

STAIN REMOVAL

Stain is spot or mark of discolouration left on fabric by the contact and absorption of foreign substances. Stain removal and 'spotting' is a skill, which calls for long experience and demands special attention. Two essential factors to be considered in stain removal are—

- Composition and colour of fabric
- Nature and age of stain.

General rules for stain removal: -

- **Identify the stain-**
- **Classify stain**
- **Select reagents to be used**
- **Select procedure to be used**
- **Proceed step by step to remove stain**

IDENTIFICATION OF STAINS:-

Identification of stains helps in selecting the reagents and procedures to be used for stain removal. Stains can be classified based on:-

- Based on color- for example a red stain can be of tomato, lipstick, nail polish, blood etc.
- Based on Texture-by touching surface of stain it can be deduced:-
If hard it may be egg; if soft it may be oil, ghee, lipstick; if sticky can be of glue and gum.
- Based on Smell- every stain has a distinct smell like eggs, medicine, food, perfume

II)CLASSIFICATION OF STAINS:-

BASED ON SOURCE:-

- Animal stains- such as blood, eggs, milk, meat etc
- Vegetable stains- these are caused by plant products such as tea, coffee, juices, fruit etc
- Grease and oil stains- These stains are from grease or some pigmented matter eg. Butter, oil, paint, tar, grease.
- Mineral stain- These stains are caused by rust, writing ink, medicines.
- Dye stains- Caused by henna, tobacco, chocolate, tea, coffee etc.
- Wax stains- Caused by nail polish, lipstick and shoe polish
- Acidic stains- these include vinegar, perspiration, urine, medicines etc.

BASED ON DEGREE OF ABSORPTION:-

- Absorbed stains- the stains which penetrate the fabric completely like ink, tea, coffee, syrup
- Built up- These stains which leave residue on top of fabric like lipstick, nail polish, chewing gum, chocolate
- Compound- when it is combination of both of above

III)STAIN REMOVING AGENTS:-

There are five main stain removing agents: -

- ❖ Organic solvents
- ❖ Acids
- ❖ Alkalis
- ❖ Bleaches
- ❖ Enzymes

i)Organic solvents – These dissolve grease and require care because they are inflammable and harmful if inhaled. Generally, it does not harm any fibres or dyes. When using, an absorbent cloth should be placed underneath and work from the outside of the stain inwards.

E.g. Flammable-benzene, acetone, amyl acetate, methylated spirit, white spirit,

Non inflammable-Carbon tetrachloride(Ccl4), Perchloroethylene(PERK), trichloroethylene. These take out stains like chewing gum (after scraping), grease, oil paint, lipstick, ballpoint ink, etc.

ii)Acids –Dilute acids can be used on most white fabrics, but most coloured ones get affected. They affect all animal fibres. It is always better to use weak acidic solutions several times than using stronger acidic solution. After treatment, wash using detergent or thorough rinsing should be done. eg. Acetic acid, Citric Acid, Oxalic Acid.

Acids remove metal stains (specially iron moulds, rust and iron stain left by blood).

iii)Alkalis – Alkalis remove old and heavy vegetable stains (tea, coffee, wine, etc.) from white linen or cotton effectively. Animal fibres may be adversely affected by it. E.g. soda, borax.

iv)**Bleaches** – Bleaching is the process in which a coloured substance is changed into a colourless one. Bleaching weakens fabrics; hence extreme care should be taken.

Oxidizing bleaches liberate oxygen from the stain and render it colourless. Most commonly used is Sodium Hypo chlorite. It removes obstinate stains in white cotton and linen but it ‘fixes’ iron stains. Hydrogen Peroxide is slower acting and is used on white fabrics. Sodium per borate is the bleach present in most detergents and safe on most fabrics.

Reducing bleaches remove oxygen from the stain and add hydrogen to the coloured stain rendering it colourless. Sodium hydrosulphite is the most commonly used one. It is used on white clothes for removal of iron stains and stripping dyes.

v)**Enzymes** – Enzymes like powdered pepsin are used to remove protein stains like egg, perspiration, blood, etc. at a temperature of 40-50 degrees.

