A HANDBOOK OF INDUSTRY TERMS

THE SOAP AND DETERGENT ASSOCIATION

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This Handbook provides the first comprehensive dictionary of terms used in the soap and detergent industry. It is hoped that the more than 200 definitions will be helpful to consumer communicators, home economics educators, the media, government officials, and businesses, as well as to the many consumers, students, and others who seek information about washing and cleaning products and their components.

The definitions are non-technical, or at times semi-technical, and designed for the layman rather than for the scientist or engineer. Following most of the alphabetized listings are related terms, which are also defined in the Handbook.

—The SDA Consumer Affairs Committee

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Revised and Expanded

A

ABRASIVE

Any of a wide variety of natural or manufactured substances used to smooth, scour, rub away, polish, scrub, etc.

Such naturally occurring mineral abrasives as calcite, feldspar, quartz, pumice, and sand are ground to a small particle size and supply scouring and polishing action to cleansers, hand soaps, and soap pads.

Related Terms: *Cleanser, Hand Cleanser, Hard Surface Cleaner, Pumice, Silica, Soap Pad*

ABS (*See ALKYLBENZENE SULFONATE*)

ACID

A chemical substance whose properties include the ability to react with bases or alkalies in water solutions to form salts.

Acids lower the pH of water solutions. When fatty acids, which are organic acids, are reacted with alkalies, soap is produced. Many soils are weakly acidic and are more easily removed in alkaline wash solutions.

Related Terms: *Alkali, Fatty Acids, pH, Saponification, Soap*

AIR, ROOM, FABRIC FRESHENER/DEODORIZER

A product intended to counteract the effect of unpleasant odors in the air and on certain surfaces and areas in the home.

Such products have been available for many years in liquid, gel, and aerosol forms. More recently, fragrance-impregnated solids have been introduced in many variations: soft absorbers protected by plastic shielding, plastic or impregnated plastic articles of many shapes, and granular solids in a toilet-roll holder.

The products are available in a variety of fragrances. Some are designed to counteract specific odors, such as those from pets, cooking, or tobacco. Baking soda can be used inside refrigerators and freezers where it absorbs odors arising from food. Borax can also be used as a deodorizer in various areas of the home.

Related Terms: *Baking Soda, Borax*

ALCOHOL

A class of organic compounds containing one or more hydroxyl

groups (OH).

The alcohols used in light duty and liquid laundry detergents are isopropanol or ethanol (ethyl alcohol). These alcohols are used at low levels in liquid detergent formulations to control viscosity, to act as a solvent for other ingredients, and to provide resistance to low and freezing temperatures encountered in shipping, warehousing, and use. Isopropanol is used in liquid hard surface cleaners. Higher molecular weight alcohols are used as raw materials for alcohol ethoxylates, one type of nonionic surfactant.

Related Terms: *Alcohol Ethoxylate, Hard Surface Cleaner, Laundry Detergent, Light Duty Detergent, Nonionic Surfactant*

ALCOHOL ETHOXYLATE

A nonionic surfactant created by adding ethylene oxide ($-OCH_2CH_2-$) groups to a long chain (high molecular weight) alcohol.

Alcohol ethoxylates are relatively low sudsing. They possess greater resistance to water hardness than many other surfactants, i.e., are less calcium sensitive, and are effective in removing oily soils from man-made fibers and hard surfaces.

Related Terms: *Alcohol, Nonionic Surfactant*

ALKALI

A chemical substance (such as a hydroxide or carbonate of sodium or potassium), which reacts with and neutralizes an acid.

Alkalies are reacted with fats and oils of animal or vegetable origin to form soap. Hard soap is generally made from sodium hydroxide (caustic soda) and soft soap, from potassium hydroxide (caustic potash).

Related Terms: *Alkalinity, Saponification, Soap*

ALKALINE SALTS

Alkaline materials used alone or in multi-ingredient balanced cleaners to increase the detergency and other desirable properties of cleaning compositions used in the building and equipment maintenance field.

Alkaline salts or builders such as trisodium phosphate, sodium carbonate, modified soda ash, sodium metasilicate, sodium tripolyphosphate, and tetrasodium pyrophosphate have well established cleaning properties.

They serve one or more of the following functions: make surfactants

more efficient, provide water softening characteristics and thereby prevent water hardness from combining with soils, help disperse and suspend dirt, saponify fatty or oily soils, maintain a desirable alkalinity, and aid in the removal of microorganisms.

Related Terms: *Alkalinity, Buffer, Builder*

ALKALINITY

A property of water soluble substances (or mixtures) causing the concentration of hydroxyl ions (OH^-) in water solutions to be higher than the concentration of hydrogen ions (H^+).

Alkalinity is exhibited in solution by alkalies such as sodium hydroxide and by alkaline salts such as sodium carbonate.

Soap and soap-based products are alkaline, since soap is a moderately alkaline salt and performs well only in an alkaline medium. Detergent products can be formulated with any desired level of alkalinity as dictated by the needs of the cleaning tasks to be performed. Since the alkalinity is useful in removing acidic, fatty, and oily soils, most detergents are more effective on laundry soils when on the alkaline side. Generally, alkalinity is supplied to laundry detergents by builders.

All automatic dishwasher detergents utilize alkalinity, as do most cleansers and hard surface cleaners. In contrast, most hand dishwashing detergents are close to neutrality, performing efficiently without alkalinity because of the mechanical action of hand rubbing with sponge or dishcloth.

Related Terms: *Automatic Dishwasher Detergent, Builder, Cleanser, Detergent, Hard Surface Cleaner, pH, Soap, Sodium Carbonate, Surface Active Agent*

ALKANE SULFONATE (PARAFFIN SULFONATE)

An anionic surfactant with high sudsing properties.

Alkane sulfonate, usually a sodium salt, is also referred to as paraffin sulfonate. It has performance characteristics similar to linear alkylate sulfonate.

Related Terms: *Anionic Surfactant, Linear Alkylate Sulfonate*

ALKYLARYL SULFONATE

A generic term covering a wide range of anionic surfactants and detergent processing aids. *(continued)*

The alkylaryl sulfonates of primary interest to the detergent industry are the surfactants classified as linear alkylate sulfonates, usually sodium salts, and the processing aids ammonium, potassium, or sodium salts of toluene, xylene, or cumene sulfonates. They are used to solubilize the active ingredients in some liquid detergents.

Related Terms: *Alkylbenzene Sulfonate, Hydrotrope, Linear Alkylate Sulfonate, Processing Aids, Surface Active Agent*

ALKYLBENZENE SULFONATE (ABS)

A major class of alkylaryl sulfonate surfactants used in detergents; usually a sodium salt.

ABS is anionic and high sudsing. Prior to the mid-1960s, the form of ABS most widely used in detergent formulations had branched hydrocarbon chains, which resisted biodegradation. In 1965, detergent manufacturers voluntarily replaced ABS nationally in household laundry products with a more rapidly biodegradable variety of ABS called linear alkylate sulfonate, or LAS.

Related Terms: *Alkylaryl Sulfonate, Biodegradability, Linear Alkylate Sulfonate, Surface Active Agent*

ALKYL ETHOXYLATE *(See ALCOHOL ETHOXYLATE)*

ALKYL ETHOXYLATE SULFATE

A high sudsing anionic surfactant that functions well in the presence of water hardness.

Sodium alkyl ethoxylate sulfates are used in many all purpose granular detergents, where the product must function with a minimum of (or completely without) the water-softening action of complex phosphates. Ammonium, potassium, and sodium alkyl ethoxylate sulfates are also used in light duty liquid detergents.

Related Terms: *All Purpose Detergent, Anionic Surfactant, Light Duty Detergent*

ALKYL GLYCERYL SULFONATE (AGS)

A high sudsing anionic surfactant, usually a sodium salt, synthesized from a glycerin base.

Surfactants of this type are used mostly in light duty liquid detergents.

Related Terms: *Anionic Surfactant, Glycerin, Light Duty Detergent, Surface Active Agent*

ALKYL SULFATE

An anionic surfactant, usually a sodium salt, derived from fatty alcohol.

Alkyl sulfates are high sudsing surfactants. They have been an ingredient in built, all purpose granular detergents for many years; today they are more often found in cosmetic products, such as shampoos. Because they are sensitive to water hardness, they perform best in all purpose detergents that are fully built to inactivate the hardness.

Related Terms: *Anionic Surfactant, Built Detergent*

ALL FABRIC BLEACH *(See NON-CHLORINE BLEACH)*

ALL PURPOSE CLEANING PRODUCT

A formulation designed for general household cleaning, in contrast to specialty cleaning products made to clean in certain situations.

Surfaces in a home are made of many materials of different composition and construction. Soils are equally varied, and differing in intensity and distribution. No single product can provide optimum performance on *all* surfaces and soils.

However, there is a range of all purpose cleaning products, which include nonabrasive products (powders, liquids, sprays) and abrasive all purpose cleaners, such as powdered and liquid cleansers and scouring pads.

Related Terms: *All Purpose Detergent, All Purpose Soap, Cleanser, Hard Surface Cleaner, Scouring Pad, Specialty Cleaning Products*

ALL PURPOSE DETERGENT

A powder or liquid detergent suitable both for laundering and for other household cleaning.

The high sudsing granular products of this detergent type have been widely used for decades not only in top-loading automatic washers but for hand care of fabrics, and for household cleaning tasks ranging from hand dishwashing to floor care. When used for household cleaning, all purpose detergents may not perform with the same efficiency as prod-

ucts designed for specific purposes. Some all purpose detergents are not high sudsing.

Related Terms: *Built Detergent, Heavy Duty Detergent, Unbuilt Detergent*

ALL PURPOSE SOAP

A granular soap consisting of a mixture of tallow and coconut oil soap, builders, fluorescent whitening agents, fragrance, and sometimes colorant.

The product is formulated primarily for household laundering but can also be used for other household cleaning and washing tasks. All purpose soaps represented a significant point in the evolution of washing and cleaning products. Just as they largely replaced laundry bars, chips, and ground powders, so today they have been almost completely superseded by detergents.

Related Terms: *Built Soap, Heavy Duty Soap, Lime Soap*

ALUMINOSILICATE

An inorganic material belonging to the class of compounds called aluminosilicates.

It is now being used as a detergent builder.

Crystalline sodium aluminosilicates or zeolites are water soluble. They soften water by an ion exchange and are effective primarily on the calcium in hard water. Thus a supplementary builder is required when they are used in detergent form to soften hardness due to magnesium and other ions.

Related Terms: *Builder, Water Hardness, Zeolite*

AMIDE

A group of compounds formed by the reaction of an organic acid with ammonia or an amine.

Only a few amides (those derived from a long-chain fatty acid, such as coconut oil fatty acid) are used in detergents. Sometimes one or two hydroxyethyl groups are also attached to the amide nitrogen. Thus, a typical amide used in a detergent formulation is an alkyl monoethanolamide. The diethanol form is also used.

Alkyl amides are used in relatively small percentages to serve as suds stabilizers.

Related Terms: *Suds Stabilizer*

AMINE

A class of organic compounds containing nitrogen.

Amines such as monoethanolamine (MEA) and triethanolamine (TEA) are often used as buffering agents in liquid laundry detergents. Other amines are used as fabric softeners.

Related Terms: *Buffer*

AMINE OXIDE

Surfactants in which the hydrophilic, or water-loving, component is the highly polar amine oxide group.

They are well known foam stabilizers, widely used in light duty liquid detergents and to a lesser extent in heavy duty liquid cleaners. In alkaline solutions they are nonionic, and in acidic solutions, cationic.

Related Terms: *Cationic Surfactant, Hydrophilic, Light Duty Detergent, Nonionic Surfactant, Surface Active Agent*

AMMONIA

An alkaline gas composed of nitrogen and hydrogen (NH_3).

Five-to-ten-percent solutions of ammonia are sold at retail as "household ammonia." A sudsy type that appears somewhat cloudy or milky contains a small amount of soap or detergent.

Household ammonia aids in removing grease and dirt from surfaces such as ovens, tile, windows, and mirrors. It is used to some extent as a laundry additive to aid cleaning and is prescribed for treatment of certain stains, like perspiration. Ammonia is included in some hard surface cleaner formulations to assist in grease cutting, wax stripping, and general soil removal.

Related Terms: *Hard Surface Cleaner*

AMPHOTERIC (AMPHOLYTIC) SURFACTANT

A surfactant that, in water solution, may be either anionic or cationic, depending on the pH.

The applications of amphoteric surfactants include shampoos and personal care products, where mildness is important; industrial cleaners, because of their wide compatibility with builders, acids, and alkalies; and to some extent, household detergents. *(continued)*

Related Terms: *Anionic Surfactant, Cationic Surfactant, Surface Active Agent*

AMYLASE

A class of enzymes that accelerates the hydrolysis (breakdown by water) of starches and other carbohydrates.

Amylase is used in laundry products, along with protease (proteolytic enzymes, to break down protein), to solubilize stains and loosen soils that otherwise might not be removed in normal washing. Products in which amylase is used include laundry detergent powders and liquids, and laundry boosters.

Related Terms: *Enzymes, Presoak Products, Protease*

ANIONIC SURFACTANT

A surfactant usually (but not always) derived from an aliphatic hydrocarbon and most commonly in the form of a sodium salt, in which detergency and other properties depend in part on the negatively charged anion of the molecule; hence the name "anionic."

The negative charge, which the hydrophilic portion of anionic surfactants carries when in water, can be partially deactivated by interaction with the positively charged water hardness (calcium and magnesium) ions. These surfactants are particularly effective at oily soil cleaning and clay soil suspension, but they need help from other ingredients to reduce the effects of water hardness ions.

The surfactants most widely used in the detergent industry are anionic, and these are usually high sudsing. Linear alkylate sulfonate is the most commonly used anionic surfactant. Others include alkane sulfonate, alkyl ethoxylate sulfate, alkyl glyceryl sulfonate, alkyl sulfate, and alpha olefin sulfonate.

Related Terms: *Amphoteric Surfactant, Cationic Surfactant, Hydrophilic, Nonionic Surfactant, Surface Active Agent*

ANTIMICROBIAL

Any substance or product that inhibits the growth of microorganisms, such as bacteria, fungi, or protozoa.

It may be used in soaps and detergents to produce bacteriostatic and bactericidal effects against both pathogens and non-pathogens (such as organisms causing body odor). Antimicrobial agents used in washing

and cleaning products range from highly complex bacteriostats, such as triclocarban, to the relatively commonplace pine oil and chlorine bleaches. Antimicrobials are used in deodorant bar soaps, in hard surface cleaners, in some laundry additives such as fabric softeners, and to a small extent in laundry detergents. They are also available as special products for adding to the rinse during laundering when there is concern for infectious organisms.

Related Terms: *Bactericide, Bacteriostat, Chlorine Bleach, Disinfectant, Germicide, Pine Oil, Preservative, Sanitizer, Triclocarban*

ANTIREDEPOSITION AGENT

An ingredient used in laundry detergents to help prevent soil from resettling on fabrics after it has been removed during washing.

