U S Chemical

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Stain Treatment Guide

Helpful Tips for the U S Chemical Training Department

INTRODUCTION TO STAINS

Stains are discolored areas on a fabric. They come in all shapes and sizes. All stains have color, even if that color is white. There is no such thing as a colorless stain. Attempting to identify what has caused a stain on a piece of fabric can be a difficult process. The best way to identify reoccurring staining is by surveying the environment and working backwards through the fabric use cycle to identify where the staining is occurring. Once this is determined, then identifying what is causing the staining is considerably easier. If this process cannot be performed, then identifying the stain is often a matter of observing the appearance and color of the stain. While there is some guesswork involved, with training many conclusions can be reached by critically evaluating the appearance of the stain.

Stain removal can be thought of as a process using the following steps:

1. **Identify the stain**
2. **Pretreat the stain (prespotting or presoaking)**
3. **Launder in a normal cycle of break, suds and bleach**

CONTACT STAINS

The majority of stains are caused by contact of the fabric with another material. This contact transfers a portion of the material (or dye from the material) to the fabric, discoloring it. Contact stains can usually, but not always, be removed through proper fabric treatment.

When inspecting a stain, the shape of the stain is often significant. Holding up the fabric to the light may reveal a hand imprint, indicating that the fabric was used to wipe something. The stain may have distinct sharp angular edges, indicating that the fabric was folded while wiping a material or that an object was rolled across the fabric. This is common for stains caused by carts rolling on fabric lying on the floor or concrete stains caused by an object lying on a fabric lying on the floor. Circular or oval stains indicate that a material dripped or splashed onto the fabric.

DIFFERENT TYPES OF STAINS

There are **four** basic categories of stains:

1. **GREASE AND OIL BASED** (animal or vegetable derived). This is generally the largest category of stains and includes body oils, greases, many foods and some cosmetics. They respond well to break, suds, solvents and sometimes enzymes.
2. **OXIDIZABLE.** These stains are caused by the color based materials found in food, medicine and many cosmetics. They respond well to chlorine or oxygen bleaching if done at higher concentrations than are found in a normal washing cycle. Bleaching, especially in higher concentrations, can damage the fabric so care must be used.
3. **METALLIC.** Iron or rust stains are the most common stains of this type. Other metals can also cause staining, such as copper, manganese, aluminum, iron and stainless steel. They respond well to rust removing products and most delimers.
4. **REDUCIBLE.** These stains are generally dyes found in hair preparations or fugitive dyes that respond well to reducing bleaches, such as the powdered IND/COM Rust Remover.

STAIN IDENTIFICATION BY COLOR

Often the source of staining can be determined by the color of the stain. Different types of materials that can cause stains are common in certain types of facilities. The four most common facility types in institutional laundering are: food service, hospitality, health care and education. The materials causing the various colored stains listed below are typical of stains encountered in each type of facility, but are certainly not an exhaustive list for each type of facility. For each type of facility listed on the following pages, the various colored stains can be caused by a variety of materials.

The stain chart in this brochure lists the products to use in pretreatment and also some general comments about the stain. If the stain is to be presoaked, the presoaking should be done overnight in warm, not hot, water. If prespotting is being done instead of presoaking, the fabric must be wetted first and then the chemical is applied directly to the stain. Applying chemicals to dry fabric can cause fabric damage. After prespotting or presoaking, the fabric can be laundered in a normal cycle. Also please note the recommendations herein are designed for use on 100% cotton or cotton/polyester blends typical of the fabrics found in an institutional laundry.

In some cases, especially if stains have been dried into the fabric in a heat dryer, the stains may not be removed completely in one stain treatment process. The presoaking and laundering procedure may need to be repeated several times before the stain is completely removed. In some cases, especially with waterproof makeup, the stain cannot be completely removed without damaging the fabric. If this is the case, future handling of fabric should focus on treatment before the initial laundering. When bleach is recommended in washing, oxygen bleaches should be used for colored fabrics. Chlorine or oxygen bleach can be used for white fabrics. On whites, chlorine bleach gives better overall stain removal.

