



You can use expensive bottled spray for fabrics, but laundry detergent will work on most stains. The key is to soak first, remove all soap before drying (or it will attract mildew), and to rinse with one of our inexpensive home-made anti-mildew agents.

The One-bucket Cleaning Kit

Cut the number of cleaners to a minimum; save money and time.

By [REDACTED]

Bright, shiny and new looking. That was what we wanted when we were shopping for our dream boat, and that is the impression our new-used PDQ catamaran gave. What was behind that spit-shine on a used boat? Besides the obvious hours of labor by the previous owner, it took two baskets of cleaning products, all stuffed in the stern lockers.

I needed the space back. The previous owners were a retired couple, and I would be cruising with kids. The stern lockers were for their stuff. I also knew that a showroom shine was not in my near future, and that my daily cleaning needs would be more basic. It was all good usable stuff—we took it all home, and we've been living off this horde for years. But the duplication and overlaps in function and chemistry were ridiculous, and there was no pattern behind the selections that we could see.

Glancing at the products with a chemist's eyes, we pared down dozens of specialty products to just a few prod-

ucts capable of same range of cleaning, which easily fit in a small pail.

THE BASICS

Years ago, I challenged a chemical salesman over the price of some industrial cleaners he offered. Packaged in 55-gallon drums, rather than consumer spray bottle packaging, they struck me as overpriced for what they contained. "We price chemicals based on what they can do for you, not what they cost," he replied. And that is foundation of plastic-bottle cleaner game; create a pleasing package, a catchy name, and focus on what it can do—not what's in the bottle. Distract your customers from the fact that the \$16 spray bottle contains only 16 cents worth of stuff.

If you dig past the picture and top-line claims and read the ingredients, you can learn the real story, or at least understand what you're buying and have some understanding of how it works. If you try to sort cleaners according to each particular task, as the marketers

would like us to do, you have almost endless permutations. These products are sorted first by the material they are supposed to clean (fiberglass, carpet, clear vinyl, etc.) and then are sorted by the type of soil or stain (and grease, metal stains, mildew, etc.).

A more efficient approach for the cruising sailor with limited budget and space is to sort them by what they are: acids, bases, surfactants, oxidizers, solvents, or emulsions. Instead of requiring 30 random products, you would need only four or five with carefully targeted chemistry. That's it—no more than five cleaners to serve most purposes, saving money, and more importantly space and weight. The challenge—and it is a small one—is to know the nature of the stain.

Do no harm. First, we must not damage what we are cleaning. Harsh chemicals are often employed to do the heavy lifting, and we don't want them eating up our project. When in doubt, test on a scrap of the same material or in an inconspicuous location.

