Extension Bulletin 400 HOME & FAMILY Series

TEXTILE CARE...

USING MODERN LAUNDRY AIDS

COOPERATIVE EXTENSION SERVICE MICHIGAN STATE UNIVERSITY

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In This Publication

For purpose of clarification, it is necessary to list brand names of some laundry products in this bulletin. No endorsement of these products is intended nor criticism implied of similar products which are not mentioned.

DO YOU KNOW the size of the job you and other homemakers manage each week in doing the family wash? Altogether, you wash 1.5 billion pounds of clothes. This is three quarters of a million tons of clothes—or 200 million loads a week. Impossible, you say? Remember—there are about 51 million of you doing it!

Of course keeping the family in clean clothes is only one of your many activities. Therefore, be realistic in setting up the standards and goals that you want to accomplish and that will be easiest and best for your family. Be well informed on modern laundry aids, as well as laundering equipment and procedures.

To help you make satisfying choices among today's laundry aids, here is information on detergents, water softeners, bleaches, fabric softeners, starches and disinfectants: what they are, how to use them, and brands on the market.

DETERGENTS

What They Are

A "detergent" is a cleansing agent. It can be water, soap, or a synthetic detergent that resembles soap in its cleansing ability.

In laundering, a detergent has three jobs:

1. Wet the fabric and the soil
2. Then loosen the soil from the fabric
3. And finally, hold the soil suspended in the water so it does not re-deposit on the clothes before it can be rinsed away.

An *all-purpose built* detergent is designed for general family washing and heavily soiled fabrics.

A *light duty unbuilt* detergent is designed for special washing of lightly soiled or delicate fabrics and for dishwashing.

SOAPS are made from fat and lye and are mildly alkaline by nature. Built soaps are all-purpose products containing at least 50% soap, plus special alkaline chemicals "built into" them to improve cleaning action, increase sudsing and help soften hard water so that less soap scum forms. (Hard water is discussed under packaged water softeners). Unbuilt soaps are about 95% soap. They are less alkaline than built soaps and are intended for lightly soiled and fine fabrics which require hand care.

SYNTHETIC DETERGENTS, also called syndets, or often just "detergents," are complex chemicals made from petroleum and animal and vegetable fats and oils. They dissolve readily in water, hot or cold, soft or hard. They do not readily form scum in hard water, as soaps do.

Built synthetic detergents (all-purpose) have alkaline salts and phosphates "built into" them to help soften the water and increase cleaning ability. Another important ingredient is CMC (carboxylmethylcellulose), a substance that prevents soil from settling back onto clothes.

Unbuilt synthetic detergents (light duty) may contain only 30 to 40% detergent. The rest may be neutral salts or water. They are non-alkaline and so especially suitable for wool, silk and unstable dyes.

Both soaps and synthetic detergents may contain fluorescent brighteners or dyes that give off a blue-white fluorescence in sunlight. They do not contain chlorine bleaches. All liquids on the market are synthetic detergents—there are no liquid soaps.

There are special-purpose soaps and synthetic detergents, called "cold water soaps." They contain a large proportion of water softener. They are designed for use on wool and other special fabrics but cost more to use than comparable regular light duty synthetic detergents and soaps. Some may not be too satisfactory in hard water.

Besides detergents for laundering, there are special products designed primarily for cleaning walls and floors that are sometimes recommended for use in the laundry. These cleaners should not be used in place of regular laundry detergents.

Suggested Amounts of Detergents for 6 to 8 Pound Load of Normally Soiled Clothes

Product	*Soft Water*	*Medium Hard Water*[1]	*Hard Water*[2]
TOP LOADING AUTOMATICS AND WRINGER WASHERS			
All-Purpose Soap	1 cup	2 cups	3 cups
High Sudsing Synthetic Detergent	¾-1 cup	1-1½ cup	1½-2¼ cups
Low Sudsing Synthetic Detergent	¾ cup	1 cup	1¼ cups
FRONT LOADING AUTOMATICS & COMBINATION WASHER-DRYERS			
All-Purpose Soap	½ cup	¾ cup	1 cup
Low Sudsing Synthetic Detergent	½-⅔ cup	⅔-¾ cup	¾-1 cup
High Sudsing Synthetic Detergent	¼-⅓ cup	⅓-½ cup	½-1 cup

Adapted from Proctor and Gamble exhibit, 16th Nat'l. Home Laundry Conference of the American Home Laundry Manufacturers Assn., October 1962.

