retard plants growth, and can cause respiratory distress in some people.

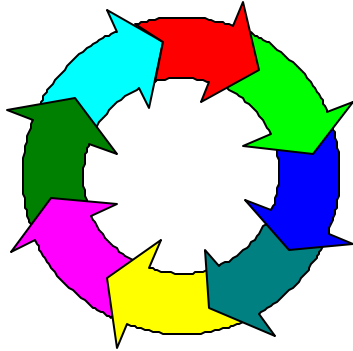
Source: California Air Resource Board

What Types of Substances Can Be Found in Commercial Cleaning Products and are Believed to Be Potentially Harmful to Human and/or Environmental Health?

- Carcinogens and Reproductive Toxins
- Neurotoxins
- Skin and Eye Irritants and Corrosives
- Skin Sensitizers
- Respiratory Irritants
- High Levels of Phosphates
- Endocrine Disruptors
- Environmental Pollutants/Hazardous Waste
- Ozone-Depleting Chemicals
- Flammables and Combustibles
- Highly Reactive Chemicals
- Poorly Designed Packaging



What makes a product green?



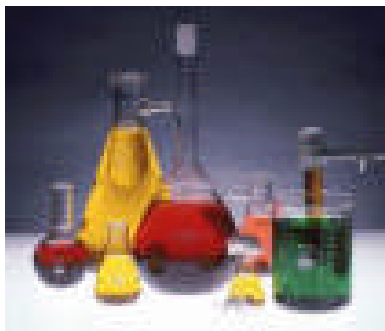
- Safer Ingredients?
- Recyclable Packaging?
- Higher Concentration?
- Multi-Use Applications?
- Improved Worker Safety?
- Reduced Environmental Impact?
- Lower Toxicity?

Take the Holistic Approach:

All of these factors combine to make a green product!

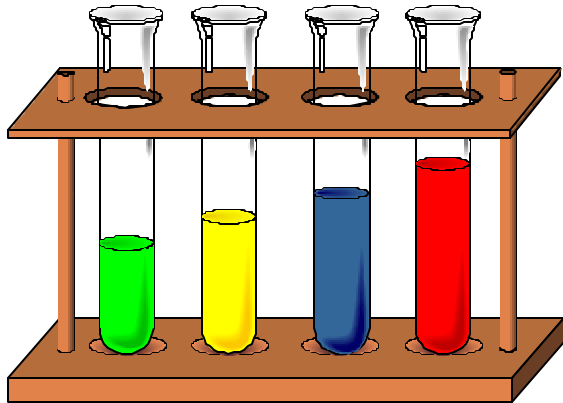
Five Rules For Formulating Eco-Effective Cleaning Products

- 1. Cleaning Provides Specific Benefits**
- 2. All Soils Are Not Created Equal**
- 3. Cleaning Products Are Chemicals**
- 4. Cleaning Products Have Specific Purposes**
- 5. Cleaning Products Must Perform**



Basic Formulating Principles

- Replace bad ingredients with better ingredients.
- Replace bad packaging with better packaging.
- Replace hazardous products with safer products.



Formulation Rule #1

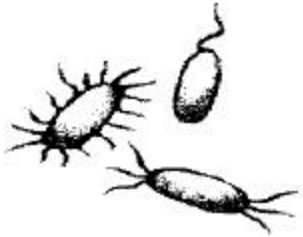
Cleaning Provides Specific Benefits

- **To Protect Health**
- **To Improve Appearance**
- **To Maintain Safety**
- **To Preserve Capital**



Formulation Rule #2

All Contaminants Are Not Created Equal



➤ **Differing Characteristics**



➤ **Some are more hazardous than others**

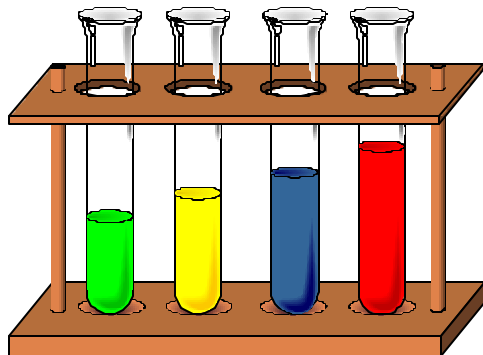


➤ **Differ in the way they disperse**

Formulation Rule #3

Cleaning Products Are Chemicals

- **Mixtures of various chemical ingredients**
- **Some chemical ingredients are safer than others**
- **Chemicals react with the surrounding environment**