IV)STAIN REMOVAL METHODS:-

According to mode of action:-

a)Solvent action- Here solvent or water is able to dissolve the stain like ball point ink stain.

b)Mechanical action:- This dislodges the stain without dissolving it.

c)Chemical action- Chemicals produce an oxidation or reduction reaction which helps to remove the stain.

d)Absorption- Certain powders such as fullers earth are able to absorb the stain like grease and oil.

According to method of application:-

a)Drop method- the stained part of the fabric is stretched and small drops of stain removal agents are poured on it with a dropper.

b)Dip method- The stained area of the fabric is immersed in the stain remover solution. This is the ideal method when stain is large or if there are many spots on the fabric.

c)Steam method- Stains on wool, silk or any coloured fabric can be removed by steaming. The stained area is saturated with steam by spreading the cloth over a basin half filled with hot water into which a small amount of appropriate removal agent has been placed.

d)Sponge method- the stain removal agent is applied on the stained area of the fabric with a sponge. This is the most frequently used method of stain removal.

Stain repellants

Fabrics may be treated to make them ‘stain repellent’ by using fluorochemicals like Scotch guard, making it both water and oil repellent. Stains will then stand on the surface and can be blotted away. This finish does not change the colour or texture of the fabric and can withstand dry-cleaning and about five washes but is expensive. Water repellency is induced by the use of silicones like Velan, Drisil, etc. polyurethane is also used as a thin coating sometimes to make fabrics waterproof. Oil-borne stains can be removed easily from these fabrics with solvent cleansers that do not affect the silicone finish.

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| STAIN | WHITE COTTON AND | COLOURED | SYNTHETICS |
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| | LINEN | COTTON, SILK & WOOL | |
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| <u>I. ANIMAL STAIN –</u> | | | |
| 1. Blood (fresh) | Soak in cold water and wash in dilute ammonia | Same as white cotton and linen | Same as white cotton and linen |
| 2. Blood (dry) | Soak in cold saline water | - Do - | - Do - |
| 3. Egg (fresh) | Wash in cold water and then in warm water and soap | - Do - | - Do - |
| 4. Egg (dry) | Apply salt and pour warm water | - Do - | - Do - |
| <u>II. VEGETABLE STAIN –</u> | | | |
| 1. Beverage (fresh) | Pour boiling water through | Steep in warm water and then in dilute borax solution | Steep in warm sodiumperborate solution |
| 2. Beverage (dry) | 1. Spread borax and pour boiling water. 2. Steep in glycerin 3. If stain persists steep in javelle water | Steep in glycerin and rub | - Do - |
| 3. Fruit & Wine (fresh) | Cover the stain with starch paste and leave for sometime. Rub. Pour boiling water through. | 1. Soak in warm borax solution. 2. Soak in salt solution | Steep in sodium perborate solution |
| 4. Fruit and wine (dry) | 1. Spread borax and salt over the stain and pour boiling water through 2. Bleach with javelle water | Sponge with dilute potassium permanganate solution and then apply hydrogen peroxide solution (1:2 with water) | Steep in warm sodium perborate solution. |
| 5. Grass | Steep in Eucalyptus oil or glycerin followed with spirit or washing | Same as white cotton and linen | Steep in kerosene or turpentine. |
| <u>III. GREASE AND OIL STAINS –</u> | | | |
| 1. Butter | Wash with warm soapy water | Cover the stain with French chalk, place the stained portion between clean blotting paper and iron with hot iron | Same as coloured silk and wool |
| 2. Oil and ghee | Wash with warm water and soap | 1. Treat with grease absorbent 2. Spread French chalk. Leave to dry. Brush off. | Same as coloured silk and wool. |
| 3. Candle grease | Scrape off as much as possible. Place stain between blotting paper and iron. Sponge with grease solvent. | Same as white linen and cotton | Same as white linen and cotton. |
| 4. Curry stain (grease & turmeric) | 1. Wash with soap and water. Bleach in sunlight, air and on grass. 2. Bleach with javelle water | Treat with potassium permanganate and ammonia alternatively. | Wash with soap and water. Bleach with sodium perborate. |
| 5. Ice-cream and chocolate | Wash in cold water. Steep in warm borax solution. Sponge with petrol | Wash in cold water and soap. Steep in ammonia solution | Same as coloured silk and wool |
| <u>IV. DYE STAINS –</u> | | | |
| 1. Dye | 1. Steep in water. Wash with soap. Steep in dilute acid or alkali. | Same as white cotton and linen, but for bleaching use hydrogen peroxide | Wash with soap water. Treat with dilute bleaching powder |