Sodium carboxymethylcellulose (CMC) is the most widely used antiredeposition agent; the literature also mentions methylcellulose, polyvinylpyrrolidone (PVP), polyvinyl alcohol, and polyethylene glycol (PEG). Antiredeposition agents are adsorbed on both soil and fabrics, where they keep soil particles from resettling on fabrics being washed and act as a dispersing agent. Surfactants and complex phosphates also help prevent soil redeposition, although this is not their primary function.

Related Terms: *Carboxymethylcellulose, Dispersing Agent, Soil Redeposition Inhibitor, Soil Suspending Agent*

ANTISTATIC AGENT OR PRODUCT

A substance that reduces static electricity by preventing friction, which causes fabrics (especially man-made fiber fabrics such as nylon and polyester) to crackle and cling during drying and use.

Antistatic agents are used in all fabric softeners. They may also be used in other laundry products. Antistatic specialty products are directly sprayed on a garment.

Related Terms: *Fabric Softener, Quaternary Ammonium Compounds*

AUTOMATIC DISHWASHER DETERGENT

A cleaning product designed specifically for use in automatic dishwashers. It can also be used to loosen baked and dried-on food soils by soaking or pretreating with it prior to automatic dishwashing.

It must produce little or no suds or foam because too much foam can

inhibit the washing action. Its important functions include the following:

Tie up water hardness minerals to permit the detergent to do its cleaning job.

Make water wetter (reduce surface tension) to penetrate and loosen soil.

Emulsify greasy or oily soil.

Remove proteinaceous and starchy soils.

Suppress foam caused by protein soils such as egg and milk.

Help water to sheet off surfaces, thus minimizing water spots.

Protect china patterns and metals from the corrosive effects of heat and water alone.

Basic ingredients in most automatic dishwasher detergents include:

Surfactant—lowers the surface tension of water so that it will more quickly wet out the surfaces and the soils, thus allowing water to sheet off dishes and not dry in spots. The surfactant also helps remove and emulsify fatty soils like butter and cooking fat. Surfactants having low sudsing characteristics are used.

Builder (complex phosphates)—combines with water hardness minerals (primarily calcium and magnesium) and holds them in solution so that the minerals cannot combine with food soils and so that neither the minerals themselves nor the mineral/food soil combination will leave insoluble spots or film on dishes.

Alkaline buffers and water softeners (sodium carbonate)—help break down and help remove proteinaceous and starchy soils.

Corrosion inhibitor (sodium silicate)—helps protect dishwasher parts, prevent the removal of china patterns, and the corrosion of metals such as aluminum.

Fragrance (optional)—covers the chemical odor of the base product and stale food odors.

Oxidizing agent—helps break down protein soils like egg and milk, aids in removing such stains as coffee or tea, and lessens spotting of glassware.

Processing aids—generally inert materials, water, and thickeners that allow the active ingredients to be combined into a usable form.

Suds suppressor—controls foam from food soils, especially protein soils.

Related Terms: *Dishwasher Detergent*

B

BACTERICIDE

A substance that kills bacteria.

The most common bactericide used in home laundering is liquid chlorine bleach. For situations where chlorine bleach cannot be used, and disinfecting action beyond that supplied by the regular laundering process is needed (e.g. baby clothes, infectious illness), special disinfectants are available. Among these are quaternary and phenolic compounds and pine oil. Pine oil and phenolics can be added to either wash or rinse water. Quaternaries should be added only to the rinse to avoid interaction with detergent surfactants, which inactivate the quaternaries.

Related Terms: *Antimicrobial, Bacteriostat, Chlorine Bleach, Disinfectant, Phenolic Compounds, Pine Oil, Preservative, Quaternary Ammonium Compounds*

BACTERIOSTAT

A substance that prevents or inhibits the growth of bacteria but does not necessarily kill them.

Bacteriostats are found in some laundry additives. They are also used as an ingredient in deodorant bar soaps.

Related Terms: *Antimicrobial, Deodorant Bar, Preservative, Triclocarban*

BAKING SODA

The common name for sodium bicarbonate, a mild alkali; it can be helpful in removing acidic soils and can be used for both general and specific cleaning tasks.

The scratchless abrasive action of dry baking soda, when used as a cleanser, helps in removing soil because the undissolved baking soda crystal is harder than soil but softer than sensitive surfaces such as fiberglass.

Baking soda can also act as a deodorizer inside refrigerators and freezers where it absorbs odors arising from food.

Related Terms: *Acid, Alkali, Sodium Bicarbonate, Specialty Cleaning Products*

BAR, LAUNDRY SOAP *(See LAUNDRY SOAP BAR)*

BATHROOM CLEANER

A category of cleaners including both all purpose, hard surface cleaning products and specialty types formulated specifically for bathroom cleaning.

The all purpose products include liquid and powder hard surface cleaners, and abrasive household cleansers for scouring difficult stains and soil.

Specialty products include deodorizing and disinfecting cleaners, which usually contain an antimicrobial agent plus a chelating agent to remove hard water scale. They may be in pump spray or aerosol form. Toilet bowl cleaners and in-tank cleaners are specialty products.

Related Terms: *Antimicrobial, Chelating Agent, Cleanser, Disinfectant, Hard Surface Cleaner, Specialty Cleaning Products, Toilet Bowl Cleaner, Tub, Tile, Sink Cleaner*

BEAUTY BAR

A toilet bar used primarily for cleansing of the skin and complexion care.

It contains soap, detergent, or a mixture of the two, along with emollients, fragrance, and colorant. An antimicrobial agent may be included as well. A detergent base makes these bars effective in hard water and can provide a neutral pH.

Related Terms: *Detergent, Deodorant Bar, Emollient, Toilet Soap*

BHT (*See BUTYLATED HYDROXYTOLUENE*)

BIODEGRADABILITY

The capability of organic matter to be decomposed by biological processes.

Both the rate and the completeness of decomposition are factors in biodegradability. In the context of detergents, biodegradation refers to decomposition of the organic ingredients in the formulation by bacteria present in waste treatment systems, surface waters, or in the soil. Since surfactants constitute the largest quantity of organic materials in detergent products, their biodegradation is of greatest interest. The surfactants in today's household detergents are readily biodegradable. as is soap.

Related Terms: *Surface Active Agent*

BLEACH

A product that will clean, whiten, brighten, and remove stains from fabrics; it also removes stains on hard surfaces.

Bleach is often used along with a detergent, but unlike a detergent, bleach reacts by the breaking of chemical bonds rather than physical bonds as detergents typically do.

The strongest and most widely used bleach for home laundering is liquid chlorine bleach (usually a sodium hypochlorite solution), which is also capable of disinfecting and deodorizing fabrics. In household cleaning, chlorine bleach is a strong disinfectant and helps eliminate mildew and many other fungi. Dry forms of chlorine bleach are used in automatic dishwasher detergents.

Non-chlorine bleaches, which are usually powders containing sodium perborate, are used to lesser degree, but due to their gentler bleaching action, these bleaches can be used on virtually all fabrics and colors. Dry non-chlorine bleaches are also present in some laundry detergents, additives and presoaks.

Bleaches are typically oxidizing agents; however, reducing bleaches, such as sodium dithionite, have been used in consumer laundry products, and are used in industrial and institutional laundry products.

Related Terms: *All Fabric Bleach, Bleaching, Chlorine Bleach, Color Remover, Laundry Aid, Non-Chlorine Bleach, Oxygen Bleach*

BLEACHING

A process for removing soils and stains from textile fabrics and hard surfaces by chemical oxidation or reduction.

Related Terms: *Bleach*

BLUING

Blue coloring materials that are added to wash or rinse water and are taken up by fabrics; bluing counteracts the yellowing that sometimes develops in white fabrics after repeated use and laundering.

Bluing produces a blue-white hue on fabrics, which is considered more pleasing to the eye than yellow-white. As a separate laundry additive, bluing may be a blue dye or pigment. It is available: in liquid or dry form for adding to the rinse; in a granular detergent base for adding to washwater along with soap or detergent; and as an ingredient in other laundry products, including detergent, oxygen bleach, fabric softener,

and starch.

Related Terms: *Fluorescent Whitening Agent, Laundry Aid, Ultramarine Blue*

BOOSTER

A laundry aid available in granular or liquid form that is formulated to reinforce specific performance characteristics desirable in laundering.

Boosters are designed for use in the wash in addition to the recommended amount of detergent. Liquid boosters can also be used for pretreating stains.

Typical ingredients are: surfactants, builders, borax, enzymes, corrosion inhibitors, and fluorescent brighteners. These ingredients are incorporated in widely divergent ratios depending on the objectives of the given product.

Related Terms: *Detergent Booster, Laundry Aid*

BORAX

A white, crystalline, mildly alkaline, water soluble salt (sodium borate).

As a laundry additive, borax provides moderate alkalinity buffering, and aids in loosening soils and stains. It is included in small amounts in some laundry detergent formulations and in most diaper presoak products where it inhibits development of ammoniacal odors. Borax can also be used for some household cleaning jobs, and as a deodorizer.

Related Terms: *Air, Room, Fabric Freshener/Deodorizer, Buffer, Diaper Soaking Product, Laundry Detergent*

BRIGHTENER OR BRIGHTENING AGENT

Synonyms for fluorescent whitening agent, the preferred term in relation to soaps and detergents.

Related Terms: *Fluorescent Whitening Agent, Optical Brightener*

BUFFER

A term with dual meaning in home laundering, referring to both chemical and mechanical action.

In chemical terms, it is a substance that stabilizes pH (in this case, alkalinity) during washing. In the mechanical sense, it refers to soft, absorbent fabrics such as terry towels, added to a washer or dryer to cushion the impact when laundering very delicate items or to enhance

tumbling action of small loads in the dryer.

Buffering in cleaning products is provided by complex phosphate builders, sodium carbonate, amines, sodium silicate, borax, washing soda, and some other chemicals. A buffer minimizes the alkalinity drop occurring during the washing process, which adversely affects cleaning.

Related Terms: *Alkalinity, Builder*

BUILDER

A material that enhances or maintains the cleaning efficiency of the surfactant.

Several types of compounds, with different performance capabilities, are used. Builders have a number of functions, principally inactivation of water hardness. This is accomplished either by sequestration, i.e. holding hardness minerals in solution, by precipitation, or by ion exchange. Complex phosphates are common sequestering builders. Sodium carbonate is a precipitating builder. Sodium aluminosilicate is an ion exchange builder. Other functions of builders are to supply alkalinity to assist cleaning, especially of acid soils, to provide buffering so that alkalinity is maintained at an effective level, to aid in keeping removed soil from redepositing during washing, and to emulsify oily and greasy soils.

Related Terms: *Alkalinity, Aluminosilicate, Buffer, Built Detergent, Built Soap, NTA, Phosphates, Precipitating Builder, Sequestering Agent, Sodium Carbonate, Sodium Citrate, Sodium Silicate, Sodium Tripolyphosphate, Surface Active Agent, Tetrapotassium Pyrophosphate, Tetrasodium Pyrophosphate, Trisodium Phosphate*

BUILT DETERGENT

A cleaning product containing both surfactant and builder.

Home laundering makes use of built detergents because of their effective performance on specific soils (clay and body). Ingredients used in formulations along with surfactant and builder include fluorescent whitening agent, antiredeposition agent, corrosion inhibitor, suds control agent, non-chlorine bleach, colorant, fragrance, enzyme, bluing, and processing aids. Not all of these ingredients are used in every built detergent. Inclusion of antiredeposition and whitening agents, corrosion inhibitor, colorant, fragrance, and processing aids is customary.

Complex phosphates (especially sodium tripolyphosphate), sodium

carbonate, and sodium silicate are the builders most commonly used. (Sodium silicate is also a corrosion inhibitor.) Borax, sodium citrate, and soap are used to a lesser extent.

Built detergents may be granular or liquid in form and produce high, medium, or low suds. Since built detergents are designed for doing laundry, they are classified as laundry detergents. They are also considered heavy duty. Those that are high sudsing are adapted to many non-laundry household cleaning tasks, and are termed "all purpose."

Related Terms: *All Purpose Detergent, Builder, Heavy Duty Detergent, Laundry Detergent*

BUILT SOAP

A combination of soap and builder designed for general purpose use, especially laundering.

It also usually contains fluorescent whitening agent, colorant, and fragrance. The granule form of built soap represented a major development and, by the late 1930s, had largely replaced laundry soap in bar and chip form. However, it still presented the classical soap problems in hard water, and thus built soap granules rapidly lost market share when built detergents were marketed in the late 1940s. Today, built soaps are in very limited distribution.

Related Terms: *All Purpose Soap, Builder, Heavy Duty Soap*

BUTYLATED HYDROXYTOLUENE (BHT)

An anti-oxidant.

Related Terms: *Preservative*

C

CALCIUM CARBONATE

An insoluble compound that occurs naturally as chalk and limestone and that results from the reaction of sodium carbonate with calcium water hardness ions.

CARBOXYMETHYLCELLULOSE (CMC)

A large molecule derived from degraded cellulose.

Carboxymethylcellulose is present in many built laundry detergents to minimize redeposition of soil that has been removed by washing.

Related Terms: *Antiredeposition Agent, Soil Redeposition Inhibitor, Soil Suspending Agent*

CARPET CLEANER

A rug shampoo (concentrated or ready-to-use liquids and aerosol sprays) formulated to wet the pile of a rug and take up oily and greasy soils.

They provide a dense foam that traps soil in suspension and dries to a brittle solid residue, which is removed by vacuuming. A surfactant is the essential ingredient. A polymer, which helps in making the dried foam brittle, is usually present in rug cleaner formulations to retard resoiling. Rug shampoos may also contain color brighteners, deodorizers, and soil retardants.

Besides products used directly on rugs, there are liquid formulations for use with rug shampooing equipment. The ingredients are essentially identical for both products.

Steam cleaning equipment requires special formulations as foam interferes with the cleaning process. One may additionally use a defoamer (silicone emulsion) if there is residue from previous shampooings.

Related Terms: *Specialty Cleaning Products*

CARPET FRESHENER

A product designed not to clean but to counteract malodors in carpets.

The principal ingredient in powdered carpet fresheners is a pleasing fragrance adsorbed on a finely divided inorganic carrier, such as baking soda (sodium bicarbonate), which neutralizes some malodors, or sodium sulfate. The powder is spread over the carpet, allowed to set for a few minutes, and then vacuumed.

Carpet fresheners may also be aerosols, which deliver a dry spray of fragrance to the carpet. Rapid drying action allows air freshening and deodorizing without need to dry and vacuum.

Related Terms: *Baking Soda, Sodium Sulfate*

CASTILE

Originally soap made from olive oil, and so named probably because such soap was produced extensively in ancient Castile, Spain. Today, castile may mean any mild soap made from vegetable oils.

Related Terms: *Soap, Toilet Soap*

CATIONIC SURFACTANT

A surfactant with a positively charged ionic group.

The most commonly used cationic surfactants are known as quaternary ammonium compounds, such as alkyl dimethyl benzyl ammonium chloride. Some are widely used in disinfecting/sanitizing household and bathroom cleaners. Others are active ingredients in wash/rinse/dryer fabric softeners. Alone they are not effective cleaners but may be part of a complex surfactant system.