VALUE GUIDE GUIDE TO GENERIC & HOMEMADE CLEANING PRODUCTS

CLEANING PROBLEM	CLEANER CATEGORY	ALTERNATIVES PRODUCTS	REPORTS @
DECKS	Surfactant	Biodegradable laundry detergent	<i>Best Boat Soaps for Regular Washdowns</i> , January 2013
BLACK STREAKS	General purpose cleaners, acid cleaners	Biodegradable laundry detergent, general purpose cleaner, oxalic acid	<i>Bye-Bye Black Blight:</i> Tests Streak Removers May 2006
BILGE	Surfactant	Biodegradable laundry detergent, boat soap, all purpose cleaner-degreaser	<i>Bilge Cleaner Shake Down</i> , March 2006
TEAK	Medium acid	Oxalic acid, ammonia	<i>Spiffy Teak Tips for the Penny Pincher</i> , March 2016
BARNACLES	Strong acids	Muriatic acid scale removers, oxalic acid	<i>Barnacle Remover Test</i> , May 2007;
MOLD AND MILDEW	Acids, alkaline cleaners, chlorine bleach	Formula B*, clorox, oxyclean, oxygen bleach	<i>Mildew Treatments and Stain Removers</i> Nov. 2013; <i>Keeping Water Fresh and Clean</i> , July 2015; <i>Fighting Mold, Mildew, and Lichens</i> , Sept. 2015
GENERAL CLEANING	Surfactants	Biodegradable laundry detergent (see Tips and Technique)	<i>Marine Maintenance: Multi-purpose Cleaners Test</i> , Nov. 2010
VINYL WINDOWS	Mild surfactants	Hand dishwashing liquid NEVER ammonia or degreaser or rain-repellant treatments	<i>Protecting Clear Vinyl Windows</i> , January 2014
CANVAS	Anti-mildew agent, surfactant	Pool algae control, Formula B*, biodegradable laundry detergent, water repellent treatments (after cleaning)	<i>Fighting Mildew, Mold, and Lichen</i> , September 2015; <i>Keeping Canvas in Tip Top Shape</i> , February 2014
RUST STAINS AND WATERLINE STAINS	Acid cleaners	Scale removers, teak cleaner, oxalic acid	<i>Star-brite Tops Marine Rust Erasers</i> , May 2006; Tests 22 Hull Cleaners, Nov. 2007
METAL CLEANERS	Acid cleaners, cleaner wax	Scale removers (stainless steel)	<i>Metal Cleaners</i> , June 2006
UPHOLSTERY	Surfactant mildew control	Biodegradable laundry detergent, pool algae control, Formula B*	<i>Mildew Treatments and Stain Removers</i> , Nov. 2013
ROPE	Surfactant mildew control	Biodegradable laundry detergent, pool algae control, water repellent treatments (after cleaning)	<i>What's the Best Way to Clean Rope?</i> July 2011; <i>Aftermarket Cordage Treatments</i> , Dec. 2011

* Formula B = 1 quart hot water, 2 tablespoons baking soda, 2 tablespoons borax, 1 tablespoon tri-sodium phosphate (TSP)

Strong oxidizers. Bleach, hydrogen peroxide, cleaners containing peroxides, percarbonates, and hypochlorites fall into this category. They can bleach and weaken fabrics. If properly diluted and exposure time is limited, oxidizers are generally safe for materials that are non-porous or color-fast in the sun.

Solvent-containing products. Solvents can be tough on certain plastics. Degreasers often contain citrus oils or glycol ethers (ethylene glycol monobutyl ether is a common co-solvent), which can damage some paints and plastics. Formula 409, Spray Nine, and anything that has orange in the name is suspect. Clear soft vinyl windows require special precautions (“Ultimate Guide to Caring for Clear Plastic,” July 2014).

Acids. Muriatic acid (3 percent solution, diluted 10:1) is quite useful for removing calcium or rust stains. However, the pH is very low and it will quickly corrode aluminum and most other metals. Nylon can be severely damaged and even melted by strong acids (a few drops of battery acid on a loose thread is one way to identify nylon). Milder acid products, such as vinegar (acetic acid), lemon juice (citric acid), and CLR (lactic acid) are both slower and safer to work with.

Alkalis. Lye (sodium hydroxide) is found in drain cleaners, paint removers, and oven cleaners. It is very effective on cooked-on grease proteins and fats, but the very high pH that makes it effective can corrode aluminum and brass and remove or dull paint. The more

moderate alkalinity of washing soda (sodium carbonate) or baking soda (sodium bicarbonate) are sometimes more appropriate.

When using either acids or alkalis, remember the following:

Protect your work. Many cleaners can streak or corrode if used incorrectly: Protect what you don’t want to contact. If preventing contact is impractical, wet it down; the chemical will be diluted, which is often enough to prevent harm.

Don’t let it dry. Bleach, for example, while normally harmless to most surfaces, becomes very alkaline (it contains lye) when allowed to dry, and can eat little pits in aluminum and etch glass. It won’t do this if you keep it wet.

Clean from the bottom up. This may seem counter intuitive, but it is related

to “don’t let it dry.” If you clean from the top down, undiluted cleaner will streak down the sides, resulting in uneven cleaning and etching. Your final cleaning and rinse can be top-down.