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| | 2. Treat with alcohol and ammonia. 3. Steep in cold solution of bleaching powder. | | solution. |
| 2. Ink (black & blue) | 1. Rub the stain with cut tomato, then salt and wash. Repeat till stain goes off. 2. Soak the stain immediately in curd and wash with soap 3. Apply salt and limejuice. Leave to dry and then wash. | Same as cotton and linen | Same as cotton and linen |
| 3. Ball point ink | Sponge with methylated spirit using a padding of blotting paper | - Do - | - Do - |
| <u>V. IRON RUST</u> | 1. Steep in oxalic acid solution and rinse with dilute borax solution 2. Steep in solution of salt and lemon. | - Do - | - Do - |
| <u>VI. WAX STAINS</u> – | | | |
| 1. Nail polish | Apply amyl acetate and rub | - Do - | - Do - |
| 2. Lipstick | 1. Steep in methylated spirit. 2. Soften with glycerin, leave for some time. Wash with soap water. | - Do - | Steep in kerosene / turpentine and wash with soap water |
| 3. Shoe polish | 1. Brush. Apply starch paste and wash with soap water 2. Steep in turpentine and wash with soap water | - Do - | Same as white cotton and linen |
| <u>VII. PRESPARATION</u> | Steep in cold water. Steep in dilute ammonia solution. Bleach in sun with javelle water | Steep in dilute ammonia. Treat with dilute hydrogen peroxide | Same as silk and wool |

AN ALPHABET FOR TREATMENT OF PARTICULAR STAINS
Treatment for all fabrics unless otherwise stated

| <i>Stain</i> | <i>Reagent required</i> | <i>Method of application</i> |
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| Animal stains | Acetic acid Ammonia | In all cases of animal staining on coloured articles (e.g. carpets), the treatment consists of alternate application with a moderately strong solution of acetic acid (up to 20%) and 5% solution of household ammonia. The stains area is thoroughly soaked with the acid for about 2 hours after rinsing the acid with water. The ammonia is applied to ensure complete neutralization |
| Ball point stains | Methylated spirit | Rub lightly with Methylated spirit |
| Boot polish | Solvents Methylated spirit | (boot polish is made by dissolving certain colour in wax). The wax is removed by means of solvent. This will also remove the colour. If the colour still remains, treatment with methylated spirit will completely remove the stain |
| Dye stains | Warm soap solution, ammonia, suitable bleach | Treatment of dye is difficult operation depends on nature of fabrics, its colour, nature of stains. The greatest success is obtain on white materials. White wool: i. treat with warm soap solution containing S.F.A. for half an hour. Repeat if improvement is seen. ii. Treat with 1% of 88 ammonia containing the trace of S.F.A. use almost boiling point. iii. Treat stains with hot solution hydrosulphite solution (1oz. per gallon). iv. Bleach with hydrogen peroxide solution. Leave it in contact with material for ½ - 1 hour. White silk: i. Treat with hot soap solution with little S.F.A. The time of application must be only 10-15 minutes. ii. Bleach as for wool. Try hydrosulphite solution first and then |