Another way to figure the amount of detergent is to use the laundry industry standard for a good washing solution: 2%-2½% concentration by weight of detergent to water. This is about ⅓ ounce of detergent for every gallon of water.

1. This is about 5-10 grains. The average hardness in home water supplies falls in this category.

2. This is over 20 grains hard. It is practical to soften the water instead of increasing detergent concentration.

Suds in All-Purpose Synthetic Detergents

The amount of suds does not necessarily indicate the cleansing power of a synthetic detergent. Some detergents produce abundant suds; some produce controlled sudsing; others produce almost no suds. (See the chart below).

Those that give abundant suds (called high or normal sudsing) often contain a chemical to increase suds in order that the amount of suds can be a guide to the amount of product to use in a top opening washer. The controlled or low sudsing products were first developed for tumble type (front loading) automatic washers. This type of mechanical action produces more suds than usual. These excess suds can interfere with washing action. In low sudsing detergents, a chemical is added to suppress suds rather than to eliminate them entirely.

Using Soaps and Synthetic Detergents

In soft or softened water, soap does an excellent, economical job of cleansing.

In hard water, an all-purpose synthetic detergent will give the best results. High or normal sudsing products are most economical. Low sudsing products are best for front loading washers, although they are effective in any type of machine. A New York study* indicates a tendency for cotton always washed in soft water in this type of detergent to be somewhat whiter than those always washed in high sudsing products.

In a top loading washer, the right amount of either high sudsing synthetic or soap will produce a rich, active layer of suds which will last throughout the wash cycle.

In most front loading tumbler washers, low sudsing synthetics are best. The recommended amount of low sudsing synthetic will form suds that come about ⅓ to ½ the way up the window. If an active suds is not formed, or if the suds die down, that is a signal to measure and add more detergent.

Measuring the Detergent

"Dumping by the handful" leads to under- or overuse of product and poor washing results. Most authorities believe *underuse of detergent is most common.* To avoid this, *always use a standard measuring cup and start with the maximum amount* recommended by the manufacturers of the product and your washer.

Package directions are reliable guides for most machines on the market under normal washing conditions. Water volume of the washer, quantity of clothes and amount of dirt, hardness and temperature of water and type of product all influence the quantity of detergent.

Some Laundry Detergents

Soaps

All-Purpose (Built, heavy duty)—*Chipso, Duz, Fels Naphtha, Rinso (green package), Super Suds, American Family Flakes.*

Light Duty (Unbuilt, fine fabric)—*Chiffon, Ivory Flakes, Ivory Snow, Lux Flakes, Kirkman Flakes.*

Synthetic Detergents

All-Purpose (Built, heavy duty)—

High Sudsing: American Family Detergent, Blue Cheer, Breeze, Duz, Fab, Felso, Fun, Oxydol, Rinso Blue, Sun, Super Suds, Surf, Tide, White King B, Wisk, Answer, Rinso Measurematic, Swerl, Tide Redi Paks.

Low Sudsing: Ad, All, Dash, Fluffy All, Spin, Ad Packs, Ad Tabs, Dash Redi-Paks, Handy Pack "All", Hum, Salvo, Vim.

Light Duty (Unbuilt, fine fabric)—*Dreft, Glim, Ivory, Joy, Lux, Swerl, Trend, Vel.*

* Whiteness of Pillowcases Laundered in 206 New York State Homes *by Kathryn Walker, and Lucille J. Williamson. Bulletin 968. Cornell University Agricultural Experiment Station, New York State College of Home Economics, Ithaca, N.Y. June 1961.*

The new extra-capacity washers use more water in the wash cycle, and therefore require more washing product. If you have one, be sure to check the washer instructions for the amount of detergent to use.

Brands of detergents are available in several forms –liquid, fluffy powder, condensed powder, premeasured tablets and packages. You must use a different amount of each to get comparable cleaning power. Therefore, it will simplify measuring if you use one form consistently.