Related Terms: *Amine Oxide, Amphoteric Surfactant, Anionic Surfactant, Disinfectant, Fabric Softener, Nonionic Surfactant, Quaternary Ammonium Compounds*

CAUSTIC

A strong base; the term, when used alone, usually refers to caustic soda (sodium hydroxide). It may also refer to caustic potash (potassium hydroxide).

Caustic soda is the alkali used in the manufacture of hard soap, and caustic potash is used in the manufacture of soft soap. Caustic soda is also used as a neutralizing agent in detergent manufacture.

Related Terms: *Alkali, Soap*

CHELATING AGENT

A special type of organic sequestering agent that inactivates water hardness and other metallic ions in water.

Chelating agents are used in detergent formulations because they inactivate the hardness minerals calcium and magnesium, and reduce ill effects of other dissolved metals such as iron and manganese. Currently, there is sparing use of chelating agents in U.S. detergent formulations. One such agent is ethylene diamine tetraacetic acid (EDTA). Sodium citrate functions as a chelating agent when used as a builder.

Related Terms: *Ethylene Diamine Tetraacetic Acid, NTA, Sequestering Agent, Sodium Citrate*

CHLORIDE SALT

A salt formed from hydrochloric acid.

There are thousands of chloride salts, including common table salt (sodium chloride). Only two are significantly involved in detergent formulation: sodium and potassium chloride. They may be present as a

by-product of processing, or may be added in small amounts to light duty liquid detergents to provide control of physical properties.

Related Terms: *Light Duty Detergent*

CHLORINATED ISOCYANURATE

A class of organic chlorine compounds used for bleaching.

The chlorinated isocyanurates most commonly used in the detergent industry are the sodium and potassium salts of dichloroisocyanurate and trichloroisocyanuric acid. These are used in cleansers and automatic dishwasher detergents where the bleaching/oxidizing action of sodium hypochlorite is desired, and when a bleach that is stable in the dry state is required. (Sodium hypochlorite is stable in solution only.) They may be used in place of chlorinated trisodium phosphate in some formulations.

These bleaches may be found in the list of ingredients on product labels under the names of sodium/potassium dichloro -s -triazinetrione and trichloro -s-triazinetrione, reflecting alternate chemical nomenclature.

Related Terms: *Automatic Dishwasher Detergent, Bleach, Cleanser*

CHLORINATED PHOSPHATE *(See CHLORINATED TRISODIUM PHOSPHATE)*

CHLORINATED TRISODIUM PHOSPHATE

A dry chlorine bleach.

Related Terms: *Chlorine Bleach, Phosphates*

CHLORINATED TSP *(See CHLORINATED TRISODIUM PHOSPHATE)*

CHLORINE BLEACH

A group of strong oxidizing agents, all of which have one or more chlorine atoms in their molecule.

Liquid chlorine bleach is commonly sold as an approximately 5% solution of sodium hypochlorite. As a laundry additive, liquid chlorine bleach removes stains, aids in soil removal, whitens, disinfects, and deodorizes. Dry forms of chlorine bleach include chlorinated isocyanurates and chlorinated trisodium phosphate. They are used as the bleaching ingredient in products marketed in dry form, such as cleansers and automatic dishwasher detergents. Neither liquid nor dry chlorine bleach

should be used on silks, woolens, dyes sensitive to hypochlorite, and certain stains, such as rust, which can be set by hypochlorite. Chlorine bleach deactivates enzymes found in laundry detergents or laundry aids.

Related Terms: *Bleach, Chlorinated Isocyanurate, Chlorinated Trisodium Phosphate, Hypochlorite, Non-Chlorine Bleach, Perborate*

CITRATE (*See SODIUM CITRATE*)

CITRIC ACID (*See SODIUM CITRATE*)

CLEANED-IN-PLACE (CIP)

CIP refers specifically to the cleaning and sanitizing of food processing equipment and piping in its assembled condition by recirculation of the necessary rinse, detergent, and sanitizing solutions under appropriate conditions of time, temperature, detergency, and physical action.

CIP systems are now present to some extent in practically every food and dairy processing plant.

CLEANSER

A powdered cleaning product usually containing an abrasive, a surfactant, and sometimes a bleach.

The abrasive is usually calcium carbonate (soft), feldspar (moderately hard), or silica (hard). Softer materials are usually preferred in products for surfaces such as fiberglass. The abrasive supplies scouring and polishing action. The surfactant aids in cleaning and in suspension and emulsification of removed soil. Bleach may be chlorinated trisodium phosphate or chlorinated isocyanurate. It aids in stain and soil removal, deodorizes, and disinfects. Colorant, fragrance, alkalies, and builders such as sodium tripolyphosphate and tetrasodium pyrophosphate are also commonly used in cleanser formulations.

Liquid cleansers, in which the abrasive is suspended in a surfactant solution or thickening agent, are also available. Liquid cleansers are generally made with abrasives, such as calcium carbonate or pearlite, but harder materials such as silica can also be used. Fragrance is a common ingredient in liquid cleansers. Optional ingredients include bleach and other detergent components.

Related Terms: *Abrasive, Chlorinated Isocyanurate, Chlorinated Trisodium Phosphate, Scouring Powder, Surface Active Agent*

CMC *(See CARBOXYMETHYLCELLULOSE)*

COCONUT SOAP

The salt of coconut oil fatty acid.

Only the soluble forms of coconut oil soap are used, usually the sodium and potassium salts. These are characterized by rapid solubility and ready sudsing. They generally make up only a portion of the soap base of toilet bars, light duty soap flakes and granules, and all purpose soap granules. The remainder of the soap base is derived from tallow and similar fats. There is very limited distribution of bar soap for use in hard water in which the base is 100% sodium coconut oil soap.

Related Terms: *Fatty Acids, Soap, Toilet Soap*

COLORANT OR COLOR ADDITIVE

Pigment or other coloring material, widely used in soaps and detergents for esthetic effect, to dramatize an ingredient, or, in the case of blue colorant, to provide bluing action on fabrics.

In the case of granules, the coloring may be uniform, or variegated to give a speckled appearance. In toilet and beauty bars it may be solid color, or deliberately streaked to give a striated effect.

COLOR REMOVER

Any of a group of reducing agents that are sufficiently reactive to decolorize or remove dyes from fabrics without markedly affecting the fabrics themselves.

The color remover most readily available at retail is sodium hydrosulfite, which is sold as a packaged product. Also available, but less effective, is photographers' "hypo" (sodium thiosulfate). No color remover is 100% effective as a dye remover; it will react only with those dyes that are susceptible to reduction, and sometimes it will change the color of a dye rather than strip or decolorize it. Color removers should be used only in treatment by hand, not in the washer, and should be rinsed thoroughly.

Besides removing dye, color removers are useful for treating certain stains, including rust, some inks, and iodine.

Color remover is also called reducing bleach and stripper.

CORROSION INHIBITOR

A material that protects against the wearing away of appliance surfaces. *(continued)*

Sodium silicate is the corrosion inhibitor used in detergents and built soap. It is incorporated in laundry and automatic dishwasher products to protect washer and dishwasher metal parts and finishes, especially porcelain enamel. In an automatic dishwasher detergent, sodium silicate also protects china and metal utensils.

Related Terms: *Automatic Dishwasher Detergent, Laundry Detergent, Sodium Silicate*

D

DEGREASER

A specialty product that removes grease and greasy/oily soils.

Designed more for hard surfaces than for fabrics, degreasers may be used for pretreatment or as the sole cleaning agent, but their use should always be followed by rinsing. Their basic ingredients are surfactants that penetrate and emulsify. They may also contain alcohol or a glycol derivative to boost cleaning and aid in solvency, a builder, fragrance, and colorant.

Related Terms: *Pretreatment*

DEODORANT BAR

A toilet or beauty bar that cleans away, masks, or inhibits the development of unpleasant odors.

Deodorant bars may contain an antimicrobial to retard growth of microorganisms on the skin and thus minimize body odors resulting from microbial action. Deodorant bars also contain perfume, which aids in masking body odors.

Related Terms: *Antimicrobial, Bactericide, Bacteriostat, Beauty Bar, Toilet Soap, Triclocarban, Triclosan*

DETERGENCY

The ability to clean or remove soil.

Generally detergency is associated with the action of a cleaning agent such as soap, detergent, alkaline salt, or a combination of these. In the context of consumer cleaning products, especially those designed for washing clothes and dishes, detergency can be described as the removal of soil by employing one or more of the following mechanisms (generally

in conjunction with mechanical action):

1. Lowering surface and interfacial tensions
2. Solubilization of soils
3. Emulsification of soils
4. Suspension/dispersion of removed soils
5. Saponification of fatty soils and enzymatic digestion of protein-based soils
6. Inactivation of water hardness
7. Neutralization of acid soils.

Related Terms: *Alkalinity, Detergent, Emulsification, Sequestering Agent, Soap, Surface Active Agent, Water Softener*

DETERGENT

Technically, any cleansing agent. In popular usage, washing and cleaning agents with a composition other than soap that clean by much the same mechanisms as does soap.

The term detergent is used to describe both the basic surface active agents and finished products. The finished products are synthesized chemically from a variety of raw materials derived from petroleum, fatty acids, and other sources. They may also contain ingredients such as builders, antiredeposition agents, corrosion inhibitors, suds control agents, enzymes, fabric softeners, fluorescent whitening agents, sodium sulfate, water, alcohols, hydrotropes, colorants, fragrances, and opacifiers.

Detergent ingredients vary with the types of products, which include light duty detergents, heavy duty detergents, hard surface cleaners, automatic dishwasher detergents, and cleansers. The finished product comes in a number of forms, such as granules, liquids, and crystals.

Related Terms: *All Purpose Cleaning Product, All Purpose Detergent, Automatic Dishwasher Detergent, Built Detergent, Hard Surface Cleaner, Heavy Duty Detergent or Soap, Laundry Detergent, Light Duty Detergent, Liquid Detergent, Specialty Cleaning Products, Synthetic Detergent, Unbuilt Detergent*

DETERGENT BOOSTER (*See BOOSTER*)

DIAPER SOAKING PRODUCT

A product designed to reduce bacteria growth and the odors they

cause in stored, used diapers awaiting washing.

A dilute solution of chlorine bleach is one of the most commonly used products for diaper soaking.

Borax is a basic ingredient in products designed especially for diaper soaking as well as for use alone. It is used by itself or formulated with other ingredients such as detergent, FWA, and fragrance. Sodium carbonate or sesquicarbonate are sometimes used to provide alkalinity, and antimicrobial agents are used to inhibit bacterial-induced odors. Most diaper soaking products are also intended as aids in washing as well as for soaking.

Related Terms: *Borax, Chlorine Bleach, Presoak Products*

DISHWASHER AIDS

Products designed to supplement the performance of automatic dishwasher detergent or to correct problems resulting from unfavorable water conditions, which the detergent alone cannot handle adequately.

The most important dishwasher aids are rinse additives, composed of nonionic wetting agent(s) to be dispensed in the final rinse. They lower surface tension, thus increasing the sheeting off of rinse water with a resultant minimization of spotting.

Related Terms: *Rinse Agent*

DISHWASHER DETERGENT

In industry usage, the term dishwasher detergent applies only to products formulated for use in automatic dishwashers in contrast to light duty detergents designed for hand dishwashing.

Related Terms: *Automatic Dishwasher Detergent*

DISINFECTANT

An agent that frees from infection by destroying harmful bacteria but not necessarily all bacterial spores.

In relation to home laundering, washing with a soap or detergent in a modern washer, using recommended laundering procedures followed by drying, provides hygienically acceptable domestic laundry under normal circumstances. When special efforts are desirable or needed (for example, when there is infectious illness), disinfectants for use in laundering are available. The most common is liquid chlorine bleach, but it cannot be used on all fabrics. For non-bleachable loads, there are three

other types of disinfectants:

Quaternary Ammonium Compounds—effective only if the "active" ingredient is sufficiently high in activity and concentration; should be used only in the rinse since they may be deactivated by soap and detergent.

Phenolic Compounds—also depend on a sufficiently high active content; can be used in wash or rinse water.

Pine Oil Products—effective when they contain at least 70% pine oil; may be added to wash or rinse. Disinfectant products containing lower concentrations of pine oil include additional active ingredients.

Hard surfaces can be disinfected by hard surface cleaners having disinfecting properties as stated on the label, and by cleansers containing chlorine bleaching agents in dry form.

Products making disinfectant claims must be registered with the U.S. Environmental Protection Agency, and it will be stated on the label.

Related Terms: *Antimicrobial, Bactericide, Germicide, Laundry Aid*

DISPERSING AGENT

A material that increases the stability of particles in a liquid.

In laundry detergents, dispersing agents keep particles of soil that have been removed from fabric in a dispersed or suspended state so that they are more readily removed from the washing machine when the washwater is pumped out. Surfactants that were instrumental in removing the soil from the fabrics serve as dispersing agents, as do antiredeposition agents and complex phosphates.

Related Terms: *Antiredeposition Agent, Carboxymethylcellulose, Surface Active Agent*

DRAIN CLEANER

A chemically strong product formulated for demanding cleaning jobs.

Clogging of kitchen drains is often caused by plugs of solid grease, which may have varied materials imbedded in them. Sodium hydroxide is often used in product formulation since it generates heat to melt fat and make it easier to rinse away. Some products also contain agents to promote evolution of gas, which provides agitation in the drain.

In bathroom drains, problems can result from hair, soap particles,

toothpaste, or combinations of these materials. Liquid drain cleaners containing sodium hypochlorite and sodium hydroxide can work well on these problems. Such cleaners are designed to be effective on hair because they contain an oxidizing agent.

In addition to liquid and crystal products, there are an aerosol type that contains an inert gas under pressure, which can force clogs out of the drainpipe, and enzyme-containing products, which act on specific matter of clogs.

Related Terms: *Specialty Cleaning Products*

DUSTING PRODUCT

May be a pump spray or aerosol that dispenses ingredients in a fine spray onto surfaces or dusting cloth; cloths may also be purchased that are already impregnated with active ingredients.

Such products can be used on both furniture and floors to attract, pick up, and retain light dust and soil. Some contain additives for helping remove oil-based and water-based stains from furniture.

Ingredients may also include a light hydrocarbon oil used for dust pick-up. A solvent is the active ingredient for removing oil-based stains; water can be present to pick up water-based soils.

Related Terms: *Specialty Cleaning Products*

E

EDTA *(See ETHYLENE DIAMINE TETRAACETIC ACID)*

EMOLLIENT

An ingredient for making skin soft or supple, or soothing the skin.

Materials such as fatty acids and lanolin are included in some toilet bars and skin preparation products to provide emollient properties.

Related Terms: *Superfatted*

EMULSIFICATION

The process of dispersing one liquid into another liquid with which it is immiscible.

The emulsification process is important in all types of cleaning where oily or fatty soils are encountered. The principal agent in emulsification

is the surfactant, with aid from a builder that ties up hardness minerals.

Related Terms: *Surface Active Agent*

ENZYMES

A large class of complex proteinaceous molecules, which act as catalysts in biochemical reactions.

Selected types of enzymes are useful in laundering, where they break down certain soils and stains to simpler forms, which are then more readily and completely removed by the laundry soap or detergent. To function most effectively on stubborn soils and stains, enzymes should be used with either high concentration, such as direct application in pretreatment of soils, or extended exposure, such as presoaking, longer than the usual wash period of 10–15 minutes.