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| | Warm soapy solution Alkali or acid suitable bleach | hydrogen peroxide. White cotton and linen: Soap either in dilute alkali or dilute acid. Some dye stains respond to one, and some to other. Strong alkaline liquors and higher temperature are permissible on these fabrics. Immerse the article in hot (nearly boiling) sodium hydrosulphite solution (4 oz. per gallon) for 5-10 minutes. |
| Food Stains | Javelle Water Chlorinated water | On Cotton and Linen i. Treatment with Laundry bleach (sodium hypochlorite sol. or Javelle water) ii. A weak solution of the above for a long time is the safest method. The progress of the treatment should be noted every 15 mins. |
| Glue and Gum stains | Hot water and Glycerin or Acetic acid or Methylated Spirit | Treat with hot water to soften and dissolve the stain. The addition of a few drops of glycerin will assist in the dissolving of stains in some cases, while a few drops of Acetic acid will help in others. Spirit gum must be dissolved by Methylated spirit. |
| Hard-court stains | Hydrosulphite of soda | On white flannels i. Remove with soap and water and brush 'turns ups' by hand. ii. Bleach red colour by solution of hydrosulphite of soda. |
| Iodine | Ammonia solution Photographer's hypo (Sodium thiosulphate) | i. Ammonia solution ii. Photographer's hypo. Dissolve 1 tbsp hypo in ¾ pint water; apply immediately over the mark. |
| Lead pencils stains | Oleic acid Ammonia | i. Generally removed by normal washing. ii. Treat with Oleic acid. Then dip in warm solution of ammonia. |
| Lipstick | Bleach | i. Treat as grease. ii. Bleach. |
| Medicine | Ethyl alcohol Surgical Spirit | Steep in Ethyl alcohol or surgical spirit. Treat any resulting by the usual method. |
| Mercurochrome | Denatured alcohol Glycerin Ammonia and Soap water | Mercurochrome stains are very hard to remove unless treated properly First sponge the stain well with a liquid made of equal parts of alcohol and water. On acetate rayon and coloured materials, use 1 part alcohol and 2 parts water. Next work glycerin into the cloth to help loosen the stain, and continue using as long as any colour doesn't bleed from the stain. Then wash well with soapsuds and rinse with water to which a few drops of ammonia solution has been added. If stain remains after the above treatment, apply 10% acetic acid with the help of a dropper and rinse well in water. |
| Mildew | Javelle water Potassium permanganate, Oxalic acid. | This is formed due to growth of fungus on damp fabric. i. Bleach by sunlight ii. Bleach with javelle water iii. Bleach with potassium permanganate iv. Bleach with hydrogen peroxide Cotton and Linen Use 1oz. Permanganate crystals in 1 gallon water Silk and wool Use ½ oz. Permanganate crystals in 1 gallon water Method: - steep material for 5 minutes until it becomes dark brown. Then remove brown stain by Applying any of the following dilute solution of sulphur acid, or oxalic acid or acidified hydrogen peroxide. Rinse thoroughly in three water. Wash according to material. Mildew proofing: The following house hold recipe is helpful to give a protective finish against mildew: 1½ oz. of cadmium chloride (poison), 1 gallon of hot water. All mix together. Method: wash fabric in a neutral soap. Do not rinse out the soap. Apply the above solution. |

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| | | This finish will withstand several laundering |
| Mineral stains | Oxalic acid Bleach Lime juice Salts of lemon Sour milk Oxalic acid Borax Ammonia Bleach Iodine solution Sodium thiosulphate | <p>Iron rust</p> <ol style="list-style-type: none"> 1. Spread mild acid, e.g., milk, lemon, vinegar or salt of lemon; pour boiling water through. 2. Use oxalic acid solution for obstinate stains. 3. Use of bleach. <p><i>Note:</i> - Iron rust stains should be removed before the fabric is wetted as dampness spreads the stain. Avoid javelle water, as it fixes iron rust into the fabric.</p> <p>Ink, black; quink fresh</p> <ol style="list-style-type: none"> 1. Wash out as much as possible or soak the stain in limejuice, curds or sour milk overnight. Then wash out. 2. Spread salt of lemon over the stain. Pour boiling water through. Wash and boil. 3. Bleach in hot solution of potassium permanganate and use oxalic acid solution to remove the brown stain. <p>Red ink</p> <ol style="list-style-type: none"> 1. Steep in borax solution (¼ pint warm water with 1 tsp. Borax). 2. Steep in ammonia solution. 3. Bleach according to fabric. <p>Marking ink</p> <ol style="list-style-type: none"> 1. Steep in iodine solution and follow by steep in sodium thiosulphate solution. 2. Wash. 3. Bleach according to fabric. |
| Nail varnish | Acetone Sodium hydrosulphate | <ol style="list-style-type: none"> 1. Use acetone. (Do not use acetone on rayon) 2. Bleach with sodium hydrosulphite. |
| Nose drops | Solvent acetic acid | (Consists of eucalyptus oil and menthol) Use a solvent. Further treat with water containing few drops of acetic acid. |
| Orange juice | Glycerin Hydrogen per-oxide | <ol style="list-style-type: none"> 1. Wash with hot soapy water. Rinse. 2. For obstinate stains, apply glycerin to the stained area. Rinse thoroughly. 3. Apply hydrogen peroxide. Rinse thoroughly after a while. |
| Paint | Turpentine Methylated spirit | Scrape and steep in turpentine. Any resulting colour stain should be washed out. Strip if necessary. Varnish and lacquer paint will dissolve in Methylated spirit. (Paint stains are easily removed when wet.) |
| Perfume | Methylated spirit Acetic acid | (Consists of alcohol and essential oils) <ol style="list-style-type: none"> 1. Remove oil by dry-cleaning or with Methylated spirit and water, or a weak solution of acetic acid. 2. If dye is affected, strip and re-dye. |
| Perspiration | | Same as mildew |
| Protein | Cold water bleach | (Milk, eggs, blood, etc.) For vegetable fibres Steep in cold water or tepid salt water, wash and boil. For animal fibres <ol style="list-style-type: none"> 1. Soak in tepid salt water and wash 2. Hydrogen per-oxide bleach 3. Hydrosulphite bleach (for human blood avoid hydrogen peroxide) <p>Non-washable fabric</p> <ol style="list-style-type: none"> 1. Cover stain with paste of starch and cold water. Leave for a short time to absorb the stain. Repeat if necessary. |