Select the type of product carefully for the washing job to be done. Measure consistently. Observe results after several washings, adjusting the amount of detergent for any special conditions. Keep a record as you go along. Compare laundered items with a fabric not washed during this test to determine if results are satisfactory. If so, continue using this product.

PACKAGED WATER SOFTENERS

In laundering, hard water causes a lime soap scum build-up on fibers which eventually weakens, greys and stiffens the fabric. Water may be considered "soft" when it contains less than three grains of dissolved calcium and magnesium salts in a gallon of water, "hard" when it contains more than this. You can consult your county sanitary engineer, your city water company or a local water conditioning dealer to get help in finding out what your water hardness is.

If water is hard, packaged water softening chemicals can be effective helps to eliminate soap scum on fabrics and washer parts and reduce the amount of soap needed. (When water contains much over 10 to 15 grains hardness, it may be more practical to consider installing a home water softening appliance.)

SOAP + HARD WATER → SCUM

DETERGENT + HARD WATER → NO SCUM

There are two kinds of packaged water softeners used in laundering today:

PRECIPITATING SOFTENERS are chemicals which, when added to the water, cause the minerals to settle out as milky white solids. This "precipitate" clings to fibers, just as soap curd does.

NON-PRECIPITATING CONDITIONERS do not form precipitates; that is, when added to the water, they keep the hardness minerals in solution and the water remains clear.

Some Packaged Water Softeners

Precipitating softeners—*Arm and Hammer Washing Soda, Rain Drops, Borax, Mel-O Cleaner, Climalene.*

Non-precipitating conditioners—*Calgon, Tex, Noctil, Spring Rain, New Oakite.*

Using Water Softeners

The amount to use depends on water hardness and water capacity of your washer. For example, with water hardness of five grains, a top loading washer with 15 gallons water capacity requires about ¼ cup non-precipitating water conditioner. With 10 grains, the same machine requires about ⅜ cup. Consult the guide on the box of softener for recommended amounts.

Use water conditioner in both wash and first deep rinse if washing with soap and water is more than five grains hard (about average hardness in urban home water supplies). Softener already in synthetic detergents can take care of this amount of hardness. If washing with synthetic detergent in very hard water (over 20 grains), you may increase the amount of detergent and use a water conditioner at least in the rinse water, or use water conditioner in both wash and first rinse waters.

Brown stains in fabrics may be caused by dissolved iron or manganese in the water combining with chlorine bleach. A non-precipitating water conditioner will prevent these stains from forming if added in the recommended amount to the wash water before adding bleach.

The non-precipitating conditioners are more effective in very hard water, more expensive, lower in alkalinity, less irritating to skin and fabrics, and easier to rinse out than the precipitating types.

BLEACHES

Bleaches are chemicals added in the washing cycle to whiten fibers and to aid in removing some stains and soils from white and colorfast colored fabrics. CHLORINE and the PEROXY or OXYGEN types (perborates and persulfates) are used mainly in laundering. Along with hydrogen peroxide and color removers, they are used for special stain removal. See the listing of different bleaches at the bottom of this column.

Chlorine Bleaches

Chlorine bleaches are generally the most effective whitening agents, are good disinfectants and are the least expensive of all bleaches to use.

They can cause serious loss of fiber strength if too much is used at one time, if used in repeated washings, or if not diluted sufficiently before reaching the fabrics.

The powder chlorine bleaches release active chlorine more slowly in the wash water than the liquids, so danger of immediate fiber damage is lessened. A recent Ohio State University study* indicated both types are equally and significantly effective in whitening cotton covered with dusty, dry types of soil, but neither are effective on oily, greasy soils. Dry chlorine was found to be somewhat less destructive to cotton and nylon fabric. After 25 washings liquid chlorine caused a 23% loss in strength for cotton and a 39% loss in strength for nylon. The dry chlorine caused 15% strength loss for cotton and 32% loss for nylon.