Enzymes' effectiveness is deactivated by liquid chlorine bleach, so the two must be used separately to obtain the full benefit of each. Enzymes are used in laundry detergent liquids, powders, and boosters.

Related Terms: *Amylase, Presoak Products, Protease*

ETCHING

A chemical change on the surface of glassware.

Incipient etching can be recognized by iridescent coloration of the glass. As etching progresses this changes the opaqueness, which appears similar to filming except that it cannot be removed. Etching is primarily associated with automatic dishwashing, less often with hand washing. Soft water, high water temperatures (above 140° F), and high pH intensify it. Mechanical etching can occur when two glasses rub against each other in the dishwasher.

Related Terms: *Filming*

ETHANOL *(See ETHYL ALCOHOL)*

ETHYL ALCOHOL

The most common variety of alcohol; also called grain alcohol and ethanol.

Since ethyl alcohol has good solvent and anti-freeze properties and is soluble at all concentrations of water, it is a useful ingredient in some liquid detergent formulas.

Related Terms: *Alcohol*

ETHYLENE DIAMINE TETRAACETIC ACID (EDTA)

A chelating agent.

The sodium salt of EDTA is used in low concentrations in some detergent formulations, hard surface cleaners, and soaps. In soap it serves as a preservative by inactivating heavy metals that may be present in trace amounts and which, if not inactivated, serve as catalysts in promoting rancidity.

Related Terms: *Chelating Agent, Hard Surface Cleaner, Preservative*

EUTROPHICATION

A term derived from Greek words meaning "to nourish well" and referring to increased levels of nutrients in a lake or other body of water.

Lakes age naturally, becoming filled with plants and silt, forming marshes and finally, solid land. This aging process (from a young or oligotrophic state to a mature or eutrophic state) normally takes thousands of years, but man's activities can speed up the process by increasing the supply of nutrients entering the lake. These nutrients include phosphorus, nitrogen, carbon, potassium, trace elements, and vitamins. Sources include human, animal and industrial wastes, agricultural and urban runoff, soil erosion, and even a sizable amount transported by the air.

Increases in nutrients cause rising rates of productivity, chiefly in the form of explosive growths or "blooms" of algae. Decay of this algae can result in decreased oxygen levels in the deeper, colder layers of large lakes, killing fish. Steps which can be taken to reverse the eutrophication process involve reducing the level of nutrients entering water bodies through treatment of wastewater and reduction of runoff. Although the fraction of phosphate that phosphate laundry detergents contribute to most lakes and streams is small, some areas also ban them.

Related Terms: *Detergent, Phosphates*

F

FABRIC BRIGHTENING AGENT *(See BRIGHTENER OR BRIGHTENING AGENT, FLUORESCENT WHITENING AGENT)*

FABRIC SOFTENER

A laundry additive that gives fabrics a soft feel and smooth surface,

reduces static electricity and wrinkling, and makes ironing easier.

Most fabric softeners are designed for addition to the rinse or drying cycles, but a few are available for the wash. Wash- and rinse-added types are liquids; dryer-added fabric softeners come as sprays, impregnated tear-off sheets, and impregnated foam (porous) sheets, or as a slow dispensing solid bar that attaches to the fin of a dryer. The softening agents most commonly used are cationic quaternary ammonium compounds. Bluing is frequently included, as well as fragrance. Infrequently, antimicrobial ingredients or fluorescent whitening agents are added.

Fabric softening ingredients also are incorporated in some laundry detergent products.

Related Terms: *Laundry Aid, Quaternary Ammonium Compounds*

FATS AND OILS

A general term that refers to lipid (fatty) materials of animal, vegetable, or marine origin.

Tallow, coconut oil, palm kernel oil, palm oil, and other fatty materials used to make soap are of the triglyceride class of lipids. Triglycerides consist primarily of glyceryl esters of fatty acids formed by the reaction of one molecule of glycerol and three molecules of fatty acids. Some other classes of fats and oils that are not triglycerides are also important commercially.

No real chemical distinction exists to support the concept that oil is a liquid and that fat is a solidified oil because reversible changes in physical state can occur due to temperature variations. According to accepted usage, triglycerides of animal origin are usually termed fats, and those from vegetable sources, oils.

Related Terms: *Fatty Acids, Glycerin, Soap*

FATTY ACIDS

The principal components in the molecular structure of natural fats, vegetable oils, fish oils, waxes, rosin, and essential oils, where they are bound chemically with glycerin; this combination is termed a glyceride.

Of primary interest in soap making are the fatty acids obtained from tallow and coconut oil, and to a lesser extent, palm, palm kernel, soybean, corn, and cottonseed oils. Fats and oils can be made either directly into soap by boiling with an alkali, or by a two-step process in which the fat or oil is first split into fatty acids and glycerin, followed by neutraliza-

tion of the fatty acid by an alkali to produce soap. The soap thus made is usually a sodium or potassium salt of the fatty acid. When a soap-based product contains uncombined fatty acids, it is termed "superfatted." Fatty acids can also be made synthetically from petroleum-derived chemicals and then used in making soap, which can perform as a builder in detergents.

Related Terms: *Emollient, Fats and Oils, Soap, Superfatted*

FATTY ALCOHOL

Primary alcohols from C_6 to C_{22}, usually straight-chain, which is the type used by the detergent industry.

Modern detergents were initially based on surfactants made from fatty alcohol raw materials. These include natural fats, oils, and waxes, and more recently high molecular weight alcohols have been produced synthetically from various hydrocarbon sources.

Detergent alcohols may be converted to various surfactants, such as sulfates, commonly used in hair and carpet shampoos; ethoxylates, used in laundry and other household detergents and in institutional and commercial cleaning and processing applications; ethoxy sulfates, used in light duty liquid detergents; and alcohol-based phosphate esters, used in a variety of more specialized applications.

Related Terms: *Alcohol, Detergent, Surface Active Agent*

FILMING

The development of a thin covering or coating.

In automatic dishwashing, filming usually refers to a deposit of mineral salts. It generally occurs when the water is high in hardness salts or total solids, and is most noticeable on clear glassware. Filming can also be a result of incompletely removed soil, especially protein or fat residues. The result may range from a thin transparent film to an opaque coating, and can usually be removed by increasing the amount of detergent or by using a vinegar rinse. These approaches will not work if a surface is opaque because of etching.

Related Terms: *Etching*

FLAKES

A form of soap for laundering characterized by ready solubility and sudsing.

One way to make soap flakes is by squeezing warm fluid soaps through two steel rollers, one of which is chilled internally. A thin film of soap adheres to the chilled roll, which is then scraped off as a sheet and cut into ribbons. These ribbons are dried by hot air and then broken or cut into flake size. A more complex process starts with dry soap in granule form, which then goes through a milling operation similar to that used for making milled toilet soaps. The soap is passed through a series of rolls (mills), which apply a squeezing and kneading action. The thin sheet that emerges from the last roll is cut into ribbons and then flakes.

Related Terms: *Granules, Milled Soap, Soap*

FLOOR CARE PRODUCT

A particularly specialized product because flooring materials come in so many types, both hard and resilient.

Each type of flooring requires a specially formulated product for maximum effectiveness in removing soil, polishing the surface, and leaving it with a shine and protective coat.

Most floor care products contain water as the carrier for small particles of wax and/or polymer such as polyethylene and polyacrylate. When dry, they leave a shine and protective film. In products for wood or cork flooring, a solvent is the carrier for wax particles such as those of natural Carnauba wax.

Lightly soiled wood floors can be cleaned with furniture dusting aids, which can be sprayed on mop or floor, depending on package directions. These can also help remove both oily and water-borne stains.

Products that only clean are closely related in composition to all purpose cleaners. Special emphasis in products for resilient flooring is on clear drying without leaving a cloudy or sticky residue. Most resilient floor cleaners also contain a low level of surfactant to loosen and suspend soil.

With continued use, most floor polishes build up residue that eventually needs to be stripped off with specially formulated strippers. True one-step products are designed to be self-stripping so that a new application dissolves the old polish and re-applies a fresh coat.

There are other products, which do not clean but are used solely for imparting gloss. These are clear emulsions of acrylic polymers, which dry to a hard shiny finish. Some products may also contain wax particles. Liquid or paste wax is still the principal gloss-producing ingredient for

wood flooring products.

Related Terms: *Specialty Cleaning Products*

FLUORESCENT WHITENING AGENT (FWA)

A chemical compound that creates a visual whitening or brightening effect when exposed to near ultraviolet radiation by virtue of fluorescence, i.e. the conversion of invisible ultraviolet light into visible blue light.

The fluorescent whitening agents used by the detergent industry share the further characteristic of adsorbing to fabrics during household laundering. The whiteness or brightness of the laundry is thus enhanced. FWA is included in all purpose soap and detergent and some light duty and laundry aid products. Its effectiveness varies with type of fabric and concentration in the wash water, which is always very low. Its effect is cumulative to a degree, so that new fabrics exhibit increased fluorescence over a period of washes. Eventually, however, a leveling-off point is reached.

In recent years an increasing number of fabrics have been prebrightened in manufacture, i.e., have incorporated FWAs, especially the acrylic and polyester fabrics.

Related Terms: *Bluing, Brightener, Optical Brightener*

FOAM

"A mass of bubbles formed on liquids by agitation." (American Society for Testing and Materials definition)

In the context of soaps and detergents, foam is synonymous with suds.

Related Terms: *Lather, Suds, Sudsing*

FORMULA STABILIZING AGENT

An ingredient used to provide product stability or desirable physical properties without necessarily adding to performance.

A number of formula stabilizing ingredients are used in detergents. The most common is sodium sulfate. This is present in most detergent granules, partly because it is formed in processing, but also because it improves physical qualities and standardizes density. Ethyl alcohol serves as a stabilizing agent in liquid detergent formulas by controlling viscosity, improving solubility of solid ingredients, and providing anti-

freeze properties. Phosphoric acid is used in small quantities for adjustment of finished product pH. Sodium silicate gives granules crispness in addition to its other contributions as a detergent ingredient.

Related Terms: *Alcohol, Chloride Salt, Phosphoric Acid, Sodium Silicate, Sodium Sulfate*

FRAGRANCE MATERIALS

Ingredients added to washing and cleaning products to produce a pleasant or distinctive aroma.

Fragrance materials are used in all types of soaps and detergents. The basic objective is to produce a fragrance in keeping with the character of the product and to mask unpleasant washwater odors, or at lower levels to mask chemical odors. In some cases fragrances are also formulated to leave a lingering scent on the skin after bathing or on fabrics after laundering. Scents for soaps and detergents are based on synthetic and naturally occurring materials. There are more than 4,000 compounds used in perfumery. One perfume/fragrance may contain a few to hundreds of compounds.

FURNITURE CLEANER/POLISH

A liquid, paste, or aerosol spray designed to remove dust and stains from wood surfaces, confer shine and protection against water spots, and formulated to reduce wax buildup with continued use.

Principal ingredients that contribute shine and water repellency are silicone fluids and a wax, often a so-called microcrystalline wax. Lemon oil (a non-drying oil) and tung oil (a drying oil) are also used for this purpose, both in products without water. Silicone fluids in addition provide easy application and reduce smearing during application. A hydrocarbon solvent helps remove oily stains and some wax buildup.

Furniture cleaners/polishes can be formulated as water-in-oil or oil-in-water emulsions. An emulsion stabilizer is present in both to prevent separation into two layers. Fragrance and color round out the formulation.

Related Terms: *Specialty Cleaning Products*

FWA *(See FLUORESCENT WHITENING AGENT)*

G

GERMICIDE

Any material that kills germs.

The term germicide is essentially synonymous with bactericide, but it may be somewhat broader in the range of its coverage, and somewhat less precise. Most soap or detergent products that contain a germicide make sanitizing/disinfecting claims.

Related Terms: *Antimicrobial, Bactericide, Disinfectant*

GLASS CLEANER

A specialty cleaning product.

Clear liquid glass cleaners are packaged in bottles with finger pumps or trigger sprays or in aerosol containers. The products contain surfactants to loosen soil, solvents to dissolve oily soils, water as the medium that carries surfactants and solvents, colorants, and fragrance. Mild alkalies such as ammonia, a cleaning booster, are present in some products. A small amount of builder may also be present.

Opaque creamy glass cleaners contain surfactants and solvents, and also colloidal clays and silica that absorb soil and dry after spreading. In addition to picking up soil, any residual dried solid also signals the areas that need to be wiped.

Related Terms: *Detergent, Silica, Specialty Cleaning Products, Surface Active Agent*

GLYCERIN

A purified commercial product containing 95% or more glycerol, a trihydric alcohol with a sweet taste and syrupy consistency. The "glycerine" spelling while technically incorrect has come into widespread general and commercial use.

Glycerol is present in all animal and vegetable fats and oils, most usually as a triglyceride, a product of naturally occurring chemical reactions with fatty acids. Glycerin may be produced from fats and oils by saponification, hydrolysis, or transesterification or it may be synthesized from propylene.

Glycerin is closely associated with soap making, being obtained as a by-product when the fatty acids in fats and oils used as a soap base react with an alkali to make soap.

Usually glycerin is separated from soap because it is an important material in its own right, finding application in many industries. It is a key ingredient in transparent bar soap and remains in bar soaps made by the "cold process" simply because the soap is made without removing glycerin.

Related Terms: *Alkyl Glyceryl Sulfonate, Fatty Acids, Soap*

GLYCEROL *(See GLYCERIN)*

GRANULES

Small particles or grains, as in granulated sugar; either hollow blown or ordinary powders.

An important industry development was the adaptation of the spray-drying process to soap and detergent manufacturing. This provided the means of producing high quality granular finished products, which dissolve readily in use. In spray drying, hot liquid soap or detergent is pumped into a tall tower, where it is sprayed as a fine mist. As the mist falls it is dried by hot air and falls to the bottom as granules. Particle size, degree of puffing, and density of finished product can be varied by changing conditions of operation.

Related Terms: *Flakes, Powder*

H

HAND CLEANSER

A product designed primarily for cleaning the hands, usually with emphasis on removing oils, grease, and other occupational soils.

Industrial hand cleansing products, which are available in bar, paste, liquid, or powder forms, are most frequently soap based. The powders also contain scrubbers of vegetable origin, and/or borax. The bar forms may contain soap or a soap/detergent blend, with or without scrubbers. Pastes contain soap with scrubbers, and the waterless forms are usually oil-in-water emulsions. Some industrial liquids or lotions also contain polyethylene or mineral scrubbers. Hand scrubbing soap, grit soap, and mechanic's hand soap are names for some of the products included within the category of industrial hand cleansers.

Skin care products for institutional use (e.g. hospitals, hotels, schools,

and health care) are, like consumer liquid hand cleansers, formulated for lighter duty and may be soaps, detergents, or soap/detergent blends. They are available in liquid or lotion, powder, and bar form. Some liquid cleansing products for hospital and health care use contain an antimicrobial. Unless designed for special uses such as on acne, the bar forms are made without scrubbers. Powdered forms do not contain organic scrubbers but may contain borax.

