

# Basic Chemical Cleaning Families

## Acids

Acid cleaners can be used to remove tarnish, alkaline discoloration and corrosion from metals; remove hard water deposits from many surfaces; will neutralize alkalis; may have bleaching effects.

- **Caution:** Acids can injure eyes, skin, and fabrics; stronger acids are highly toxic and can eat through metal. Acids can etch surfaces and porcelain enamel.

**Mild Acid Cleaners** include Lemon Juice (or Citric Acid) and Vinegar (or Acetic Acid). They help dissolve hard water deposits from shower doors, mild rust stains and soap film and remove tarnish from brass and copper. Acids tend to bleach some stains.

**Mild Acid Cleaners - Cream of Tartar (or Tartaric Acid)** For example if you simmer a solution (1 tablespoons of cream of Tartar in a quart of water and discolorization of aluminum pans, caused by alkali such as tomato sauce, will tend to disappear.

**Strong Acid Cleaners - Oxalic Acid** Used in commercial rust removers to remove iron rust; a weak solution will remove rust stains from tubs and sinks.

- **Caution:** These acids are highly toxic; follow label instructions exactly. Do not get on skin or in eyes, or on other materials

**Strong Acid Cleaners** - dilute hydrochloric acid, dilute sulfuric acid, muriatic acid and sodium bisulfate. These acids are used in some toilet bowl cleaners and etching compounds. They remove hard water and iron deposits and organic matter.

- **Caution:** Never mix with any other cleaner! Very toxic! Follow label instructions exactly. Do not get on skin, in eyes, or on other materials.
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## **Alkali**

Alkali cleaners remove and suspend heavy soil and grease so it can be rinsed away.

- **Caution:** Alkalis can damage skin and fabrics, corrode and darken aluminum. Most (except baking soda) are toxic if swallowed.

### **Mild Alkali Cleaners Baking Soda (Sodium bicarbonate)**

Soak burnt food from pans in solution of 2 tablespoons per quart of warm water. (For heavier or sticky soil spots, sprinkle on damp sponge, rub and rinse; or make paste of soda.) Clean glass, tile, porcelain enamel, stainless steel sinks, chrome, fixtures, fiberglass tubs and showers. Remove coffee and tea stains from dishes. Clean and deodorize refrigerator.

### **Moderately Strong Alkali Cleaners Ammonia**

Use solution of 2 tablespoons per quart of warm water to clean windows, glass, ovens, range burners, greasy surfaces. Use 1 tablespoon per quart warm water to wash painted walls and rinse well. Will remove some water based floor waxes.

- **Caution:** Irritating fumes. Can soften paint, especially latex, if too strong. Has a slight bleaching effect. Always use alone because combining ammonia with other cleaners may produce lethal gases.

### **Moderately Strong Alkali Cleaners Borax**

In mild solution, 1 to 2 tablespoons per gallon of warm water to wash sinks, painted walls, etc. Laundering (as diapers) to remove odors and retard bacterial growth.

- **Caution:** Rinse thoroughly

### **Moderately Strong Alkali Cleaners TSP (Tri-Sodium Phosphate)**

Buy at paint stores. Is an ingredient in some commercial cleaners. Use a solution of 1 tablespoon per gallon warm water to clean painted surfaces, porcelain fixtures, tile- glazed and unglazed. Removes soot and smoke (greasy dirt).

- **Caution:** Always wear rubber gloves to protect skin; strong solutions remove paint. ALWAYS rinse thoroughly.

### **Strong Alkali Cleaners Washing Soda (Sodium carbonate)**

Use in hot solution, soak greasy burners, pans; dissolves grease from drains. This is a builder for many powdered detergents.

- **Caution:** Highly toxic; do not get on skin. Will darken and corrode aluminum.

### **Very Strong Alkali Cleaners Lye (Sodium hydroxide)**

Uses are to clean grease from drains and open drains. Found in many drain and oven cleaners.

- **Caution:** Very caustic and toxic; can cause serious burns to eyes or skin. Follow label instructions exactly.

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## **Bleaches**

Bleaches can oxidize and remove stains from surfaces and fabrics. Bleaches may also be used to lighten stains in wood as well as remove the color naturally in woods such as mahogany.

- **Caution:** Rinse bleach thoroughly promptly to prevent fading.

**Mild Bleaches** - Sodium Perborate (an ingredient in commercial all purpose bleaches) and Hydrogen Peroxide. A solution will help lighten stains on surfaces such as plastic laminate, etc.

- **Caution:** Rinse thoroughly; follow label directions.

**Strong Bleaches** - Chlorine Bleach (Sodium hypochlorite). Removes stains. Disinfects toilet bowls, trash cans, other surfaces.

- **Caution:** May bleach dark-colored surfaces; can dull porcelain enamel finish of sinks and tubs; darken aluminum; may be used with detergents. NEVER mix with ammonia, FUMES ARE TOXIC. When removing stains, leave on surface only a brief time, and rinse off immediately.

**Wood Bleaches** - Oxalic Acid, removes color and stain from wood. Opens pores of wood to help accept new stain.

- **Caution:** requires neutralization, very dangerous to work with, always wear hand and eye protection. Read label instructions carefully.

