

Performing a Stain Audit

By Steven J. Tinker

Everyone understands that we can never remove 100% of the stains we encounter in our laundry operations. And if we tried to achieve “zero stains” we would quickly learn that the chemical costs and deterioration of the textiles would increase to levels beyond reason. So our challenge is to design processes that assure maximum cleaning and stain removal performance while minimizing resource costs and maximizing textile life.

Many of our standard operating procedures are focused on these objectives. We soften our water to assure that minerals don't interfere with our washing processes and cause problems with heat transfer due to scale build-up in water heaters and boilers. We sort textiles into different classes so we can assure ourselves that we are using just the right combination of chemistry, water, and energy to get the best possible results. And we design wash processes that aim for 98-96% stain-free textiles: because we know that to remove those last few stains, it can be very costly.

Every laundry has stained items that need to be reprocessed, but do you know what your stains are, and what you need to do to remove them? It is a very important part of your process to identify the general classifications of your stains, just to make sure that you understand what it may take to keep your stain counts in control.

STAIN AUDITS:

It is recommended that periodically you perform a stain audit by evaluating your latest collection of stained or rewash items. This will allow you to better understand what types of stains you are encountering and to what degree. First you need to classify your stains into four general categories:

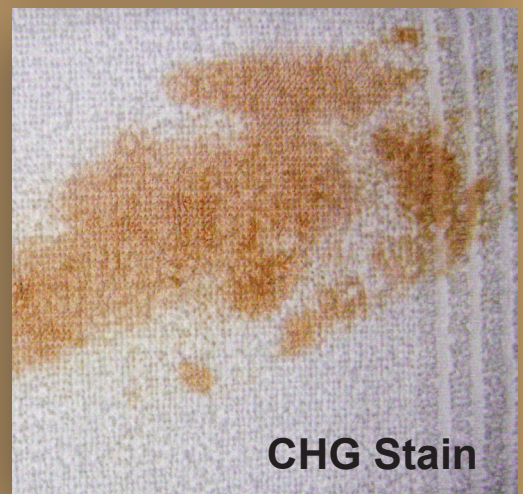
- 1| Typically removable stains:** This class includes stains that are usually bleachable: Food soils, blood or other bodily fluids, mildew. And also soils that are alkali and detergent soluble, such as fats, greases and other organic soils
- 2| Special stain processing required:** These soils include rust, fugitive or transferred dyes, adhesives, cosmetics, inks, etc.
- 3| Non-reclaimable stains:** These stains are usually due to linen abuse and include concrete stains, metal stains, and some medicines
- 4| Post-wash/non-stain items:** These items may end up in your “rewash” carts due to errors in finishing, such as ironer misfires, wrinkles, items dropped on the floor, lint or paper residue, etc.



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Chlorhexidine Gluconate (CHG) or Rust Stains

Skin sanitizers that contain CHG such as Hibiclens® or Chloraprep® have long been a problem in healthcare laundries. Hibiclens has a characteristic pink color when it is fresh, Chloraprep is colorless. However, when laundered in the presence of chlorine bleach, CHG stains transform into a permanent brownish colored stain that cannot be removed. Because of this many healthcare laundries have transitioned to oxygen bleach because it does not affect CHG the same way. Many times CHG stains can be confused with rust stains. In the accompanied photos you can see the color differences between the two stains. Rust stains have more of a red-orange look. CHG looks more tan-brown. Plus you can see that many times rust stains are irregular in shape and color intensity. CHG stains look like a liquid has soaked into the fabric, and the stain is fairly even in intensity and color.



Our objective is to reduce category #1, and to develop stain rewash process that minimizes the stained items in category #2 (and possibly even #3). The art to this process is being able to identify stain types with a quick visual check. But, if you need help in learning this art it is recommended that you use a few spotting chemicals to help you learn the stain types. The most common stains are bleachable. To test the effect of bleach on a stain, make a 1-5% solution of concentrated chlorine bleach and use a dropper to test the stain if it decolorizes it is "bleachable." Most bleachable stains are yellowish to tan in color; except blood which has a distinctive red-brown color.

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Grease and oils stains can be affected by solvents. In the lab we can use very volatile solvents to help us identify grease and oils stains, but it is not that simple in a laundry. Sometimes grease or oils stains will affect the absorbency of the textile. A gently placed drop of water may not quickly absorb into the fabric if there is a large oily stain.

Next, you should be able to recognize the typical red-orange of a rust stain. Your laundry chemical service representative should have a couple of test chemicals that he uses to identify iron stains. Ask him to show you how the test works, and see if he or she can loan you some test chemical dropper bottles. Note that blood stains will also test positive for iron.

The next step is to decide how you will process and reclaim these items. Typically, most laundries will send their rewash through another "standard" wash cycle and then evaluate the success of stain removal. Any textiles with persistent stains will be separated into a "reclaim" cart for one final wash cycle before the textile is removed from service. Designing an effective reclaim formula can help you reduce linen replacement costs.

We recommend a stain reclaim formula that starts with a 10-15 minute Oxalic Acid (1-1.5 lbs/cwt) at 160-180°F wash to remove rust stains. Then a few rinses to remove the acid and into a heavy-duty stain wash with high levels of alkali to go after imbedded stains; 10-15 minutes at 165°F. Next comes a few rinses to get the pH down to 10.5 so you can run a chlorine bleach cycle with 200 ppm active chlorine for 10 minutes at 150°F. Next comes several rinses to make sure all the residual chemistry is rinsed out and into extract and finishing. This

type of wash formula has great success at removing many stains, including even some stains caused by abuse or mishandling.

After you run a few stain audits over the course of a few months you should get a good

idea as to what your greatest challenges are. If you have a high level of category #3, perhaps you need to run a linen handling training session to reduce abuse and mis-use. If you have a high level of category #1, you should discuss options with your laundry chemical service representative and see if the standard wash formulas need to be modified.

The better you understand your stain problems, the more effective you can be in controlling your overall quality.

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