* Bleaches–Whitening Effect and Fabric Strength *by Mary Lapitsky. Research Circular 112. Ohio Agricultural Experiment Station, Wooster, Ohio. October 1962.*

Some Laundry Bleaches

Chlorine Bleaches

Liquid–*Clorox, Fleecy White, McCoy's, Purex, Roman.*

Dry–*Action Tablets, Beads O' Bleach* (old formula), *Purex Concentrated Bleach, Hi-lex Dry Bleach, 101 Heavy Duty Dry Bleach.*

Peroxy-type Bleaches

Perborate–*Dexol, Lestare packets, Safety, Snowy, Thanx, Liquid Wash 'N Wear.*

Persulfate–*Dri Brite, Du Rite, All-Fabric Formula Beads O' Bleach.*

Using Chlorine Bleach

Bleaching with chlorine is *not a substitute for effective soil removal* by regular washing in hot (at least 140°F.), soft water with an all-purpose built detergent–*nor a substitute for pre-treating* ground-in greasy stains (soot, smoke, body oils) with concentrated detergent paste or solvent.

To maintain or restore whiteness to fabrics with chlorine bleaches, add the measured, diluted bleach during the wash cycle and agitate about 10 minutes.

Dilute chlorine bleach in 1 quart of water or add to the wash water before adding fabrics. You may want to delay addition of liquid chlorine bleach a few minutes to give brighteners in the detergent time to adhere to the fabrics. Brighteners in most detergents become ineffective if mixed with liquid chlorine. Dry chlorine bleaches contain their own brighteners not affected by chlorine and so may be added with the detergent. At least two thorough rinses are needed to remove all traces of active chlorine. This bleach should never be used on silk, wool, some resin-treated fabrics, and spandex fiber as used in foundation garments.

How Much?

There is no consensus by "the experts" on amount of liquid chlorine to use. The standard recommenda-

tion is often one tablespoon per gallon of water (1 cup for 16 gallons of water for many top loading automatic washers). This amount is necessary for disinfecting and deodorizing and for occasional bleaching. But some authorities in the commercial laundry industry believe this quantity is *more than enough* for effective regular bleaching, *provided* the washing solution is always hot, soft and properly alkaline because of added detergent. Under these conditions, the following amounts, used regularly, may prove sufficient for average size loads of normally soiled cottons, yet minimize fiber damage. For top loading washer with about 16 gallons water use 4 tablespoons liquid chlorine; for front loading washer with about 8 gallons water, use 2 tablespoons.

The equivalent amount of dry chlorine bleach varies with the brand but is about 3 times more for regular bleaching. In any case, it is wise to use the minimum recommended quantities of chlorine bleaches.

Peroxy-type Bleaches

These light duty bleaches are safe for all fabrics when used in quantities recommended on the label. Such bleaches are called *preventive* because when used regularly they help prevent a grey or yellow build up on new fabrics. Due to their mild action, however, they do not restore whiteness to discolored fabrics. They are most effective in hot water. They have little or no disinfecting power.

The persulfates are among the newer bleach products and may not be readily available in all areas. Some may have chlorine added for increased bleaching power. The Ohio study already mentioned, showed that persulfates or perborates used in recommended amounts after 25 washings did not cause any loss of strength for cotton or nylon. They were not effective in whitening cotton, but the persulfate was most effective of all bleaches in whitening nylon.

FABRIC SOFTENERS

Newer laundry additives are the fabric softeners. They are chemicals which combine ammonium salts in a solution of alcohol and water. They form a lubricating film that helps fibers retain a certain amount of moisture.

A fabric softener does just what the name implies –it makes all fabrics feel softer. It has no effect on water, as do water softeners.

An iron will glide over a fabric treated with a fabric softener much more easily than an untreated one. Softeners minimize wrinkling and make woolens

Some Fabric Softeners

Sta-Puf, Nu Soft, Jiffy Rinse, Vane Fabric Fluffer, Pink Cloud, Sun-Soft, Downy, Texize Laundry Fluff.

fluffy. They will help prevent the build-up of static electricity which makes fabrics like nylon cling. (Some "anti static" agents are sold for this purpose only.)