Formulation Rule #4

Cleaning Products Have Specific Purposes

- **Some are designed for types of soil**
- **Some are designed for types of materials or surfaces**
- **Some are designed for types of application methods**
- **Some are designed for level of cleaning or decontamination**



Formulation Rule #5

Cleaning Products Must Perform

**Failure of a product to properly perform
will destroy its sustainability**

Cleaning Product Formulations: What's in a Cleaning Product?

- **Water**
- **Surfactants**
- **Sequestrants**
- **Builders**
- **Acids**
- **Solvents**
- **Dispersants**
- **Hydrotropes**
- **Thickeners**
- **Fragrances**
- **Colorants**

Traditional Glass Cleaner Formulation

- **Water** Deionized
- **Surfactants** APEs & SLES
- **Sequestrant** EDTA
- **Alcohol** Isopropyl Alcohol
- **Glycol Ether** 2-butoxyethanol
- **Builder** Ammonium Hydroxide
- **Colorant** Dye
- **Fragrance** Terpene Based

Possible Green Alternative Formulation

Eco-Effective Glass Cleaner

- **Water** Deionized
- **Surfactants** LEA & APG
- **Sequestrant** Gluconates
- **Alcohol** Lactate Ester
- **Builder** Hydrogen Peroxide (1%)
- **Colorant** Food Colorant
- **Fragrance** No Added Fragrance

What are some examples of alternative chemical ingredients used in green cleaning products and what do they replace?

- Polyglucoside Surfactants replace APEs
- Hydrogen Peroxide replaces Harsh Acids and Alkali Builders
- Lactate Esters replace petroleum distillates
- Vegetable Derived Surfactants replace petroleum derived surfactants
- Fruit Derived Solvents and Acids replace unfriendly petroleum solvents and inorganic acids

Eight Key

Environmental, Health & Safety

Guidelines for Cleaning

Eight Key EH&S Guidelines for Cleaning

1

**Select High Performance,
Eco-Effective
Commercial Cleaning Products**

Eight Key EH&S Guidelines for Cleaning

2

Provide for the safety of all humans before, during and after cleaning operations.

Eight Key EH&S Guidelines for Cleaning

3

**Clean for Health First and
Appearance Second**

Eight Key EH&S Guidelines for Cleaning

4

**Extract and remove pollutants
from the building**

Eight Key EH&S Guidelines for Cleaning

5

Reduce Chemical, Particle and Moisture Residues

Eight Key EH&S Guidelines for Cleaning

6

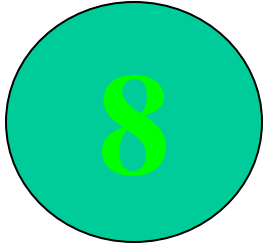
**Minimize Human Exposure to
Contaminants, Cleaning Chemicals
and Cleaning Residues**

Eight Key EH&S Guidelines for Cleaning

7

**Evaluate Cleaning in Relation to
the Total Environmental
System, Not Just Part of It**

Eight Key EH&S Guidelines for Cleaning



Properly Dispose of Cleaning Waste, Pollutants and Contaminants



Why Use **Eco-Effective Commercial Cleaning** Products?

- Minimize the human and environmental hazards
- Improve indoor air quality
- Eliminate hazardous waste treatment and disposal
- Reduce environmental pollutants
- Lower the aquatic plant and animal toxicity
- Reduce VOC emissions inside and outside buildings
- Reduce the regulatory burden
- Protect the cleaning worker
- Expand your business and market opportunities



**The Environmental Protection Agency's Design for
the Environment (DfE) Program Motto is:**

“If it's not in your product, then you don't
have to worry about it!”