Related Terms: *Abrasive, Liquid Hand Soap/Detergent, Waterless Hand Cleaner*

HAND DISHWASHING DETERGENT *(See LIGHT DUTY DETERGENT)*

HARD SURFACE CLEANER

A product formulated for cleaning painted surfaces, washable floor coverings, plastics, metals, porcelain, and other surfaces.

Hard surface cleaners come in a variety of physical forms and formulas. There are powders that must be dissolved before use, liquids that can be diluted or used full strength, and liquids with mechanical pump dispensers or in aerosol containers.

The powders generally depend on builders to enhance cleaning and reduce filming and streaking. The liquid detergent formulations are highly individualized. They all have a soap or detergent surfactant base, and, generally, water-softening ingredients (such as EDTA and potassium pyrophosphate) and alkaline builders, such as sodium carbonate. Petroleum distillates and pine oil may be included for grease and oil cutting. Those products designed to deodorize/disinfect as well as clean normally contain pine oil, quaternary ammonia, or phenol disinfectants.

Related Terms: *Alkalinity, Disinfectant*

HARD WATER *(See WATER HARDNESS)*

HEAVY DUTY DETERGENT OR SOAP

A term that describes products designed for doing the total family laundry, including heavily soiled items. They may usually be used for general household cleaning tasks as well.

Related Terms: *All Purpose Detergent, All Purpose Soap, Built Detergent, Built Soap, Laundry Detergent*

HOUSEHOLD CLEANER *(See HARD SURFACE CLEANER)*

HYDROPHILIC

Water loving; defined by the American Society for Testing and Materials as "a descriptive term applied to the group or radical of a surfactant molecule that makes or tends to make it soluble in water."

Associated with the hydrophilic portion of a surfactant molecule is the opposite hydrophobic (water-hating) portion. The special capabilities of surfactants in loosening dirt are a direct consequence of these incompatible component parts, which have opposite attractions toward dirt and toward water.

Related Terms: *Surface Active Agent*

HYDROPHOBIC *(See HYDROPHILIC)*

HYDROTROPE

A substance that increases the solubility in water of another material, which is only partially soluble.

The most common materials are ammonium, potassium or sodium salts of toluene, xylene, or cumene sulfonates. They are used to solubilize the active ingredients in some liquid detergents.

Related Terms: *Alkylaryl Sulfonate, Detergent, Liquid Detergent*

HYPOCHLORITE

In its sodium salt form, the active bleaching ingredient in liquid chlorine bleach.

Related Terms: *Chlorine Bleach, Liquid Chlorine Bleach*

L

LAS *(See LINEAR ALKYLATE SULFONATE)*

LATHER

A foam or froth consisting of very small bubbles formed when soap or detergent is agitated with or in water.

While the mechanics of lathering and sudsing are the same, the term sudsing covers the whole range of suds formation from very low to

voluminous, from small to large bubbles. Lathering commonly refers to only close-knit, small bubbles and lower volume suds. Lathering, or lather, is primarily associated with the use of bar soap and shaving cream.

Related Terms: *Foam, Suds, Sudsing*

LAUNDERING

The process of cleaning and refurbishing fabrics, which includes sorting, washing with an aqueous solution of laundry product(s), rinsing, water extraction, and drying.

Laundering may be done by hand or by machine. The washing step entails mechanical or manual action in the soap or detergent solution to loosen and remove soil from the fabric.

It may also include stain removal, soaking, and other pretreatment steps, as well as bleaching, fabric softening, starching, and ironing.

Related Terms: *Bleaching, Bleach, Booster, Borax, Detergent, Disinfectant, Fabric Softener, Laundry Detergent, Laundry Aid, Laundry Soap Bar, Presoak, Presoak Products, Pretreatment, Prewash, Prewash Laundry Soil and Stain Removers, Soap, Spotting, Starch, Sudsing.*

LAUNDRY ADDITIVE *(See LAUNDRY AID)*

LAUNDRY AID

A product that contributes to the effectiveness of laundry detergents and/or provides specialized performance.

Related Terms: *Bleach, Bluing, Booster, Color Remover, Disinfectant, Fabric Softener, Presoak Products, Prewash Laundry Soil and Stain Removers, Starch, Sizing, Washing Soda, Water Softener*

LAUNDRY DETERGENT

A product containing a surfactant and other ingredients, formulated to clean and care for the many different fabrics in the family wash.

Next to the surfactant, a builder is an important ingredient in formulated laundry detergents. Builders have a number of functions, principally inactivation of water hardness, which interferes with good cleaning. Built detergent types include granules and liquids. Some liquid detergents are unbuilt, containing surfactants that are relatively insensitive to water hardness.

Other customary ingredients of laundry detergents include antiredeposition agents, corrosion inhibitors, fluorescent whitening agents, colorants, fragrance, and processing aids. Optional ingredients include suds control agents, bleach, borax, enzymes, bluing, fabric softener, and soil release agent.

Some laundry detergents are denser or more concentrated than others. Density or concentration influences the amount of product recommended for the wash. Detergents also vary in sudsing characteristics, ranging from high to low suds levels. Different suds levels are provided for reasons of compatibility with washer design and to satisfy consumer preferences.

Depending on the presence of other ingredients in the laundry detergent formulation, some products offer special benefits in addition to the expected cleaning. Thus, certain laundry detergents are especially effective at lower washing temperatures; others provide additional fabric care benefits, such as softening, static control, and wrinkle reduction.

Related Terms: *All Purpose Detergent, Built Detergent*

LAUNDRY DETERGENT BOOSTER *(See BOOSTER)*

LAUNDRY SOAP BAR

Heavy duty or built soap in bar form.

The fat base of a laundry soap bar is usually tallow, with rosin added for quicker solubility. Borax and builders, such as sodium silicate and sodium carbonate, are added to improve performance and help soften hard water. Laundry soap bars were first displaced by more convenient chip and granule forms. Today, these have been largely supplanted by laundry detergents. Laundry soap bars are used for pretreating heavily soiled and stained items before machine washing or for hand washing hosiery or lingerie.

Related Terms: *Heavy Duty Soap, Soap, Tallow Soap*

LAUNDRY SOUR

Various acid compounds are used in institutional laundries to condition the load of fabrics being washed to a desirable degree of acidity, important to finishing operations that follow.

Souring neutralizes alkaline salts remaining in fabrics and in the water held by cloth after washing and rinsing cycles are completed. Residual

alkali can cause fabric yellowing, some degree of dye color changing, and sometimes skin irritation. Sours may also help kill some types of bacteria and/or remove certain stains.

Laundry sours come in both powdered and liquid forms.

Related Terms: *Acid, Alkalinity*

LIGHT DUTY DETERGENT

An unbuilt, or infrequently low-level-built, detergent-based washing product designed for light cleaning tasks, especially hand dishwashing.

While not made for general laundering, it does find use in hand washing lightly soiled, delicate garments, and in household cleaning tasks where ability to handle heavy soil is not required.

Originally introduced as granules, today's light duty detergents are usually liquids. Emphasis in formulation is on hand dishwashing, which places a premium on a product's ability to handle all food soils, its mildness to hands, plentiful long-lasting suds, and rinsing that leaves surfaces free of film and spots. Light duty detergents are based principally on anionic surfactants, which are generally high sudsing, but they may also contain some nonionic surfactants. Other commonly used ingredients are ethyl alcohol, suds boosters and stabilizers such as acyl or fatty acid ethanolamides, opacifying and/or colorant agents, and fragrance.

Related Terms: *Amine Oxide, Unbuilt Detergent*

LIGHT DUTY SOAP

A soap containing little or no builder, designed for the care of baby clothes and fine fabrics, and hand dishwashing.

Light duty soaps may contain FWA and fragrance, and can be made in flake, granular, and bar form.

Related Terms: *Unbuilt Soap*

LIME SOAP

The insoluble salt formed by the interaction of soaps and fatty acids with the minerals in hard water; it is commonly referred to as soap curd.

The use of the word lime in this term may come from the fact that limestone areas generally foster hard water, or from the fact that the words lime and calcium are closely associated. Calcium and magnesium fatty acid salts are very insoluble and precipitate immediately on forma-

tion. Since they tend to agglomerate (cluster together), they form curd-like masses. They also tend to adhere to surfaces, thus causing filming or deposits, such as bathtub ring. The problems lime soap causes spurred the development of mechanical water softeners, packaged water softeners, and the technology leading to new surfactants and builders and detergent products based on them.

Related Terms: *Soap Curd, Water Conditioner, Water Hardness, Water Softener*

LINEAR ALKYLATE SULFONATE (LAS)

Readily biodegradable form of alkylbenzene sulfonate surfactant.

This is the workhorse of the detergent industry, with sodium dodecylbenzene sulfonate being the most important single type. It is distinguished from an earlier form of alkylbenzene sulfonate, termed ABS, by its linear (straight chain) structure, which provides its good biodegradation properties. All LAS surfactants are anionic and high sudsing, but their sudsing may be controlled by formulation.

Related Terms: *ABS, Alkylbenzene Sulfonate*

LIQUID CHLORINE BLEACH

A solution of sodium hypochlorite, a highly active oxidizing agent.

Liquid chlorine bleach is also called household bleach or simply liquid bleach, and is commonly distributed as an approximately 5% solution of sodium hypochlorite.

Related Terms: *Bleach, Chlorine Bleach, Hypochlorite*

LIQUID DETERGENT

Liquid detergents may be formulated as heavy duty laundry detergents, light duty detergents, or hard surface cleaners.

Heavy duty liquid laundry detergents are manufactured with or without a builder. Liquid detergents that do not contain a builder generally contain a high percentage of surfactant. Some of these detergents contain nonionic surfactants, and some contain a combination of anionic and nonionic surfactants. Currently the builders in liquid products are sodium citrate and soap (fatty acid salts). Other ingredients include fluorescent whitening agents, possibly a corrosion inhibitor, an anti-redeposition agent, enzymes, fabric softener, and fragrance.

Light duty liquid products are used for laundering lightly soiled items

or for hand dishwashing. They are not suitable for machine washing because of their high sudsing characteristics. The surfactant, which is their most important ingredient, is often a mixed anionic/nonionic system. Most of the products do not contain a builder.

Liquid hard surface cleaners use a moderate amount of surfactant, generally both anionic and nonionic. Solvent materials such as various alcohols, pine oil, or naphtha are used to handle oily or greasy soils. Builders are used at a moderate or low level depending on the product. Some of the products may contain a disinfectant.

Related Terms: *Alcohol, Alcohol Ethoxylate, Alkyl Glyceryl Sulfonate, Built Detergent, Detergent, Hard Surface Cleaner, Laundry Detergent, Light Duty Detergent, Opacifier, Sodium Citrate, Surface Active Agent, Unbuilt Detergent*

LIQUID HAND SOAP/DETERGENT

A liquid soap, detergent, or soap/detergent blend.

It is designed for consumer personal use and sold in dispensers. Many formulas are used. In general, the soaps contain, as additional ingredients, water, fragrance, color, and preservative. Detergent varieties contain surfactant, water, fragrance, preservative, and color. Some lotion formulas contain various emollients. Some liquid cleansing products for institutional use contain an antimicrobial.

Related Terms: *Antimicrobial, Detergent, Soap*

LYE

Potassium hydroxide, sodium hydroxide.

Related Terms: *Alkali, Caustic, Saponification, Soap*

M

MAGNESIUM SOAP

The magnesium salt of the fatty acid portion of soap.

Magnesium soap is part of the insoluble lime soap curd formed when soap is used in water in which magnesium is one of the hardness minerals. It thus contributes to the problems inherent in using soap in hard water. Paradoxically, magnesium soap is useful as a processing aid in making detergent-based beauty bars.

Related Terms: *Lime Soap, Soap Curd, Water Conditioner, Water Hardness*

MEDICATED SOAP

A toilet soap containing an antibacterial ingredient to help reduce or inhibit the growth of bacteria on the skin that might cause skin infection.

Related Terms: *Antimicrobial, Bactericide, Bacteriostat, Deodorant Bar, Toilet Soap*

METAL CLEANER/POLISH

A paste or thick opaque liquid, which may hold a fine abrasive in suspension.

Since surface impurities on most metals are more easily removed in an acidic medium, metal cleaning products contain acids, usually organic acids such as oxalic or citric. Because it is non-toxic, citric acid is preferred.

To aid in mechanical removal of tarnish and soil and to contribute to metallic luster, a very mild abrasive is present in metal cleaning products as a polishing/buffing agent. Clay-like materials such as kaopolite or finely divided hydrous silica are common mild abrasives used. Metal cleaning formulations may also contain surfactants, for ease in spreading the product and as an aid in soil removal. Some products also contain an antioxidant to protect cleaned metalware against rapid retarnishing.

Related Terms: *Specialty Cleaning Products*

MILLED SOAP

Soap processed by an operation in which soap chips or pellets are squeezed and kneaded by passing them through a series of heavy, closely-set rollers.

If the milled soap is to be made into bars, it is compressed into a hard continuous strip (usually oval or circular in cross section), cut into bar size, stamped, and wrapped. The milling operation provides the vehicle for incorporating uniformly into the finished soap fragrance, colorants, and whiteners, which would lose much of their effectiveness if they were added during the early processing stages when the soap is hot. Milling converts the soap to a form that provides the finished bar with an appropriate solution rate, ready lathering, and extra firmness. While milling is largely used for the production of toilet soaps, it is also

employed in making flake soaps.

Milled soaps are sometimes referred to as French-milled, since the method of manufacture was developed from the old French process of making toilet soaps. Another operation that incorporates fragrance, colorants, and whiteners uniformly into finished soap is refining, which is carried out by use of equipment called a refiner.

Related Terms: *Flakes, Soap, Toilet Soap*

N

NON-CHLORINE BLEACH

A laundry product containing peroxygen compounds, which release active oxygen in wash water. This type of product produces gentler bleaching (oxidizing) action than chlorine bleach.

The most frequently used non-chlorine bleach ingredient is sodium perborate (usually referred to simply as perborate). Potassium monopersulfate, sodium percarbonate, hydrogen peroxide, and organic peracids are used less frequently. Non-chlorine bleach can be used safely on most fabrics, colors, and fabric finishes.

Perborate is available in dry laundry bleach, and is also an ingredient in laundry detergent, presoak products, and cleanser. A solution of hydrogen peroxide is marketed as a liquid non-chlorine bleach.

Powdered non-chlorine bleaches also contain a builder, usually sodium carbonate, which provides additional alkalinity and allows the peroxygen compound to function more effectively as a bleach. Other ingredients such as surfactants, enzymes, brighteners, bluing agents, and fragrance may be incorporated in non-chlorine bleaches, depending on the formulation.

Water temperature affects the bleaching rate of non-chlorine bleach. Hot water accelerates the bleaching action. As water temperature decreases, bleaching time must be increased.

Related Terms: *All Fabric Bleach, Bleach, Chlorine Bleach, Oxygen Bleach, Perborate*

NONIONIC SURFACTANT

A surface active agent that contains neither positively nor negatively

charged (ionic) functional groups; such surfactants have been found to be particularly effective in removing oily soil.

In contrast to anionic and cationic surfactants, nonionic surfactants do not ionize in solution. Some nonionics are low sudsing and are found in low sudsing laundry detergents, prewash stain removers, hard surface cleaners, and machine dishwashing detergents. Commonly used types include ethoxylated alcohols.