To get the most benefit from fabric softeners, the fabric must be clean and free of soap or synthetic detergent. Add softener to the *final rinse water*, carefully following the manufacturer's directions, because constantly using too much can make the material water repellent. The concentrated products generally recommend ¾ to 1¼ cup per washload, the more dilute products 1¼ to 1½ cup per washload. To obtain uniform results, don't pour directly on the fabrics. Don't add other products such as starch or water softeners to the same rinse water.

STARCHES

Starching helps improve the appearance of garments and prevent soil from clinging to fabrics. Today two types of starches or sizing agents are available;

VEGETABLE STARCHES, liquid or dry in form, made with either boiling or cold water, coat the surface of the fabric.

PLASTIC STARCHES, made from synthetic resins, penetrate into the fibers. A liquid plastic starch, referred to as CMC sizing agent, gives a soil resistant finish with little stiffness. Some plastic starches are so durable that one treatment lasts through several washings. It is very important to measure carefully to get proper stiffness when applying them because they do not rinse out easily.

Spraying starch from a pump-type or pressurized can is a recent method of applying starch. It is now possible to starch individual pieces lightly as you

Some Laundry Starches

Dry Vegetable—(add hot water) *Argo, Linit, Staley's Quick Elastic;* **(add cold water):** *Niagara, Jiffy.*

Liquid Vegetable—*Linit, Quick Plastic, Sta-Flo, Jiffy.*

Liquid Plastic—Sizing: *Gloss Tex, Texize Starch;* **Durable:** *Perma-Starch, Prim, Dura, All.*

Spray—*Sta-Flo, Easy-On, Glamorene, Reddi.*

come to them in ironing. You must be careful to spread the starch evenly and not to starch, accidentally, garments not needing it. Some spray starches tend to coat the iron and all are still fairly expensive to use.

If starching a whole load of fabrics, using the automatic washer is convenient and gives uniform results. Use a washable starch. The dry starches are most economical. Check the instruction with your washer on the procedure to use.

DISINFECTANTS

Certain types of disinfectants greatly reduce bacteria that are not killed in laundering. It is not necessary to use these products in every batch of laundry unless there is sickness in the family or several families use the same washer.

QUATERNARY DISINFECTANTS should be added to the rinse water.

PHENOLIC DISINFECTANTS may go into either the rinse or wash cycles.

CHLORINE BLEACHES should be added to the hot wash water.

Read the label to find out how much to use. The amount and cost per load will vary with the type of disinfectant, kind of washer you use and the size of tub. For disinfecting with chlorine bleach, add the amount recommended by the manufacturer for bleaching.

For example, in a washer that holds 15 gallons of water, the United States Department of Agriculture used 4 ounces of quaternary disinfectant (6-10¢ per load), about 1 cup of phenolic disinfectant (about 29¢ per load), or 1 cup liquid chlorine (about 4¢ per load).

Some Disinfectants

Quaternary (Commercial Disinfectant)—*Co-op Sanitizer, Roccal.*

Phenolic (Household Cleaners or Sanitizers)—*Pine-Sol, Fast.*

Chlorine Bleach—*See list on page 5.*

SUMMARY

It is the manufacturers' responsibility to design products suited to your needs today. Trends in laundry aids reflect their efforts to do this:

Needs	Trends
More safety in use	More plastic containers, dry chlorine bleaches
Effective detergency without measuring	More premeasured packets
Faster, easier dissolving in warm or cool water	More liquids
Less suds and better rinsing in the washer	More low sudsing detergents

Now it's up to you—to study each type of laundry aid, select those especially designed for the job you want done, then use them as intended for the best possible laundering results.

ADDITIONAL READING

Here are other publications in this TEXTILE CARE series:

401 *Problems in Textile Care*

402 *Selecting Easy Care Clothes*

403 *Give Labels a Try Before You Buy*

404 *Keeping Clothes in Service*

Other publications related to home laundering:

389 *Choosing and Using Your Automatic Clothes Dryer*

392 *Choosing and Using Your Automatic Washer*

Single copies of these publications are available free from the MSU Bulletin Office, P.O. Box 231, East Lansing, Michigan, or at your County Extension Office.

Home & Garden Bulletin No. 62 Removing Spot and Stains from Fabrics, available from Supt. of Documents, GPO, Washington 25, D. C.

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