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| | | <ol style="list-style-type: none"> Hydrosulphite bleach Hypochlorite bleach. (For human blood avoid hypochlorite) |
| Rouge | Petrol Ammonia | Apply petrol to remove grease. Wash with hot soapy water and a few drops of ammonia. Rinse thoroughly. |
| Sealing wax | Methylated spirit | Soften with Methylated spirit and dissolve in warm dry-cleaning solvent |
| Scorch | <ol style="list-style-type: none"> Sunlight and soapy water Hydrogen peroxide Potassium permanganate | <ol style="list-style-type: none"> When fibers of the material are burnt, bleaching is the only method, which is effective. When light remove by gently brushing the surface and then rewash the article. Bleach in sunlight. Bleach with hydrogen peroxide or potassium permanganate or other chemical bleaches according to fabric for scorch. <p>Scorch mixture: 2 oz. washing soda... ½ pint vinegar. 2 oz. fuller earth..... 1 onion</p> <p><u>Method:</u></p> <ol style="list-style-type: none"> Peel, slice and pound the onion. Mix with other ingredients. Boil for 30 minutes. Strain and bottle |
| Tar | Oil Grease-solvent | Spread a little on scorch; let it dry and repeat until mark disappears. <ol style="list-style-type: none"> If necessary scrap first. Rub with oil or grease using a clean cloth and working from edge of stain. Treat material with grease-solvent. |
| Transfer | Methylated spirit, Ethyl alcohol, Hot soapy water | Steep in surgical spirit or ethyl alcohol; wash according to fabric |
| Turmeric Kumkum | Sun and grass Hydrogen peroxide | <ol style="list-style-type: none"> Soak in soapy water and dry in sun on grass Apply a few drop of hydrogen peroxide, leave for few minutes, rinse thoroughly and dry in sun. |
| Vegetable (tea, coffee, cocoa, beer, fruit, wine) | | <p>For vegetable fiber <u>Fresh</u> – Pour boiling water through the stain. <u>Old</u> – 1. Steep in boiling water containing soda or borax or both; or apply glycerine and put into hot soda water 2. Bleach with javelle water. 3. Bleach with sodium perborate.</p> <p>For animal fiber <u>Fresh</u> – Steep in warm water, repeat until stain is removed. <u>Old</u> – 1. Apply glycerine and steep in warm borax or weak ammonia solution. 2. hydrogen peroxide bleach 3. Hydrosulphite bleach (also called photographer's hypo)</p> |
| Varnish | Methylated spirit | Steep in surgical or commercial Methylated spirit. |
| Unknown stain | | Bleaching is carried out. For vegetable and rayon fibres – hypochlorite bleach For animal fibres – hydrogen peroxide bleach If this is not effective, use hydrosulphite bleach for all fibres Fabrics must be thoroughly rinsed after bleaching. |

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