STAIN	TREATMENT METHOD & COMMENTS
Activated Charcoal	Presoak in surfactants, use bleach in wash. This soil is an inert particulate and needs high levels of mechanical action.
Adhesive Tape	Presoak in solvents and surfactants. The solvents emulsify the glue from the tape.
Albumin	Presoak in alkalinity, enzymes and surfactants using warm (not hot) water.
Aluminum	Presoak in solvents and surfactants and wash. Then presoak in Powdered Rust Remover and wash a second time. This metal stain is usually greasy and needs separate treatments to completely remove the stain.
Animal Fats	Presoak in alkalinity and surfactants. The alkalinity saponifies the fats.
Asphalt	Presoak in solvents and surfactants. The solvents will emulsify the hydrocarbons.
Balsam of Peru	Presoak in solvents and surfactants. This is an oil based medicinal stain.
Beer	Presoak in surfactants. Use bleach in wash.
Betadine	Presoak in an antichlor. The thiosulfate antichlor removes the iodine stains.
Blood	Presoak in enzymes and surfactants in cool water. Blood is tough to remove if dried. The wash cycle should include a cold water flush. Hot water sets blood stains.
Butter/Margarine	Presoak in solvents and surfactants. The oils must be emulsified.
Carbon	Presoak in surfactants. Use bleach in wash. This soil is an inert particulate and needs high levels of mechanical action.

STAIN	TREATMENT METHOD & COMMENTS
Chewing Gum	Presoak in solvents and surfactants. Freeze the gum with ice first. Scrape off the frozen gum and then pretreat with chemicals.
Chocolate/Cocoa	Presoak in surfactants. Use bleach in the wash. The particulates must be emulsified.
Clay	Presoak in surfactants and alkalinity. This soil is an inert particulate and needs high levels of mechanical action.
Coffee	Presoak in surfactants. Use bleach in the wash.
Concrete/Cement	Presoak in Liquid Laundry Sour and Rust Remover or Powdered Rust Remover. These stains are tough to remove and the acid may damage the fabric.
Cosmetics	Presoak in solvents and surfactants. These stains are tough to remove if dried. Some of the newest waterproof cosmetics can be impossible to remove, especially if heat dried.
Crayon or Marker	Presoak in solvents and surfactants. The soils must be emulsified or bleached during the cycle.
Cuffs or Collars	Prespot or presoak in enzymes and surfactants. Prespotting usually works better.
Diapers	Presoak in enzymes and surfactants. Stains are tough to remove if dried.
Dye	No presoaking. Wash with bleach. Bleaching may cause additional damage and dye loss to fabric.
Egg	Presoak in alkalinity, enzymes and surfactants. Presoak in warm (not hot) water.
Fecal Matter	Presoak in surfactants, alkali and enzymes. Stains are tough to remove if dried.

STAIN	TREATMENT METHOD & COMMENTS
Felt Tip Marker	Presoak in solvents and surfactants. Use bleach in washing.
Fingernail Polish	Presoak in solvents and surfactants. Long presoaks and repeat treatment are often needed as the polish puts layers of strong resins or polymers on the fabric.
Fish Oil	Presoak in enzymes, surfactants, solvents and alkalinity. Fish oil is albumin and oil.
Floor Wax/Finish	Presoak in solvents, surfactants and alkalinity. Longer soaking is needed if dried onto fabric. The finish puts a layer of strong polymer on the fabric.
Food Soils, Misc.	Presoak in enzymes and surfactants. Stains are tougher to remove if heat dried.
Glue, Protein, White	Presoak in solvents, surfactants and alkalinity. Stain removal is poor on the stronger epoxy in some glues.
Granulex	Presoak in solvents and surfactants. Use bleach in the wash. This is an oily, greasy soil.
Grass	Presoak in enzymes and surfactants. These stains are tougher to remove if aged.
Grease, Food Based	Presoak in alkalinity, solvents and surfactants. Strong alkalinity and hot temperatures improve results.
Grease, Synthetic	Presoak in solvents and surfactants. The solvents are very important.
Hibiclens, Hibitane	Presoak in Powdered Rust Remover. Chlorine bleach sets Hibiclens stains, so use chlorine bleach carefully.
Ice Cream, Milk	Presoak in surfactants, alkalinity and enzymes. Enzymes are optional. Use bleach during the cycle.
Ink	Presoak in solvents and surfactants. Use bleach in washing.
Iodine	Presoak in antichlor. The thiosulfate antichlor removes iodine stains.
Iron or Rust	Presoak in Powdered Rust Remover. Fabric may need multiple treatments.
Ketchup	Presoak in surfactants. Use bleach in the cycle. This is usually not difficult to remove.
Kitchen Rags	Presoak in alkalinity, solvents and surfactants. Strong alkali and hot temperatures improve results.
Lacquer	Presoak in solvents and surfactants. A nitrocellulose layer is put down by the lacquer.
Lipstick	Presoak in solvents and surfactants. Stains are tougher to remove if dried. There are many types of lipstick. Some of the waterproof ones are impossible to remove completely.
Mayonnaise	Presoak in alkalinity, enzymes and surfactants.
Medicinal, Unknown	Presoak in solvents, surfactants and alkalinity. Use bleach during the cycle. Another method would be to use a Powdered Rust Remover and then wash normally.
Merthiolate	No presoaking, use strong chlorine bleaching in wash.
Metal Stains	Presoak in Liquid Laundry Sour and Rust Remover or Powdered Rust Remover. This may damage the fabric.
Methylene Blue	Presoak in solvents and surfactants. Use bleach during the cycle. This medicinal stain is tough to remove if dried.
Mildew	No presoaking needed. Wash with a strong solution of chlorine bleach.
Molasses	Presoak in solvents, surfactants and alkalinity. Use bleach during washing.
Mud	Presoak in solvents and surfactants. Rinse fabric. Then presoak in Powdered Rust Remover. Remember to rinse between soakings, then wash normally.