Related Terms: *Anionic Surfactant, Cationic Surfactant, Surface Active Agent*

NTA (SODIUM NITRILOTRIACETATE)

The sodium salt of nitrilotriacetic acid (NTA), and the form actually used in detergents.

Sodium nitrilotriacetate is an effective chelating agent and is also readily biodegradable. These properties, plus the fact that it can be included in detergent granules, make NTA a useful adjunct to the complex phosphates as a detergent builder. It is used in built detergents in Canada and in limited areas and in some industrial and institutional products in the United States.

Related Terms: *Builder, Chelating Agent*

O

OPACIFIER

A constituent or additive that renders the system of which it is a part impervious to light rays.

Opacifiers are sometimes used in liquid detergents to produce an esthetic or special effect. Such opacifying compounds are of large molecular structure and are water insoluble, but lend themselves to forming a stable colloidal dispersion. Titanium dioxide, a pigment, is widely used in milled soaps for opacification, or to reduce translucence, and may be used alone to make the bar white or, when dyes are added, to produce a desired color.

OPTICAL BRIGHTENER

An alternate name for fluorescent whitening agent (FWA).

OVEN CLEANER

Usually a liquid in an aerosol container or pump-actuated bottle.

In most oven cleaners designed to work in a cold oven, soil removal calls for strong chemicals. A strong alkali like sodium hydroxide is the principal agent in such products.

Another type uses a combination of special weakly alkaline salts, which are heat activated to remove soil. Surfactant is also present to help penetrate soil and wet the oven surface.

Liquid products are formulated to be as thick as possible to promote clinging to vertical oven surfaces.

A novel form recently developed is a pad of synthetic abrasive, which contains a reservoir holding sodium or potassium hydroxide and surfactant. Before use, the reservoir is punctured, releasing the formulation, which can be spread over oven surfaces, where it reacts with the soil and is then rinsed off.

Related Terms: *Specialty Cleaning Products*

OXYGEN BLEACH *(See NON-CHLORINE BLEACH)*

P

PERBORATE *(See NON-CHLORINE BLEACH)*

pH

A chemical symbol expressing the degree of acidity or alkalinity of a solution.

The pH scale runs from 0 to 14, with 7 indicating neutrality. The numbers increase as alkalinity increases and decrease as acidity rises. See ALKALINITY for the relationship to cleanliness products.

PHENOLIC COMPOUNDS *(See DISINFECTANT)*

PHOSPHATES

Salts of the various phosphoric acids.

The complex phosphates are a group of sequestering agents widely used in detergent formulations because of their superiority in water softening, sequestering, and other builder functions. Complex phosphates soften water by sequestration. Orthophosphates, another form of

phosphate, soften water by precipitation. The most important phosphates are the following:

Sodium tripolyphosphate was the original builder upon which modern laundry detergent technology developed, and is used in laundry granules, automatic dishwasher detergents, and cleansers. It is adaptable to the spray drying process by which granules are made.

Tetrasodium pyrophosphate is also used in detergent granules, but since it does not rank as high in overall performance as sodium tripolyphosphate, its application is more limited. Tetrapotassium pyrophosphate is used in many liquid detergent products because of its high solubility. It is also used in industrial and institutional cleaners and to a limited extent in hard surface cleaners.

Sodium hexametaphosphate is widely used as a water softener industrially and as a household laundry additive. Trisodium phosphate (an orthophosphate) is used primarily in powdered cleansers as a source of alkalinity.

Related Terms: *Alkalinity, Builder, Precipitating Builder, Sequestering Agent, Water Softener*

PHOSPHORIC ACID

The most common of the acids based on phosphorus; also called orthophosphoric acid.

Phosphoric acid is used in very small amounts for final adjustment of pH in some light duty liquid detergent processing. It does not remain in the acid form in the finished product, as it is converted to a phosphate salt in the process of adjusting pH to a nearly neutral level. In this application, phosphoric acid is both a processing aid and a formula stabilizing agent.

PINE OIL

The oil obtained by steam distillation and subsequent processing of gum taken from pine trees, or recovered as a by-product of paper pulp-making by the sulfate process.

Pine oil's principal application in household cleaning is in liquid hard surface cleaners, where it is a popular ingredient because of its characteristic aroma and its sanitizing/disinfecting properties.

Related Terms: *Disinfectant, Fragrance Materials, Hard Surface Cleaner, Pine Oil Cleaner*

PINE OIL CLEANER

A liquid hard surface cleaner, characterized by a soap or detergent base and pine oil among the major ingredients.

The pine oil provides solvent action for oil and fatty soils, paints and tars; sanitizing/disinfecting properties; and fragrance. The soap or detergent supplies the basic cleaning power.

Related Terms: *Hard Surface Cleaner, Pine Oil*

POWDER

A physical form of soap or detergent.

Powders differ in size, density, and form as a result of their method of manufacture, e.g. spray drying, dry blending, and agglomeration.

Related Terms: *Granules*

PRECIPITATING BUILDER

A chemical that softens water by converting hardness minerals to an insoluble form in contrast to softening by sequestration, i.e., without precipitation.

A common precipitating water softener is sodium carbonate; trisodium phosphate is used less frequently. These chemicals soften or inactivate hardness salts by removing mainly calcium as insoluble compounds.

Related Terms: *Builder, Calcium Carbonate, Sequestering Agent, Sodium Carbonate, Trisodium Phosphate, Water Softener*

PRESERVATIVE

A substance that protects against the natural effects of aging, such as decay, discoloration, oxidation, and bacterial degradation.

In soap products, preservatives are used to forestall and slow down the natural tendency to develop rancidity upon aging. In doing this, preservatives also protect color and fragrance. Butylated hydroxytoluene and stannic chloride are commonly used. Also used are small amounts of EDTA.

Related Terms: *Antimicrobial, Bactericide, Bacteriostat, Butylated Hydroxytoluene, Chelating Agent, Ethylene Diamine Tetraacetic Acid, Toilet Soap*

PRESOAK

A soaking operation that precedes the regular laundering process.

Presoaking is generally employed for laundry that presents unusual problems in regard to stains or soil level, or when extra cleaning action is considered advisable, e.g., for diapers and baby clothes. Soak water should be warm or cool depending on the type of stain. Length of soaking is determined by the job to be done; usually a minimum of thirty minutes is needed to produce major benefits. Prolonged soaking (more than overnight) is not recommended.

Some automatic washers provide presoak cycles, with a brief period of agitation, a soak period, and a spin out. The exact nature of the cycle varies with make and model. For automatic washers that do not provide a presoak cycle, the dial can be manipulated by hand. Whatever the means employed, presoaking should be followed by wringing or spinning (or at least by emptying the soak water), and then by a regular wash with laundry soap or detergent.

Related Terms: *Presoak Products*

PRESOAK PRODUCTS

Products designed primarily for soaking stained or heavily soiled articles prior to regular laundering; they are also used in the washwater along with detergent.

The special contribution of a major group of presoak products is the stain removal and soil loosening action of their enzymes. Two enzyme types, amylase and protease, are used on a broad spectrum of stains. Also included to augment the enzyme action are builders and surfactants, plus optional ingredients such as fragrance, bluing, colorant, and sodium perborate. Builder ingredients may include sodium tripolyphosphate, if permitted by law, and frequently sodium silicate and sodium carbonate. Less frequently used, mostly in non-phosphate formulations, are sodium bicarbonate and sodium citrate.

Enzymes require time to do their work. When a half hour, or more for very difficult tasks, can be allotted, the presoak operation makes full use of enzymatic activity. Enzymes are deactivated by chlorine bleach, so enzyme presoaks and chlorine bleach should not be used together.

Another presoak group, used for diaper soaking, usually contains enzymes and has borax as a basic ingredient. *(continued)*

Related Terms: *Amylase, Borax, Diaper Soaking Product, Enzymes, Prewash, Protease*

PRETREATMENT

Procedures that may be used prior to laundering or dishwashing to handle special or unusual problems, such as spots, stains, or heavy soil that are unlikely to be removed by washing alone.

Laundry pretreatment procedures in common use include:

Soaking (presoaking)—Especially helpful for general problems of heavy soil and stains. Special presoak products are useful for treating generalized staining, while regular laundry detergent is helpful in cases of heavy soil.

Direct Application (for soil lines)—Soil lines, as on shirt collars, and small stained areas can be pretreated by dampening the soiled area and rubbing in a paste of detergent granules, bar soap, liquid detergent, or laundry additive.

Special Treatment (for difficult stains)—The precise method and product for removing difficult stains vary with the kind of stain. Stain-removal charts are widely available. Also available are prewash soil and stain removers, special laundry products that come in aerosol, liquid, and solid stick form. The products containing solvent are useful for treating oily and greasy stains, for which permanent press and synthetic fiber fabrics have an affinity.

In dishwashing, pretreatment usually refers to anything done prior to the normal washing process. This includes scraping, rinsing, and soaking.

Related Terms: *Presoak Products, Prewash Laundry Soil and Stain Removers, Spotting*

PREWASH

A short wash preceding the regular machine wash cycle, usually employed for loads with heavy particulate soil or when special cleaning is desired as in washing diapers.

Regular laundry detergent should be used in the prewash and in the full wash period that follows. Some automatic washers provide a prewash cycle followed by spinning to extract the soiled water.

Related Terms: *Presoak*

PREWASH LAUNDRY SOIL AND STAIN REMOVERS

Special laundry products used to treat stains and heavy soils.

Available in aerosol, liquid, and solid stick forms, they alter soils and stains held to fibers, enabling their release in the laundry. They contain surfactants (which serve as emulsifying, dispersing, wetting agents), solvent (which aids the surfactant in penetrating the surface of the soil), and stabilizers (which keep the surfactant and solvent from separating). Corrosion inhibitors are used in aerosol products to protect the metal containers.

Prewash soil and stain removers are applied to soiled or stained portions of fabric before washing with a laundry detergent.

Related Terms: *Laundry Aid, Pretreatment*

PRILLING

A process for converting a dry material into granular form by first melting the material or component of it, then forcing it through nozzles, and finally cooling the extruded material in air to form granules.

Usually prilling is used to produce a more desirable physical form in keeping with the character of the finished product in which the prilled compound is to be an ingredient. A dry dusty material, for example, can be converted by prilling into a non-dusty product. The material to be prilled must lend itself to the prilling process, i.e., it must contain a component that melts at reasonably low temperatures without losing desirable properties of any of the components.

Prilling is used in preparing enzymes for inclusion in powdered laundry detergents and in some pretreatment products. In this case, the ingredients are mixed with a material, which has a low melting point and is water soluble, e.g., one of the polyethylene glycols.

Related Terms: *Granules*

PROCESSING AIDS

Agents used in the manufacture of detergents to prevent caking, to promote flow properties, and to standardize product density.

Processing aids include magnesium silicate, sodium silicate, sodium sulfate, clays, sodium xylenesulfonate, sodium toluenesulfonate, and absorbents.

PROTEASE

A group of enzymes that is effective in breaking down proteins into smaller, less complex molecules.

Protease is used in powdered and liquid laundry detergents and laundry boosters/presoak products. It may also be used with amylase (effective on carbohydrates) in laundry products to either remove or reduce to smaller units a broad spectrum of stains and soils for later removal in the wash.

Related Terms: *Amylase, Enzymes, Presoak Products*

PUMICE

Porous volcanic rock.

Pumice in a finely ground form is used as the abrasive in bar hand soap, and sometimes in paste and powder hand soaps.

Related Terms: *Abrasive, Hand Cleanser*

Q

QUALITY CONTROL AGENT

An ingredient used to produce or help maintain desirable physical and/or functional characteristics in finished products, while only indirectly contributing to product performance.

In liquid detergents ethyl alcohol serves to provide viscosity control and pourability; in granular detergents sodium silicate makes a crisper, more free-flowing product with greater resistance to caking in a moist atmosphere. Sodium sulfate can be used for density control of granules. BHT is a quality control agent in that it preserves the color and odor of soap from the deterioration caused by rancidity.

Related Terms: *BHT, Ethyl Alcohol, Sodium Silicate, Sodium Sulfate*

QUATERNARY AMMONIUM COMPOUNDS

Substances derived from the ammonium cation, NH_4^+, with one or more hydrogen atoms being replaced by organic groups, and for most purposes prepared as a salt (chloride, bromide, sulfate).

The nature of the organic groups determines the character and properties of any given quaternary ammonium compound. Some possess disinfecting and deodorizing capabilities and are used in hard surface

cleaners. If more than one of the organic groups are fatty in nature, the quaternary ammonium compound is usually water insoluble. Some of these compounds (such as ditallow dimethyl ammonium chloride) are used as the fabric softening and static control agent in rinse-added fabric softeners and detergent-containing fabric softener. If at least one of the organic groups is fatty in nature, the quaternary ammonium compound is a cationic surfactant.

Related Terms: *Cationic Surfactant, Disinfectant, Fabric Softener, Hard Surface Cleaner*

R

REDUCING AGENT (*See COLOR REMOVER*)

REDUCING BLEACH (*See COLOR REMOVER*)

RESERVE ALKALINITY (BUFFERING CAPACITY)

A measure of the buffering capacity (above pH 9.5) of alkaline cleaning products, expressed as the equivalent amount of sodium hydroxide, i.e. as grams of sodium hydroxide per 100 grams of product.

Reserve alkalinity, in combination with toxicity information, is used to assess the potential oral ingestion hazard and eye irritation effect of cleaning products.

Related Terms: *Alkali, Caustic, pH, Sodium Carbonate*

RINSE AGENT

A nonionic surfactant or wetting agent, which, when injected into the last rinse of a dishwasher cycle, lowers surface tension, thus improving draining of the water from the dishes and utensils.

Dishwasher rinse agents come in both a solid bar and liquid form, the liquid for use in dishwashers equipped with a rinse aid dispenser, the bar for machines without a dispenser. By improving draining of the last rinse, spotting and filming, caused by water solids that remain after drying, are minimized.

Related Terms: *Water Hardness*

ROSIN

The residue left after the steam distillation of crude oleo-resins exuded

by various species of pine trees.

The distillate is turpentine, from which pine oil is obtained. Rosin is also recovered as a by-product of pulp making by the sulfate process.

Rosin is a major ingredient in most bar laundry soaps, where it provides faster solubility.

Related Terms: *Laundry Soap Bar*

RUST REMOVER

A product that removes rust stains from fabrics, dishwashers, and other washable surfaces, such as bathrooms, kitchens, tea kettles, dishes and glassware, and wherever water comes in contact.

Most commonly, these materials are composed of reducing agents (such as sodium hydrosulfite) or acid products, and may be in liquid, powder, or gel form. During laundering, some rust removers may be used in the regular laundry cycle or for presoaking. They may also be useful for miscellaneous stain removal, such as removal of dyebleeding.

Rust removers made to remove rust, scale, and lime deposits from the inside of dishwashers are a combination of acids. Used periodically as needed, they are added at the beginning of the main wash cycle (no dishes or other cleanser present) and are allowed to remain through the balance of the cycles.

Related Terms: *Color Remover, Stripping Agent*

S

SANITIZER

An agent that reduces the number of bacterial contaminants to safe levels as determined by public health requirements.