Rinse completely. The aim is to remove any residue. Use a shop-vac or carpet extractor if cleaning carpet or upholstery. Consider using a weak anti-mildew treatment in the rinse step. Don’t go from dirty, to clean, to smelly because it didn’t dry and you left biodegradable soap (mildew food) in it.

CLEANING CHEMISTRY 101

There are four general approaches to cleaning, often with several combined in one product, though some are mutually exclusive (either opposites, or they react with each other).

LOW PH

By definition, chemicals with low pH are acids. In rough order of aggressiveness, the most common ones we use are: muriatic (hydrochloric), oxalic (teak cleaners), citric (lemon juice), lactic (CLR), acetic acid (vinegar). Some of these products contain surfactants. They work well on the following:

- Metal stains. These include rust (iron III hydroxide), aluminum black streaks (aluminum II oxide), water spots (salt and calcium hydroxide).
- Soap scum.
- Waterline stains, including tannin stains.
- Uncured epoxy. Organic acids, such as vinegar, react with unreacted monomer, stopping the curing process and softening uncured epoxy. Much better than soap or solvent.

HIGH PH

These are the alkalis, in rough order of aggressiveness: sodium hydroxide (lye, drain cleaners, paint strippers), ammonia, washing soda, baking soda). They are generally combined with other surfactants to clean the following:

- Heavy grease, particularly if cooked-on. The high pH hydrolyzes the soap (acid can also be effective—corrosiveness to metals depends on the metal, so test first).
- Removing or de-glossing many



We tested 22—yes 22—different products that claim to remove waterline stains. Almost all of them used a similar formula with an acid as the active ingredient.

paints. This is either handy (Easy-Off is a handy paint and varnish remover for small spots) or disastrous. It is also very hard on skin (dissolves the fats that make up the cell walls).

SOLVENT AND CO-SOLVENTS

These include D-limonene, citrus oils, ethylene glycol monobutyl ether (Celusolve), and petroleum spirits). Usually, these solvents are combined with other surfactants to clean the following:

- Oil and grease. Solvents have much of the grease-cutting ability of alkaline cleaners, but without the high pH. They can harm plastics and some paints. Not generally as effective as alkaline cleaners on fats, but gentler on skin and many surfaces.

OXIDIZERS

These include bleaching agents, in rough order of aggressiveness: sodium hypochlorite, hydrogen peroxide, calcium percarbonate. The effectiveness is influenced by pH; mixing with baking soda (a few teaspoons per quart) moderates the pH of stronger hypochlorite solutions, increasing bleaching and disinfection effectiveness dramatically. Never mix bleach with acids or ammonia, which will create a toxic gas. Oxidizers are effective on the following:

- Organic stains (mildew). Bleaching metal stains and tannin stains will often only set them, making them more

resistant to subsequent treatments (you are trying to oxidize an oxide, which won’t work).

Don’t mix with organic cleaners (most surfactants and degreasers). Bleach reacts with many organic ingredients, destroying both. Bleaches can be mixed with borax, TSP, and baking soda to control pH.

Bleach eliminates stains because it breaks apart bonds within chromophores in molecules, the structures responsible for color. The compounds that cause the stain may become colorless, but may still exist, explaining why stains often return quickly.

Many cleaners, specifically acids, caustics, and oxidizers, work better by prolonging the soak time. However, unless you can put the article in a bucket, this can be a little awkward. For bleach, making a paste with baking soda is time-proven, holding the bleach in place and buffering the pH. For acids and caustics, soaking it in a rag can work, although the rag may be damaged in the process. A final trick is to mix the cleaner with an inert powder; cabosil/fumed silica works very well for nearly all chemicals, stiffening them without affecting the chemistry.