STAIN	TREATMENT METHOD & COMMENTS
Mustard	Presoak in solvents and surfactants. Use bleach in the wash. The yellow in mustard is tumeric, a natural yellow dye that is bleachable.
Oil, Natural	Presoak in alkalinity. Strong alkalinity and hot temperatures saponify the stain.
Oil, Synthetic	Presoak in solvents and surfactants. Long presoaking times are important.
Paint, Oil Based	Presoak in solvents, surfactants and alkalinity. The solvents are very important.
Paint, Water Based	Presoak in alkalinity and surfactants. Also adding solvents may help.
Paraffin (Wax)	Presoak in solvents and surfactants. The solvents are very important.
Perspiration	Presoak in solvents, surfactants, alkalinity and enzymes. Wash normally.
Petroleum Jelly	Presoak in solvents and surfactants. The solvents are very important.
Red Clay	Presoak in Powdered Rust Remover, rinse fabric, then presoak in alkalinity and surfactants. Remember to rinse between soakings and then wash normally. Iron makes the clay red. This soil is an inert particulate and needs high levels of mechanical action.
Rouge	Presoak in solvents and alkalinity. Rinse the fabric, then presoak in Powdered Rust Remover. Remember to rinse between soakings, then wash normally.
Rust Stains	Presoak in Powdered Rust Remover or Liquid Laundry Sour & Rust Remover. The strong acid of the sour may damage the fabric.
Salad Dressing	Presoak in solvents, surfactants and alkalinity. The solvents are very important.
Scorch Marks	Presoak in surfactants. Use bleach in the wash. Finishing equipment temperatures that are too high often cause these tough to remove stains.
Shoe Polish	Presoak in solvents, surfactants and alkalinity. The solvents are very important.
Shop Grease	Presoak in solvents and surfactants. The solvents are very important.
Silicone	Presoak in solvents and surfactants. The solvents are very important.
Silver Nitrate	No presoaking needed. Wash with bleach. Stain is mostly bleachable. Sometimes stain removal is enhanced by adding table salt to the wash.
Smoke	Presoak in solvents, surfactants and alkalinity. Tar and resin from the tobacco need to be removed. Use bleach in the cycle.
Soot	Presoak in surfactants. Use bleach in the wash. This soil is an inert particulate and needs high levels of mechanical action.
Tannin	No presoaking needed. Wash with bleach. With washing, stain is mostly bleachable. Aged stains are much tougher to remove.
Tar	Presoak in solvents and surfactants. The solvents are very important.
Urine	Presoak in enzymes, surfactants and alkalinity. Wash with a strong bleach solution.
Vegetable Fats	Presoak in surfactants and alkalinity. The alkalinity saponifies the fats.
Vomit	Presoak in enzymes, surfactants and alkalinity. Wash with a strong bleach solution.
Wax (Paraffin)	Presoak in solvents and surfactants. The solvents are very important.
Wine	Presoak in enzymes and surfactants. Wash with a strong bleach solution.