The term sanitizing generally refers to inanimate objects (particularly food-related utensils, equipment, and surfaces) and implies providing a satisfactory condition of cleanliness in addition to a safe bacterial level. Thus, detergent sanitizers combine cleaning and sanitizing. The same kinds of compounds that provide disinfecting action in cleansers and hard surface cleaners also contribute sanitizing capability.

Related Terms: *Disinfectant, Hard Surface Cleaner*

SAPONIFICATION

The process of converting a fat into soap by treating it with an alkali.

This may be done by boiling fat and alkali in a kettle under controlled conditions. They react to form soap and glycerin. Modern methods make soap in continuous processes, either by treating fat with alkali or by first splitting the fat into fatty acids and glycerin by a process called hydrolysis. The fatty acids are purified by distillation and then mixed with the correct amount of alkali to convert them into soap.

Related Terms: *Fatty Acids, Glycerin, Soap*

SCOURING PAD

A hand-size pad that supplies the cleaning action of an abrasive and usually a cleaning composition.

In the most widely used types, a ball of fine steel wire contributes the scouring action. For chemical cleaning and as aid in polishing, the steel wool pad may be impregnated with a formulated mixture whose principal ingredient is soap. Particularly on metal surfaces, the combination of soap and metal pad is capable of providing effective cleaning and a pleasing shine.

On continued use, the soap composition in steel wool pads is exhausted and the pads begin to corrode. Some scouring pads are constructed of noncorroding materials such as a mesh of copper, stainless steel wire, or nylon, while others are manufactured with a plastic material in which small particles of abrasive are embedded. These pads are not coated with cleaning compositions and rely on mechanical action alone to provide cleaning.

Recently scouring pads consisting of a cellulose sponge with a polyurethane backing have been introduced. These pads tend to significantly reduce scratching of surfaces being cleaned.

Related Terms: *Abrasive, All Purpose Cleaning Product, Soap Pad*

SCOURING POWDER *(See CLEANSER)*

SEQUESTERING AGENT

"Any compound that, in aqueous solution, combines with a metallic ion to form a water-soluble combination in which the ion is substantially inactive." (American Society for Testing and Materials definition)

Complex phosphates are sequestrants, since they have the ability to inactivate the water hardness metals (calcium and magnesium) and iron and manganese without precipitation. Water softening without precipita-

tion, i.e., by sequestration, distinguishes the complex phosphates from compounds such as sodium carbonate and sodium orthophosphate, which soften by precipitation of the hardness metals.

Related Terms: *Chelating Agent, Phosphates, Precipitating Agent, Sodium Citrate, Water Softener*

SILICA

Silicon dioxide, occurring naturally as quartz, flint, sand, and in many other forms.

Finely ground silica is used as an abrasive ingredient in cleansers and soaps.

Related Terms: *Abrasive, Cleanser, Hand Cleanser*

SILICATE

A salt or ester derived from silicic acid.

The sodium silicate salts, which are available over a wide range of alkalinity and thus can be tailored to specific needs, find wide use in both soap and detergent formulations. They serve as builders at higher quantity levels in some detergent formulations, provide a source of buffered alkalinity, aid in keeping soil suspended in laundry washwater, and add crispness to detergent granules. Sodium silicate is used as a corrosion inhibitor in granular laundry detergent, automatic dishwasher detergent, and built soap, as well as in some liquid laundry detergents, to provide protection of washer and dishwasher metal parts. An additional function of silicate in dishwasher detergents is to provide protection for china patterns and metal utensils.

In soap and detergent nomenclature, "sodium silicate" is ordinarily referred to as "silicate."

Related Terms: *Builder, Corrosion Inhibitor, Sodium Metasilicate, Sodium Silicate*

SIZING

A product that supplies a coating, stiffening, or glaze.

Sizing is not normally a word that occurs in home laundry terminology, but when it does, it is synonymous with starch.

Related Terms: *Laundry Aid, Starch*

SOAP

"The product formed by the saponification or neutralization of fats, oils, waxes, rosins, or their acids with organic or inorganic bases." (American Society for Testing and Materials definition)

This definition of soap covers a wide range of compositions, but in the area of consumer products, soap usually means the sodium or potassium salt of animal fat or a combination of vegetable oil and animal fat. The principal fats and oils used are tallow and coconut oil. In common usage, the word soap is also employed generically to describe any washing product that is preponderantly soap or depends on soap for its primary function. Thus toilet and laundry bars, light duty flakes and granules, and all purpose built products are all termed soap, if soap is their base ingredient.

Soap performs its principal task, cleaning, by various mechanisms, including reducing surface tension (it is an anionic surfactant), loosening, dispersing and suspending particulate soil, emulsifying fatty and oily matter, and providing alkalinity. Soaps are mildly alkaline. The major drawback to soap, particularly in laundering, is that it forms insoluble lime soap (soap curd) with water hardness minerals, which is deposited on fabrics and in washing machines. It was this problem that spurred the development of detergents, which are relatively unaffected by hard water and as a result have largely replaced soap for laundry purposes.

Related Terms: *All Purpose Soap, Built Soap, Light Duty Soap, Saponification, Surface Active Agent, Toilet Soap*

SOAP CURD

The insoluble precipitate that forms when soap is used in hard water. Soap curd and lime soap are synonymous.

Related Terms: *Lime Soap, Water Hardness*

SOAP PAD *(See SCOURING PAD)*

SODA ASH

A common name for a commercial form of anhydrous (without water) sodium carbonate.

Related Terms: *Sodium Carbonate*

SODIUM ALUMINOSILICATE *(See ALUMINOSILICATE)*

SODIUM BICARBONATE

A mild alkali, commonly called baking soda.

Sodium bicarbonate is used in powdered hard surface cleaners and some presoak formulations to provide alkaline cleaning at a controlled level.

Related Terms: *Baking Soda, Sodium Carbonate*

SODIUM CARBONATE

A fairly strong alkaline salt occurring naturally as soda ash.

Sodium carbonate finds wide use as a builder in laundry detergents and as a source of alkalinity in powdered hard surface cleaners and presoak products. Sodium carbonate supplies alkaline cleaning power and also softens water by precipitating the hardness minerals out of solution. It is also called soda ash, and is available on the retail market in a hydrated crystalline form under the name "washing soda."

Related Terms: *Builder, Washing Soda, Water Softener*

SODIUM CARBOXYMETHYLCELLULOSE *(See CARBOXYMETHYLCELLULOSE)*

SODIUM CITRATE

The sodium salt of citric acid.

Sodium citrate sequesters hardness minerals and is used as a builder in some non-phosphate products. Its principal application is in liquid laundry detergents. It also is used in some presoak products.

Related Terms: *Builder, Citrate, Citric Acid, Sequestering Agent, Water Hardness, Water Softener*

SODIUM HYDROSULFITE *(See COLOR REMOVER)*

SODIUM METAPHOSPHATE

Any of several complex phosphates with excellent sequestering properties.

Related Terms: *Phosphates*

SODIUM METASILICATE

A highly alkaline form of sodium silicate.

Sodium metasilicate is used infrequently and sparingly in laundry

detergents, liquid hard surface cleaners, and in some automatic dishwasher detergents as a source of alkaline cleaning power.

Related Terms: *Sodium Silicate*

SODIUM NITRILOTRIACETATE *(See NTA)*

SODIUM SESQUICARBONATE

A moderately alkaline compound that is not a chemical entity but rather a crystalline combination of sodium bicarbonate and sodium carbonate in equal parts.

Sodium sesquicarbonate is used in hard surface cleaners as a means of moderating product alkalinity while still providing alkaline cleaning power.

SODIUM SILICATE

A sodium salt of silicic acid.

Related Terms: *Silicate*

SODIUM SULFATE

The sodium salt of sulfuric acid.

Sodium sulfate is present in most granular detergents, both as a result of its formation during processing of the surfactant, and in some cases because of the inclusion of additional amounts. Sodium sulfate improves the physical state of detergent granules by aiding pourability and by making the granules crisper. It also provides a means of adjusting density so that the finished product supplies the desired amount of surfactant, builders, and other active ingredients per unit of volume (such as a cup). Sodium sulfate is essentially a neutral compound, neither alkaline nor acidic. It is considered both a processing or manufacturing aid and a quality control agent.

Related Terms: *Formula Stabilizing Agent, Quality Control Agent*

SODIUM SULFITE

The sodium salt of sulfurous acid.

Sodium sulfite is a reducing agent, producing a reaction opposite to the oxidation supplied by chlorine bleaches. The color remover finds little use in the home as it is not generally available on the retail market. It is used in very small amounts in some liquid hard surface cleaners to

ward off ill effects of product oxidation, which might occur on long aging.

Related Terms: *Color Remover*

SODIUM THIOSULFATE (*See COLOR REMOVER*)

SODIUM TOLUENESULFONATE (*See ALKYLARYL SULFONATE*)

SODIUM TRIPHOSPHATE (*See SODIUM TRIPOLYPHOSPHATE*)

SODIUM TRIPOLYPHOSPHATE (STPP)

One of the complex phosphates.

Related Terms: *Phosphates*

SODIUM XYLENESULFONATE (*See ALKYLARYL SULFONATE*)

SOIL REDEPOSITION INHIBITOR

A product or ingredient that helps prevent soil that has been removed from a surface from redepositing on the surface.

Surfactant, complex phosphate, sodium carboxymethylcellulose, and other polymers are used in laundry detergent formulation as inhibitors of soil redeposition on fabrics being washed. They also enter into other related mechanisms of the washing process affecting redeposition, particularly deflocculation (breaking soil particles into small units), and dispersion of removed soil.

Related Terms: *Antiredeposition Agent, Dispersing Agent, Soil Suspending Agent*

SOIL SUSPENDING AGENT

A detergent ingredient that aids in keeping soil suspended and dispersed in washwater, and thus minimizes the settling or redepositing of soil on fabrics being laundered.

Soil suspension is closely associated with dispersion and antiredeposition. Substances such as CMC, surfactant, and complex phosphates aid in soil suspension by either of these mechanisms.

Related Terms: *Antiredeposition Agent, Carboxymethylcellulose, Dispersing Agent, Soil Redeposition Inhibitor*

SPECIALTY CLEANING PRODUCTS

These have a narrower spectrum of application than all purpose products.

They are designed for use on specific surfaces and the soils that usually collect on these surfaces, such as glass, bathroom surfaces, ovens, drains, metal, floors, carpet, furniture, upholstery, and also indoor air. By concentrating on these specific conditions, specialty products can deliver optimum performance and convenience for the user.

Related Terms: *All Purpose Detergent, All Purpose Soap, Bathroom Cleaner, Carpet Cleaner, Drain Cleaner, Dusting Product, Floor Care Product, Furniture Cleaner/Polish, Glass Cleaner, Metal Cleaner/Polish, Oven Cleaner, Toilet Bowl Cleaner, Tub, Tile, Sink Cleaner, Upholstery Cleaner*

SPOTTING

The process of specially treating isolated spots and stains that are not likely to come out in the normal washing process.

Spotting is a form of pretreatment oriented toward problems requiring specialized individual attention rather than toward general problems, such as gross staining or heavy soil, where soaking is more practical. Stain removal charts provide information on treatment procedures. Rubbing in soap or detergent prior to laundering is effective in removing difficult soil, such as soil lines on shirt collars and cuffs.

Related Terms: *Pretreatment*

STAIN

A visible discoloration.

A stain may be one or more relatively small spots or a fairly large area of discoloration. Instructions are available from many sources for removing stains from washable fabrics. Among techniques are presoaking and other pretreatment, bleaching, and special use of detergent or of special materials appropriate to the particular stain.

Related Terms: *Bleach, Presoak, Pretreatment, Prewash, Spotting*

STARCH

Chemically, starch refers to complex carbohydrates obtained from vegetable sources.

In home laundry usage, the term has been expanded to cover products

that perform the same function as starch, i.e., supplying body or stiffness to fabrics, but that are based on synthesized chemicals such as carboxymethylcellulose or polyvinyl acetate. The latter are called synthetic or plastic starches.

Vegetable starch comes as: 1) dry, uncooked starch (lump, cube, or powder), which must be mixed with hot water or cooked before use; 2) pre-cooked flakes, which can be mixed with cold water; 3) a concentrated pre-cooked solution; and 4) a concentrated solution in an aerosol container for spraying directly on fabrics while ironing. Synthetic or plastic starches come as liquids and in aerosol form for direct application. The liquids are available in soluble form, which is removed in the next laundering. More durable varieties last through several washes.

Besides supplying body and stiffness, starch gives ironed articles a fresh smooth appearance, helps garments stay clean longer because of the harder, smoother surface, and facilitates soil removal in the next wash since the soil becomes imbedded in the starch, not the fabric.

Related Terms: *Laundry Aid, Sizing*

STRIPPER *(See COLOR REMOVER)*

STRIPPING AGENT

An automatic dishwasher aid.

This alkaline product contains sequestering phosphates and chlorine. Stripping agents are used as needed, instead of the regular dishwashing detergent, to remove films deposited on dishes and utensils because of high total dissolved solids that may accumulate.

Related Terms: *Dishwasher Aids, Dishwasher Detergent*

SUDS

A mass of bubbles formed on the surface of a liquid by agitation.

Most soap products suds fairly readily and voluminously, provided there is sufficient agitation and an excess of soap over that required to overcome the hardness of the water. Detergents vary widely in sudsing properties.

The words "suds" and "foam" are interchangeable. In home laundering, suds also refers to the washwater or to the washing segment of the laundry cycle.

Related Terms: *Foam, Lather, Sudsing*

SUDS CONTROL AGENT *(See SUDS STABILIZER, SUDS SUPPRESSOR)*

SUDSING

The act of forming or making suds.

Soaps are generally effective sudsing agents in warm and soft water only, although the volume and stability of the suds vary somewhat among products, depending on whether the soap is built or unbuilt and on the kind of fatty acids used in making the base soap.

Detergents are designed to have a wide range of sudsing characteristics. Hand dishwashing detergents generally produce a high, stable suds to mask the soiled dishwater and to serve as an indicator of residual cleaning potential. Automatic dishwasher detergents are low sudsing, as too many suds would cushion the washing action and interfere with cleaning. Laundry detergents range all the way from high sudsing through a moderate or intermediate range to low, or controlled, sudsing, as judged by their appearance in the washing machine. Low sudsing products are especially recommended for front-loading, tumbler-type washers and washer-dryer combinations, because too much suds in these washers cushions the clothes as they drop into the water after being lifted up in tumbler washing action, thus reducing the washing action and cleaning.

Related Terms: *Foam, Lather, Suds*

SUDS STABILIZER

An ingredient included in a detergent to boost suds and keep them from decomposing.

Use of suds stabilizers is limited to detergents in which stable, lasting, voluminous suds are desirable, primarily in high sudsing laundry formulations and in light duty liquids designed for hand dishwashing. The most widely used suds stabilizers are alkanolamides.

Related Terms: *Amide, Suds Suppressor*

SUDS SUPPRESSOR

A detergent ingredient that suppresses or inhibits sudsing or controls it at a low level.