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## Abrasives

Abrasive Cleaners are mechanical cleaners. They physically scratch off dirt, stains and tarnish via friction as you rub the surface. They are composed of either particles or physical abraders such as sandpaper, steel wool, scrubbing pads, etc. The finer the particle the less abrasive and the coarser the particle the more abrasive. Baking soda and salt can be used as abrasives. Baking soda is finer, less abrasive. Salt more abrasive. Abrasives dull glossy surfaces and change both the reflection from, and texture of, surfaces. They should never be used on mica because they take away top layers making future cleaning eventually impossible.

**Mild Abrasives** include fine plastic mesh pads, nylon coated sponges, fine brass wool, rotten-stone and whiting. Mild abrasives are used to scour pots and pans, oven interiors, and drip pans. Use as directed to remove stains on surfaces as furniture, countertops, etc. NOTE: Abrasives will scratch fine, hard, smooth surfaces if you rub hard.

**Moderate Abrasive** Cleaners include fine pumice and fine steel wool. Steel wool is actually graded from 0000-super fine, 000-extra fine, 00-very fine, 0-fine, 1-medium, 2-medium course and 3-0 course. The finer 00 and finer should be used lightly on pots and pans when needed to remove burned on crusty foods and grease. They are often used on

burnt spills in non self cleaning or continuous cleaning oven interiors when they will not come off with other milder cleaners. NOTE: Do not use regularly for cleaning; use only for stubborn spots.

**Strong Abrasives** include medium and coarse steel wool, metal mesh cloths and balls, metal brushes, coarse pumice, and sand/silica. Use them on barbecue grills and untreated oven racks for stubborn deposits when damage to surface is not important. NOTE: Strong abrasives quickly abrade hard surfaces making them rough and thus harder to remove dirt from in the future. Use only when necessary.

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### **Commercial Blends**

Commercial cleaners are normally made from a combination of one or more of the other types of cleaner family: acids, alkalis, abrasives, bleaches, detergents, and solvents. Most are low sudsing detergents or alkaline-based cleaners. They often contain extra ingredients that are more effective for certain cleaning jobs. For example, some all-purpose household cleaners with petroleum based solvents dissolve grease better. Always read label and follow directions and cautions.

### **Powdered Cleaners**

Dissolve in water; use to clean large surface areas such as painted walls, woodwork and washable floors.

- **Caution:** Most contain TSP (tri sodium phosphate) a moderately strong alkali and should be rinsed well.

### **Liquid Cleaners**

Are diluted in water and often used for same cleaning jobs as powders. Full strength many make good spot removers.

- **Caution:** Follow label instructions; rinse well if label indicates rinsing.

### **Aerosol and Liquid Sprays**

Use full strength and wipe dry. Usually require no rinsing. For touch-up cleaning and spot removal.

- **Note:** Generally considerably more expensive to use than liquids.

**Concentrated cleaners that you mix with water at home are usually the cheapest to use.**

Using concentrated cleaners that are environmentally neutral and biodegradable makes sense. You don't have to buy a lot of different types and brands of cleaners that you never use up. They just take up valuable storage space. Many have hazards if children can get at them, and may create chemical environmental hazards when disposed of improperly.

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## **Detergents**

Detergents can be alkaline or neutral. Neutral detergents are pH 7 meaning neither acidic nor alkaline. Read the can or bottle first to determine.

### **Mild Detergents - Hand Dish washing Liquid Detergent**

Mild detergents have surfactants that dissolve dirt and grease; use in solution of warm to hot water to clean washable surfaces such as counter-tops, appliances, fixtures, floors.

- **Caution:** Safe for washable surfaces and skin. High-sudsing, so do not put much in the solution, and rinse all suds off thoroughly.

### **Moderately Strong Detergents - Laundry Detergents Uses**

Has both surfactant and builder, so dissolves heavier soil and grease; use in a solution of warm to hot water to clean washable surfaces where a stronger detergent is safe. Use the smallest amount of detergent that will do the job. Low sudsing types are easier to rinse off.

- **Caution:** Most powdered detergents contain washing soda as a builder and some are very alkaline which can damage surfaces,

and irritate skin with prolonged contact. Strong solutions can dissolve paint. Always rinse thoroughly. Do NOT use where mild detergent is recommended.

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## Solvents

Solvent cleaners are readily available and are often used to dissolve household soil. The solvent is often the medium the stain or soil goes into to facilitate its removal.

**Water** is a universal solvent because it will dissolve most kinds of soils except oils. Alkalis, acids, bleaches or detergents are added to water to chemically react with specific soils and loosen them so they are removed with the water. Prompt sponging with water (if material is water safe) will remove many stains without adding chemicals.

**Caution:** Surfaces damaged by water include wood which warps, wood finishes which soften or turn white, textiles which shrink, padding which can be soaked and mildew, materials that soften or disintegrate in water such as paper, or around electrical components where shock hazards exist.

**Organic Solvents** - Acetone, Denatured Alcohol, Petroleum Distillates including kerosene, mineral spirits, naphtha, dry cleaning fluid, and turpentine are used to remove greasy soil, or stains that will not dissolve in water; or used for cleaning surfaces that would be damaged by water. Some remove waxes, wood finishes, and oil-base paint. Many are used in polishes, waxes, spot removers, rug cleaners, degreasers, and all purpose household cleaners.

- **Caution:** Most are flammable or combustible. Read and follow all label directions completely.