STAIN IDENTIFICATION BY COLOR

FACILITY	STAIN COLOR	POSSIBLE CAUSES
FOOD SERVICE	**Black**	Cigarette Ash, Mildew
	Blue	Ink, Wine
	Brown	Animal fats, Beer, Chocolate, Cocoa, Coffee, Cooking oil, Grease, Rust/Iron, Wine
	Gray	Concrete
	Green	Metal salts
	Purple	Wine
	Red	Lipstick
	Yellow	Animal fats, Chlorine, Cooking oil, Cosmetics, Grease, Sizing
HOSPITAL	**Black**	Cigarette Ash, Ink, Mildew, Shoe Polish
	Blue	Ink, Wine
	Brown	Cosmetics, Grease, Rust/Iron, Wine
	Gray	Concrete
	Green	Metal Salts
	Purple	Wine
	Red	Lipstick
	Yellow	Body Oil, Chlorine, Cosmetics, Sizing

FACILITY	STAIN COLOR	POSSIBLE CAUSES
EDUCATIONAL	**Blue**	Ink
	Black	Cigarette Ash, Mildew, Shoe Polish
	Brown	Blood (after washing), Dirt, Grease, Rust/Iron
	Green	Grass, Metal Salts
	Red	Blood (prior to washing), Lipstick
	Yellow	Body Oil, Chlorine, Cosmetics
HEALTH CARE	**Black**	Ink, Mildew
	Blue	Ink, Methylene Blue
	Brown	Betadine, Blood (after washing), Cosmetics, Granulex, Grease, Hibiclens (after washing), Iodine, Rust/Iron
	Gray	Concrete
	Green	Metal Salts
	Orange	Betadine, Hibiclens (prior to washing)
	Red	Blood (prior to washing), Hibiclens (prior to washing)
	White	Alkaline damage, Benzoyl Peroxide, Chlorine damage
	Yellow	Balsam peru, Body Oil, Castor Oil, Chlorine, Cosmetics, Granulex, Iodine

Stain removal must also be seen in the context of the overall rewash rate for a facility. When the rewash rate is high, ordinary soils are not being removed. Increasing the chemical levels alone may lower the rewash rate. In instances where small numbers of items are coming through stained, investigation needs to be done to see if these items had other uses which contributed to the difficulty of stain removal. In some cases, disposable rags and towels can be used more cheaply than the money spent to treat and rewash these items. In other cases, rewash is more desirable. The facility manager and the type of program in place will dictate what are acceptable rewash rates. Some facilities rely on the rewash to generate the rags they need for other cleaning. Everything has a cost and it is up to the laundry specialist to help the laundry manager balance the costs for rewash with the costs for the rest of the program in place.

Lastly, to aid in selecting the appropriate U S Chemical products, what follows is a list of the product types by category and the products in that category. A generic term used to describe products with the listed active ingredients is given in parenthesis following the active ingredients. Liquid products have a (L) before the name and powders have a (P).

Alkalinity
(Breaks)

- L USC Liquid Builder Plus
- L USC Liquid Laundry Break
- L NEXUS™ Break
- L USC Premium Break
- L Ultra Active® Break
- P IND/COM® Break

Alkalinity & Surfactants
(Built Detergents)

- L USC Compac
- L USC Blue Star
- L USC Combo
- L NEXUS™ Built Detergent
- P USC All Temperature Laundry Detergent
- P USC Suds
- P IND/COM® Built Detergent
- P IND/COM® Suds

Alkalinity, Enzymes & Surfactants
(Specialty Products)

- P USC Re-Nu
- P IND/COM® Enzyme Detergent

Alkalinity, Solvents & Surfactants
(Specialty Products)

- L USC Laundry Prespotter

Antichlor (Specialty Product)

- L USC Liquid Antichlor

Bleach
(Chlorine Based)

- L USC Liquid Laundry Destainer
- L NEXUS™ Destainer
- L Ultra Active® Destainer +
- P IND/COM® 3.7% Chlorine Bleach
- P IND/COM® 10% Chlorine Bleach
- P IND/COM® 16% Chlorine Bleach

Bleach
(Oxygen Based)

- L USC Liquid Oxy Bleach II
- L USC Liquid Oxygen Bleach
- L Ultra Active® Oxy Bleach
- P IND/COM® Oxygen Bleach

Rust/Metal Treatment Products
(Specialty Products)

- L USC Liquid Laundry Sour and Rust Remover
- L NEXUS™ Sour
- L Ultra Active® Sour
- L USC Liquid Sour Plus
- L USC De-Iron
- L USC Premium Sour
- P IND/COM® Rust Remover

Surfactants
(Suds Products)

- L USC Fresh and Clean Laundry Detergent
- L USC Liquid Laundry Suds
- L USC Premium Suds
- L USC Premium Suds EC
- L USC Premium Enzyme Suds EC

Surfactants & Enzymes
(Specialty Suds Products)

- L Ultra Active® Suds +

Surfactants & Solvents
(Specialty Suds Products)

- L USC Merit
- L NEXUS™ Suds
- L Ultra Active® Suds
- L Ultra Active® Prespotter
- L USC Liquid Laundry Emulsifier and Presoak
- L USC Concentrated Laundry Emulsifier

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