CONCLUSION

Hopefully this report, prompted a little more consideration regarding the sort of stain you are actually removing,

A generic approach to specific stains

For general deck cleaning, unless there is a specific stain, always start with a relatively mild, biodegradable surfactant. Not strong enough to remove wax or corrode metal, but enough to loosen what the birds left, hard water spots, and atmospheric dirt. One possible remedy is a little spot cleaning with biodegradable laundry detergent. Today, most detergents are biodegradable.

The EPA has banned the most damaging ingredients in laundry soap, and the EPA "Safer Choice" program sets minimum standards for degradable products. Wet the boat with water to help soften the thick dirt, mix about ½-cup of laundry soap per three gallons warm water, scrub, and rinse. Yes, it is biodegradable (it is required to be), and a lot cheaper than many boat soaps. You will have it on the boat for laundry, too. It is also good for upholstery and carpets, although it is good to follow those applications with a rinse in an anti-mildew solution.

Metal stains. Use acid cleaner for rust spots, black streaks, and other metal stains. You probably already have a de-scaling chemical for your boat's head hoses, engine cooling passages: Rydlyme, CLR, or vinegar. A year ago I was trying to remove a pesky yellow stain on the topsides. Saving a trip to the store, I diluted the CLR with water at a ratio of 20:1, sprayed the sides down, wiped lightly to even it up, and waited 15 minutes before rinsing. It came out as white as new.

Mildew. Clean first with either alkaline cleaner or vinegar, followed by diluted bleach or Formula B (no rinse with Formula B). The real secret is prevention through eliminating dampness.

will help lead you to the best cleaner for each job. Being able to narrow down your cleaning supplies to a few essential products is not so critical for the marina-bound boat, but it becomes more important once you begin a long cruise.

All we carry while cruising is hand dishwashing soap, laundry detergent, vinyl window cleaner (Star Brite View Guard), an acid-based cleaner (CLR), and anti-mildew agent (do-it-yourself Formula B, see table footnote page 20), and a degreaser (Star Brite Degreaser or Sudbury Bilge Cleaner). At the boatyard we focus additional products on



Ecofriendly cleaners are preferable for boats in the water. The online version of this article www.practical-sailor.com offers a more detailed guide of "green" cleaners.

Soft Vinyl. Clear vinyl has requires special care—review [redacted] articles on clear vinyl care. Dish washing liquid is a safe choice, as are specialty products from Imar, Star brite, and Plexus. Vinegar for tough water spots. There are many cleaners that can do real damage to soft vinyl windows, so this is one area where you shouldn't experiment. We've done the dirty work.

Decks, Black Streaks, and Bilges. Many general purpose cleaners overlap here. Acid cleaners are best for corrosion product streaks, degreasers are great in the bilge, and general purpose cleaners loosen general grime that has found its way into the pores.

Upholstery, Canvas and Ropes. These are all fabrics, so laundry detergent works, as do general purpose cleaners and deck cleaners. The key is to soak first, remove all of the soap before drying (remaining laundry detergent is great mildew food—either rinse a lot or extract with a wet vac), and to finish with an anti-mildew agent in the rinse water (either our DIY Formula B or a BAC-based pool algae control agent). Mineral spirits can also be very effective, though the covers should be removed and the cleaning done outside.

specific needs; a protectant for the vinyl windows (IMAR 302), a vinyl treatment (303 Aerospace), generic oxalic acid for most heavy duty scale and metal stain removal needs, and a paste wax (Meguiar's Cleaner Wax) for most everything else. Some of our applications are off-label, like "Easy-Off" as a paint remover, or CLR for the waterline stain. But having satisfied all of our marine cleaning needs with just a few versatile products, we now have an answer for every problem and a lot more space in our lockers.

All that said, there are some very effective specialty formulated marine

products that might outperform our basic kit. If you are a stickler for a clean boat, want to impress guests (or potential buyers), or are having trouble with tough stains, check out our four-volume Ebook series: "Marine Cleaners, the Complete Series," which covers more than you need to know to keep your boat looking her looking best. ▲

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