Suds suppression is critical in dishwasher detergents, not only to ensure that the detergent itself produces a minimum of suds, but also to

keep foodstuffs from creating suds. Proprietary compounds are used for this purpose. Suds suppressors are sometimes used in low sudsing laundry detergents to control suds at a low level but not entirely eliminate them. Special long-chain soaps are one class of compound used for this purpose.

Related Terms: *Suds Stabilizer*

SUPERFATTED

A term used to describe bar soaps made with extra fat or oil, or fatty acid in the free state, i.e., unconverted to soap.

Superfatting provides emollient properties in toilet soaps. Commonly used for the purpose are coconut oil and tallow fatty acids, cocoa butter, cold cream, lanolin, stearic acid, and fatty esters or alcohols. In the process of superfatting, all the fat or fatty acid present is not used to make soap. Most of the time the extra fatty material is incorporated in the soap base just before it is dried to a proper moisture level for milling.

Related Terms: *Emollient, Fatty Acids, Toilet Soap*

SURFACE ACTIVE AGENT

An organic chemical that, when added to a liquid, changes the properties of that liquid at a surface.

This is a basic function for products serving as detergents and as wetting, foaming, dispersing, emulsifying, and penetrating agents. Surface active agent is commonly shortened to surfactant.

Surfactants are classified by whether or not they ionize in solution, and by the nature of their ionic or electrical charges. Categories of charges are called anionic, nonionic, cationic, or amphoteric. The anionic and nonionic surfactant types (for example, LAS, ethoxylated alcohol, alkyl sulfate, alpha olefin sulfonate, and soap) possess good cleaning properties and are important ingredients in household soaps and detergents.

In most detergent products designed for washing clothes and dishes, the surfactant is a basic ingredient. Soap is basic to most body-washing products. All surfactants and soaps perform the important function of lowering water's surface tension, commonly known as making water "wetter." This enables the cleaning solution more quickly to wet out the surface being cleaned so that soil can be readily loosened and removed (usually with the aid of mechanical action). Surfactants are also instrumental in removing soils, both fatty and particulate, and in keeping them

emulsified, suspended, and dispersed so that settling back on the surface is minimized.

In addition to their leading role in laundry and light duty formulations, surfactants are used to some degree in most other household cleaning and washing products. They are the base of most liquid hard surface cleaners. Relatively small amounts of surfactant are usually included in powdered hard surface cleaners, cleansers, and automatic dishwasher detergents. Specialized surfactant applications include the use of cationics (quaternary ammonium compounds) to provide deodorizing and disinfecting action, while nonionic wetting agents are available for adding to the last rinse in automatic dishwashing to provide better draining of rinse water.

Related Terms: *Amphoteric Surfactant, Anionic Surfactant, Automatic Dishwasher Detergent, Built Detergent, Cationic Surfactant, Hard Surface Cleaner, Laundry Detergent, Light Duty Detergent, Nonionic Surfactant, Quaternary Ammonium Compounds, Rinse Agent*

SURFACTANT (*See SURFACE ACTIVE AGENT*)

SYNDET

A contraction for "synthetic detergent."

SYNTHETIC DETERGENT

A term describing washing and cleaning products based on synthetic surfactants rather than traditional soaps.

Over a period of years the adjective "synthetic" (which in this context means put together chemically, or synthesized, from a variety of raw materials) has been gradually dropped so that today non-soap washing and cleaning products are simply called detergents.

Related Terms: *All Purpose Cleaning Product, All Purpose Detergent, Automatic Dishwasher Detergent, Built Detergent, Detergent, Hard Surface Cleaner, Heavy Duty Detergent, Laundry Detergent, Light Duty Detergent, Liquid Detergent, Specialty Cleaning Products, Unbuilt Detergent*

T

TALLOW

A fat obtained from sources such as cattle and sheep, as opposed to

lard, which is the fat of hogs.

The principal production method applied for the recovery of beef tallow is steam rendering. Tallow is the fat most widely used in making soap.

Related Terms: *Fatty Acids, Saponification, Soap*

TALLOW SOAP

The salt of tallow fatty acids.

In household soaps, the salts are usually sodium salts or frequently a mixture of sodium and potassium tallow fatty acid salts. Tallow soap has good cleaning properties but is somewhat slow to dissolve and make suds. As a result, it is common practice to use a mixture of tallow and coconut soaps to combine the good detergent properties of tallow with the improved solubility and quicker sudsing characteristics of coconut soap. Solubility and speed of sudsing are also aided by using some potassium soap instead of all sodium. Tallow soap is the backbone of the soap industry, with coconut second in importance.

Related Terms: *Soap*

TETRAPOTASSIUM PYROPHOSPHATE

The tetrapotassium salt of pyrophosphoric acid.

TETRASODIUM PYROPHOSPHATE

The tetrasodium salt of pyrophosphoric acid.

Related Terms: *Phosphates*

TITANIUM DIOXIDE

A naturally occurring mineral.

Titanium dioxide is widely used in a refined and finely ground state as an opacifier and whitening agent in toilet and beauty bars.

Related Terms: *Opacifier*

TOILET BOWL CLEANER

A specialty cleaning product.

Toilet bowl cleaners are designed to maintain a clean and pleasant smelling bowl, and some also disinfect. Their many different forms include thickened liquids that cling to the sides of the bowl, fresheners that keep the bowl smelling fresh, and various forms of in-tank cleaners

that release active ingredients into the bowl with each flush.

Surfactants, chlorine bleach, and/or acids are the primary ingredients for soil removal. Some cleaners contain acids or sequestrants to facilitate removal of stains caused by hard water deposits. Specific organic stains are also cleaned by bleaching agents provided by some products.

Products with disinfecting action may contain antimicrobial agents. When quaternary ammonium salts are used for this purpose, the products are often acidic and may contain strong acids such as hydrochloric acid. Products containing chlorine bleaching agents contain alkalies such as sodium hydroxide, sodium metasilicate, or sodium carbonate. Most toilet bowl cleaners contain a pleasing fragrance.

Because of the incompatible nature of these products, manufacturers often warn consumers not to mix the products.

Related Terms: *Bleach, Cleanser, Sequestering Agent, Specialty Cleaning Products, Surface Active Agent*

TOILET SOAP

Soap manufactured as a cleansing agent for the body.

With few exceptions, toilet soap in bar form is produced by a milling or refining, extrusion, and stamping operation as a firm, quick lathering bar. The soap base is most commonly composed of the sodium or sometimes mixed sodium/potassium salts of tallow and coconut oil fatty acids. An exception to the milling operation is provided by floating soap, which is made by a whipping or beating process that disperses air through the soap. The bar so produced is lighter than water. Framed soap is made by pouring hot, molten soap into a frame with the resultant large soap block later being cut into bar-sized pieces, which are stamped into appropriate shapes.

Toilet bars are usually made with fragrance and colorant or whitener. Use of a preservative is common. By use of optional ingredients special effects may be obtained. Some special types of soap are: deodorant, medicated, superfatted, and transparent.

Related Terms: *Beauty Bar, Deodorant Bar, Medicated Soap, Milled Soap, Superfatted, Transparent Soap*

TRANSLUCENT SOAP

A type of toilet soap that transmits light but causes sufficient diffusion to eliminate perception of distinct images. *(continued)*

Usually translucent soap contains more glycerin than other toilet soap but not as much as transparent soap. Its distinctive characteristics are achieved through processing.

Related Terms: *Glycerin, Toilet Soap, Transparent Soap*

TRANSPARENT SOAP

A type of toilet soap capable of transmitting light so that objects or images can be seen as if there were no intervening materials.

Transparent soap's distinctive characteristics are achieved through its processing. This form of soap usually contains more glycerin than other toilet soaps. Use of alcohol in some transparent soaps inhibits crystallization.

Related Terms: *Glycerin, Toilet Soap, Translucent Soap*

TRICLOCARBAN

A simplified and accepted name for trichlorocarbanilide, a bacteriostatic ingredient used primarily in deodorant toilet bars.

Triclocarban provides deodorant action against body odors caused by skin bacteria.

Related Terms: *Antimicrobial, Bacteriostat, Deodorant Bar, Triclosan*

TRICLOSAN

A simplified and accepted name for trichlorohydroxy diphenyl ether, a bacteriostatic ingredient used in deodorant toilet soaps.

Like triclocarban, triclosan provides deodorant action against body odors caused by bacteria on the skin.

Related Terms: *Antimicrobial, Bacteriostat, Deodorant Bar*

TRISODIUM PHOSPHATE

The trisodium salt of phosphoric acid, also called orthophosphate.

Related Terms: *Phosphates*

TUB, TILE, SINK CLEANER

A specialty cleaning product formulated to remove not only normal soils introduced on bathroom surfaces during normal use but also hard water deposits, soap scum, rust stains, and discolorations due to mold growth.

Such cleaners, in general, are liquid. They are marketed as pump-

actuated sprays, liquids, and aerosols. Some sprays are dispensed as foams. Almost universally, such cleaners contain surfactants, and they may also contain special sequestering agents to dissolve and keep in solution calcium (hardness) deposits, soap scum, and metal discolorations. Products designed to remove mildew stains on grout between tiles may also contain a chlorine bleach or antimicrobial agents.

Depending on the soil, both acidic and alkaline conditions promote cleaning. Tub, tile, and sink cleaners thus may contain, in addition to the above ingredients, acids such as phosphoric, hydrochloric, or hydroxyacetic, or alkalies such as sodium carbonate, sodium metasilicate, or sodium hydroxide.

Related Terms: *Antimicrobial, Bathroom Cleaner, Chlorine Bleach, Sequestering Agent, Specialty Cleaning Products, Surface Active Agent*

U

ULTRAMARINE BLUE

A pigment used in some laundry detergents to provide bluing effects as part of the washing operation.

UNBUILT DETERGENT

A detergent without a builder.

Practically all light duty detergents fall in the unbuilt category, as do types of liquid laundry detergents that are unbuilt but also heavy duty.

Related Terms: *Heavy Duty Detergent, Laundry Detergent, Light Duty Detergent*

UNBUILT SOAP *(See LIGHT DUTY SOAP)*

UPHOLSTERY CLEANER

A concentrated or ready-to-use liquid, aerosol spray, or powder, very similar to carpet cleaners.

Upholstery cleaners provide a dense foam, which dries to a brittle residue. Surfactants and polymers are the essential components in such products.

Related Terms: *Specialty Cleaning Products*

W

WAREWASHING

Washing of dishes, utensils, glassware, pots and pans, etc. in the institutional area, such as restaurants, hotels, motels, hospitals, schools, nursing homes, and governmental facilities.

Special equipment and cleaning products are usually employed. Products of higher concentration are generally used when dispensed through equipment where the products are not touched. When warewashing is carried out by hand, products used are more like consumer products.

Governmental codes regulate sanitary standards in most areas, and voluntary standards for equipment have also been issued by such organizations as the National Sanitation Foundation.

WASHABLE (AS APPLIED TO A GARMENT)

A term applied to a garment that will be restored to wearability (Note 1) by laundering according to an acceptable (Note 2) procedure in the absence of irreparable damage.

Note 1 — Wearability includes consideration of size (stretch or shrinkage), appearance (color, freedom from stain or dinginess, or both, etc.), and odor (some synthetics have been found to retain perspiration odors, etc.). Wearability also includes considerations of utilization; thus a pair of overalls used by a painter cannot be judged by the same criteria as a frilly blouse.

Note 2 — Acceptable procedure refers to the requirement that the instructions given by the detergent manufacturer and the garment manufacturer and the appliance manufacturer shall be followed within reasonable limits, taking due note of local water hardness, etc.

(Definition of Washable copyrighted by ASTM. Reprinted with permission.)

WASHING SODA

A common name for a commercial form of hydrated sodium carbonate. It is also called "sal soda" and "soda." Washing soda is often used as a detergent booster.

Related Terms: *Sodium Carbonate*

WATER CONDITIONER

A material that improves the quality of water for a given application or use.

In the context of household washing and cleaning, the term "water conditioner" is usually used interchangeably with water softener.

Related Terms: *Water Softener*

WATER HARDNESS

Soluble metal salts, principally those of calcium and magnesium, and sometimes iron and manganese, that when present in water in sufficient amounts create cleaning problems.

In the case of soap, insoluble soap curds are formed. In general, water hardness reduces the ability of surfactants to perform their cleaning function.

Hardness is expressed in grains per gallon (gpg), grains per liter (gpl), or parts per million (ppm), the last more accurately being expressed as milligrams per liter. One gpg equals 17.1 ppm. Water essentially free of calcium and magnesium is described as soft; if appreciable amounts of either or both are present, it is called hard. The U.S. Geological Survey categories of hardness are:

	Soft	Moderately Hard	Hard	Very Hard
Grains per gallon	0.0–3.5	3.6–7.0	7.1–10.5	10.6+
Parts per million or milligrams per liter	0.0–60	61–120	121–180	more than 180

Related Terms: *Detergent, Soap, Water Softener*

WATER REPELLENT

A product applied to fabric to reduce absorption of water; it is usually applied directly to the fabric from an aerosol container.

WATER SOFTENER

An agent that inactivates or removes water hardness minerals, principally calcium and magnesium and to a lesser degree, iron and manganese. *(continued)*

There are three basic ways to soften water in the home:

1) *A mechanical water softener*—a system tied into the water line that actually removes the hardness minerals

2) *Packaged chemical water softeners*—classified either as nonprecipitating softeners that sequester hardness minerals, or as precipitating products that remove hardness by forming insoluble compounds

3) *Built detergents*—in which the softener is incorporated in the washing product.

Mechanical softening operates on what is known as an ion-exchange system, in which hardness minerals are removed from the water and replaced by sodium. The ion-exchange system is regenerated by treatment with a salt. Packaged chemical water softeners of the sequestering type are usually based on complex phosphates; the precipitating kind is based on sodium carbonate and trisodium phosphate.

Related Terms: *Phosphates, Precipitating Builder, Sequestering Agent, Water Conditioner, Water Hardness*

WATER TEMPERATURE

Degree of hotness or coldness of water.

Water temperature is considered here only in the context of temperatures for laundering and dishwashing. Suggested temperature ranges are:

Hot water	130°F (54.4°C) or above
Warm water	90°F (32.2°C) to 110°F (43.3°C)
Cold Water	80°F (26.7°C) or colder

WATERLESS HAND CLEANER

A paste, gel, or lotion that does not require rinsing.

Waterless hand cleaners are useful when facilities for handwashing are not available and are also helpful in removing difficult soils. Available for use from dispensers, or directly from their own containers, they are usually oil-in-water emulsions. They are available with or without scrubbers. The scrubbers may be organic (e.g. particles of polyethylene or polystyrene) or inorganic (pumice).

Related Terms: *Hand Cleanser*

WETTING AGENT

A compound that increases the ability and speed with which a liquid displaces air from a solid surface, thus improving the process of wetting that surface.

Wetting agents are all surfactants. They function by lowering surface and interfacial tension. Soap and detergent surfactants serve as wetting agents in washing products, in addition to their other functions. In automatic dishwashing, nonionic surfactants are sometimes introduced into the last rinse for the purpose of maximizing drainage of water from dishes and utensils.

Related Terms: *Rinse Agent, Surface Active Agent.*

Z

ZEOLITE (*See ALUMINOSILICATE*)

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